

APPENDICES

A CONTINUATION OF

FEASIBILITY STUDY FOR THE MANUFACTURE OF ZERO GRAVITY

PHARMACEUTICALS, IMMUNOLOGICAL, AND VIRAL AGENTS

(NASA-CR-120425)	FEASIBILITY STUDY FOR	N74-32930
THE MANUFACTURE OF ZERO GRAVITY		
PHARMACEUTICALS, IMMUNOLOGICAL, AND VIRAL		
AGENTS, APPENDICES (Little (Arthur D.),		Unclas
Inc.) 238 p HC \$15.00	CSSL 13H G3/15	48261

National Aeronautics and Space Administration
 George C. Marshall Space Flight Center
 Alabama 35812
 NASA 29874
 8

by

Arthur D. Little, Inc.
 Cambridge, Massachusetts

August 29, 1974

76087



Arthur D Little Inc

APPENDIX 1

USES OF ELECTROPHORESIS IN BIOLOGY AND MEDICINE (UP TO 1970)

The first recorded use of electrophoresis in protein chemistry was the determination by Michaelis in 1909 of isoelectric points of enzymes. In 1937, Tiselius extended Michaelis' work and refined the moving boundary method of electrophoresis to separate proteins according to their electrophoretic mobility. In this method, also known as "free" electrophoresis, the motion of a boundary between a colloidal solution and the solvent is observed, usually by measuring the refractive index of the solvent along the electric field gradient. Although the technique provides an accurate measurement of electrophoretic mobility, it is difficult to use for separation for clinical or fractionation purposes. Since "free" electrophoresis operates without any supporting media, it is difficult to keep the overlapping boundaries separate; gravitational instability and convection causes mixing of the components, and instability of the moving layers results.

These problems of destabilization of separation zones has been overcome by the use of stabilizing anticonvective media. The preferred approach to stabilization is the use of solid media such as paper, powders, or especially, gels such as starch, agar, silica gel, or polyacrylamide gel. The latter gel is the most widely used medium for protein separation.

With the advent of the stabilizing gel media, the uses of electrophoresis in protein chemistry, and particularly in protein analytical chemistry, have multiplied enormously, until it has become one of the most widely used analytical tools in biochemistry.

Several excellent review articles over the past few years have illustrated the particularly wide diversity of applications to which electrophoresis has been applied, ranging from routine clinical diagnostic applications and basic research into the structure of proteins to the use of electrophoresis in the monitoring of adulteration of food products and to forensic science detection work. The review article of R. D. Strickland (Analytical Chemistry, Vol. 42, No. 5) is particularly comprehensive. In the following sub-sections we briefly survey some of the common uses of electrophoresis in biology and medicine.

A. Clinical and Diagnostic Chemistry

Electrophoretic analysis of body fluids provides a rapid and sensitive method of detecting a number of disorders.

Urinary protein patterns are useful in the diagnosis of a wide range of biochemical disorders and diseases. In cancer patients, a slow-moving

glycoprotein is characteristically present in the urine which is not found in the urine of normal patients.⁷⁵ Heavy-chain immunoglobulin fragments may also accompany Bence-Jones proteins in myeloma.¹¹⁴ Electrophoretic detection has also been used to screen for amino acidurias and for abnormal excretion of amino acids and sugars in urine.^{46, 113, 147} Similarly radioiodine coupled with electrophoretic separation has been used to detect and measure picogram amounts of protein in the urine.⁷⁰ Urine gamma globulin in elevated amounts is found by electrophoresis in the patients suffering from lupus-erythematosus.³²

Electrophoresis of cerebrospinal fluid has been used for the detection of multiple sclerosis; ^{14a} in the active phase of the disease, cells from the cerebrospinal fluid have been shown to produce a unique immunoglobulin which is not found in normal subjects, nor is it found in multiple sclerosis patients during periods of remission of the disease. These findings have provided evidence that the disease is caused by autoimmunity. Other changes in electrophoretic patterns of cerebrospinal fluid proteins have also been found in glycoproteins, and the diagnostic significance of these are currently under study.

Electrophoretic separation and analysis of gastric juice proteins have shown that the albumin level of gastric juice is elevated in anemia, gastric cancer and gastritis. The distribution of proteins and microproteins in duodenal fluid have been shown to be markedly changed in patients suffering from cystic fibrosis.

Electrophoretic patterns of human serum have been used for a number of diagnostic applications. The first sign of liver cirrhosis, for example, is a rise in β_{2A} -globulin, and a new zone in the γ -globulin region of cirrhotic serum has also been shown under special applications.^{33, 57} In other types of liver disease, special types of hyper-gamma globulinemia have been shown to occur, and the significance of these is currently under study.¹⁶

Electrophoretic patterns of maternal serum has been shown to differ in pre-toxemia, and periodic electrophoresis of toxemia-prone pregnant women has been used as a screening test to detect the onset of toxemia as early as possible.²² Electrophoresis has also been used to detect extremely dilute antibodies in serum, as well as dilute antigens such as gonadotropins.¹²⁴ Immunoelectrophoresis has also shown abnormalities in the α , γ , and β globulins in the serum of children with systemic lupus erythematosus.¹³²

A great number of other diseases have been shown to give slightly or greatly abnormal electrophoretic patterns in serum. For example, Banti's disease (congestive splenomegaly) has been shown to display lowered albumin content, while globulins are elevated.¹²⁶ Niemann-Pick's disease, a hereditary disease characterized by a set of syndromes involving the liver, spleen, lungs, nervous system, etc., results in greatly diminished levels of lipoproteins in serum. Acute tetanus

causes a great increase in α , β , and γ globulins. 149 A number of other electrophoretic tests have been found especially useful in the diagnosis of a range of cancers. Diagnosis of myeloma 115 and differentiation between myeloma and Waldenstrom's macroglobulinemia^{38, 122} have relied heavily on electrophoresis. Leukemia leukocytes have been shown to have a unique antigen present,⁶⁴ while reversal in the ratio of α_1 to β globulin vitamin B₁₂ binding can be detected by electrophoresis, and is used to diagnose chronic myelogenous leukemia. 100

Generally in many cases of cancer, significantly elevated levels of glycoprotein have been shown in the serum. 8

Other diseases in which abnormal patterns in serum occur include:

leishmaniasis (infantile splenomegaly caused by a mediterranean parasite) in which the electrophoretic pattern shows greatly elevated IgG and slightly elevated IgA and IgM 90 ;

typhoid, in which carriers have been shown to be notably low in IgM and high in IgG 121 ;

ulcerative colitis, in which α_1 and α_2 proteins have been shown to be elevated, and cryoproteins containing IgG and IgM have been shown to be present 108, 116

and a variety of other common and obscure diseases.

Electrophoresis has been extensively used for the detection of genetic and disease-induced protein abnormalities in blood, particularly hemoglobin. These include sickle-cell anemia,⁸⁰ hemoglobins with diminished 14, 111 and enhanced ⁶⁰ oxygen affinities, and a variety of other hemoglobin variants 63, 118, 127, 148, 139, 94 which may, or may not be associated with a diseased state.

Immunoelectrophoresis of other body fluids used for diagnostic purposes includes:

synovial fluid, in which haptoglobin increases have been shown to be associated with arthritis 79 , as are abnormal distribution of the lactic dehydrogenases. Measurement of the degree of polymerization of hyaluronic acid in synovial fluid is useful for assessing the effects of anti-inflammatory drugs⁶²

amniotic fluid, in which abnormal protein distributions have been used for the detection of toxemia, some congenital fetal malformations and diabetes mellitus²⁷

B. Protein Research

Electrophoresis is extensively used in the investigation of the properties of proteins, including a characterization of their electrical charge, their size, and their degree of homogeneity. Serum albumin, for example, has been shown to separate into two distinct components, and several poorly resolved ones¹²⁰, and considerable research has gone into the investigation of whether these components represent polymerization or depolymerization, and the factors affecting aggregation.

Vitamin binding studies, particularly in vitamin B₁₂, have actively employed electrophoresis.^{49, 56} Most vitamins are bound by the α and β proteins, but albumin has been shown to transport most of the biotin, pantothenate and β -carotene.¹¹

Other proteins which have been studied include clotting factors, serum globulins^{37, 136, 137} enzymes including deoxyribonucleases¹⁴² glycosidases⁸⁷ proteases,^{101, 119} cellulases,² lactases,⁶⁶ carbonic anhydrase⁶⁵ etc.

Milk proteins have been extensively studied, using electrophoresis as one of the major separating and analysis tools.^{52, 97} Studies have shown that protein content in bovine milk varies from breed to breed^{41, 76, 77, 81, 106} and that some protein fractions may be totally lacking in some breeds of cattle⁹⁹. The genetics controlling the variations in milk proteins have been studied in cows^{5, 43, 54, 58, 98, 125} and in other species including buffalos^{51, 93} sheep^{12, 31, 75} and zebus⁶. Human milk has been shown to lack casein present in other mammal milk, while most of the other proteins found in human milk, such as albumin, lipoprotein, glycoprotein, ceruloplasmin, haptoglobin, transferrin, IgA, IgG and IgM^{26, 28, 83, 110} have been shown in cows^{91, 109}, sows⁸⁶ and rats.¹⁰² IgA protein has been shown to be present in particularly concentrated amounts.

Electrophoresis has been used to analyze saliva proteins (parotid saliva, for example, has been shown to contain thirty different proteins¹³³ sweat (where sixteen different plasma proteins have been shown to be present¹³⁸ and tears (human tears have been shown to contain a specific prealbumin^{15, 67} and an IgA that differs from that of serum.

The interactions of proteins, and complex formation has been actively studied with the aid of electrophoresis. Heparin has been shown to form complexes with gamma-globulin and thrombin, but not with albumin and fibrinogen.¹¹⁷ This has lent considerable insight into the understanding of the mechanism of this anti-coagulant in preventing clot formation. Hyaluronic acid has been shown to form a complex with serum albumin that is sufficiently stable to appear as a new electrophoretic peak.¹⁰⁵ The interactions of proteins with ions has been extensively studied. For example, the competitive binding of iron with plasma proteins and chelating agents such as ethylenediaminetetraacetic acid has been studied. The iron has been shown to be removed from

the plasma protein and irreversibly bound to the EDTA.⁴ The EDTA chelating agent has been shown to bind to albumin. Fluoride in serum has been shown to be preferentially and irreversibly bound to albumin¹³⁴, while calcium binding to serum proteins has been shown to be an equilibrium reaction; the extent of binding depends upon both the calcium and the protein concentrations.⁶⁸

The field of enzymology has made particularly widespread use of electrophoresis in the isolation, purification and identification of enzymes, and a number of general reviews have been written on the subject^{85, 89, 146}.

In hormone identification and analysis, a technique has been developed for the separation of free and anti-body bound hormones¹²³. Electrophoresis has been used to analyze the purity of hormones. Commercial preparations of insulin, for example, have been shown to have several slowly-migrating fractions.⁹ Insulin has been shown to circulate in the blood stream bound mostly to α 2-globulin.

C. Detection and Analysis

(1) Food Applications

Electrophoresis has been used in the analysis of a number of commercial food applications to assess purity and protein content. The egg content of noodles can be determined electrophoretically,¹²⁹ and the presence of egg white in commercial preparations of egg yolk can be detected.^{104a} Electrophoresis is particularly useful--and has been widely used--to distinguish between species of fish in commercial products^{30, 36, 84, 88, 135}

Because the types of protein in mammalian milk has been so extensively evaluated (see above), adulteration of one milk with that from another species can be detected. Adulteration of cow milk with goat milk for example^{50, 21} or buffalo milk with cow milk^{3, 42} has been reported. Similarly, adulteration of cheeses can be detected. Classic Roguefort cheese, for example, is from sheep, while Blue cheese is from cow milk.⁷ Adulteration of Roguefort with Blue has been documented. It has been reported that Swiss cheese aging can be followed by observing the variations of its proteins.⁴⁰

Electrophoresis can also be used for the detection of milk protein adulteration of meat products. This is particularly common in meat by-product products such as sausage and meat patties.¹³⁰

Electrophoresis is useful in the analysis of cereal grain products. It has been proposed to replace the inexact "dropping number" method of evaluating bread grains,¹¹² and has been used to detect the changes in barley proteins in beer fermentation.⁵⁵

In the wine and cider industry, electrophoresis has been used to distinguish between sparkling and carbonated wines by measurement of aspartic and glutamic acid contents³⁵ and to detect apple cider adulteration of wine.²⁵

(2) Forensic Science

Electrophoresis has been particularly useful in the detection of toxins after autopsy.¹⁷ These include digitoxin, barbiturates, and other drugs. A rapid method for identifying bloodstains by immunoelectrophoresis has been developed.³⁹ Sperm can be identified electrophoretically by its characteristic pattern,¹⁴⁰ by confirmation of the presence of spermine,²⁴ or by demonstrating the presence of lactic dehydrogenase X.⁴⁷

Toxins such as insecticides have been detected for as long as twelve days after death.²³

(3) Pharmacology

Electrophoresis has been used in a number of pharmacological applications to measure purity of drugs, and to separate components. It is routinely used to measure purity of plasma protein fractions such as human albumin,¹⁰³ gamma globulin preparations, etc.

Anti-biotics such as streptomycin and its derivatives and the erythromycin derivatives have been separated by electrophoresis.^{73, 72, 82}

In the analysis of compound medicinals, electrophoresis has proved useful for separating the salicylates, barbiturates and alkaloids.¹⁰

D. Botany

Electrophoresis has been extensively used in the study of the genetics of cereal grains. Both the albumins and globulins of wheat, for example, are extremely heterogeneous^{44, 48, 59, 128}; the protein patterns are related to wheat varieties, and can be used to trace the genetics of the wheat strains. Similarly, barley contains proteins which are very heterogeneous⁹⁵ as do soybeans and other beans and peas.

Electrophoresis has also been applied to non-protein plant substances including the separation of metal-organic complexes,⁶¹ phosphate esters,¹⁹ amino acids and organic acids.³⁴ It has also been used for the measurement of bound carbohydrates and other neutral fractions.^{85a 34}

Electrophoresis has been applied to soil measurements to study such components as humic acids,^{18, 69} iron complexes,⁷⁸ and other metal complexes.¹

E. Microbiology

In microbiology, electrophoresis has been particularly useful in the measurement of different forms of DNA (deoxyribonucleic acid) and RNA (ribonucleic acid.) Virus-specific RNA has been identified in cells infected with polio virus.¹⁰⁷ Infection RNA has been isolated from foot-and-mouth disease virus⁹² and the virulent form of bacteriophage λ has been shown to contain less DNA than the non-virulent form.¹⁴¹

Protein synthesis has been studied in cell cultures infected with herpes simplex, and it has been shown that the virus causes at least 25 different proteins to be synthesized.¹³¹

Electrophoresis has been found to be useful in the classification of a variety of microorganisms including Penicillium,¹³ Mycoplasma,¹⁴⁵ Phytophthora,⁵³ etc. Enteric bacteria²⁰ mycobacteria¹⁰⁴ and a variety of other fungi, plants and other microorganisms have been classified with the aid of electrophoresis.

The proteins of a number of different viruses have been fractionated. These include Newcastle virus,⁴⁵ herpes virus,¹⁴⁴ vesicular stomatitis virus^{71, 143} tobacco mosaic virus⁹⁶ and a wide variety of other viruses responsible for disease in plants, animals and man.

REFERENCES
for
APPENDIX 1

1. Agapov, A. I., Agrokhimiya 1968, 106: CA 69, 18282c.
2. Ahlgren, E., Eriksson, K. E., Vesterberg, O., Acta Chem. Scand. 21, 937 (1967).
3. Albonico, F., Resmini, P., Ind. Agr. (Florence) 4, 539 (1966); CA 67, 51786b.
4. Anghileri, L. J., Int. Z. Klin. Pharmakol. Ther. Toxikol. 1, 523 (1968); CA 70, 46028p.
5. Aschaffenburg, R., Michalak, W., J. Dairy Sci. 51, 1849 (1968).
6. Aschaffenburg, R., Sen, A., Thompson, M. P., Comp. Biochem. Physiol. 25, 177 (1968).
7. Assenat, L., Lait 47, 495 (1967).
8. Babaev, T. A., Med. Zh. Uzb. 1966, 3; CA 67, 1957r.
9. Babich, P. A., Safonov, V. I., Plekhan, M. I., Dokl. Akad. Nauk SSR 174, 1443 (1967).
10. Babick, S. Kh., Mendibaev, B. T., Farm. Zh. (Kiev) 23, 14 (1968); CA 68, 117158c.
11. Baker, H., Frank, O., Feingold, S., Leevy, C. M., Nature 215, 84 (1967).
12. Bell, K., McKenzie, H. A., ibid., p 123.
13. Bent, K. J., J. Gen. Microbiol. 49, 195 (1967).
14. Bonaventura, J., Riggs, A., J. Biol. Chem. 243, 982 (1968).
15. Bonavida, B., Sapse, A. T., Sercarz, E. E., Nature 221, 375 (1969).
16. Bonomo, L., Gillardi, U., Acta Hepato-Splenol. 14, 142 (1967).
17. Bors, Gh., Popa, I., Voiecu, A., Ionid, N., ibid., 15, 269 (1967).
18. Bottner, P., C. R. Acad. Sci., Paris, Ser. D 265, 1468 (1967).
19. Bouillenne-Comnaire, F., Bull. Soc. Roy. Sci. Leige 36, 56 (1967).
20. Bowman, J. E., Brubaker, R. R., Frischer, H., Carson, P. E., J. Bacteriol. 94, 544 (1967).

21. Bret, G., Annu. Bull., Int. Dairy Fed. 1968, (Pt. 7), 39 pp.
22. Bronsema, A., Pregnancy 1965, 131.
23. Bunyan, P. J., Jennings, D. M., Taylor, A., J. Agr. Food Chem. 16, 326 (1968).
24. Bures, L., Sud.-Med. Ekspertiza 11, 46 (1968).
25. Burkhardt, R., Nahrung 12, 615 (1968).
26. Canale, M., La Cavera, A., Med. Leg. Assicurazioni 14, 499 (1966); CA 67, 88824 p.
27. Castelazo-Ayala, L., Karchmer K. S., J. Int. Fed. Gynaecol. Obstet. 6, 67 (1968).
28. Cattaneo, R., Cattaneo, G., Bazzi, C., Besana, C., Boll. Ist. Sieroter. Milan 46, 310 (1967).
29. Chalumeau-Le Foulgoe, M. Th., Gallien, Cl. L., Comp. Biochem. Physiol. 23, 679 (1967).
30. Chu, R., J. Ass. Off. Anal. Chem. 51, 743 (1968).
31. Cianci, D., Ciruzzi, B., Bufano, G., Ann. Fac. Agr., Univ. Bari 20, 411 (1966): CA 68, 27874d.
32. Cirila, E., Ligniere, G. C., Vergani, C., Reumatismo 18, 513 (1966).
33. Comoli, G., Castelletta, L., Arch. Ital. Mal. App. Diger. 32, 353 (1965).
34. Cook, A. R., Bielecki, R. L., Anal. Biochem. 28, 428 (1969).
35. Correia, E. M., Parro, A. da C., Bull. O.I.V. (Office Int. Vigne Vin) 40, 607, discussion 609 (1967); CA 67, 89729y.
36. Cowie, W. P., J. Sci Food Agr. 19, 226 (1968).
37. Dale, G., Latner, A. L., Clin. Chim. Acta 24, 61 (1969).
38. Dammacco, F., Pinto, L., Riv. Ist. Sieroter. Ital. 42, 17 (1967).
39. de Boissezon, J. F., Ducos, J., Moron, P., Ann. Med. Leg. 46, 463 (1966).
40. Dilanyan, Z. Kh., Agababyan A. A., Ioanissyan, J., Zakharyan, L., Int. Dairy Congr., Proc. 17th Munich, 1966, 4, 301.

41. Dilanyan, Z., Kh., Saakyan, R. V., Vestn. Sil'skokhoz. Nauki (Moscow) 12, 69 (1967); CA 67, 41591v.
42. El-Hawary, M. F. S., Hassan, F., J. Egypt. Med. Ass. 50, 547 (1967).
43. El-Negoumy, A. M., Biochim. Bio-phys. Acta 140, 503 (1967).
44. Elton, G. A. H., Ewart, J. A. D., Baker's Dig. 41, 36, 42 (1967).
45. Evans, M. J., Kingsbury, D. W., Virology 37, 597 (1969).
46. Farrelly, R. O., Watkins, W. B., Clin. Chim. Acta 20, 291 (1968).
47. Farriaux, J. P., Muller, P. H., Fontaine, G., Lille Med. 12, 687 (1967).
48. Feillet, P., Bourdet, A., Berger, D., Gobin, G., Guillemot, F., Ann. Technol. Agr. 17, 217 (1968).
49. Flodh, H., Bergrahm, B., Oden, B., Life Sci. (Oxford) 7, 155 (1968).
50. Freimuth, U., Krause, W., Nahrung 12, 881 (1968).
51. Ganguli, N. C., Majumder, G. C., J. Dairy Sci. 51, 796 (1968).
52. Gehrke, C. W., Graven, D. A., Absheer, J., Tripathi, K. K., Separ. Sci. 2, 199 (1967).
53. Gill, H. S., Powell, D., Phytopathol. Z., 63, 23 (1968).
54. Glasnak, V., Zivocisna Vyroba 13, 335 (1968); CA 70, 35747 w.
55. Grabar, P., Nummi, M., Brew Dig. 42, 68 (1967).
56. Grasbeck, R., Acta Chem. Scand. 22, 1041 (1968).
57. Grossmann, H., Wagner, H., J. Chromatogr. 35, 301 (1968).
58. Groves, M. L., Kiddy, C. A., Arch. Biochem. Biophys. 126, 188 (1968).
59. Hamauzu, Z., Yonezawa, D., Shimomura, H., Agr. Biol. Chem. (Tokyo) 31, 448 (1967).
60. Hamilton, H. B., Iuchi, I., Miyaji, T., Shibata, S., J. Clin. Invest. 48, 525 (1969).
61. Hoefner, W., Atti Simp. Int. Agrochin. 6, 94 (1966); CA 67, 88280h.

62. How, M. J., Long, V. J. W., Clin. Chim. Acta 23, 251 (1969).
63. Huisman, T. H. J., Reynolds, C. A., Dozy, A. M., Wilson, J. B., Biochim. Biophys. Acta 175, 223 (1969).
64. Hyde, R. M., Garb, S., Bennett, A. J., J. Nat. Cancer Inst. 38, 909 (1967).
65. Jonsson, M., Pettersson, E., Acta Chem. Scand. 22, 712 (1968).
66. Jonsson, M. Pettersson, E., Reinhammar, B., Acta Chem. Scand. 22, 2135 (1968).
67. Josephson, A. S., Weiner, R. S., J. Immunol. 100, 1080 (1968).
68. Jovanovic, V., Simonovic, I., Iugoslav. Physiol. Pharmacol. Acta 3, 307 (1967); CA 70, 34910g.
69. Jurion, R., Bull. Soc. Chim. Fr. 1968, 2622.
70. Kallee, E., Ergeb. Laboratoriumsmed. 3, 109 (1965) (Pub. 1967); CA 68, 84902k.
71. Kang, C. Y., Prevec, L., J. Virol 4, 404 (1969).
72. Katayama, T., Ikeda, H., Sci Pap. Inst. Phys. Chem. Res. (Tokyo) 61, 146 (1968); CA 68, 98600x.
73. Katayama, T., Ikeda, H., Sci Pap. Inst. Phys. Chem. Res. 63, 130 (1968); CA 70, 40610a.
74. Kawauchi, H., Minato, S., Sakakibara, F., Nakamura, K., Tohoku Yakka Daigaku Kenkyu Nempo 13, 53 (1966); CA 68, 1472w.
75. King, J. W. B., Polymorphismes Biochim. Anim., Cong. Eur. Groupes Sang., 10th Paris 1966, 427 (Pub. 1977); CA 68, 94015n.
76. Kirchmeier, O., Hoppe-Seyler's Z. Physiol. Chem. 349, 29 (1968).
77. Kirchmeier, O., Z. Lebensm.-Unters. 135, 181 (1967).
78. Kloeking, R., Kleist, H., Muecke, D., Experientia 23, 519 (1967).
79. Kondo, H., Igaku to Seibutsugaku 73, 72 (1966); CA 69, 84875z.
80. Konotey-Ahulu, F. I. D., Gallo, E., Lehmann, H. Ringelhann, B., J. Med. Genet. 5, 107 (1968).
81. Kostov, L., Vet. Med. Nauki (Sofia) 4, 29 (1967).

82. Kotula, Z., Kaminska, A., Med. Dosw. Mikrobiol. 19, 381 (1967).
83. Kwon, Yong Joe, Kim, Ae Soo, New Med. J. (Seoul, Korea) 10, 51 (1967); CA 68, 76304b.
84. Lane, J. P., Hill, W. S., Learson, R. J., Solutions (Ann Arbor) 7, 10 (1968).
85. Latner, A. L., Advan. Clin. Chem. 9, 69 (1967).
- 85a. Lerch, B., Stegemann, H., Anal. Biochem. 29, 76 (1969).
86. Leskova, R., Onderscheka, K., Z. Tierphysiol., Tierernaehr. Futtermittelk. 23, 257 (1968); CA 69, 94229f.
87. Li, Yu-Teh, Li, Su-Chen, J. Biol. Chem. 243, 3994 (1968).
88. Mackie, I. M., Analyst (London) 93, 458 (1968).
89. Markert, C. L., Whitt, G. S., Experientia 24, 977 (1968).
90. Maroufoff, A., Delt. Hellinik. Mikrobiol. Hyg. Hetaireias 12, 66 (1967); CA 69, 65375t.
91. Martinez-Resa, P., Alvarez-Moreno, C., Hermida, F., Chordí, A., J. Dairy Sci. 52, 1 (1969).
92. Matheka, H. D., Trautman, R., Bachrach, H. L., Arch. Biochem. Biophys. 121, 325 (1967).
93. Mawal, R. B., Acta Physiol. Pharmacol. Neer. 14, 317 (1967).
94. Mayerova, A., Cicmancova, L., Hrubisko, M., Lek. Obz. 17, 65 (1968); CA 69, 25534q.
95. Mazon, P., Krischer, J., Horn, P., Bull. Soc. Chim. Biol. 49, 791 (1967).
96. McCarthy, D., J. Gen. Virol. 3, 417 (1968).
97. Melachouris, N. P., J. Dairy Sci. 52, 456 (1969).
98. Meyer, H., Deut. Tierärztl. Wochenschr. 74, 535 (1957).
99. Michalak, W., J. Dairy Sci. 50, 1319 (1967).
100. Mikkonen, L., Finkler, A. E., Hall, C. A., Acta Med. Scand. 181, 591 (1967).

101. Mitchell, W. M., Biochim. Biophys. Acta 178, 194 (1969).
102. Morgan, E. H., Biochim. Biophys. Acta 154, 478 (1968).
103. Myszkowska, K., Diss. Pharm. Pharmacol. 20, 373 (1968); CA 70, 1571u.
104. Nakayama, Y., Jap. J. Microbiol. 11, 95 (1967); CA 67, 88450p.
- 104a. Ney, K. H., Fette, Seifen, Anstrichm. 69, 794 (1967); CA 68, 2052w.
105. Niedermeier, W., Gramling, E. S., Carbohydr. Res. 8, 317 (1968).
106. Nikolaeva, G. N., Uch. Zap. Petrozavodsk Gos. Univ. 13, 39 (1965); CA 68, 1359q.
107. Noble, J., Kass, S. J., Levintow, L., Virology 37, 535 (1969).
108. Nowak-Golabowa, M., Skawinska, Z., Przegl. Lek. 22, 694 (1966); CA 67, 30777j.
109. Nyiredy, I., Tuboly, S., Magy. Allatorv. Lapja 23, 451 (1968); CA 70, 36053d.
110. Ogata, K., Rinsho Shoni Igaku 15, 56 (1967); CA 68, 37387 m.
111. Ohba, Y., Bull. Yamaguchi Med. Sch. 14, 201 (1967); CA 70, 84344w.
112. Olered, R., Jonsson, G., Ber. Getreidechem.-Tag., Detmold 1967, 207; CA 68, 18916s.
113. Opienska-Blauth, J., Jugoslav. Physiol. Pharmacol. Acta 3, 362 (1967); CA 70, 9875s.
114. Ortolani, C., Cattaneo, R., Massarotti, G., Boll. Ist. Sieroter. Milan. 46, 596 (1967).
- 114a. Paltrinieri, E., Acta Neurol. (Naples) 22, 216 (1967).
115. Paraskevas, F., Clin. Biochem. 1, 135 (1967).
116. Polcak, J., Wiedermann, D., Polcakova, J., Skalova, M., Gastroenterologia 107, 273 (1967).
117. Porter, P., Porter, M. C., Shanberge, J. N., Biochemistry 6, 1854 (1967).
118. Quattrin, N., Ventruto, V., Helv. Med. Acta 33, 388 (1967).

119. Robeyrotte, P., Labbe, J. P., C. R. Acad. Sci., Paris, Ser. D. 268, 1125 (1969).
120. Reis, H. E., Wetter, O., Klin. Wochenschr. 47, 426 (1969).
121. Ricciardi, R., Restivo, O., Piazza, V., Sindoni, G., Boll. Sòc. Med-Chir. Catania 33, 645 (1965); CA 68, 1548a.
122. Ritzmann, S. E., Cobb, E. K., Levin, W. C., Tex. Rep. Biol. Med. 25, 273 (1967).
123. Rosselin, G., Rev. Med. Liege 23 (Suppl. 1), 17 (1968).
124. Rothen, A., Mathot, C., Immunochemistry 6, 241 (1969).
125. Sandberg, K., Acta Agr. Scand. 17, 127 (1967).
126. Sato, T., Uchiyama, S., Hayama, T., Koyama, K., Tohoku J. Exp. Med. 87 (1965); CA 67, 62453s.
127. Shibata, S., Miyaji, T., Iuchi, I., Ohba, Y., Yamamoto, K., J. Biochem. (Tokyo) 63, 193 (1968).
128. Silano, V., De Cilliis, U., De Ponte, R., D'Errico, A. M., Pocchiari, F., Ric. Sci. 38, 745 (1968).
129. Silano, V., D'Errico, A. M., Micco, C., Muntoni, F., Pocchiari F., J. Ass. Off. Anal. Chem. 51, 1213 (1968).
130. Sinell, H. J., Kluge-Wilm, R., Zentr. Veterinaermed., Reihe B 15, 802 (1968).
131. Spear, P. G., Roizman, B., Virology 36, 545 (1968).
132. Starosel'tseva, L. K., Belokrinitskii, D. V., Pediatriya (Moscow) 1967, 79.
133. Steiner, J. C., Keller, P. J., Arch Oral Biol. 13, 1213 (1968).
134. Taves, D. R., Nature 220, 282 (1968).
135. Thompson, R. R., J. Ass. Off. Anal. Chem. 51, 746 (1968).
136. Valmet, E., Sci. Tools 15, 8 (1968).
137. Van Baelen, H., Heynes, W., De Moor, P., Ann. Endocrinol (Paris) 30, 199 (1969).
138. Vanfraechem, J., Poortmans, J. R., Rev. Fr. Etud. Clin. Biol. 13, 383 (1968).

139. Vella, F., Clin. Biochem. 1, 118 (1967).
140. Villanueva, E., Castilla, J., Gisbert-Calabuig, J. A., Ann. Med. Leg. 47, 878 (1967).
141. Villarejo, M., Hua, S., Evans, E. A., Jr., J. Virol. 1, 928 (1967).
142. Wadstrom, T., Biochim. Biophys. Acta 147, 441 (1967).
143. Wagner, R. R., Schnaitman, T. A., Snyder, R. M., J. Virol. 4, 395 (1969).
144. Watson, D. H., J. Gen. Virol. 4, 151 (1969).
145. Whitney, P. J., Vaughan, J. G., Heale, J. B., J. Exp. Bot 15, 415 (1968).
146. Yakoveleva, V. I., Usp. Biol. Khim. 9, 55 (1968).
147. Young, D. S., Clin. Chem. 14, 418 (1968).
148. Zaidman, J., Clin. Chim. Acta 23, 67 (1969).
149. Zoria, V. G., Klin Khir. 1967, 43.

APPENDIX 2

INDUSTRIAL RESPONSES

TO

ARTHUR D. LITTLE, INC. INQUIRY



ABBOTT

Scientific Division

Abbott Laboratories
North Chicago, Ill. 60064

November 1, 1973

Dr. P.A. Gempel
Arthur D. Little Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Dr. Gempel:

Your letter to Dr. Singisey concerning electrophoresis in space has been transmitted to me for reply.

We are already very much involved in designing experiments of the type you mentioned and I am working with Marshall Space Flight Center now on a possible experiment for the Soyuz-Apollo Flight in 1975.

I'm not sure what this would mean in regards to your program, but if you would like to discuss it some time please let me know.

Sincerely yours,

Grant H. Barlow
Molecular Biology Research

GHB/cm

MERCK SHARP & DOHME

RESEARCH LABORATORIES

DIVISION OF MERCK & CO., INC. RAHWAY, NEW JERSEY 07065 • TELEPHONE (201) 381-5000

RONALD A. ROSENBERGER
ASSISTANT TO THE PRESIDENT

October 22, 1973

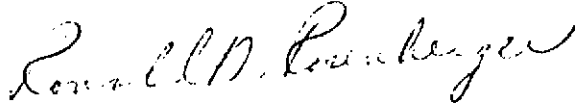
Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Thank you for your recent letter to Dr. Sarett regarding the NASA project you have been contracted to undertake. Dr. Sarett asked that I inform you that we will consider the information you supplied and the questions you raised at the next monthly meeting of our Research and Development Council. Since the Committee will be meeting later this month, we should be in a position to reply sometime in November.

Thank you for your interest in the Merck Sharp & Dohme Research Laboratories.

Sincerely,


Ronald A. Rosenberger

MERCK SHARP & DOHME

RESEARCH LABORATORIES

DIVISION OF MERCK & CO., INC. RAHWAY, NEW JERSEY 07065 • TELEPHONE (201) 381-5000

RONALD A. ROSENBERGER
ASSISTANT TO THE PRESIDENT

November 20, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Our Research and Development Council has considered the information you supplied regarding potential space projects. In order to explore several ideas in more depth, it was referred to our Basic Research area here in the Merck Sharp & Dohme Research Laboratories. Since I indicated we expected to reply sometime in November, I am writing to let you know that it will probably be several more weeks before we will be in a position to provide a definitive reply and that Dr. David P. Jacobus, our Vice President for Basic Research or one of his colleagues will be writing you directly.

Sincerely,



Ronald A. Rosenberger

MERCK SHARP & DOHME

RESEARCH LABORATORIES

DIVISION OF MERCK & CO., INC. RAHWAY, NEW JERSEY 07065 • TELEPHONE (201) 381-5000

DAVID P. JACOBUS, M. D.
VICE PRESIDENT FOR BASIC RESEARCH

15 January 1974

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

This letter is to follow up your letter of 17 October 1973 to Dr. L. H. Sarett and Mr. R. A. Rosenberger's acknowledgment dated 22 October 1973.

You have asked us to identify a substance of potential importance which would be best isolated using electrophoresis under zero-gravity conditions. At present, we are not able to suggest a substance that has not yielded to examination using terrestrial techniques. The problem is made more difficult for us because we believe that a system equivalent to zero gravity can be achieved in an ultracentrifuge using diffusion across an equilibrium boundary. Such a system could then be subjected (we have not) to electrophoresis.

There are two other areas which might be of potential interest for an experiment in space if they have not already been adequately explored.

The rapid and profound demineralization is apparently comparable to the demineralization seen in fracture immobilization and in prolonged bed rest. On earth these changes take place so slowly that the factors affecting the demineralization have never been properly identified. The non-exercise situation in space might provide a sufficient change in the levels of the factors involved (calcitonin, somatomedin, growth hormone, vitamin D, etc.) so that the non-exercise situation could be unravelled.

Mr. P. A. Gempel
Arthur D. Little, Inc.
Cambridge, Massachusetts

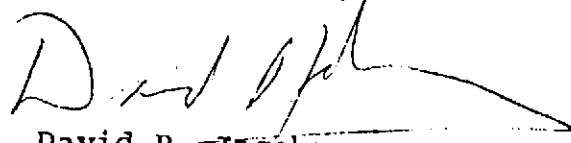
2

15 January 1974

The second area in which I suspect the Space Agency has done work deals with the examination of the circadian rhythm since the astronauts are undoubtedly on a special space schedule. Following the pattern of their biological clock by different metabolites in the urine might provide an insight into normal circadian rhythms as well as perhaps assist in developing appropriate schedules for future flights.

Please let us know if we can be of further assistance.

Sincerely yours,



David P. Jacobus

DPJ:ht

LEDERLE LABORATORIES



A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10985
AREA CODE 914 785-8000

November 30, 1973

Dr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Dr. Gempel:

Thank you for your letter of October 17, regarding the interest of NASA to study the potential benefits to mankind of isolating or purifying biochemical, immunological or viral agents in space. Your correspondence has been circulated to members of our research staff, but I regret that we are unable to suggest any appropriate experimentation.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Ira Ringler".

Ira Ringler
Director of Research

IR:cam



AYERST LABORATORIES
DIVISION OF AMERICAN HOME PRODUCTS CORPORATION

685 Third Avenue / New York, N. Y. 10017 / Tel: (212) 986-1000 / Cable: ALPHAMIN, New York

C. J. CAVALLITO, Ph. D.
EXECUTIVE VICE PRESIDENT

October 19, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Mass. 02140

Dear Mr. Gempel:

Thank you for your letter of October 17th in which you describe the substance of your contract with the National Aeronautics and Space Administration to study certain operations in space.

I have forwarded copies of your letter to our Research and Development administrators who will discuss your interests with others of their staffs to see whether there are some projects or experiments that could be suggested to you.

Thank you for your interest.

Sincerely,



C. J. Cavallito

CJC:chh

cc: R. Deghenghi
S. M. Olin



THE DOW CHEMICAL COMPANY

POST OFFICE BOX 68511
INDIANAPOLIS, INDIANA 46268

317 638-2521

CABLE: DOWPHARM — INDIANAPOLIS

November 27, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Thank you for your letter of October 17, 1973 in reference to your program to study the potential benefits to mankind for isolating or purifying biochemical, immunological, or viral agents in space. We appreciate your extending to Dow the opportunity to participate in this program, but after examination of all our projects, we do not have one which we feel would qualify at this time for this program. If, in the future, we do have something suitable, we will contact you.

Thank you again for your consideration.

Sincerely,

Anton J. Schwarz, M.D.
Director of Biological
Research and Development

AJS/jw

ORTHO RESEARCH FOUNDATION
RARITAN, NEW JERSEY 08869

October 25, 1973

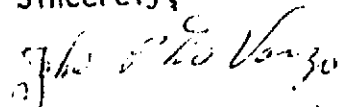
Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Your letter dated October 17, 1973 to Dr. Cronk was referred to me for reply. I took the liberty of discussing the programs which you have under contract with the National Aeronautics and Space Administration with a few of my Division Directors and, although they were intrigued with the scope of the work, they failed to see how we could contribute to the project. I must, therefore, respectfully decline your offer to work with us.

We do thank you, however, for thinking of Ortho.

Sincerely,



John P. DaVanzo, Ph.D.
Executive Director of Research
Basic Sciences

JPD:v

WARREN-TEED PHARMACEUTICALS INCORPORATED



82 WEST GOODALE STREET, COLUMBUS, OHIO 43215
614) 221-5574

AMUEL GUSMAN
RESIDENT

November 7, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

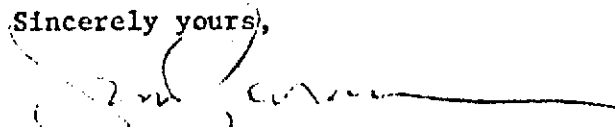
Dear Mr. Gempel:

Thank you for your October 17 letter regarding electrophoretic studies under conditions of "zero g". There are no such studies which I have in mind at the present point; hence, I have no suggestions.

However, it has occurred to me that perhaps some of my associates at the Rohm and Haas Company may have some experiments in mind, and I am taking the liberty of forwarding a copy of your letter to them. Should there be any interest on their part, they will take the initiative in contacting you separately.

I found the proposal in your letter quite interesting and very much appreciated hearing from you.

Sincerely yours,



Sam Gusman, Ph.D.

mm

THE UPJOHN COMPANY

KALAMAZOO, MICHIGAN 49001
TELEPHONE (616) 382-4000

November 19, 1973

Ms. Pat A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

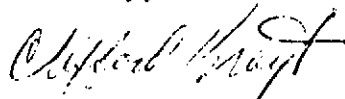
Dear Ms. Gempel:

I have consulted with the Manager of my unit, Dr. E. S. Gerard, and have been advised that company policy has been developed to deal with contract research. Higher management decides which concepts could be developed within the framework of the Corporation and which concepts would be best developed outside of our immediate resources.

A great number of applications of electrophoretic techniques can be cited as beneficial to mankind. My contribution to such a program would first need to be funneled through the channels; however at this point I would like to receive more information about specifics of contract relationships, and the type of consultation and guidance that you would be seeking outside of a contract relationship. A great number of clouding issues are raised by such an involvement. Clearly most efforts to solve a biological problem require the coordinated efforts of many portions of society, industry, non-profit public and private research foundations, universities and the government. I would be interested in participating in such a coordinated effort and would serve as an advocate within the company structure to try to balance profit motivation; exclusivity, legal responsibility with a cooperative venture with individual contributions and responsibilities defined. I believe that some of the fears that exist would be decreased if there was a clear understanding of the individual roles in such a venture, along with some prior legal understanding of the degree of sharing to take place in the return in investment that occurs.

I will be happy to discuss further scientific concepts upon receipt of additional information and company approval.

Sincerely,



Clifford L. Kragt, Ph.D.
Fertility Research

CLK:mem



MARION LABORATORIES, INC.

10236 BUNKER RIDGE ROAD • KANSAS CITY, MISSOURI 64137

October 24, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

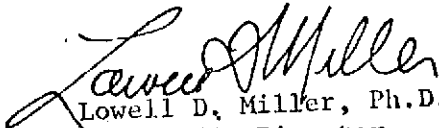
I am in receipt of your letter dated October 17, 1973, to Dr. Zuber of this organization.

The potential benefit that could result from a project such as you describe is certainly tremendous and I am sure that many new avenues of research could open up even in the initial stages of the project. However, this is an area in which Marion Laboratories is not involved and most likely will not be involved with in the immediate future.

We appreciate your consideration and hope the results of your work prove to be most beneficial.

Sincerely,

MARION LABORATORIES, INC.


Lowell D. Miller, Ph.D.
Scientific Director

LDM:pd

APPENDIX 3

MEDLAR LITERATURE SEARCH REFERENCES

(1970 - 1973)

MACRO-CELLULAR SEPARATION

- 10 Weiss L. Cudney TL.
Some Effects of PH and Formaldehyde on the Cellular Electrokinetic Surface
Eng. Int. J. Cancer. 4,776-84. 15 Nov 69.
- 16 Bert G. Lajolo Di Cossano D. Pecco P. Mazzei D.
Effect of A.L.S. and Prednisolone on the Electrophoretic Mobility of Lymphocytes
Eng. Lancet. 1,365. 14 Feb 70.
- 17 Klein EE. Kurtskhaliia EG. Chogovadze IS.
Separation of Brain Proteins by Combination of the Methods of Gel Filtration on Sephadex G-200 (on column and in a thin layer) with Electrophoresis.
Rus. UKR Biokhim ZH. 41,512-8. 1969.
- 166 Chrambach A. Bridson WE. Turkington RW.
Human Prolactin--Identification and Physical Characterization of the Biologically Active Hormone by Polyacrylamide Gel Electrophoresis.
Eng. Biochem Biophys Res Commun. 43,1296-303. 18 Jun 71.
- 167 Pechere JF. Demaille J. Capony JP.
Muscular Parvalbumins--Preparative and Analytical Methods of General Applicability.
Eng. Biochim Biophys Acta. 236,391-408. 25 May 71.
- 168 Laycock MV. Craigie JS.
Purification and Characterization of Cytochrome 553 from the Chrysophycean Alga Monochrysis Lutheri.
Eng. Can J Biochem. 49,641-6. Jun 71.
- 181 Seidel D.
Quantitative Lipid Electrophoresis.
Ger. Dtsch Med Wochenschr. 96,1233. 16 Jul 71.
- 183 Grasslin D. Czygan PJ. Weise HC.
Preparation of Highly Purified HCG Controlled by Gel Isoelectric Focussing.
Eng. Acta Endocrinol Suppl (KBH). 155,52. 1971.
- 184 Page M.
Demonstration of the Microheterogeneity of Fetuin by Electrofocusing.
Eng. Biochim Biophys Acta. 236,571-7. 29 Jun 71.
- 185 Kisaki H. Mizuguchi R.
Electrophoresis of Glycoprotein on Cellulose Acetate Membrane.
Jap. Bull Seishin Igaku Inst. 17,21-4. 1970.
- 191 Inouye M.
Internal Standards for Molecular Weight Determinations of Proteins by Polyacrylamide Gel Electrophoresis. Applications to Envelope Proteins of Escherichia Coli.
Eng. J Biol Chem. 246,4834-8. 10 Aug 71.

MACRO-CELLULAR SEPARATION

- 195 Stahn R. Maier KP. Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation
of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.
Eng. J Cell Biol. 47,576-91. Sep 70.
- 199 Stancek D. Paucker K.
Preparative Electrophoresis of Isotopically Labeled L-Cell Interferons.
Eng. Appl Microbiol. 21,1067-71. Jun 71.
- 200 Urasawa S. Urasawa T. Kanamitsu M.
Radioimmuno-electrophoretic Identification of Poliovirus Inhibitors and
Their Characteristic Mode of Action.
Eng. Arch Gesamte Virusforsch. 33,113-25. 1971.
- 201 Forsgren M.
Immuno-electrophoresis of Poliovirus Antigens.
Eng. Arch Gesamte Virusforsch. 33,27-36. 1971.
- 202 Good AH. Ceverha BB.
Immunologic Assays for Identifying Single Components in Protein Mixtures
after Isoelectric Focusing in Urea-Containing Acrylamide Gels.
Eng. J Immunol. 106,1677-80. Jun 71.
- 203 Caspary EA.
Lymphocyte-Antigen Interaction in Electrophoretic Mobility Test for
Cellular Sensitization.
Eng. Nature New Biol. 231,24. 5 May 71.
- 206 Jackson RL. Lovenberg W.
Isolation and Characterization of Multiple Forms of Hydroxyindole-O-
Methyltransferase.
Eng. J Biol Chem. 246,4280-5. 10 Jul 71.
- 209 Porembaska Z. Jachimowicz J. Gasiorowska I.
Arginase Isoenzymes in Electrophoresis.
Eng. Bull Acad Pol Sci Biol. 19,27-30. 1971.
- 212 Schlesinger D.
Determination of GC Types by Starch-Gel Electrophoresis.
Eng. Arch Immunol Ther Exp (Warsz). 19,173-8. 1971.
- 213 Wellings FM. Sather GE. Hammon WM.
Immuno-electrophoretic Studies of the California Encephalitis Virus Group.
Eng. J Immunol. 107,252-9. Jul 71.
- 219 Li TS. Shulman S.
Immuno-electrophoretic Analysis of Human Seminal Plasma Fractions after
Fractionation by Various Methods.
Eng. Int J Fertil. 16,87-100. Apr-Jun 71.
- 220 Amberson WR. Bauer AC.
Electrophoretic Studies of Muscle Proteins. II. Complex Formation between
Delta Protein, Myogen and Myosin.
Eng. J Cell Physiol. 77,281-300. Jun 71.

MACRO-CELLULAR SEPARATION

- 222 Pyrovolakis J. Hatzicannou J. Gardikas C.
Modification of the Electrophoretic Separation of Lipoproteins on Paper.
Eng. J Clin Pathol. 24,368. May 71.
- 225 Doerr P. Chrambach A.
Anti-Estradiol Antibodies--Isoelectric Focusing in Polyacrylamide Gel.
Eng. Anal Biochem. 42,96-107. Jul 71.
- 227 Grula EA. Savoy CF.
A Detergent-Polyacrylamide Gel System for Electrophoretic Resolution of
Membrane and Wall Proteins.
Eng. Biochem Biophys Res Commun. 43,325-32. 16 Apr 71.
- 228 Kawauchi S. Iwanaga S. Samejima Y. Suzuki T.
Isolation and Characterization of Two Phospholipase A's From the Venom
of Agkistrodon Lays Blomhoffii.
Eng. Biochim Biophys Acta. 236,142-60. 27 Apr 71.
- 230 Neuwelt E. Stumpf D. Austin J. Kohler P.
A Monospecific Antibody to Human Sulfatase A. Preparation, Characterization
and Significance.
Eng. Biochim Biophys Acta. 236,333-46. 27 Apr 71.
- 231 Bert G.
Some Applications of the Cell Electrophoresis Technique to the Study of
the Lymphocytes.
Eng. Folia Allergol (Roma). 17,548-55. Nov-Dec 70.
- 233 Ikeda A. Langman J.
Electrophoretic Analysis of Muscle Proteins.
Eng. Hiroshima J Med Sci. 19,163-76. Dec 70.
- 234 Winterhoff D. Drewitz B.
Method of Electrophoresis of 10MG Liver Tissue on Cellulose Acetate Strips.
Ger. Z Klin Chem Klin Biochem. 9,31-2. Jan 71.
- 236 Barrolier J. Busse V.
Combined Electrophoretic Separation of Proteins and Carbohydrates on
One Strip.
Ger. Z Klin Chem Klin Biochem. 9,53-6. Jan 71.
- 237 Friesen AD. Jamieson JC. Ashton FE.
Effect of Nonionic Detergent on Fractionation of Proteins by Isoelectric
Focusing.
Eng. Anal Biochem. 41,149-57. May 71.
- 239 Fernandez-Sorensen A. Carlson DM.
Purification and Properties of Phosphoacetylglucosamine Mutase.
Eng. J Biol Chem. 246,3485-93. 10 Jun 71.

MACRO-CELLULAR SEPARATION

- 240 Reis HE. Wetter O.
Isoelectric Fractionation in Protein Chemistry.
Ger. Klin Wochenschr. 48,643-50. 1 Jun 70.
- 242 Claeysens M. Loontjens FG. Kersters-Hilderson H. DeBruyne CK.
Partial Purification and Properties of an *Aspergillus Niger* Beta-D-Xylosidase.
Eng. Enzymologia. 40,177-98. 31 Mar 71.
- 250 Thobe J. Seiler N. Werner G.
Electrophoresis in a Carrier-Free Buffer Stream. 3. A Simple Apparatus for the Optical Evaluation of Numerous Samples Simultaneously.
Ger. Hoppe Seylers Z Physiol Chem. 352,700-6. May 71.
- 251 Kopperschlager G. Hofmann E.
Agar and Polyacrylamide Gel Electrophoresis of Hexokinase in Cell Homogenates from Baker's Yeast.
Ger. Z Med Labortech. 10,366-70. 1969.
- 255 Neiman PE. Henry PH.
An Analysis of the Rapidly Synthesized Ribonucleic Acid of the Normal Human Lymphocyte by Agarose-Polyacrylamide Gel Electrophoresis.
Eng. Biochemistry. 10,1733-40. 27 Apr 71.
- 256 Beeley JG.
Ovomucoid Heterogeneity Examined by Flat Bed Isoelectric Focussing.
Eng. Biochim Biophys Acta. 230,595-8. 1971.
- 258 Hantschel H.
Determination of the Size of Viruses using Gel Electrophoresis.
Ger. Arch Exp Veterinaermed. 24,571-80. 1970.
- 266 Roubaud P.
Definition of a Method of Histobiochemical Analysis--Making of Ordered Clusters of Microtubes with Semi-Permeable Walls Intended for Electrophoresis on Cluster.
Fre. C.R Acad Sci D (PARIS). 272,1166-8. 22 Feb 1971.
- 270 Oka T. Simpson FJ. Child JJ. Mills C.
Degradation of Rutin by *Aspergillus Flavus*. Purification of the Dioxxygenase, Querecentinase.
Eng. Can J Microbiol. 17,111-8. Jan 71.
- 285 Wright GL Jr.
Separation of Proteins in Concentrated Cerebrospinal Fluid by Two-Dimensional Electrophoresis in Acrylamide Gel.
Eng. Clin Chem. 17,430-2. May 71.
- 286 Miller JN. Newton AH. Burns DT.
Cellulose Acetate Electrophoresis--The Use of Discontinuous Buffer Systems for Protein Separations.
Eng. Clin Chim Acta. 31,427-33. Feb 71.

MACRO-CELLULAR SEPARATION

- 288 West DW. Chase JF. Tubbs PK.
The Separation and Properties of Two Forms of Carnitine Palmitoyl-transferase from Ox Liver Mitochondria.
Eng. Biochem Biophys Res Commun. 42,912-8. 5 Mar 71.
- 318 Pistenma DA. Mel HC. Snapir N.
Biophysical Characterization of Fowl Spermatozoa. II. Interrelationships between Intrinsic Motility and Electrophoretic Mobility
Eng. J Reprod Fertil. 24,161-9. Feb 71.
- 325 Kulshrestha RC. Atal PR. Wahi PN.
Immuno-Electrophoretic Characterization of Brucella Species--Chemical Extract.
Eng. Indian J Med Res. 58,1662-70. Dec 70.
- 329 Richards EG. Lecanidcu R.
Quantitative Aspects of the Electrophoresis of RNA in Polyacrylamide Gels.
Eng. Anal Biochem. 40,43-71. Mar 71.
- 336 Dasgupta S. Kung-Ho C.
Electrophoretic Analysis of Cell Populations in Presumptive Epidermis of the Frog, Rana Pipiens.
Eng. Exp Cell Res. 65,463-6. Apr 71.
- 348 Streiff F. Stoltz JF. Genetet B. Humbert JC.
Electrophoretic Mobility of Human Lymphocytes. Determination of Phi and Effect of Cytotoxic Antibodies.
Fre. Rev Fr Transfus. 13,285-91. Sep 70.
- 350 Lemp JF Jr. Ashbury ED. Ridenour EO.
Electrophoresis of Colloidal Biological Particles.
Eng. Biotechnol Bioeng. 13,17-47. Jan 71.
- 354 Elsayed S. Aas K.
Isolation of Purified Allergens (Cod) by Isoelectric Focusing.
Eng. Int Arch Allergy Appl Immunol. 40,428-38. 1971.
- 363 Johns EW. Forrester S.
The Identification of the Five Main Histone Fractions by Comparative Electrophoresis in Polyacrylamide Gel.
Eng. J Chromatogr. 55,429-30. 3 Mar 71.
- 373 Gorovsky MA.
Studies on Nuclear Structure and Function in Tetrahymena Pyriformis. 3. Comparison of the Histones of Macro- and Micronuclei by Quantitative Polyacrylamide Gel Electrophoresis.
Eng. J Cell Biol. 47,631-6. Dec 70.
- 378 Gisbert Calabuig JA. Villanueva E. Rubin De Celis G.
Mixed Method (Electrophoresis-Chromatography) for Identification of Alkaloid Mixtures.
Spa. Zacchia. 6,386-402. Jul-Sep 70.

MACRO-CELLULAR SEPARATION

- 379 Salach JI. Turini P. Seng R. Hauber J. Singer TP.
Phospholipase A of Snake Venoms. I. Isolation and Molecular Properties
of Isoenzymes from NAJA NAJA and Vipera Russellii Venoms.
Eng. J Biol Chem. 246,331-9. 25 Jan 71.
- 386 Waldhausl WK. Lucas CP. Conn JW. Lutz JH. Cohen EL.
Studies on the Partial Isolation of Human Renin.
Eng. Biochim Biophys Acta. 221,536-48. 22 Dec 70.
- 389 Diederich D. Grisolia S.
Purification and Properties of Acyl Phosphatase from Heart Muscle.
Comparative Properties of Acyl Phosphatase from Several Sources.
Eng. Biochim Biophys Acta. 227,192-8. 13 Jan 71.
- 391 Jacobsen N.
Isoelectric Separation of Proteins after in Vitro Cultivation of
Sublingual Tissue.
Eng. Caries Res. 5,23-4. 1971.
- 398 Theodore TS. Tully JG. Cole RM.
Polyacrylamide Gel Identification of Bacterial L-Forms and Mycoplasma
Species of Human Origin.
Eng. Appl Microbiol. 21,272-7. Feb 71.
- 405 Strasser R. Miserez A.
Behavior of Polysaccharides during Microelectrophoresis.
Ger. Experientia. 27,239-40. 15 Feb 71.
- 411 Cubadda R. Fratoni A. Lelli ME. Quattrucci E.
Immuno-electrophoretic Characterization of the Soluble Proteins of the
Genus Triticum. I.T.Durum.
Ita. Boll Soc Ital Biol Sper. 45,705-8. 15 Jun 69.
- 420 Sass NL. Martin WG.
Separation of Sulfated Nucleotides using Polyacrylamide Gel Electrophoresis.
Eng. Anal Biochem. 38,559-64. Dec 70.
- 423 Belokon AN. Popov MP. Gubarev EA. Lakin KM. Efimov VS.
Device for the Determination of the Electrophoretic Mobility of Cellular
Blood Elements.
Rus. Farmakol Toksikol. 33,634-8. Sep-Oct 70.
- 424 Karppinen K. Halonen PI.
Red Cell and Platelet Electrophoresis in Coronary Heart Disease.
Eng. Adv Cardiol. 4,175-8. 1970.
- 425 Balbierz H. Nikolajczuk M.
Immuno-electrophoretic Analysis (IEA) of Bull Semen Plasma (BSP).
Eng. Arch Immunol Ther Exp (WARSZ). 18,537-42. 1970.

MACRO-CELLULAR SEPARATION

- 426 Sellei K. Krebs A. Butler R.
 Immuno-electrophoretic Evidence for Two Characteristic Proteinbands in
 Psoriatic Epidermis.
 Ger. Dermatologica. 141,89-94. 1970.
- 427 Lutstorf UM. Schurch PM. Wartburg JP Von.
 Heterogeneity of Horse Liver Alcohol Dehydrogenase. Purification and
 Characterization of Multiple Molecular Forms.
 Eng. Eur J. Biochem. 17,497-508. Dec 70.
- 428 Griffith AL. Lavelle A. Catsimpoolas N.
 Isoelectric Focusing of Soluble Brain Proteins and Changes Associated
 with Development.
 Eng. Brain Res. 24,537-40. 18 Dec 70.
- 432 Kamaryt J. Mechlova V.
 Direct Detection of Pepsinogen and Pepsin Fractions by Means of Agar Gel
 Electrophoresis with Denatured Substrate.
 Ger. Z Klin Chem Klin Biochem. 8,567-9. Nov 70.
- 446 Lewin S.
 Use of Electrofocusing for the Detection of Carrier Proteins and Their
 Differentiation from Antibodies.
 Eng. Biochem J. 118,37P-38P. Jun 70.
- 447 Hioki N. Kuragane K.
 Fractionation of Thyroid Hormone Binding Protein by Polyacrylamide (PAA)-
 Ultramacro-Gel Electrophoresis.
 Jap. Clin Endocrinol (Tokyo). 18,925-30. Nov 70.
- 448 Stojimirovic B.
 Electrophoresis of Urinary Proteins.
 Cro. Med Glas. 24,35-6. Jan 70.
- 450 Caspary EA. Knowles M.
 Effect of Haemagglutinating and Mitogenic Fractions of Phytohaemagglutinin
 on Electrophoretic Mobility of Lymphocytes and Macrophages.
 Eng. Experientia. 26,1258-9. 15 Nov 70.
- 457 Holland AA. Sen Y. Choo.
 Immuno-electrophoretic Characteristics of *Ophiobolus Graminis* Sacc. as an
 Aid in Classification and Determination.
 Eng. Antonie Van Leeuwenhoek. 36,541-8. 1970.
- 459 Teisberg P.
 High Voltage Agarose Gel Electrophoresis in the Study of C3 Polymorphism.
 Eng. Vox Sang. 19,47-56. Jul 70.
- 463 Fossard C. Dale G. Latner AL.
 Separation of the Proteins of Cerebrospinal Fluid using Gel Electrofocusing
 Followed by Electrophoresis.
 Eng. J Clin Pathol. 23,586-9. Oct 70.

MACRO-CELLULAR SEPARATION

- 465 Feinstein RN. Peraino C.
Separation of Soluble and Particulate Mouse Liver Catalase by Isoelectric Focusing.
Eng. Biochim Biophys Acta. 214, 230-2. 27 Jul 70.
- 467 Strauss EG. Kaesberg P.
Acrylamide Gel Electrophoresis of Bacteriophage Q Beta-Electrophoresis of the Intact Virions and of the Viral Proteins.
Eng. Virology. 42,437-52. Oct 70.
- 468 Fowlks E. Young RJ.
Detection of Heterogeneity in Plant Viral RNA by Polyacrylamide Gel Electrophoresis.
Eng. Virology. 42,548-50. Oct 70.
- 469 Bogdanikowa B. Bernacka K. Mysliwiec B.
Independence of Changes in the Components OFIGG Globulin.
Eng. Arch Immunol Ther Exp (Warsz). 18,289-97. 1970.
- 470 Schnaitman CA.
Examination of the Protein Composition of the Cell Envelope of Escherichia Coli by Polyacrylamide Gel Electrophoresis.
Eng. J Bacteriol. 104,882-9. Nov 70.
- 474 Singh J. Wasserman AR.
Detection of Aggregation and Non-Destructive Disaggregation of Membranous Proteins using Polyacrylamide Gel Electrophoresis with Non-Ionic Detergents.
Eng. Biochim Biophys Acta. 221,379-82. 17 Nov 70.
- 475 Kemp RB. Jones BM.
Aggregation and Electrophoretic Mobility Studies on Dissociated Cells. I. Effects of P-Benzoquinone and Tannic Acid.
Eng. Exp Cell Res. 63,293-300. Dec 70.
- 476 Jones BM. Kemp RB.
Aggregation and Electrophoretic Mobility Studies on Dissociated Cells. II. Effects of ADP and ATP.
Eng. Exp Cell Res. 63,301-8. Dec 70.
- 497 Razin S. Valdesuso J. Purcell RH. Chanock RM.
Electrophoretic Analysis of Cell Proteins of T-Strain Mycoplasmas Isolated from Man.
Eng. J Bacteriol. 103,702-6. Sep 70.
- 500 Haslam EA. Hampson AW. Egan JA. White DO.
The Polypeptides of Influenza Virus. II. Interpretation of Polyacrylamide Gel Electrophoresis Patterns.
Eng. Virology. 42,555-65. Nov 70.

MACRO-CELLULAR SEPARATION

- 501 Lesnaw JA. Reichmann ME.
Determination of Molecular Weights of Plant Viral Protein Subunits by Polyacrylamide Gel Electrophoresis.
Eng. Virology. 42,724-31. Nov 70.
- 503 Winters WD. Brownstone A. Pereira HG.
Separation of Adenovirus Penton Base Antigen by Preparative Gel Electrophoresis.
Eng. J Gen Virol. 9,105-10. Oct 70.
- 505 Chepulis GK. Zhdanov VM.
Cellular Antigens in Myxo- and Paramyxoviruses as Revealed by Immunodiffusion Methods.
Eng. Experientia. 26,1141-3. 15 Oct 70.
- 506 Stocker K. Straub PW.
Rapid Detection of Fibrinopeptides by Bidimensional Paper Electrophoresis.
Eng. Thromb Diath Haemorrh. 24,248-55. 31 Oct 70.
- 514 Sonneborn HH. Renninger W.
Determination of Adenosine Deaminase Gene Frequency with a New Technic.
Ger. Humangenetik. 10,188-90. 17 Sep 70.
- 515 Heaney A. Weller DL.
Isoelectric PH of Hemoglobin and Cytochrome C by Electrofocusing.
Eng. J Chem Educ. 47,724-6. Oct 70.
- 520 Braselton WE Jr. McShan WH.
Purification and Properties of Follicle-Stimulating and Luteinizing Hormones from Horse Pituitary Glands.
Eng. Arch Biochem Biophys. 139,45-58. Jul 70.
- 521 Bert G. DiCossano DL. Pecco P.
Capacity of Peripheral Blood Lymphocytes to Recognize a Specific Antigen. Usefulness of Cellular Electrophoresis.
Ita. Haematol Lat. 12,309-11. Jul-Dec 69.
- 523 Sakurabayashi I. Kawai T. Hasunuma S.
Fractionation of Serum Lipoproteins by Cellulose-Acetate Electrophoresis with Special Reference to Clarification of Cello-Gel Membrane.
Jap. Med Biol (Tokyo). 81,47-51. 10 Aug 70.
- 529 Gusev AI. Iazova AK.
Isolation and Purification of Human and Animal Embryo Specific Alpha-Globulins by the Method of Preparatory Disk Electrophoresis in Polyacrylamide Gel.
Rus. Biokhimiia. 35,172-81. 1970.
- 530 Chowrashi PK. Chatteraj DK. Chakravarty K. Chatterjea JB.
Electrophoresis of Genetically Different Proteins in the Adsorbed State.
Eng. Indian J Biochem. 7,89-94. Jun 70.

MACRO-CELLULAR SEPARATION

- 533 Nilsson P. Wadstrom T. Vesterberh O.
Separation of Proteins from Carrier Ampholytes after Isoelectric Focusing.
Eng. Biochim Biophys Acta. 221,146-8. 20 Oct 70.
- 534 Pavlik I.
Principles of Microbial Electrophoresis.
Che. Cas Lek Cesk. 109,981-5. 9 Sep 70.
- 537 Narurkar MV. Narurkar LM. Sahasrabudhe MB.
A New Technique of PH Gradient Electrophoresis as Applied to the Separation of Nucleic Acid Bases.
Eng. Anal Biochem. 26,174-7. 10 Oct 68.
- 542 Borkowski T. Wojcierowski J. Kulesza S.
A New Rapid Electrophoretic Method for Determination of Deoxyribonucleic Acid Base Composition.
Eng. Anal Biochem. 27,58-64. Jan 69.
- 544 Bont WS. Geels J. Rezelman G.
An Apparatus for Preparative Polyacrylamide Electrophoresis--The Isolation of a Ribonuclease Inhibitor.
Eng. Anal Biochem. 27,99-107. Jan 69.
- 546 Ibrahim AN. Sweet BH.
Application of Immunodiffusion Methods for Typing Members of the Phlebotomus Group of Arboviruses.
Eng. Proc Soc Exp Biol Med. 135,23-9. Oct 70.
- 548 Hill BJ. Baxby D. Douglas HW.
Microelectrophoresis of Enzyme and Chemically Treated Viruses and Cores of Vaccinia, Buffalopox, Variola and Alastrim.
Eng. J Gen Virol. 16,39-46. Jul 72.
- 551 Greene EL. Halbert SP. Jequier S.
Analysis of the Tissue Constituents and Enzymes of Human Liver by Crossed Immunoelectrophoresis--Comparison of Normal and Cystic Fibrosis Liver.
Eng. Int Arch Allergy Appl Immunol. 42,751-63. 1972.
- 553 Castle AV. Wheelock JV.
Purification of Rennin.
Eng. J Dairy Res. 38,69-71. Feb 71.
- 554 Josephson RV. Mikolajcik EM. Singh VK.
Isoelectric Focusing of Bovine Colostrum Immunoglobulins.
Eng. J Dairy Sci. 55,1050-7. Aug 72.
- 556 Choulis NH.
Examination of Molecular Associations via Thin-Layer Electrophoresis. II. Interactions of Amphetamine Isomers with Optically Active and Racemic Acids.
Eng. J Pharm Sci. 61,1325-6. Aug 72.

MACRO-CELLULAR SEPARATION

- 563 Hoppe HH. Hennig W. Brinkmann B.
Horizontal Polyacrylamide Electrophoresis for the Determination of Serum Protein (Haptoglobin) and Red Cell Enzyme Polymorphisms.
Eng. Humangenetik. 14,224-31. 1972.
- 565 Rice RH. Horst J.
Isoelectric Focusing of Viruses in Polyacrylamide Gels.
Eng. Virology. 49,602-4. Aug 72.
- 569 Kehoe, JM. Hurvitz AI. Capra JD.
Characterization of Three Feline Paraproteins.
Eng. J Immunol. 109,511-6. Sep 72.
- 577 Paus E. Christensen TB.
Alpha-Mannosidase from Phaseolus Vulgaris. Purification and Characterization.
Eng. Eur J Biochem. 25,308-14. 15 Feb 72.
- 588 Klibansky C.
Separation of N-Acetyl- -D-Hexosaminidase-Isoenzymes from Human Brain and Leukocytes by Cellulose Acetate Paper Electrophoresis- A Simple Procedure for the Diagnosis of Tay-Sachs Disease.
Eng. Isr J Med Sci. 7,1086-9. Sep 71.
- 591 Kramer RL. Richens A.
Two Dimensional Immunoelectrophoresis of Human Serum Proteins for the Investigation of Protein Drugs.
Eng. Br J Pharmacol. 45,184P-185P. May 72.
- 593 Melville JC. Scandalios JG.
Maize Endopeptidase- Genetic Control, Chemical Characterization; and Relationship to an Endogenous Trypsin Inhibitor.
Eng. Biochem Genet. 7,15-31. Aug 72.
- 594 Stevens RL. Micalizzi ER. Fessler DC. Pals DT.
Angiotensin I Converting Enzyme of Calf Lung. Method of Assay and Partial Purification.
Eng. Biochemistry. 11,2999-3007. 1 Aug 72.
- 598 Smith AF.
Separation of Tissue and Serum Creatine Kinase Isoenzymes on Polyacrylamide Gel Slabs.
Eng. Clin Chim Acta. 39,351-9. Jul 72.
- 603 Gussmann S. Rames K.
Separating the Polymorphous Enzymes Glutamate Pyruvate Transaminase (GPT, E.C-2.6.1.2) And Phosphoglucomutase (PGM 1, E.C-2.7.5.1) By Horizontal Starch Gel Electrophoresis in One Step.
Ger. Z Rechtsmed. 70,148-9. 1972.

MACRO-CELLULAR SEPARATION

- 604 Oranskii IE. Iuvonina LM.
Electrophoresis of Drugs in an Ultrasonic Field.
Rus. Vopr Kurortol Fizioter Lech Fiz Kult. 37,217-9. May-Jun 72.
- 612 Koyanagi Y. Hara M. Inoue T. Goara K.
Isolation of Antigenic Component Specific for Human Seminal Plasma-Seminoprotein (-SM) by Electrofocusing. Forensic Immunological Study of Body Fluids and Secretions. 8.
Jap. Jap J Leg Med. 26,78-80. Mar 72.
- 615 Stoltz JF. Streiff F. Genetet B. Larcan A.
Demonstration of ABO Antigens on Human Lymphocytes by Means of Liquid Phase Electrophoresis.
Fre. Acta Haematol (Basel). 47,134-9. 1972.
- 616 Minderhoud JM. Smith JK.
Immunological Activity of Blood Lymphocyte Fractions. A Study by the Macrophage Electrophoretic Mobility Method.
Eng. Clin Exp Immunol. 10,571-9. Apr 72.
- 617 Eisenstadt M. Scheinberg IH.
Dielectrophoresis of Macromolecules--Determination of the Diffusion Constant of Poly- -Benzyl-L-Glutamate.
Eng. Science. 176,1335-7. 23 Jun 72.
- 620 Lever JE.
Purification and Properties of a Component of Histidine Transport in Salmonella Typhimurium. The Histidine-Binding Protein J.
Eng. J Biol Chem. 247,4317-26. 10 Jul 72.
- 624 Mikhno VV. Levitska GK.
Paper Electrophoresis in Analysis of Galanthamine and Securinin in Forensic Chemistry.
Ukr. Farm Zh. 26,26-31. Nov-Dec 71.
- 630 Angeloni G. Iacobelli S. Garcea N. Papparatti L. Bompiani A.
Cervical Mucus. V. Electrophoretic Study of Proteins of Human Cervical Mucus.
Ita. Ann Ostet Ginecol. 92,887-92. Dec 71.
- 631 Tokarskaia ZB. Vedencev VS.
Carbohydrate-Protein Relationship in Serum Electrophoretic Fractions in Pneumonia.
Rus. Lab Delo. 10,621-4. 1971.
- 633 Hultbery B. Ockerman PA.
Artificial Substrates in the Assay of Acid Glycosidases.
Eng. Clin Chim Acta. 39,49-58. Jun 72.

MACRO-CELLULAR SEPARATION

- 636 Gregoriades A.
Isolation of Neuraminidase from the WSN Strain of Influenza Virus.
Eng. Virology. 49,333-6. Jul 72.
- 637 Hayward GS.
Gel Electrophoretic Separation of the Complementary Strands of Bacteriophage DNA.
Eng. Virology. 49,342-4. Jul 72.
- 643 Coe JE.
A Genetic Polymorphism of Peromyscus 7S 1 Globulins- Detection by Differences in Electrophoretic Mobility.
Eng. J Immunol. 108,907-12. Apr 72.
- 644 Mori I. Asada N. Kawamura Y.
Rapid Separation of 208 TL and 207 TL from their Decay Series by Zone-
Electrophoresis.
Jap. J Pharm Soc Jap. 92,37-41. Jan 72.
- 651 Van Kreel Bk. Van Eijk HG. Leijnse B.
The Iso-Electric Fractionation of Rabbit Ferritin.
Eng. Acta Haematol (Basel). 47,59-64. 1972.
- 658 Waehneltd TV. Mandel P.
Isolation of Rat Brain Myelin, Monitored by Polyacrylamide Gel
Electrophoresis of Dodecyl Sulfate-Extracted Proteins.
Eng. Brain Res. 40,419-36. 26 May 72.
- 664 Landel AM. Aloni Y. Raftery MA. Attardi G.
Electrofocusing Analysis of Hela Cell Metaphase Chromosomes.
Eng. Biochemistry. 11,1654-63. 25 Apr 72.
- 677 Zeiller K. Holzberg E. Pascher G. Hannig K.
Free Flow Electrophoretic Separation of T and B Lymphocytes. Evidence
for Various Subpopulations of B Cells.
Eng. Hoppe Seylers Z Physiol Chem. 353,105-10. Jan 72.
- 678 Zeiller K. Schubert JC. Walther F. Hannig K.
Free Flow Electrophoretic Separation of Bone Marrow Cells. Electro-
phoretic Distribution Analysis of In Vivo Colony Forming Cells in
Mouse Bone Marrow.
Eng. Hoppe Seylers Z Physiol Chem. 353,95-104. Jan 72.
- 688 Hultin T. Sjoqvist A.
Two-Dimensional Polyacrylamide Gel Electrophoresis of Animal Ribosomal
Proteins Based on Charge Inversion.
Eng. Anal Biochem. 46,342-6. Mar 72.
- 690 Feldman RI. Weiner H.
Horse Liver Aldehyde Dehydrogenase. I. Purification and Characterization.
Eng. J Biol Chem. 247,260-6. 10 Jan 72.

MACRO-CELLULAR SEPARATION

- 693 Dellinger JD. Jasper DE.
Polyacrylamide-Gel Electrophoresis of Cell Proteins of Mycoplasma Isolated from Cattle and Horses.
- 697 Porcelli G. Angelett M. Angeletti M. Marini-Bettolo GB.
Chromatographic and Electrophoretic Behavior of Chromogranine Obtained from Bovine and Equine Adrenal Medulla.
Eng. J Chromatogr. 66,162-6. 22 Mar 72.
- 698 Yamada K.
Method for Separating Aspartate and Alanine Aminotransferase in Fowl Blood Plasma.
Jap. Jap J Vet Sci. 34, 39-48. Feb 72.
- 721 Hashimoto N.
Isolation of Blood Cells by Electrophoresis.
Jap. Saishin Igaku. 27,612-21. Mar 72.
- 723 Vasu S.
Electrophoretic Analysis of Nucleic Acids in Agarose and Polyacrylamide Gels.
Rum. Stud Cercet Inframicrobiol. 22,459-74. 1971.
- 726 Arnold EA. Young KE.
Isolation and Partial Electrophoretic Characterization of Total Protein from Non-Sheared Rat Liver Chromatin.
Eng. Biochim Biophys Acta. 257,482-96. 29 Feb 72.
- 729 Vielle-Breitburd F. Orth G.
Rabbit Liver L-Arginase. Purification, Properties, and Subunit Structure.
Eng. J Biol Chem. 247,1227-35. 25 Feb 72.
- 730 Dutton GR. Barondes SH.
Macromolecular Behaviour of Gangliosides on Electrophoresis in Sodium Dodecyl Sulphate.
Eng. J Neurochem. 19,559-62. Feb 72.
- 737 Zeiller K. Liebich HG. Hannig K.
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studied after Prolonged Cannulation and Immunization.
Eng. Eur J Immunol. 1,315-22. Nov 71.
- 741 Shishido H.
Cell Electrophoresis--With Special Reference to the Antibody-Sensitized Red Cells.
Jap. Jap J Clin Pathol. 19,811-4. Dec 71.
- 744 Toneva V.
Comparative Studies of the Aujeszky Virus and the Herpes Simplex Virus with the Immunoelectrophoresis Method.
Fre. Bull Off Int Epizoot. 75,350-62. Jul-Aug 71.

MACRO-CELLULAR SEPARATION

- 745 Field EJ.
Delayed Hypersensitivity Studies--Some Applications of Cell Electrophoresis.
Eng. J R Coll Physicians Lond. 6,316-26. Apr 72.
- 752 Barengo E. Itoiz JE.
Rapid Quantitative Evaluation of Serum LDH Isoenzyme Patterns After Agar Gel Electrophoresis.
Eng. Experientia. 28,19-20. 15 Jan 72.
- 753 Lepri L. Desideri PG. Coas V.
Chromatographic and Electrophoretic Behavior of Purines and Pyrimidines on Layers of Weak and Strong Cation Exchangers.
Eng. J Chromatogr. 64,271-84. 2 Feb 72.
- 758 Change PC. Yano Y. Dighton M. Dickie N.
Fractionation of Staphylococcal Enterotoxin C 2 by Isoelectric Focusing.
Eng. Can J Microbiol. 17,1367-72. Nov 71.
- 759 Hauschild AH. Hilsheimer R.
Purification and Characteristics of the Enterotoxin of Clostridium Perfringens Type A.
Eng. Can J Microbiol. 17,1425-33. Nov 71.
- 770 Zeiller K. Liefich HG. Hannig K.
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studied after Prolonged Cannulation and Immunization.
Eng. Eur J Immunol. 1,315-22. Nov 71.
- 782 Maffezzoli RD. Kaplan GN. Chrambach A.
Fractionation of Immunoreactive Human Chorionic Gonadotropin and Luteinizing Hormone by Isoelectric Focusing in Polyacrylamide Gel.
Eng. J Clin Endocrinol Metab. 34,361-9. Feb 72.
- 783 Elgin SC. Bonner J.
Partial Fractionation and Chemical Characterization of the Major Non-histone Chromosomal Proteins.
Eng. Biochemistry. 11,772-81. 29 Feb 72.
- 788 Grigor'ev RN. Stepanova LA. Vorobeichikov VM.
Methods of Electrophoretic Concentration of Mycobacterium Tuberculosis.
Rus. Probl Tuberk. 49,64-8. 1971.
- 792 Hata R. Nagai Y.
Preparative Gel Electrophoresis of Liver Polyribosomal RNA.
Eng. Anal Biochem. 45,645-52. Feb 72.
- 795 Graesslin D. Trautwein A. Bettendorf G.
Gel Isoelectric Focusing of Glycoprotein Hormones.
Eng. J Chromatogr. 63,475-7. 23 Dec 71.

MACRO-CELLULAR SEPARATION

- 814 Hoekstra J. Deinhardt F.
Counter-Immunoelectrophoresis--Rapid Method for Detecting Group--
Specific Antigen and Antibodies Associated with Oncogenic Ribonucleic
Acid Viruses.
Eng. Appl Microbiol. 22,1172-3. Dec 71.
- 823 Tosa T. Sano R. Yamamoto K. Nakamura M. Chibata I.
L-Asparaginase from Proteus Vulgaris. Purification, Crystallization,
and Enzymic Properties.
Eng. Biochemistry. 11,217-22. 18 Jan 72.
- 825 Wuepper KD. Cochrane CG.
Plasma Prekallikrein- Isolation, Characterization, and Mechanism of
Activation.
Eng. J Exp Med. 135,1-20. Jan 72.
- 833 Tallman JF. Brady RO.
The Purification and Properties of a Mammalian Neuraminidase (Sialidase).
Eng. Biochim Biophys Acta. 293,434-43. 15 Feb 73.
- 835 Dajani AS.
Rapid Identification of Beta Hemolytic Streptococci by Counterimmuno-
electrophoresis.
Eng. J Immunol. 110,1702-5. Jun 73.
- 836 Van Epps DE. Andersen BR.
Isolation of Streptolysin O by Preparative Polyacrylamide Gel Electrophoresis.
Eng. Infect Immun. 7,493-5. Mar 73.
- 847 Righetti PG. Drysdale JW.
Small-Scale Fractionation of Proteins and Nucleic Acids by Isoelectric
Focusing in Polyacrylamide Gels.
Eng. Ann NY Acad Sci. 209,163-86. 15 Jun 73.
- 848 Park CM.
Isoelectric Focusing and the Study of Interacting Protein Systems-Ligand
Binding, Phosphate Binding, and Subunit Exchange in Hemoglobin.
Eng. Ann NY Acad Sci. 209,237-57. 15 Jun 73.
- 851 Weller DL. Heaney A. Franceschi RT. Boudreau RE. Shaw DE.
Isoelectric Focusing and Study of Ribosomal Proteins and Lactate
Dehydrogenase.
Eng. Ann NY Acad Sci. 209,258-80. 15 Jun 73.
- 856 Bagshaw JC. Drysdale JW. Malt RA.
Multiple Forms of Mammalian RNA Polymerase Displayed by Gel Electrofocusing.
Eng. Ann NY Acad Sci. 209,363-71. 15 Jun 73.
- 869 Guarriero-Bobyleva V. Volpi-Becchi MA. Masini A.
Parallel Partial Purification of Cytoplasmic and Mitochondrial Aconitate
Hydratases from Rat Liver.
Eng. Eur J Biochem. 34,455-8. 2 May 73.

MACRO-CELLULAR SEPARATION

- 872 Kohnert KD. Ziegler M. Zuhlke H. Wilke B.
Isoelectric Focusing-Immunoassay- A New Technique applied to the High Molecular Weight A-Component from Bovine Insulin.
Eng. Anal Biochem. 53,650-3. Jun 73.
- 895 Stahn R. Maier KP. Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.
Eng. J Cell Biol. 46,576-91. Sep 70.
- 901 Wright GL Jr. Farrell KB. Roberts DB.
An Evaluation of Gradient Acrylamide Gel Electrophoresis and Acrylamide Gelisoelectric Focusing for the Primary Separation of Complex Mixtures of Proteins- Comparison of One- and Two-Dimensional Analytical Procedures.
Eng. Biochim Biophys Acta. 295,396-411. 21 Feb 73.
- 905 Dietrich CP.
Continuous Fractionation of Proteins and Mucopolysaccharides by Simultaneous Two-Dimensional Gel Filtration and Electrophoresis.
Eng. Anal Biochem. 51,345-53. Feb 73.
- 908 Shimada K. Sekikawa K. Fujinaga K. Ito Y.
A New Device of Preparative Polyacrylamide Gel Electrophoresis and Its Application to Analysis of Cellular RNA.
Eng. Anal Biochem. 51,456-65. Feb 73.
- 928 Krichevskaja AA. Lukash AI. Sherstnev KB.
Separation of Brain Proteins by a Combination of Isoelectric Focusing and Polyacrylamide Gel Electrophoresis.
Rus. Dokl Akad Nauk SSSR. 209,1454-6. 21 Apr 73.
- 932 Conde RD. Paladini AC. Santome JA. Dellacha JM.
Isolation, Purification and Characterization of Equine Growth Hormone.
Eng. Eur J Biochem. 32,563-8. 1 Feb 73.
- 934 Rippe DF. Berry LJ.
Purification and Immunological Characterization of Mouse Hepatic Phosphoenolpyruvate Carboxykinase.
Eng. Prep Biochem. 3,99-112. 1973.
- 940 Obijeski JF. Palmer EL. Gafford LG. Randall CC.
Polyacrylamide Gel Electrophoresis of Fowlpox and Vaccinia Virus Proteins.
Eng. Virology. 51,512-6. Feb 73.
- 952 Milosevic P. Rakic L.
Fractionation of the Proteins of the Soluble Fraction of Brain.
Eng. J Neurochem. 19,2459-60. Oct 72.
- 954 Chan SL. Shirachi DY. Bhargava HN. Gardner E. Trevor AJ.
Purification and Properties of Multiple Forms of Brain Acetylcholinesterase (EC 3.1.1.7).
Eng. J Neurochem. 19,2747-58. Dec 72.

MACRO-CELLULAR SEPARATION

- 974 Jacobsen N.
Isoelectric Variants of Macaca Iruus Salivary Alpha-Amylase.
Eng. Comp Biochem Physiol B. 44,157-61. 15 Jan 73.
- 978 Kawata I.
Polyacrylamide Gel Electrophoresis of RNA.
Jap. Protein Nucleic Acid Enzyme (Tokyo)., Suppl-78-85. Oct 72.
- 980 Jirka M. Blanicky P.
Quantitative Immunolectrofocusing of Proteins with Respect to Their Heterogeneity.
Eng. Biochim Biophys Acta. 295,1-7. 25 Jan 73.
- 981 Barrett LD. Johns EW.
A Method for Differentiating Between Arginine-Rich Histones and Others in Polyacrylamide Gel.
Eng. J Chromatogr. 75,161-4. 3 Jan 73.
- 985 Vinik AI. Kaplan SL. Grumbach MM.
Purification, Characterization and Comparison of Immunological Properties of Monkey Chorionic Somatomammotropin with Human and Monkey Growth Hormone, Human Chorionic Somatomammotropin and Ovine Prolactin.
Eng. Endocrinology. 92,1051-64. Apr 73.
- 986 Sherins RJ. Vaitukaitis JL. Chrambach A.
Physical Characterization of Human Follicle Stimulating Hormone and Its Desialylation Products by Isoelectric Focusing and Electrophoresis in Polyacrylamide Gel.
Eng. Endocrinology. 92,1135-41. Apr 73.
- 989 Beckers JL. Everaerts FM. Houtermans WJ.
The Qualitative Separation of Fatty Acids by Isotachophoresis.
Eng. J Chromatogr. 76,277-9. 7 Feb 73.
- 1002 Murros J. Konttinen A. Somer H.
An Electrophoretic Method for the Quantitation of Aspartate Aminotransferase Isoenzymes.
Eng. Clin Chim Acta. 41,263-8. Oct 72.
- 1009 Paus PN. Alfheim I.
Analytical Polyacrylamide Gel Electrophoresis of Milligram Quantities of RNA.
Eng. Anal Biochem. 50,430-8. Dec 72.
- 1010 Amaldi P.
Autoradiographic Detection of H 3 -RNA Fractionated by Polyacrylamide Gel Electrophoresis.
Eng. Anal Biochem. 50,439-41. Dec 72.
- 1018A Loh WP.
Three-Minute Electrophoresis for Rapid Identification of Hemoglobin S.
Eng. J Indiana State Med Assoc. 65,1249. Dec 72.

MACRO-CELLULAR SEPARATION

- 1024 Josephson RV.
Isoelectric Focusing of Bovine Milk Caseins.
Eng. J Dairy Sci. 55,1535-43. Nov 72.
- 1025 Matheka HD. Straub OC.
Further Investigations to Differentiate IBR-Virus from IPV-Virus by
the Carrier-Free Zone Electrophoresis in a Glucose Density Gradient.
Ger. Arch Gesamte Virusforsch. 39,265-73. 1972.
- 1033 Chern CJ. Rittenberg MB. Black JA.
Purification of Human Erythrocyte Pyruvate Kinase.
Eng. J Biol Chem. 247,7173-80. 25 Nov 72.
- 1039 Tiollais P. Galibert F. Lepetit A. Auger MA.
Polyacrylamide Gel Electrophoresis of Ribonucleic Acids.
Fre. Biochimie. 54,339-54. 1972.
- 1041 Ishikawa H.
Fractionation of Dermal Acid Mucopolysaccharides by Cellulose Acetate
Electrophoresis.
Jap. Jap J Dermatol A. 82,375-9. Jun 72.
- 1042 Koshiyama I.
Purification and Physico-Chemical Properties of 11S Globulin in Soybean
Seeds.
Eng. Int J Protein Res. 4,167-76. 1972.
- 1046 Merz DC. Good RA. Litman GW.
Segregation of Membrane Components using Isoelectric Focusing in Poly-
acrylamide Gels.
Eng. Biochem Biophys Res Commun. 49,84-91. 6 Oct 72.
- 1054 Fletcher PL Jr. Hash JH.
Ribonuclease of Chalaropsis Species. I. Isolation and Physical
Properties.
Eng. Biochemistry. 11,4274-80. 7 Nov 72.
- 1061 Miner GD. Heston LL.
Method for Acrylamide Gel Isoelectric Focusing in Insoluble Brain Proteins.
Eng. Anal Biochem. 50,313-6. Nov 72.
- 1066 Wachter R De. Fiers W.
Preparative Two-Dimensional Polyacrylamide Gel Electrophoresis of 32
P-Labeled RNA.
Eng. Anal Biochem. 49,184-97. Sep 72.
- 1071 Vestermark A. Sjodin B.
Isotachopheresis in Two-Dimensional Combination with Zone Electrophoresis
for the Concentration and Separation of Glucose Metabolites.
Eng. J Chromatogr. 73,211-8. 8 Nov 72.

MACRO-CELLULAR SEPARATION

- 1074 Girolami A. Sticchi A. Bareggi G.
Crossover Electrophoresis (Electrosyneresis) Visualization of the
Abnormal Factor X (Factor X Friuli).
Eng. J Lab Clin Med. 80,740-7. Nov 72.
- 1076 Koenig R.
Anomalous Behavior of the Coat Proteins of Potato Virus X and Cactus
Virus X During Electrophoresis in Dodecyl Sulfate-Containing Polyacrylamide
Gels.
Eng. Virology. 50,263-6. Oct 72.
- 1085 Zeiller K. Dolan L.
Thymus Specific Antigen on Electrophoretically Separated Rat Lymphocytes.
Tracing of the Differentiation Pathway of Bone Marrow-Derived Thymocytes
by Use of a Surface Marker.
Eng. Eur J Immunol. 2,439-44. Oct 72.
- 1094 Barry J. Alberts B.
In Vitro Complementation as an Assay for New Proteins Required for
Bacteriophage T4 DNA Replication- Purification of the Complex Specified
by T4 Genes 44 and 62.
Eng. Proc Natl Acad Sci USA. 69,2717-21. Sep 72.
- 1098 Ventrelli I.
Electrophoretic Fractionation of Staphylococcus Aureus Extracts.
Ita. Boll Soc Ital Biol Sper. 48,314-8. 30 Jun 72.
- 1102 Schumacher K. Alzer G. Oerkermann H. Uhlenbruck G.
Isolation of the Mitogenic Components from Phytohaemagglutinin.
Eng. Klin Wochenschr. 50,713-4. 15 Jul 72.
- 1104 Zuidweg MH. Bos CJ. Welzen H Van.
Proteolytic Components of Alkaline Proteases of Bacillus Strains.
Zymograms and Electrophoretic Isolation.
Eng. Biotechnol Bioeng. 14,685-714. Sep 72.
- 1114 Paine PL. Feldherr CM.
Nucleocytoplasmic Exchange of Macromolecules.
Eng. Exp Cell Res. 74,81-98. Sep 72.
- 1115 Hiramatsu A. Ouchi T.
A Neutral Proteinase from Streptomyces Naraensis. 3. An Improved
Purification and Some Physicochemical Properties.
Eng. J Biochem (Tokyo). 71,767-81. May 72.
- 1118 Smeds S. Bjorkman U.
Micro-Scale Protein Separation by Electrophoresis in Continuous Poly-
acrylamide Concentration Gradients.
Eng. J Chromatogr. 71,499-505. 20 Sep 72.

MACRO-CELLULAR SEPARATION

- 1119 Vestermark A. Sjodin B.
Isotachopheresis Used Alone or in Two-Dimensional Combination with
Zone Electrophoresis for the Small-Scale Isolation of Labelled
Ribulose-1,5-Diphosphate.
Eng. J Chromatogr. 71,588-92. 20 Sep 72.
- 1125 Nordberg GF. Nordberg M. Piscator M. Vesterberg O.
Separation of Two Forms of Rabbit Metallothionein by Isoelectric
Focusing.
Eng. Biochem J. 126,491-8. Feb 72.
- 1126 Caspary EA. Field EJ.
Electrophoretic Slowing of Sensitized Lymphocyte-Macrophage Mixtures-
A Cellular Technique in Immunochemistry.
Eng. Biochem J. 126,4P-5P. Feb 72.
- 1128 McCarthy D. Hawkes SP. Lander DE.
Small-Scale Preparative Gel Electrophoresis of Ribonucleic Acids.
Eng. Biochim Biophys Acta. 277,301-5. 25 Aug 72.

PHARMACEUTICALS

- 9 Larcan A. Stoltz JF. Alexandre P.
Antagonistic Effects of Heparin and Protamine Sulfate on the
Electrophoretic Mobility of Blood Platelets.
Fre. Path Biol (Paris). 17,729-32. Aug-Sep 69.
- 35 Calcinari R.
The Zeta Potential And its Value in Pharmaceutical Technology.
Ita. Farmaco Prat. 25,24-38. Jan 70.
- 82 Maeda K. Yagi A. Naganawa H. Kondo S. Umezawa H.
Application of High-Voltage Paper Electrophoresis for Separation and
Identification of Antibiotics.
- 218 Martelli P. Bovalini L. Neri P. Pellerana Domini I.
Detection of Nad-Glycchydrolase in Electropherograms and
Chromatograms.
Ita. Atti Accad Fisiocrit Siena Med Fis. 17,1580-2. 1968
- 370 Khizhnki ZA. Lebedenko VIA.
Identification of Pharmaceutical Preparations From The S
Group of Aromatic Amines By Thin Layer Electrophoresis.
Ukrc. Farm ZH. 25,26-8. 1970.
- 382 Reichert LE Jr.
Electrophoretic Properties of Pituitary Gonadotropins as Studied by
Electrofocusing.
Eng. Endocrinology. 88,1029-44. Apr 71.
- 458 Sato S. Noguchi S. Noguchi A.
Experimental Studies on the Determination of Thyroxine-Binding
Protein Capacities by Cellulose-Acetate Electrophoresis
Jap. Jap J Clin Pathol. 18,715-8. Oct. 70.
- 462 Boll M. Falkenberg F. Jeckel D. Pedeiderer G.
Quantitative Immunologic Studies on Modified and Hybird Forms of
Lactate Dehydrogenase.
Ger. Hoppe Seylers Z Physiol Chem. 351,1268-72. Oct 70.
- 479 Vaitukaitis J. Hammond J. Ross G. Hickman J. Ashwell G.
A New Method of Labeling Human Chorionic Gonodotropin for Physiologic
Studies.
Eng. J Clin Endocrinol Metab. 32,290-3. Feb 71.
- 487 Jennings RC. Brocklehurst D. Hirst M.
A Comparative Study of Alkaline Phosphatase Enzymes Using Starch-Gel
Electrophoresis and Sephadex Gel-Filtration with Special Reference to
High Molecular Weight Enzymes.
Eng. Clin Chim Acta. 30,509-17. Nov 70.

PHARMACEUTICALS

- 510 Seno N. Anno K. Kondo K. Nagase S. Saito S.
Improved Method for Electrophoretic Separation and Rapid Quantitation
Of Isomeric Chondroitin Sulfates on Cellulose Acetate Strips.
Eng. Anal Biochem. 37,197-202. Sep 70.
- 520 Braselton WE Jr. McShan WH.
Purification and Properties of Follicle-Stimulating and Luteinizing
Hormones from Horse Pituitary Glands.
Eng. Arch Biochem Biophys. 139,45-58. Jul 70.
- 528 Norberg P. Hofsten B Von.
Chromatography of a Halophilic Enzyme on Hydroxylapatite in 3.4 M
Sodium Chloride.
Eng. Biochim Biophys Acta. 220,132-3. 14 Oct 70.
- 553 Castle AV. Wheelock JV.
Purification of Rennin.
Eng. J Dairy Res. 38,69-71. Feb 71
- 604 Oranskii IE. Iuvonina LM.
Electrophoresis of Drugs in an Ultrasonic Field.
Rus. Vopr Kurortol Fizioter Lech Fiz Kult. 37,217-9. May-Jun 72.
- 608 Schwartz D.
A Method of High Resolution Immuno-electrophoresis for the Alcohol
Dehydrogenase Isozymes.
Eng. J Chromatogr. 67,385-8. 3 May 72.
- 651 Van Kreel BK. Van Eijk HG. Leijnse B.
The Iso-Electric Fractionation of Rabbit Ferritin.
Eng. Acta Haematol (Basel). 47,59-64. 1972.
- 653 Kennedy SC. Rauner R. Gawron O.
On Pig Heart Aconitase.
Eng. Biochem Biophys Res Commun. 47,740-5. 26 May 72.
- 662 Eto S. Suzuki H.
Detection of Antithyroid Antibody by Fluoro-Electrosynthesis, with
Special Reference to Clear Line Antibody.
Jap. Clin Endocrinol (Tokyo). 20,62-8. Jan 72.
- 714 Urushizaki I. Niitsu Y. Matsuda M.
Electrofocusing Column Fractionation of Horse Spleen Ferritin.
Jap. Med Biol (Tokyo). 82,209-14. 6 Jun 71.
- 749 Ellis N. Alperin JB.
Laboratory Suggestions- A Rapid Method for Electrophoresis of
Erythrocyte Glucose-6-Phosphate Dehydrogenase on Cellulose Acetate
Plates.
Eng. Am J Clin Pathol. 57,534-6. Apr 72.
- 782 Maffezzoli RD. Kaplan GN. Chramback A.
Fractionation of Immunoreactive Human Chorionic Gonadotropin and
Luteinizing Hormone by Isoelectric focusing in Polyacrylamide Gel.
Eng. J Clin Endocrinol Metab. 34,361-9. Feb 72.

PHARMACEUTICALS

- 790 Carter WA.
Purification of Mouse and Human Interferons--Detection of Subunit Structure.
Eng. Prep Biochem. 1,55-75. Jan 71.
- 795 Graesslin D. Trautwein A. Bettendorf G.
Gel Isoelectric Focusing of Glycoprotein Hormones.
Eng. J Chromatogr. 63,475-7. 23 Dec 71.
- 823 Tosa T. Sano R. Yamamoto K. Nakamura M. Chibata I.
L-Asparaginase from *Proteus Vulgaris*. Purification, Crystallization, and Enzymic Properties.
Eng. Biochemistry. 11,217-22. 18 Jan 72.
- 846 Wrigley CW. Shepherd KW.
Electrofocusing of Grain Proteins from Wheat Genotypes.
Eng. Ann NY Acad Sci. 209,154-62. 15 Jun 73.
- 872 Kohnert KD. Ziegler M. Zuhlke H. Wilke B.
Isoelectric Focusing-Immunoassay- A New Technique Applied to the High Molecular Weight A-Component From Bovine Insulin.
Eng. Anal Biochem. 53,650-3. Jun 73.
- 925 Saluja PG. Gronow M. Hamilton JM.
Measurement of Canine Pituitary Prolactin.
- 935 Illingworth JA.
Anomalous Behavior of Yeast Isocitrate Dehydrogenase During Isoelectric Focusing.
Eng. Biochem J. 129,1125-30. Oct 72.
- 985 Vinik AI. Kaplan SL. Grumbach MM.
Purification, Characterization and Comparison of Immunological Properties of Monkey Chorionic Somatomammotropin With Human and Monkey Growth Hormone, Human Chorionic Somatomammotropin and Ovine Prolactin.
Eng. Endocrinology. 92, 1051-64. Apr 73.

BLOOD RESEARCH

- 15 Strekalov AA. Novoseletskii AG.
Behavior of Hemoglobin Octamer in Linear Mice in Electrophoresis.
Rus. Vop Med Khim. 15,462-4. Sep-Oct 69.
- 31 Fondo EY Jr. Bartalos M.
Electrophoretic Separation of Multiple Bands with Beta-Glucuronidase
Activity in Human Sera.
Eng. Biochem Genet. 3,591-3. Dec 69.
- 32 Praxedes H. Mesquita MP DE. Dias AG.
Hemoglobin Paper Electrophoresis. A Simple and Efficient Technic.
Por. Hospital (Rig). 74,567-73. Aug. 68.
- 41 Searcy RL. Hines LR.
Electrophoretic Behavior of Sonicated Human Serum Proteins.
Eng. Experientia. 25,914-6. 15 Sep 69.
- 46 Abraham K. Schutt K. Muller I. Hoffmeister H.
Continuous Polyacrylamide Electrophoresis. I. Studies on Normal Sera.
Ger. Z Klin Chem. 8,92-8. Jan 70.
- 52 Kostner G. Albert W. Holasek A.
Analytical Isoelectric Focussing of Human Serum Lipoproteins.
Ger. Hoppe Seyler Z Physiol Chem. 350,1237-52. Nov 69.
- 70 Burstein M.
Serum Beta Lipoproteins in Reversed Immuno-electrophoresis.
Fre. Rev Franc Etud Clin Biol. 14,918-21. Nov 69.
- 75 Furuta K.
Immuno-electrophoretic Study of Circulating Blood.
Jap. Jap J Leg Med. 23,294-8. Jul 69.
- 84 Fahie-Wilson MN.
Routine Investigation of Amino Acid Patterns in Blood Serum and Urine
By Thin-Layer Electrophoresis.
Eng. J Med Lab Techn. 26,363-70. Oct 69.
- 108 Wraxall BG. Culliford BJ.
A Thin-Layer Starch Gel Method for Enzyme Typing of Bloodstains.
Eng. J Forensic Sci Soc. 8,81-2. Oct 68.
- 134 Lane RF.
Serum Lipoprotein Patterns by Electrophoresis.
Eng. J Med Lab Techn. 26,212-7. Jul 69.

BLOOD RESEARCH

- 139 EK N.
Studies on Electrophoresis on Cellulose Acetate Membrane of Bovine Serum Proteins in Healthy Animals.
Eng. Acta Vet Scand. 10,118-26. 1969.
- 140 Hara T.
A Study on Serum Protein Fraction by Cellulose Acetate Membrane Electrophoresis in Childhood.
Jap. J Kumamoto Med Soc. 43,752-71. 25 Sep 69.
- 144 Turowska B. Gawrzewski W. Opolska B.
The Use of Thin-Layer Electrophoresis in Starch Gell for Determination of Alkaline Phosphatase in Human Blood Serum.
Eng. Acta Med Pol. 10,315-8. 1969.
- 156 Schutzler G. Siegert M. Jarofke D.
Quantitative Determination of Serum Proteins and Test of Their Color Affinity with Agar Gel Electrophoresis.
Ger. Berlin Munchen Tieraerztl Wschr. 82,42-5. 1 Feb 69.
- 180 Stephan W. Frahm U.
Quantitative Immuno-electrophoresis- A Micromethod for the Routine Determination of Serum Proteins.
Ger. Z Klin Chem Klin Biochem. 8,469-74. Sep 70.
- 208 Leaback DH. Walker PG.
Some Applications of Gel Isoelectric Focusing to the Examination of Human Serum Proteins.
Eng. Proc R. Soc Med. 64,645-6. Jun 71.
- 212 Schlesinger D.
Determination of GC Types by Starch-Gel Electrophoresis.
Eng. Arch Immunol Ther Exp (Warsz). 19,173-8. 1971.
- 217 Larcan A. Streiff F. Stoltz JF. Alexandre P.
Influence of Liquoid on Electrophoretic Mobility and Some Thrombocytic Properties. Correlation with the Action on Mesenteric Circulation in the Rat.
Fre. Agressologie. 12,49-56. 1971.
- 232 Kucerova L. Stork A. Fabian E. Papezova R.
Use of Electrophoresis of Serum Lipoproteins in the Diagnosis of Primary Hyperlipoproteinemias.
Che. SB Lek. 73,135-42. May 71.
- 238 Ferri S. Birgel EH. Silva RA.
Electrophoretic Study of Seric Proteins in Normal Toggenburg Female Goats with Aging.
Eng. Arch Vet Ital. 21,119-25. 30 Jun 70.

BLOOD RESEARCH

- 241 Wehinger H. Alebouyeh M.
Quantitative Densitometric Determination of Hemoglobin A2 Following Micro-Zone Electrophoresis with Cellulose Acetate Foil.
Ger. Klin Wochenschr. 48,701-3. 1 Jun 70.
- 243 Chalvardjian A.
Agarose--Starch Gel Electrophoresis of Rat Serum Lipoproteins.
Eng. J Lipid Res. 12,265-9. May 71.
- 260 Johnson EA.
Electrophoretic Separation of Plasma Lipoproteins Using Agarose Gel On a Slide.
Eng. AM J Med Technol. 37,233-4. Jun 71.
- 267 Kucerova L. Stork A. Fabian E. Papezova R.
Determination of Serum Lipoproteins with Paper and Agarose Electrophoresis.
Che. Cas Lek Cesk. 110,258-9. 12 Mar 71.
- 271 Srinivasan SR. Lopez A. Radhakrishnamurthy B. Berenson GS.
A Simple Technic for Semiquantitative, Clinical Estimation of Serum Beta- and Pre-Beta-Lipoproteins.
Eng. Angiologica. 7,344-50. 1970.
- 272 Schyma D. Taubert M.
Analysis of Paraproteins of Serum by Electrophoresis Using a Carrier-Gel Produced from Alginic Acid and Electrolytes.
Ger. Aerztl Forsch. 25,68-71. 10 Mar 71.
- 275 Elphick MC.
Microscope Slide Electrophoresis of Serum Lipoproteins in Agarose Gel.
Eng. J Clin Pathol. 24,83-5. Feb 71.
- 284 Papadopoulos NM. Kintzios JA.
Varieties of Human Serum Lipoprotein Pattern- Evaluation by Agarose Gel Electrophoresis.
Eng. Clin Chem. 17,427-9. May 71.
- 291 Lyngbye J. Kroll J.
Quantitative Immunoelectrophoresis of Proteins in Serum from a Normal Population- Season-, Age-, and sex-Related Variations.
Eng. Clin Chem. 17,495-500. Jun 71.
- 293 Rho GL. Vergani C. Vannotti M. Vecchi G.
Electrophoresis of Plasma Lipoproteins on Gelatinized Cellulose Acetate.
Eng. Clin Chem. 17,551-2. Jun 71.

BLOOD RESEARCH

- 299 Brown IR. Grech JL.
Separation and Characterization of a Foetal Haemoglobin Variant by Means of Isoelectric Focussing.
Eng. Life Sci II. 10,191-4. 22 Feb 71.
- 307 Potel M. Wagner J.
Additional Distinct Gamma-Globulin Fractions in Agar-Gel Electrophoretograms.
Eng. Acta Biol Acad Sci Hung. 21,299-302. 1970.
- 323 Muller HE.
A Method for in Verito Studies on the Degradation of Human Plasma Proteins by Bacterial Proteases Using Pseudomonas Aeruginosa As an Example.
Ger. Zentralbl Bakteriol Crig. 216,79-87. 1971.
- 324 Werner H. Muller HE.
Immunelectrophoretic Studies of the Action of Bacteroides, Fusobacterium, Leptichtrichia, and Sphaerophorus Species on Human Plasma Proteins.
Ger. Zentralbl Bakteriol Crig. 216,96-113. 1971.
- 328 Plesa M. Scripcaru G.
Electrophoretic Study of Human and Animal Hemoglobins.
Rum. Rev Med Chir Soc Med Nat Iasi. 75,179-85. Jan-Mar 71.
- 333 Rosemeyer D. Schleyer F.
Are Immuno-Electrophoretically Developed Serum Protein Patterns Individually Determined.
Ger. Z Immunitaetsforsch Allerg Klin Immunol. 141,274-9. 1971.
- 346 Arima T. Yamazaki S.
Technic of Serum Lipoprotein Analysis by Paper Electrophoresis and its Clinical Significance.
Jap. Jap J Clin Pathol. 18,856-9. Dec 70.
- 369 Scott RB.
Rapid Technic for Preparation of Hemoglobin Solutions for Electrophoresis.
Eng. Am J Clin Pathol. 54,78-81. Jul 70.
- 376 Lindner H. Muller J.
Paper Electrophoretic Study of Serum Lipoproteins in Clinically Healthy Cattle and Horses.
Ger. Arch Exp Veterinaermed. 24,781-4. 1970.
- 390 Drysdale JW. Righetti P. Bunn HF.
The Separation of Human and Animal Hemoglobins by Isoelectric Focusing in Polyacrylamide Gel.
Eng. Biochim Biophys Acta. 229,42-50. 19 Jan 71.

- 403 Kaplan LJ. Foster JF.
Isoelectric Focusing Behavior of Bovine Plasma Albumin,
Mercaptalbumin, and Beta-Lactoglobulins A and B.
Eng. Biochemistry. 10,630-6. 16 Feb 71.
- 410 Sandor G. Orley C. Sandor M.
Composition of Serum Roteins. II. Influence of Certain Physiological.
Factors.
Fre. Ann Biol Clin (Paris). 28,319-26. 1970.
- 422 Cornelissen PJ. Roelcfs-Fizaan LE.
Electrophoretic Separation of Lipoproteins.
Eng. Clin Chim Acta. 29,344-5. Aug 70.
- 434 Domschke W. Seyde W. Domagk GF.
Two Dimensional Separation of Serum Proteins by Isoelectrical
Focussing and Disk Gel Electrophoresis.
Ger. Z Klin Chem Klin Biochem. 8,319-20. May 70.
- 437 Wollenweber J. Kahlke W.
Comparative Serum Lipoprotein Analysis by Polyacrylamide Disc Gel and
Gel Electrophoresis.
Ger. Clin Chim Acta. 29,411-20. Sep 70.
- 466 Larcan A. Stoltz JF. Voiry AM
Changes in the Electric Charge of Blood Platelets During Various
Agressions. (Thrombosis. Endotoxin Shock. Acute Hemolysis).
Fre. Presse Med. 78,2379-80. 12 Dec 70.
- 478 Utermann G. Wiegandt H.
Determination of the LP(A)-Protein by Disc-Electrophoresis of
Lipoprotein-Fractions.
Ger. Humangenetik. 11,66-71. 1970.
- 483 Ito KF. Miyai K. Kimura K. Abe H. Kumahara Y.
Radio-Immuno- And Paper-Electrophoretic Analysis of
3,5,3'-L-Tri-Iodothyronine-Binding, Proteins in Normal Human Sera.
Eng. Clin Chim Acta. 30,259-66. Nov 70.
- 484 Dangerfield WG. Pratt JJ.
An Investigation of Plasma Lipoproteins by Polyacrylamide
Electrophoresis.
Eng. Clin Chim Acta. 30,273-8. Nov 70.
- 489 Geiger H. Hoffmann P.
Quantitative Immunological Determination of 16 Different Blood
Proteins in 260 Normal Children, Aged 0 to 15 Years.
Ger. Z Kinderheilkd. 109,22-40. 1970.
- 495 Ayme G. Fresnel A. Triau R.
An Improved Technic for Polyacrylamide Gel Electrophoresis-
Application for the Study of Serum Proteins During Plasmapheresis.
Fre. Progr Immunobiol Stand. 4,434-45. 1970.

- 507 Zollner N. Grobner W. Berger C. Wolfram G.
Electrophoretic Separation of Serum Lipoproteins in Agarose Gel With
the Addition of Albumin.
Ger. Z Klin Chem Klin Biochem. 7,525-9. 8 Sep 70.
- 508 Klemens UH. Schmalbeck J.
Lipoprotein Electrophoresis on Cellulose Acetate Membranes. An
Analytical and Semi-Quantitative Method Suitable for the Clinical
Routine.
Ger. Z Klin Chem Klin Biochem. 7,540-6. 8 Sep 70.
- 513 Frangini V.
Hemoglobin A2 Values Determined by Means of Radial Electrophoresis on
Cellulose Acetate Gel in Normal Neonates and Infants.
Ita. Riv Clin Pediatr. 81,372-3. Jul - Aug 68.
- 549 Kroning G. Rechenberger J.
Electrophoretic Separation of Serum Lipoproteins Using Eri 10 for the
Assessment of the Pherograms.
Ger. Z Gesamte Inn Med. 27,211-5. 1 Mar 72.
- 552 Streiff F. Stoltz JF. Larcan A. Alexandre P.
Influence of Ionic Strength, H + Ions and Polybrene on the
Electrophoretic Mobility of Human Blood Platelets.
Fre. C R Soc biol (Paris). 165,1685-9. 1971.
- 573 Kampen EJ Van. Plceg PH Van DER.
Lipoprotein Electrophoresis on Gelatinized Cellulose Acetate.
Eng. Clin Chim Acta. 40,485-8. Sep 72.
- 582 Streiff F. Stoltz JF. Genetet B.
Electrophoretic Mobility of the Erythrocyte.
Fre. Nouv Rev Fr Hematol. 11,913-27. Nov-Dec 71.
- 621 Ahlers I. Milarova R. Ahlersova E.
Electrophoresis of Human Serum Lipoproteins in Modified Agar and
Agarose.
Sloc. Cas Lek Cesk. 111,592-4. 16 Jun 72.
- 629 Fuller JM. Keyser JW.
Some Technical Aspects of Quantitative Immunoelectrophoresis of Human
Serum and Cerebrospinal Fluid.
Eng. Clin Chem. 18,625-9. Jul 72.
- 639 Koubek K. Erbenova L.
Electrophoretic Pattern of Mouse Haemoglobin in F 1 Hybrids as
Compared to a Mixture of Parent-Strain Haemoglobins.
Eng. Folia Biol (Praha). 18,219-21. 1972.

- 645 Dees SC.
Longitudinal Study of Serum Proteins in Allergic Children.
Eng. Ann Allergy. 30,231-40. May 72.
- 655 Sturgeon P. Kolin A. Kwak KS. Luner SJ.
Studies of Human Erythrocytes by Endless Belt Electrophoresis. I. A
Comparison of Electrophoretic Mobility with Serologic Reactivity.
Eng. Haematologia (Budap). 6,92-108. 1972.
- 661 Gabr Y. Soliman MH. Dawoud S. El-Molla A. Amin ES.
Studies on Stabilized Human Plasma Protein Solution.
Eng. Acta Biol Med Ger. 27,341-9. 1971.
- 703 Kipping D.
Importance of Electrophoresis in Studies of Proteins of Human Semen.
Ger. Dermatol Monatsschr. 157,589-98. Aug 71.
- 710 De Pizzolota MC Del Campo GB. Pizzolato MA. Vergani C.
Sensitive, Rapid Quantitation of Serum and Urinary Protein by
Electroimmunodiffusion.
Eng. Clin Chem. 18,203-5. Mar 72.
- 711 Koti KB. Sharsri MG. Sainani GS.
Study of Electrophoretic Pattern of Serum Proteins in
Hypoproteinaemic States.
Eng. J Indian Med Assoc. 58,83-7. 1 Feb 72.
- 717 Yamazaki S. Arima T.
Lipoprotein Analysis Using Paper Electrophoresis.
Jap. Saishin Igaku. 27,429-33. Mar 72.
- 718 Kanno T. Tsukamoto H.
Electrophoresis Analysis of Lipoproteins of Cellulose Acetate.
Jap. Saishin Igaku. 27,434-40. Mar 72.
- 719 Okishio T. Matsumiya K.
Analysis of Lipoproteins Using Agarose Gel and Disc Electrophoresis.
Jap. Saishin Igaku. 27,441-6. Mar 72.
- 731 Magnani HN. Howard AN.
A Quantitative Method for Blood Lipoproteins Using Cellulose Acetate
Electrophoresis.
Eng. J Clin Pathol. 24,837-45. Dec 71.
- 732 Evans DI.
Haemoglobin Electrophoresis on Cellulose Acetate Using Whole Blood
Samples.
Eng. J Clin Pathol. 24,877-8. Dec 71.

BLOOD RESEARCH

- 742 Wada M. Mise J.
Disc Electrophoresis of Serum Lipoprotein--A New Method Derived From
Ornstein-Davis Method.
Jap. Jap J Clin Pathol. 19,849-52. Dec 71.
- 746 Waldmann-Meyer H.
Rheophoretic Evaluation of Stokes Radii in Cell Electrophoresis.
Eng. Bio chim Biophys Acta. 261,148-60. 28 Jan 72.
- 754 Mione RR.
Repeated Reuse of a Starch Gel in Hemoglobin Screening.
Eng. Vox Sang. 22,192. 1972.
- 763 Aoki N. Matsuda S. Kawai T. Oshima S. Yamagishi Y.
Evaluation of Quantitative Analysis of Serum Protein by Immunological
Methods.
Jap. Jap J Clin Pathol. 19,Suppl-147-8. Aug 71.
- 794 Hatch FT. Mazrimas JA. Moore JL. Lindgren FT. Jensen LC. Wills
Rd. Adamson GL.
Semi-Quantitative Paper Electrophoresis of Serum Lipoproteins.
Eng. Clin Biochem. 3,115-23. Jun 70.
- 827 Wright GL Jr.
High Resolution Two-Dimensional Polyacrylamide Electrophoresis of
Human Serum Proteins.
Eng. Am J Clin Pathol. 57,173-85. Feb 72.
- 838 Charman RC. Braeuler C.
An Evaluation of Cellulose Acetate Electrophoresis for the
Determination of Human Plasma Lipoprotein Patterns.
Eng. Atherosclerosis. 17,483-91 May-Jun 73.
- 854 Scanu AM. Edelstein C. Aggerbeck L.
Application of the Technique of Isoelectric Focusing to the Study
of Human Serum, Lipoproteins and Their Apoproteins.
Eng. Ann NY Acad Sci. 209,311-28. 15 Jun 73.
- 857 Spragg J. Kaplan AP. Austen KF.
The Use of Isoelectric Focusing to Study Components of the Human
Plasma Kinin-Forming System.
Eng. Ann NY Acad Sci. 209,372-86. 15 Jun 73.
- 887 Hatch FT. Lindgren FT. Adamson GL. Jensen LC. Wong AW. Levy RI.
Quantitative Agarose Gel Electrophoresis of Plasma Lipoproteins-A
- 888 Gausach PP.
Characteristics of Posthemorrhagic Regeneration of Blood Proteins in
Disordered Thyroid Hormone Balance.
Rus. Pathol Fiziol Eksp Ter. 17,78-80. Mar-Apr 73.

BLOOD RESEARCH

- 914 Catsimpoolas N. Kenney J.
Analytical Isotachopheresis of Human Serum Proteins with Ampholine Spacers.
Eng. Biochim Biophys Acta. 285,287-92. 28 Dec 72.
- 923 Saint-Paul M. Rebeyrotte P. Derobert L. Peillet J. Labbe JP.
2-Dimensional Immunoelectrophoretic Studies on the Degradation of Serum Proteins by Decay.
Ger. Beitr Gerichtl Med. 30,376-81. 1973.
- 968 Barton RJ.
Anomalous Behaviour of Bovine Serum Albumin in Electrophoresis on Non-Denaturing Polyacrylamide Gel.
Eng. Biochem J. 129,983-5. Oct 72.
- 973 Wada M. Naito HK. Ehrhart LA. Lewis LA.
Polyacrylamide-Gel Block-Electrophoresis of Plasma Lipoproteins.
Eng. Clin Chem. 19,235-9 Feb 73.
- Kleist H.
Electrophoresis of Native Serum Albumin and Albumin Preparations in Urea-Agar-Gel.
Ger. Z Med Labortech. 13,319-24. 1972.
- 996 Gysin J.
Analysis of Scorpion Serum Proteins by Immunoelectrophoresis.
Fre. Ann Inst Pasteur (Paris). 123,109-13. Jul 72.
- 995 Laurell CB.
Is Electrophoretic Analysis of Plasma Proteins Becoming Out-Dated.
Eng. Scand j Clin Lab Invest. 30,233-5. Nov 72.
- 1003 Afonso E. Affonso A. Sansguiri RS.
Orthogonal Immunodiffusion and Immunodiffusion and Immunoelectrophoresis of Serum Proteins.
Eng. Clin Chim Acta. 41,275-86. Oct 72.
- 1012 Ghosh S. Basu MK. Schweppe JS.
Agarose Gel Electrophoresis of Serum Lipoproteins- Determination of True Mobility, Isoelectric Point, and Molecular size.
- 1026 Dudarev VP.
An Improvement of Methods for Rat Hemoglobin Electrophoresis in Agar Ge.
Ukr. Fiziol Zh. 17,558-60. Jul-Aug 71.
- 1037 Winch MA. Versey J. Noble AR. Munday KA.
A New Direct Method for the Assay of Human Renin.
Eng. Experientia. 28,1394-5. 15 Nov 72.

BLOOD RESEARCH

- 1027 Haynes JK. Ingram VM
A Simple Screening Procedure for Hemoglobin S.
Eng. N Engl J Med. 288,49. 4 Jan 73.
- 1045 Kartel " MV.
The Variability of Electrophoretic Mobility of Rat Serum Protein
- 1048 Villanueva E. Ky Pt. Lenoir L. Demailly A. Muller P.
Study of Human Haptoglobins by Means of Continuous Density Gradient
Polyacrylamide Gel Electrophoresis.
Fre. Med Leg Domm Ccropr (Paris). 5,48-51. Jan-Mar 72.
- 1050 Saint-Paul M. Rebeyrotte P. Derobert I. Peillet J. Labbe JP.
Modifications Observed by Bidimensional Immunoelectrophoresis During
The Putrefactive Degradation of Serum Proteins.
Fre. Med Leg Domm Ccropr (Paris). 5,68-70. Jan-Mar 72.
- 1083 Rocks MJ.
Rapid Haemolysate Preparation for Foetal Haemoglobin Estimation and
Haemoglobin Electrophoresis.
Eng. Med Lab Technol. 29,398-400. Oct 72.
- 1100 Koepke JA. Miller L.
Fractionation of Human Hemoglobins Using Isoelectric Focusing.
Eng. Ann Clin Lab Sci. 2,335-42. Jul-Aug 72.
- 1116 Charlesworth D.
Starch-Gel Electrophoresis of Four Enzymes from Human Red Blood
Cells- Glyceraldehyde-3-Phosphate Dehydrogenase, Fructioldolase,
Glyoxalase II and Scrbitol Dehydrogenase.
Eng. Ann Hum Genet. 35,477-84. Apr 72.
- 1124 Wilkinson PA. Mills GL.
The Analysis of Serum Lipoproteins by "Crossed Wlectrophoresis".
Eng. Biochem J. 126,28P. Feb 72.

BASIC RESEARCH

- 2 Bertrand F. Watelet M. Genetet F. Nabet P. Paysant P.
Lipoproteinograms on Gel Cellulose Acetate in the Micromethod.
Fre. Ann Biol Clin (Paris). 27,735-47. Oct-Dec 69.
- 3 Harris GC Jr. Sweeney MJ.
Electrophoretic Evaluation of Blood Sera Proteins of Adult Male Chickens.
Eng. Poult Sci. 48,1590-3. Sep 69.
- 5 Koziol A.
Serum Proteinogram in the Newborn with Serological Conflict Treated by Exchange Blood Transfusion.
Pls. Roczn Pom Akad Med Swierczewski. 15,491-511. 1969.
- 10 Weiss L. Cudney TL.
Some Effects of PH and Formaldehyde on the Cellular Electrokinetic Surface.
Eng. Int J Cancer. 4,776-84. 15 Nov 69.
- 11 Saha N. Banerjee B.
A Comparative Study of Serum Protein Electrophoretic Patterns in Indians and Europeans.
Eng. Trop Geogr Med. 22,53-60. Mar 70.
- 14 Wilkins DJ. Myers PA.
The Anomalous Electrophoretic Behavior of Certain Absorbed Protein.
- 16 Bert G. Lajolo Di Cossano D. Pecco P. Mazzei D.
Effect of A.L.S. and Prednisolone on the Electrophoretic Mobility of Lymphocytes.
Eng. Lancet. 1,365. 14 Feb 70.
- 19 Lichtman MA. Weed RI.
Electrophoretic Mobility and N-Acetyl Neuraminic Acid Content of Human Normal and Leukemic Lymphocytes and Granulocytes.
Eng. Blood. 35,12-22. Jan 70.
- 24 Moggi C. Carattoli MT.
Study of Serum Protein Fractions in Full Term and Premature Infants by Means of Radial Electrophoresis on Cellulose Acetate Gel.
Ita. Riv Clin Pediat. 81,723-7. Sep-Oct 68.
- 27 Tanner CE.
Immunochemical Study of the Antigens of Trichinella Spiralis Larvae. IV. Purification by Continuous-Flow Paper Electrophoresis and Column Chromatography.
Eng. Exp Parasit. 27,116-35. Feb 70.

BASIC RESEARCH

- 29 Brummel MC. Montgomery R.
Acrylamide Gel Electrophoresis of the S-Sulfo Derivatives of Fibrinogen.
Eng. Anal Biochem. 33,28-35. Jan 70.
- 33 Refetoff S. Robin NI. Fang VS.
Parameters of Thyroid Function in Serum of 16 Selected Vertebrate Species- A Study of PBI, Serum T4, Free T4, and the Pattern of T4 and T3 Binding TC Serum Proteins.
Eng. Endocrinology. 86,793-805. Apr 70.
- 34 Hamilton RW Jr. Cohen JD. Doebbler GF. Exposito LF. King JM. Smith KH. Schreiner HR.
Biochemical and Metabolic Effects of a Six-Month Exposure of Small Animals to a Helium-Oxygen Atmosphere. NASA Cr-1372.
Eng. US NASA. ,1-86. Oct 69.
- 36 Gotz H. Heinebrodt A.
Serum Proteins in Animals. Biochemical and Immuno-electrophoretic Analyses of Bovine Serum.
Ger. ZBL Veterinaermed A. 16,691-702. Oct 69.
- 38 Kuhn RA.
Igg-Paraproteinemias in Immuno-electrophoresis. A Contribution on the Structure and Importance of These Proteins.
Ger. Blut. 20,14-24. Jan 70.
- 42 Zippel R. Meyer P. Bietz G.
Electrophoresis of Parotid Secretion. II. Membrane Electrophoresis.
Ger. Z Laryng Phincl Otol. 48,891-4. Dec 69.
- 43 Sebastiani A. Assumma M. Balestrieri A.
Standard Serum Protein Electrophoretic Diagram in Certain Groups of Tropical Populations.
Ita. Arch Ital Sci Med Trop. 50,107-18. Mar-Apr 69.
- 47 Beckering RE Jr. Elleeson RD.
A Rapid Method for Lipoprotein Electrophoresis Using Cellulose Acetate as Support Medium.
Eng. Amer J Clin Path. 53,84-8. Jan 70.
- 49 Dmitrenko NP.
Studying the Sarcoplasmic and Mitochondrial Isoenzymes of Atp-Creatine Phosphotransferase of Vertebrate Muscles by Electrophoresis on Agar Gel.
Ukr. Ukr Biokhim ZH. 41,26-30. 1969.

- 50 Belik IAV. Smerchinskaia LS. Glovatskaia EP.
Electrophoretic Study of Proteins Extracted From Subcellular Structures of Brain with Triton X-100.
- 55 Korinek J.
Adjustment of the Agar Carrier for Immunoelectrophoresis of Proteins With Regard to Demonstration of the GC Component in Human Serum.
Che. Vnitřni Lek. 15,1025-8. Oct 69.
- 63 Reichel A. Gerbstadt H.
Comparative Studies of Plasma and Lymph of the Frog (*Rana Esculenta* and *Rana Temporaria*), By Means of Medium-Free Electrophoresis and Paper Electrophoresis.
Ger. Acta Biol Med German. 22,269-85. 1969.
- 64 Brown IR.
Polyacrylamide Gel Electrophoresis of DNA Polymerase From Ehrlich Ascites Tumor Cells and Recovery of Active Enzyme.
Eng. Biochim Biophys Acta. 191,731-4. 1969.
- 66 Azen EA. Smithies C. Hiller C.
High-Voltage Starch-Gel Electrophoresis in the Study of Post-Albumin Proteins and C'3 (Beta 1C-Globulin) Polymorphism.
Eng. Biochem Genet. 3,215-28. Jun 69.
- 67 Der Kaloustian VM. Eyrne R. Young WJ. Childs B.
An Electrophoretic Method for Detecting Hypoxanthine-Guanine Phosphoribosyl Transferase Variants.
Eng. Biochem Genet. 3,299-302. Jun 69.
- 69 Fullarton JR. Kenny AJ.
A Rapid System for Preparative Electrophoresis Depending on Isoelectric Buffers of Low Conductivity.
Eng. Biochem J. 116,147-9. Jan 70.
- 71 Bert G. Lajolo Di Cossano D. Pecco P.
The Detection by Cellular Electrophoresis of Surface Antibodies on Human Lymphocytes.
Eng. Clin Exp Immun. 5,669-72. Dec 69.
- 78 Abrams B. Clarke HG.
Serum Immunoelectrophoresis in Patients with Ewing's Sarcoma.
Eng. Lancet. 1,300. 7 Feb 70.
- 86 Schellner HP.
Electrophoresis of Chicken Serum with Acetate Folium and Reseparation in Polyacrylamide Gel.
Ger. Berlin Munchen Tieraerztl Wschr. 82,351-2. 15 Sep 69.

BASIC RESEARCH

- 89 Lozza A. Kereszti Z. Berencsi G.
Possibilities of Differentiation of Paraproteins by Means of Electrophoresis.
Ger. Z Med Labortechn. 10,205-7. 1969.
- 91 Brachmann K. Muller J.
Use of Paper Electrophoresis Apparatus of the Veb Carl Zeiss Jena for Other Types of Electrophoresis. 3. Membrane-Foil Electrophoresis.
Ger. Z Med Labortechn. 10,247-8. 1969.
- 95 Birnboim HC. Glickman J.
Fractionation of Cligonucleotide Isopliths by Electrophoresis on Polyacrylamide Gels.
Eng. J Chromatogr. 44,581-92. 11 Nov 69.
- 98 Peduzzi R. Turian G.
Immunochemistry and Electrophoresis of the Conidiation of Neurospora Crassa.
Fre. Experientia. 25,1178-80. 15 Nov 69.
- 100 Caliguiri LA. Klenk HD. Choppin PW.
The Proteins of the Parainfluenza Virus SV5. 1. Separation of Virion Polypeptides by Polyacrylamide Gel Electrophoresis.
Eng. Virology. 39,460-6. Nov 69.
- 101 Lewis WH. Truslove GM.
Electrophoretic Heterogeneity of Mouse Erythrocyte Peptidases.
Eng. Biochem Genet. 3,493-8. Oct 69.
- 103 Jonas We.
Immunolectrophoretic Analysis of Sheep Serum Using Guinea-Pig Antisera To Particulate Antigens Treated With Sheep Antiserum.
Eng. Res Vet Sci. 10,397-404. Sep 69.
- 112 Alper CA. Johnson AM.
Immunofixation Electrophoresis- A Technique for the Study of Protein Polymorphism.
Eng. Vox Sang. 17,445-52. Nov 69.
- 128 Goulet P.
Fractionation of Escherichia Coli K12 Soluble Proteins by Agarose Acrylamide Gel Electrophoresis.
Fre. C R Acad Sci D (Paris). 269,258-60. 16 Jul 69.
- 129 Merkur'Eva RV. Balaea TIA. Markova ON.
Electrophoretic Study of Mucopolysaccharides After Compound Fracture.
Rus. Vop Med Khim. 15,351-6. Jul-Aug 69.
- 130 Berger B.
Agarose Gel Electrophoresis of Proteins from Bovine Corneal Epithelium.
Eng. Acta Ophthal (Kobenhavn). 47,1026-40. 1969.

BASIC RESEARCH

- 148 Montie TC. Montie DB.
Heterogeneity Between Two Mouse-Toxic Protein Polymers From
Pasteurella Pestis Indicated by Electrophoresis Patterns in a
Phenol-Acetic Acid-Urea Gel System.
Eng. J Bact. 100,535-7. Oct 69.
- 153 Buresh L.
Determination of Sperm in Sperm Stains by Paper Electrophoresis.
Rus. Sudebnomed Ekspert. 11,46-7. Jul-Sep 68.
- 163 Caputo MJ. Taft DM.
Separation of Serum Alkaline Phosphatases by Micro Starch Gel
Electrophoresis.
Eng. Am J Clin Pathol. 56,220-4. Aug 71.
- 165 Hamana K. Hafez ES.
Protein Electrophoretic Pattern of Bovine Allantoic Fluid During
Early Pregnancy.
Eng. Cornell Vet. 61,375-80. Jul 71.
- 175 Flodh H. Bergrahn B. Oden B.
Vitamin B 12-Binding Substances in the Gastric Mucosa of Mice as
Studied by Sephadex Gel Filtration and Isoelectric Focusing.
Eng. Life Sci II. 7,155-9. 15 Feb 68.
- 176 Sherwin RM. Moore GH.
Microzone Electrophoresis of Unconcentrated Cerebrospinal Fluid Using
Cellulose Acetate Strips and Nigrosin Dye.
Eng. Am J Clin Pathol. 55,705-12. Jun 71.
- 264 Tohou HP. Claflin AJ. Muench KH.
Tryptophanyl Transfer RNA Synthetase from Lymphocytes of Human
Chronic Lymphocytic Leukemia.
Eng. Cancer Res. 31,679-83. May 71.
- 319 Vaidya RA. Glass RH. Dankekar P. Johnson K.
Decrease in the Electrophoretic Mobility of Rabbit Spermatozoa
Following Intra-Uterine Incubation.
Eng. J Reprod Fertil. 24,299-301. Feb 71.
- 320 Rose H. Moldenhauer H.
Immuno-electrophoretic Examinations of the Effect of Whole Body
Irradiation on the Serum Protein Picture of Juvenile Rats.
Ger. Radiobiol Radiother (Berl). 11,471-4. 1970.
- 337 Vymola F. Lochmann C. Buda J. Jedlickova Z. Phiich J.
Study of Pseudomonas Aeruginosa-Haemolysin by Electrophoresis.
Eng. J Hyg Epidemiol Microbiol Immunol (Praha). 15,23-7. 1971.

BASIC RESEARCH

- 338 Darwiche Z. Tran -Van-Ky P. Muller PH.
New Electrophoresis Technic Applied to the Identification of the Specific Enzyme of Human Sperm.
Fre. Med Leg Domm Coropr (Paris). 3,407-12. Oct-Dec 70.
- 342 McClelland DB. Finlayson ND. Samson RR. Nairn IM. Shearman DJ.
Quantization of Immunoglobulins in Gastric Juice by Electroimmunodiffusion.
Eng. Gastroenterology. 60,509-14. Apr 71.
- 349 Yabuno K.
Changes in Electronegativity of the Cell Surface During the Development of the Cell Surface During the Development of the Cellular Slime Mold, Dictyostelium Discoideum.
Eng. Dev Growth Differ (Nagoya). 12,229-39. Dec 70.
- 415 Kolar O. Mathews F. Pedersen B.
Immuno-electrophoretic and Immunochemical Studies of Human Muscle Proteins.
Eng. Z Immunitaetsforsch Allerg Klin Immunol. 139,236-44. Apr 70.
- 416 Gesinski RM
Dextran Induced Changes in the Electrophoretic Mobility of Rat Bone Marrow Erythrocytes.
Eng. Experientia. 26,1370-1. 15 Dec 70.
- 433 Spiess E. Richter G.
Isolation and Characterization of Rapidly Labelled RNA From Euglena Gracilis by Means of Analytical and Preparative Electrophoresis in Polyacrylamide Gels.
Ger. Arch Mikrobiol. 75,37-58. 1970.
- 435 Spiess E. Richter G.
Isolation and Characterization of Rapidly Labelled RNA From Euglena Gracilis by Means of Analytical and Preparative Electrophoresis in Polyacrylamide Gels.
Ger. Arch Mikrobiol. 75,37-58. 1970.
- 473 Jarecki R. Pogacar P. Gunther G. Klein H.
Early Enzyme Changes in Skin Wounds Demonstrated by Isoelectric Focusing in Polyacrylamide Gel.
Eng. Z Rechtsmed. 67,313-8. 1970.
- 477 Dan M.
A New Method for Microelectrophoresis. Separation of Hemoglobins Contained in Erythrocytes of R. Catesbeiana Tadpoles.
Eng. Exp Cell Res. 63,436-42. Dec 70.
- 480 Schettler CH.
Evidence of Hemoglobin-Binding Protein in Serums of Chicken.
Ger. Dtsch Tieraerztl Wochenschr. 77,33-7. 15 Jan 70.

BASIC RESEARCH

- 482 Milkowski S. Zajaczkowski S.
Electrophoresis of Tears.
Pls. Wlad Lek. 23,1725-3C. 1 Oct 70.
- 492 Saint-Paul M. Derobert L.
Perspective in Immunologic Study of Cadaver Blood.
Fre. Med Leg Domm Corpor (Paris). 1,414-22. Oct 68.
- 502 Urbaschek B. Rapo W.
Electrophoretic and Immuno-electrophoretic Analyses After Induction of
Endotoxin Tolerance by Detoxified Endotoxin (Endotoxoid).
Ger. Z Med Mikrobiol Immunol. 156,60-9. 1970.
- 519 Ranque J. Quillioi M. Dunan S. Assadourian Y.
Gelose Immunoprecipitation Reactions in Leishmaniasis.
Fre. Med Trop (Mars). 29,70-5. Jan-Feb 69.
- 558 O'Brien SJ. Macintyre RJ.
The -Glycerophosphate Cycle in *Drosophila Melanogaster*. I.
Biochemical and Developmental Aspects.
Eng. Biochem Genet. 7,141-61. Oct 72.
- 559 Berne BH. Dray S. Knight KL.
Contribution of the Allelic MTZ3 and MTZ4 Allotype Genes to the
Formation of Individual Rabbit Serum Alpha₂-Macroglobulin
Molecules.
Eng. Biochem Genet. 7,95-110. Oct 72.
- 570 Yamada T.
The Electrophoretic Changes of Mammalian Cells Associated with
Malignant Transformation.
Eng. Acta Pathol Jap. 22,1-10. Feb 72.
- 739 Coutelle R.
Resolution of -Glucuronidase From Ehrlich Ascites Carcinoma Cells
and Mouse Brain by Isoelectro Focusing in Polyacrylamide.
Ger. Acta Biol Med Ger. 27,681-91. 1971.
- 762 Bonar RA. Ishizaki R. Beard JW.
Immuno-electrophoretic Analysis of Avian Ribonucleic Acid Tumor Virus
Group-Specific Antigens.
Eng. J Virol. 9,90-5. Jan 72.
- 820 Potapenkova LS.
An Electrophoretic Analysis of the Serum Proteins and Soluble Liver
Proteins of Mice During Experimental Hepatocarcinogenesis.
Rus. Vorp Onkol. 17,65-70. 1971.
- 840 Iudicello P. Nigro N. Jacob RM. Benso A. Camonte A.
Electrophoretic Analysis of Human Serum After Incubation with a
RNA-Rich Fraction. Study in Children with Tumors.
Fre. Nouv Presse Med. 2,1456-7. 26 May 73.

BASIC RESEARCH

- 879 Rosai J. Tillack TW. Marchesi VT.
Membrane Antigens of Human Colonic Carcinoma and Non-Tumoral Colonic Mucosa- Results Obtained with a New Isolation Method.
Eng. Int J Cancer. 10,357-67. 15 Sep 72.
- 892 Orrick LR. Olson MD. Busch H.
Comparison of Nucleolar Proteins of Normal Rat Liver and Novikoff Hepatoma Ascites Cells by Two-Dimensional Polyacrylamide Gel Electrophoresis.
Eng. Pro Natl Acad Sci USA. 70,1316-20. May 73.
- 964 Quinn JR.
The Reduction of Ferric Myoglobin by Ampholine on Acrylamide Gel Electrofocusing.
Eng. J Chromatogr. 76,520-2. 28 Feb 73.
- 971 Storrington PL. Burns TW. Furnival BE. Hales ON. Langley P. Hartree AS.
Lipolytic Activity of Human Pituitary Fractions on Human Adipose Tissue Cells.
Eng. J Endocrinol. 55,543--4. Dec 72.
- 997 Allouch P. Baulieu EE. Milgrom E.
Physicochemical Properties of Progesterone Binding Protein (PBP) from the Plasma of Pregnant Guinea Pigs.
Fre. C R Acad Sci D (Paris). 275,1707-10. 9 Oct 72.
- 1001 Lindbak H. Skandsen S. Julsrud OJ.
Agarose-Electrophoresis of Spinal Fluid.
Eng. Acta Neurol Scand Suppl. 48,381-3. 1972.
- 1020 Dion AS. Moore DH.
Gel Electrophoresis of Reverse Transcriptase Activity of Murine Mammary Tumour Virions.
Eng. Nature New Biol. 240,17-9. 1 Nov 72.
- 1030 Starostin NN.
Gel Preparation for Electrophoretic Determination of Haptoglobin Types.
Rus. Sud Med Ekspert. 15,44-6. Jul-Sep 72.
- 1029 Cohen S. Yalor JM. Murakami K. Michelakis AM. Inagami T.
Isolation and Characterization of Remin-Like Enzymes from Mouse Submaxillary Glands.
Eng. Biochemistry. 11,4287-92. 7 Nov 72.
- 1072 Sjodin B. Vestermark A.
Quantitative Determination of Glucose Metabolites Separated by Isotachopheresis in Two-Dimensional Combination with Zone Electrophoresis.
Eng. J Chromatogr. 72,219-25. 8 Nov 72.

BASIC RESEARCH

- 1087 Tegtmeyer P. Macasaet F.
Simian Virus 40 Deoxyribonucleic Acid Synthesis- Analysis by Gel
Electrophoresis.
Eng. J Virol. 10,599-604. Oct 72.
- 1089 Tashian RE. YU YS.
Effect of Chilorthalidone Binding on the Electrophoretic Properties of
Human Red Cell Carbonic Anhydrase Isozymes.
Eng Adv Exp Med Biol. 28,209-13. 1972.
- 1109 Munyon W. Buchsbaum R. Pagletti E. Mann J. Kraiseblurd E.
Davis D.
Electrophoresis of Thymidine Kinase Activity Synthesized by Cells
Transformed by Herpes Simples Virus.
Eng. Virology. 49,683-91 Sep 72.

SPECIAL TECHNIQUE

- 8 Bannister WH. Wood EJ.
Isoelectric Focussing and Acrylamide Gel Electrophoresis of Human Erythrocyte Protein.
Eng. Life Sci. 9,229-33. 22 Feb 70.
- 18 Kavsan VM. Taikova NV. Serebriani SB.
Determination of Amino Acid Composition by High-Voltage Electrophoresis.
Ukr. Ukr Biokhim Zh. 41,601-5. 1969.
- 56 Wingo WJ. Carlson GL. Bordenca CM
Apparatus for Rapid Application of Samples in Paper Chromatography, Paper Electrophoresis, and Thin-Layer Chromatography.
Eng. Alabama J Med Sci. 6,464-5. Oct 69.
- 73 Nakamura S.
Cross Electrophoresis (1969 Japan Medical Association Prize-Winning Thesis).
- 80 Khavkin IUA. Akatova EN.
The Technic of Zonal Electrophoresis. 2. Horizontal Electrophoresis in Polyacrylamide Gel with Transverse Gradient of Density.
Rus. Lab Delo. 7,411-5. 1969.
- 85 Nelson TE Jr.
Multiple Channel Gel Immunoelectrophoresis- a Further Step Towards Standardization.
Eng. J Med Lab Techn. 26,373-5. Oct 69.
- 88 Dittmer A.
Methods and Perspectives of Micro-Zone Electrophoresis on Paper Strips Impregnated with Agar.
Ger. Z Med Labortechn. 10,201-4. 1969.
- 93 Chalvardjian A.
An Apparatus for Vertical Gel Electrophoresis on Microscope Slides.
Eng. Clin Chim Acta. 26,174-6. Oct 69.
- 97 Kamaryt J.
An Apparatus for the Production and Photodocumentation of Agar Gel Enzyme Electrophoretograms.
Ger. Z Klin Chem.. 7,391-2. Jul 69.
- 99 Momotani Y.
Electrofocusing with Acrylamide Gel as a Support.
Jap. Protein (Tokyo). 14,1024-5. Oct 69.

SPECIAL TECHNIQUE

- 109 Lewin S.
Electrofocusing and Protein Detection and Isolation.
Eng. Postgrad Med J. 45,729-30. Nov 69.
- 135 Radola BJ.
Thin-Layer Isoelectric Focusing of Proteins.
Eng. Biochim Biophys Acta. 194,335-8. 11 Nov 69.
- 136 Hashimoto I. Nishigori H. Iwami K. Ito C. Ishitoya Y.
Revised Technics for the Analysis of Got Isoenzyme by Starch Gel
Electrophoresis.
Jap. Jap J Clin Path. 17,861-4. Nov 69.
- 152 Szyllit M.
Thin Layer Analytic and Preparative Microelectrophoresis with Special
Reference to Human Hemoglobins.
Fre. Bull Soc Chim Biol (Paris). 51,799-810. 18 Sep 69.
- 154 Firestone HJ. Aronson SB.
A Thin Gel Quantitative Two-Dimensional Immuno-electrophoretic
Method.
Eng. Techn Bull Regist Med Techn. 39,217-24. Oct 69.
- 158 Davies DR. Spurr ED. Versey JB.
Modifications to the Technique of Two-Dimensional
Immuno-electrophoresis.
Eng. Clin Sci. 40,411-7. May 71.
- 159 Kleist H. Freimel H. Brock J. Mucke D. Nelius H.
Thermoelectric Cooling Device for Gel and Immuno-electrophoresis.
Ger. Z Med Labortech. 11,351-5. 1970.
- 169 Schutz W.
Electronic Table-Computer in the Clinical Laboratory. I. Computation
of Electrophoresis.
Ger. Med Lab (Stuttg). 24,169-73. Aug 71.
- 190 Raisys VA. Arvan DA.
Determination of Proteins in Biological Fluids by
Electroimmunodiffusion and Two-Directional Immuno-electrophoresis.
Eng. Clin Chem. 17,745-50. Aug 71.
- 196 Szyllit M.
Electrophoresis with Specific Adsorption- Amylase-Starch Interactions
in Mixed Polyacrylamide-Starch Gel.
Fre. Ann Biol Clin (Paris). 29,215-27. 1971.
- 197 Haglund H.
Isoelectric Focusing in PH Gradients--A Technique for Fractionation
and Characterization of Ampholytes.
Eng. Methods Biochem Anal. 19,1-104. 1971.

SPECIAL TECHNIQUE

- 214 Hansson BG. Johnsson T. Kindmark CO.
Comparison Between the Sensitivity of the Immuno-electro-osmophoresis
and the Ouchterlony Gel-Diffusion Method in Detecting Australia
Antigen.
Eng. Acta Pathol Microbiol Scand B. 79,440-1. 1971.
- 215 Hodson AW. Latner AL.
An Automated Preparative Gel Electrophoresis Apparatus.
Eng. Anal Biochem. 41,522-32. Jun 71.
- 229 Righetti P. Drysdale JW.
Isoelectric Focusing in Polyacrylamide Gels.
Eng. Biochim Biophys Acta. 236,17-28. 27 Apr 71.
- 253 Brinkhoff N. Dohner L.
A Method of Preparative Electrophoresis.
Ger. Z Med Labortech. 10,146-50. 1969.
- 274 Daniels JC. Cobb EK. Levin WC. Ritzmann SE.
IV. Detection and Differentiation of M-Proteins by the Acid-Gel
Reaction--A Re-Evaluation.
Eng. Tex Rep Biol Med. 28,541-5. Winter 70.
- 279 Florini JR. Brivio RP. Battelle BA.
Isoelectric Focusing of Myosin in Dilute Polyacrylamide Gels.
Eng. Anal Biochem. 40,345-50. Apr 71.
- 281 Shukoliukov SA. Zhuchikhina AA.
Apparatus for High Voltage Microelectrophoresis at a Constant
Temperature.
Rus. Lab Deol. 9,562-5. 1970.
- 292 Gill CW. Fischer CL. Holleman CL.
Rapid Method for Protein Quantitation by Electroimmunodiffusion.
Eng. Clin Chem. 17,501-4. Jun 71.
- 311 Rodbard D. Kapadia G. Chrambach A.
Pore Gradient Electrophoresis.
Eng. Anal Biochem. 40,135-57. Mar 71.
- 314 Johansson BG. Stenflo J.
Polyacrylamide Slab Electrophoresis Followed by Electrophoresis into
Antibody-Containing Agarose Gel.
Eng. Anal Biochem. 40,232-6. Mar 71.
- 315 Stevenson KJ.
Use of Visual Dye Markers on High-Voltage Paper Ionophoresis.
Eng. Anal Biochem. 40,29-34. Mar 71.

SPECIAL TECHNIQUE

- 321 Finlayson GR.
Isoelectric Focusing in Polyacrylamide Gel and its Preparative Application.
Eng. Anal Biochem. 40,292-311. Apr 71.
- 322 Josephson RV. Maheswaran SK. Morr CV. Jenness R. Lindocrfer RK.
Effect of Urea on Pi's of Ampholytes and Casein in Isoelectric Focusing.
Eng. Anal Biochem. 40,476-82. Apr 71.
- 344 Kaliuzhnyi VV.
Electrophoretic Determination of Benzohexonium in Rabbit Urine Using Nonpolarizing and Standard Electrodes.
Rus. Vorp Kurortol Fizioter Lech Fiz Kult. 35,452-4. Sep-Oct 70.
- 339 Serlvanova KF. Gordeev IUN. Troitskii GV.
Spectropolarimetric Characteristics of Albumin and Globulin in Thyroid Toxicosts.
Ukr. Ukr Biochim ZH. 42,39-43. 1970.
- 368 Glazer LG.
Method of Forming Wells in Gels for Use in Electrophoresis.
Eng. Am J Clin Pathol. 54,152. Jul 70.
- 377 Kubicek R.
Determination of the Purity of Plasma Derivatives by Means of Agar Electrophoresis Using the Eri-10-Densitometer.
Ger. Folia Haematol (Leipz). 94,255-60. 1979.
- 381 Logan EF. Stenhouse A. Watt JG. Clark AE.
The Recovery of Immunoglobulin G From Horses by Combination of Selective Plasmapheresis and Forced Flow Electrophoresis.
Eng. Res Vet Sci. 11,431-7. Sep 70.
- 383 Koenig R.
Nucleic Acids in the Potato Virus X Group and in Some Other Plant Viruses- Comparison of the Molecular Weights by Electrophoresis in Acrylamide-Agarose Composite Gels.
Eng. J Gen Virol. 10,111-4. Jan 71.
- 384 Matthaeus W.
Determination of the Electrophoretic Mobility of the Foot-and-Mouth Disease Virus in Agar Gel By Radioactivity Measurements.
Ger. Zentralbl Bakteriol Orig. 204,161-5. 1967.
- 402 Baumstark JS.
Pipetting Device for Preparation of the Second or Electrophoretic Stage of Peptide Maps.
Eng. Anal Biochem. 39,73-8. Jan 71.
- 418 Frater R.
Behavior of Ampholines During Isoelectric Focusing.
Eng. Anal Biochem. 38,536-8. Dec 70.

SPECIAL TECHNIQUE

- 421 Sax SM. Moore JJ.
Computer Calculation of Serum Protein Electrophoresis, Based on Peak Height Measurements.
Eng. Clin Chem. 16,760-2. Sep 70.
- 430 Salvaggio JE. Arguembourg PC. Sylvester GA.
A Comparison of the Sensitivity of Electroimmunodiffusion and Single Radial Diffusion in Quantitation of Immunoglobulins in Dilute Solution.
Eng. J Allergy. 46,326-35. Dec 70.
- 431 Larcan A. Stoltz JF. Niclause M. Streiff F.
Introduction to the Study of Electrokinetic Phenomena. Applications to the Blood Suspension and to the Study of the Vascular System.
Fre. Agressologie. 11,317-25. 1970.
- 438 Pfafflin W.
Experiences with Cellulose Acetate Foils in Immuno-electrophoresis.
Ger. Med Lab (Stuttg). 23,85-90. Apr 70.
- 441 Chlebarov S.
Electrophoretic Introduction of Allergens into the Skin. (Allergenophoresis).
Ger. Allerg Asthma (Leipz). 15,271-6. 1969.
- 442 Zawadzki ZA. Edwards GA.
Pseudoparaproteinemia Due to Hypertrasferrinemia.
Eng. Am J Clin Pathol. 54,802-9. Dec 70.
- 443 Schyma D. Taubert M.
Alginat-Electrophoresis- A Method for Fractionation and Isolation of Proteins.
Ger. Aerztl Forsch. 24,326-30. 10 Nov 70.
- 485 Chamoles N. Karcher D.
Correlation Between the Classic Enzymogram of Lactate Dehydrogenase and its Fractionation by Isoelectric Focusing in Acrylamide Gel.
Fre. Clin Chim Acta. 30,337-41. Nov 70.
- 490 Hohenwallner W. Gabl F.
Comparability of Paper and Acetate Thin-Layer Electrophoresis.
Ger. Wien Lkin Wochenschr. 82,809-11. 6 Nov 70.
- 509 Macko V. Stegemann F.
Free Electrofocusing in a Coil of Polyethylene Tubing.
Eng. Anal Biochem. 37,186-90. Sep 70.
- 522 Davies DR. Spurr ED. Versey JM.
Some Modifications to the Technique of Two-Dimensional Immuno-electrophoresis.
Eng. Biochem J. 118,57P. Jul 70.

- 525 Ray DK. Troisi RM. Rappaport HP.
An Elution Device for Analytical-Scale Polyacrylamide Gel
Electrophoresis.
Eng. Anal Biochem. 32,322-30. Nov 69.
- 532 Domschke W. Seyde W. Domagk GF.
Two Dimensional Separation of Serum Proteins by Isoelectrical
Focussing and Disk Gel Electrophoresis.
Ger. Z Klin Chem Klin Biochem. 8,319-20. May 70.
- 540 Hjerten S. Jerstedt S. Tiselius A.
Apparatus for Large-Scale Preparative Polyacrylamide Gel
Electrophoresis.
Eng. Anal Biochem. 27,108-29. Jan 69.
- 557 Hayashi K. Ohba Y.
SDS-Polyacrylamide Gel Electrophoresis.
Jap. Protein Nucleic Acid Enzyme (Tokyo). 17,304011. Apr 72.
- 564 Vladescu C. Zamfirescu-Gheorghiu M.
Histo-electrophoresis Used in the Technique of Zymograms- Preliminary
Note.
Eng. Rev Roum Med Intern. 9,79-83. 1972.
- 576 Banker GA. Cotman CW.
Measurement of Free Electrophoretic Mobility and Retardation
Coefficient of Protein-Sodium Dodecyl Sulfate Complexes by Gel
Electrophoresis. A method to Validate Molecular Weight Estimates.
Eng. J Biol Chem. 247,5856-61. 25 Sep 72.
- 578 Darskus RL.
Electrophoretic and Chromatographic Characterization of Sulphur-Rich
Proteins From Wool.
Eng. J Chromatogr. 69,341-8. 5 Jul 72.
- 583 Laurell CB.
Electroimmuno Assay.
Eng. Scand J Clin Lab Invest. 29,Suppl 124-21-3. 1972.
- 579 Hemminki K.
Specific Radioactivities of Protein Discs in a Polyacrylamide Gel.
Eng. Acta Chem Scand. 25,3887-9. 1971.
- 584 Ganrot PO.
Crossed Immunoelectrophoresis.
Eng. Scand J Clin Lab Invest. 29, Suppl 124-39-4. 1972.

SPECIAL TECHNIQUE

- 585 Skude G. Jeppsson JC.
Thin Layer Electrofocusing Followed by Electrophoresis in Antibody
Containing Gel.
Eng. Scand J Clin Lab Invest. 29, Suppl 124-55-8. 1972.
- 586 Johansson BG.
Agarose Gel Electrophoresis.
Eng. Scand J Clin Lab Invest. 29, Suppl 124-7-19. 1972.
- 587 Grubb A.
Quantitative Determination of the Distribution of the Specific
Antibodies of Antisera Subjected to Gel Electrophoresis.
Eng. Immunochemistry. 9, 635-45. Jun 72.
- 589 Tung JS. Knight CA.
Relative Importance of Some Factors Affecting the Electrophoretic
- 597 Hyslop NS.
Application of an Improved System of Electrophoresis in Acrylamide
Gel to Studies on the Sera of Different Species.
Eng. J Clin Pathol. 25, 508--11. Jun 72.
- 599 O'Connor ML.
Cerebrospinal Fluid Electrophoresis in MS.
Eng. J Iowa Med Soc. 62, 435. Aug 72.
- 605 Storch W. Hagert M. Trenckmann H. Kronberger H. Schuppel KF.
Immunofluorescence Microscopic and Immuno-electrophoretic Studies with
an Antiserum of Goats Against Human Myocardium.
Ger. Z Gesamte Inn Med. 27, 297-9. 1 Apr 72.
- 607 Ramsden DB.
The Use of Material Labelled with Soft β -Emitters in the Laurell
Immuno-electrophoretic Technique.
Eng. J Chromatogr. 67, 382-4. 3 May 72.
- 609 Staynov D.
Mobility-Concentration Effects for RNA in Agar Gel Electrophoresis.
Eng. Anal Biochem. 47, 13-9. May 72.
- 618 Almy RE. Ziegler FD.
A Modification of the Beckman Microzone Cell for Performance of
Immuno-osmophoresis on Agarose Coated Plates.
Eng. Am J Clin Pathol. 58, 66-8. Jul 72.
- 622 Gilson W. Gilson R. Rueckert RR.
An Automatic High-Precision Acrylamide Gel Fractionator.
Eng. Anal Biochem. 47, 321-8. Jun 72.

SPECIAL TECHNIQUE

- 623 King JG.
The Microzone System. A Study on its Use in Hemoglobin Electrophoresis.
Eng. Can J Med Technol. 34,83-105. May-Jun 72.
- 626 Jones RE. Hemmings WA. Fallk WP.
Ethylene Glycol as a Stabilizing Agent in Electrofocusing.
Eng. Immunochemistry. 8,299-301. Mar 71.
- 647 Griffith IP.
Immediate Visualization of Proteins in Dodecyl Sulfate-Polyacrylamide Gels by Prestaining with Remazol Dyes.
Eng. Anal Biochem. 46,402-12. Apr 72.
- 649 Kostner G. Holasek A.
Influence of Dextran and Polyethylene Glycol on Sensitivity of Two-Dimensional Immuno-electrophoresis and Electrimmunodiffusion.
Eng. Anal Biochem. 46,680-3. Apr 72.
- 650 Sommer H. Unglaub W.
The Importance of Buffer-Membrane Combinations on the Results of Cellulose Acetate Membrane Electrophoresis.
Ger. Zentralbl Veterinaermed R. 18,779-86. Dec 71.
- 652 Schubert P. Kreutzberg GW. Lux HD.
Use of Microelectrophoresis in the Autoradiographic Demonstration of Fiber Projections.
Eng. Brain Res. 39,274-7. 14 Apr 72.
- 663 Weiner AM. Platt T. Weber K.
Amino-Terminal Sequence Analysis of Proteins Purified on a Nanomole Scale by Gel Electrophoresis.
Eng. J Biol Chem. 247,3242-51. 25 May 72.
- 671 Reid PE. Culling CF. Livingstone DJ. Dunn WL.
Staining of Polymeric Carbohydrate Half Sulphate Esters with High Iron Diamine After Cellulose Acetate Electrophoresis.
Eng. Stain Technol. 47,101-2. Mar 72.
- 672 Dominguez CJ. Civantos F. Di Bella J. Rywlin A.
Immuno-electrophoresis of Human Serum Proteins. Application to
- 675 Conway-Jacobs A. Lewin LM.
Isoelectric Focusing in Acrylamide Gels-Use of Amphoteric Dyes As Internal Markers for Determination of Isoelectric Points.
Eng. Anal Biochem. 43,394-400. Oct 71.

SPECIAL TECHNIQUE

- 683 Kaufmann U. Rosenstand A. Hansen M.
Polyacrylamide Electrophoresis Peroxidases on Microscope Slides and
Evaluation with the Aid of Reflecting Light.
Eng. J Chromatogr. 65,583-6. 1 Mar 72.
- 686 Tedesco TA. Bonow R. Mellman WJ.
Vertical Column Electrophoresis in Sephadex G-200.
Eng. Anal Biochem. 46,172-80. Mar 72.
- 687 Maurer HR. Dait FA.
Polyacrylamide Gel Electrophoresis on Micro Slabs.
Eng. Anal Biochem. 46,19-32. Mar 72.
- 689 Lamy J. Lamy J. Compin S. Weill J.
Theoretical and Practical Aspects of New Methods of Polyacrylamide
Gel Electrophoresis in PH Gradient and Porosity Gradients.
Fre. Ann Biol Clin (Paris). 29,125-43. 1971.
- 695 Schwartz HG.
Immuno-electrophoresis on Cellulose Acetate Membranes.
Eng. Am J Clin Pathol. 57,326-31. Mar 72.
- 696 Fritsche HA Jr. Adams-Park HR.
Cellulose Acetate Electrophoresis of Alkaline Phosphatase Isoenzymes
in Human Serum and Tissue.
Eng. Clin Chem. 18,417-21. May 72.
- 700 Boudergues R. Calvet H.
Proteinograms of Gobra Zebu Serums in Senegal. Seasonal Quantitative
Variations.
Fre. Pev Elev Med Vet Pays Trop. 24,581-6. 1971.
- 712 Sorkina DA. Iukhnovets RA.
Simple Device for High-Voltage Electrophoresis.
Rus. Lab Delo. 2,119-20. 1972.
- 743 Fessenden-Raden JM.
Effect of Fatty Acids on the Movement and Staining of Membrane
Proteins in Polyacrylamide Gel Electrophoresis.
Eng. Biochem Biophys Res Commun. 46,1347-53. 16 Feb 72.
- 748 Demarchi J.
Immuno-electrophoresis and Immunofluorescence.
Fre. Maroc Med. 51,642-5. Nov 71.
- 750 Barnes MG. Komarmy L. Kerson R.
Use of a Spectrophotometer Power Supply for Electrophoresis.
Eng. Am J Clin Pathol. 57,540-3. Apr 72.

- 751 Oelshlegel FJ Jr. Brewer GJ.
New Positive, Tetrazolium-Linked, Staining Method for Use With
Electrophoresis of Phosphoglycerate Kinase.
Eng. Experiential. 28,116-7. 15 Jan 72.
- 755 Nedviga NN.
Method of Paper Electrophoresis.
Rus. Veterinaria. 12,94-5. Dec 71.
- 761 Delincee H. Radola EJ. Drawert F.
Isoelectric Properties of Gamma-Irradiated Horse-Radish Peroxidase.
Eng. Int J Radiat Biol. 19,93-7. 1971.
- 772 Clotten R.
High-Voltage Electrophoresis.
Eng. J Chromatogr. 63,153-66. 9 Dec 71.
- 773 Geyer H.
High-Voltage Electrophoresis of Enzymes.
Eng. J Chromatogr. 63,173-6. 9 Dec 71.
- 774 Ellis DB.
The Use of High-Voltage Paper Electrophoresis in Studies of the
Biosynthesis of Mucin Glycoproteins.
Eng. J Chromatogr. 63,177-84. 9 Dec 71.
- 775 Clotten R.
Porphyrias. Separation and Identification by High-Voltage
Electrophoresis.
Eng. J Chromatogr. 63,185-91. 9 Dec 71.
- 789 Staynov DZ. Pinder JC. Gratzner WB.
Molecular Weight Determination of Nucleic Acids by Gel
Electrophoresis in non-Aqueous Solution.
Eng. Nature New Biol. 235,108-10. 26 Jan 72.
- 800 Delincee H. Radola BJ. Drawert F.
The Effect of Heat on the Isoelectric and Size Properties of
Horseradish Peroxidase.
Eng. Experientia. 27,1265-7. 1971.
- 804 Ravi JM.
Detection of Hemoglobin S Utilizing sickledex Solubility, Reduced
Oxygen Tension, and Electrophoresis.
Eng. Am J Med Technol. 38,7-8. Jan 72.

- 808 Sherbet GV. Lakshimi MS. Rao KV.
Characterisation of Ionogenic Groups and Estimation of the Net
Negative Electric Charge on the Surface of Cells Using Natural PH
Gradients.
Eng. Exp Cell Res. 70,113-23. Jan 72.
- 837 Verbanov VS. Spasskii GA. Leont'ev VK.
Modification of the MF-4 Microphotometer for the Densitometry of
Electrophoregrams on Polyacrylamide Gel.
Rus. Med Tekh. 3,55-7. May-Jun 73.
- 841 Fawcett JS.
Continuous-Flow Isoelectric Focusing and Isotachopheresis.
Eng. Ann NY Acad Sci. 209,112-26. 15 Jun 73.
- 843 Radila BJ.
Analytical and Preparative Isoelectric Focusing in Gel-Stabilized
Layers.
Eng. Ann NY Acad Sci. 209,127-43. 15 Jun 73.
- 844 Catsimpoilas N.
Immuno-Isoelectrofocusing.
Eng. Ann NY Acad Sci. 209,144-6. 15 Jun 73.
- 855 Wellner D. Hayes MB.
Isoelectric Focusing in Polyacrylamide Gels.
Eng. Ann NY Acad Sci. 209,34-43. 15 Jun 73.
- 853 Florini JR. Brivio RP. Battelle BA.
Isoelectric Focusing of Myosin and other Muscle Proteins in
Polyacrylamide Gels.
Eng. Ann NY Acad Sci. 209,299-310. 15 Jun 73.
- 859 Everaerts FM. Beckers JL. Verheggen TP.
Some Theoretical and Practical Aspects of Isotachopheretical
Analysis.
Eng. Ann NY Acad Sci. 209,419-44. 15 Jun 73.
- 860 Routs RJ.
The Choice of Electrolyte Conditions for Isotachopheretic Separations.
Eng. Ann NY Acad Sci. 209,445-56. 15 Jun 73.
- 861 Chrambach A. Doerr P. Finlayson GR. Miles LE. Sherins R.
Rodbard D.
Instability of PH Gradients Formed by Isoelectric Focusing in
Polyacrylamide Gel.
Eng. Ann NY Acad Sci. 209,44-64. 15 Jun 73.
- 862 Vestermark A.
Determination of PH Differences Occurring During Isotachopheresis
With Different Systems of Leading and Terminating Electrolytes.
Eng. Ann NY Acad Sci. 209,470-4. 15 Jun 73.

SPECIAL TECHNIQUE

- 902 Radola BJ.
Isoelectric Focusing in Layers of Granulated Gels. I. Thin-Layer Isoelectric Focusing of Proteins.
Eng. Biochim Biophys Acta. 295,412-28. 21 Feb 73.
- 907 Secchi C.
A New Method for PH Determination in Isoelectric Focusing Experiments.
Eng. Anal Biochem. 51,448-55. Feb 73.
- 906 Williams JA. Brank JM. Bosman T.
Apparatus for Discontinuous Electrophoresis in Polyacrylamide Gel Slabs.
Eng. Anal Biochem. 51,383-9. Feb 73.
- 910 Schaffer HE. Johnson FM.
Constant 90Optimum) Power Electrophoresis.
Eng. Anal Biochem. 51,577-83. Feb 73.
- 911 Ressler N.
A Systematic Procedure for the Determination of the Heterogeneity and Nature of Multiple Electrophoretic Bands.
Eng. Anal Biochem. 51,589-610. Feb 73.
- 912 Brade W. Dietz H.
An Apparatus for Longitudinal and Transverse Gel Slicing.
Eng. Anal Biochem. 51,641-5. Feb 73.
- 913 Gainer H.
Isoelectric Focusing of Proteins at the 10 to 10 -G Level.
Eng. Anal Biochem. 51,646-50. Feb 73.
- 915 Beeley JA. Stevenson SM. Beeley JG.
Polyacrylamide Gel Isoelectric Focusing of Proteins-Determination of Isoelectric Points Using an Antimony Electrode.
Eng. Biochim Biophys Acta. 285,293-300. 28 Dec 72.
- 939 Ghabrial SA. Lister RM.
Anomalies in Molecular Weight Determinations of Tobacco Rattle Virus Protein by SDS-Polyacrylamide Gel Electrophoresis.
Eng. Virology. 51,485-8. Feb 73.
- 942 Markowski B.
Quantification of 2-Dimensional Immunoelectrophoresis.
Ger. Clin Chim Acta. 44,319-25. 30 Mar 73.
- 947 Datyner A. Finnimore E.
A New Staining Method for the Assay of Proteins of Polyacrylamide Gels.
Eng. Anal Biochem. 52,45-55. Mar 73.

SPECIAL TECHNIQUE

- 953 Tenforde T. Clarke EJ. Macgregor RD. Streibel MJ. Todd PW.
A Convenient Microelectrophoresis Assembly.
Eng. Med Biol Eng. 11,236-8. Mar 73.
- 955 Furlong CE. Cirakoglu C. Willis RC. Santy PA.
A Simple Preparative Polyacrylamide Disc Gel Electrophoresis
Apparatus - Purification of Three Branched-Chain Amino Acid Binding
Proteins from Escherichia Coli.
Eng. Anal Biochem. 51,297-311. Jan 73.
- 958 Margolis J.
Practical System for Polyacrylamide Gradient Gel Electrophoresis.
Eng. Lab Pract. 22,107-9. Feb 73.
- 959 Cann JR. Oates DC.
Theory of Electrophoresis and Sedimentation for Some Kinetically
Controlled Interactions.
Eng. Biochemistry. 12,1112-9. 13 Mar 73.
- 970 Idu SM. Cociumian L.
Easily Installed Electrophoresis Chamber for Low Temperatures.
Ger. Rev Roum Med Intern. 9,329-33. 1972.
- 979 Schilling K. Horn A. Bornig H.
A Preparative Membrane Electrophoresis Apparatus Based on the Barrier
Principle for the Separation of Proteins in Gram Quantities.
Ger. Acta Biol Med Ger. 29,341-8. 1972.
- 982 Miller JN. Mutzelberg ID.
Kaurell Electrophoresis on Cellulose Acetate.
Eng. J Chromatogr. 75,165-8. 3 Jan 73.
- 983 Fairbanks G. Avruch J.
Four Gel Systems for Electrophoretic Fractrophoretic Fractionation of Membrane
Proteins Using Ionic Detergents.
Eng. J Supramol Struct. 1,66-75. 1972.
- 987 Jovin TM.
Multiphasic Zone Electrophoresis. 3. Further Analysis and New Forms
of Discontinuous Buffer Systems.
Eng. Biochemistry. 12,890-8. 27 Feb 73.
- 993 Lewis JH. Wilson JH. Brandon JM.
Counterelectrophoresis Test for Molecules Immunologically Similar
to Fibrinogen.
Eng. Am J Clin Pathol. 58,400-4. Oct 72.
- 1007 Lewis JP. Neal WA. Welch ET. Lewis WG 3 D. Dubose CM Jr. Wright
CS. Smith LL.
The Isolation of Erythropoiesis Regulatory Factory by an
Electrofractionation Technique Combined with Selective Membrane
Permeability.
Eng. Proc Soc Exp Biol Med. 142,293-8. Jan 73.

SPECIAL TECHNIQUE

- 1011 Fredriksson S.
Scanning Isoelectric Focusing in Small Density Gradient Columns. II.
Microfractionation of Column Contents. Evaluation of PH Course.
Isoelectric Points of -Lactoglobulins A and B.
Eng. Anal Biochem. 50,575-85. Dec 72.
- 1018 Soderholm J. Allestam P. Wadstrom T.
A Rapid Method for Isoelectric Focusing in Polyacrylamide Gel.
Eng. Febs Lett. 24,89-92. 15 Jul 72.
- 1021 Wallis C. Melnick JL.
Detection of Protein Contaminants in Biological Preparations by
Discontinuous Counterimmunoelectrophoresis.
Eng. Infect Immun. 6,557-60. Oct 72.
- 1023 Abe S. Fujisawa T. Satake M.. Ogata K.
Studies on SDS-Phenol Methods for Extraction of Rzt Liver Nuclear
RNA. II. Polyacrylamide Gel Electrophoresis of Nuclear RNA Obtained
Using Various Conditions for SDS-Phenol Extraction.
Eng. J Biochem (Tokyo). 72,571-81. Sep 72.
- 1028 Rizov B. Dimitrov D. Aleksieva A. Pashova E.
Studies on Serum Streptomycin Concentrations by Ingrauterine
Electrophoresis with Streptomycin.
Eng. Am J Obstet Gynecol. 114,103-5. 1 Sep 72.
- 1034 Tadokoro M. Boulpaep EL.
Electrophoretic Method Of Ion Injection in Single Kidney Cells.
Eng. Yale J Biol Med. 45,432-5. Jun-Aug 72.
- 1036 Grossbach U.
Microelectrofocusing of Proteins in Capillary Gels.
Eng. Biochem Biophys Res Commun. 49,667-72. 1 Nov 72.
- 1038 Baehr R Von.
Combination of Preparative Agar Gel and Discontinuous Polyacrylamide
Gel Electrophoresis.
Ger. Z Gesamte Inn Med. 27,751-4. 1 Sep 72.
- 1043 Kiddy CA. Rollins RE. Zikakis JP.
Discontinuous Polyacrylamide Electrophoresis for - Lactoglobulin
Typing of Cow's Milk.
Eng. J Dairy Sci. 55,1506-7. Oct 72.
- 1057 Freedman MH.
The Use of Preparative Liquid Isoelecrric Focusing for the Further
Purification of Rabbit Antihapten Antibodies.
Eng J Immunol Methods. 1,177-98. Jan 72
- 1058 Creason MT. Creason PL.
Alpha 1 - Antitrypsin Immunolectrophoresis.
Eng. AM J Med Technol. 38,387-93. Oct 72.

SPECIAL TECHNIQUE

- 1059 Tykva R. Votruba I.
Estimation of Radioactivity in Electrophoresis Gels by a Scanning
Semiconductographic Procedure.
Eng. Anal Biochem. 50,18-27. Nov 72.
- 1060 Creighton MC. Trevithick JR.
Quantitative Rapid Separation of Histones on Cellogel Strips Using
Dansyl Chloride.
Eng. Anal Biochem. 50,255-66. Nov 72.
- 1081 Roberts RM. Jones JS.
Improved Apparatus for Vertical Gel Electrophoresis.
Eng. Anal Biochem. 49,592-7. Oct 72.
- 1106 Howery DG. Vermeulen T. Nady L.
Continuous-Flow Rectangular-Bed Electrophoresis.
Eng. J Chromatogr Sci. 10,557-9. Sep 72.
- 1107 Taylor KJ. Newman DL.
Electrophoretic Mobility of Ehrlich Cell Suspensions Exposed to
Ultrasound of Varying Parameters.
Eng. Phys Med Biol. 17,270-6. Mar 72.
- 1117 Diezel W. Liebe S. Kopperschlager G. Hofmann E.
Bovine Liver Catalase- Microheterogeneity and Enzyme Association.
Ger. Acta Biol Med Ger. 28,715-25. 1972.

IMMUNOLOGY

- 53 Bratthall D.
Immunodiffusion Studies on the Serological Specificity of Streptococci Resembling Streptococcus Mutans.
Eng. Odont Rev (Malmo). 20,231-43. 1969.
- 76 Kataoka T. Nojima S.
Immuno-electrophoresis of Rabbit Antisera Against Phospholipid Haptens.
Eng. Jap J Exp Med. 39,129-34. Apr 69.
- 90 Roding H. Muller U.
Evaluation of Electropherograms According to the 'Medium Information Content'.
Ger. Z Med Labortechn. 10,308-14. 1969.
- 92 Weeke B.
Quantitative Immuno-electrophoresis. Rocket Electrophoresis.
Dane. Ugeskr Laeg. 131,1419.23. 21 Aug 69.
- 111 Mohos JZ. Cseh E.
Further Development of Immuno-electrophoresis- Micro and Semi-Micro Immuno-electrophoresis, Immunocathoresis.
Hun. Orv Heital. 110,2575-9. 2 Nov 69.
- 150 Cannon DC.
Immunoglobulin Analysis in Clinical Diagnosis. 2
Immuno-electrophoresis.
Eng. Postgrad Med. 45,55-9. Sep 69.
- 151 Rebeyrotte P. Koutsoukos A. Labbe JP.
Modifications of Laurell Quantitative Immuno-electrophoresis Method. Demonstration of Gamma-Globulins.
Fre. C R Acad Sci D (Paris). 269,531-4. 1969.
- 170 Localization of the IGM-Fraction in Discontinuous Polyacrylamide Electrophoresis Columns.
Ger. Blut. 23,104-12. Aug 71.
- 183 Grasslin D. Czygan PJ. Weise HC.
Preparation of Highly Purified HCG Controlled by Gel Isoelectric Focussing.
Eng. Acta Endocrinol Suppl (KBH). 155,52.1971.
- 298 Lee D. Marinkovich V. Robertson W Wan B.
Studies of the Binding of a Timothy Pollen Antigen by Sera and Serum Fractions of Atopic Individuals Using Acrylamide Gel Electrophoresis.
Eng. J Allergy. 47,321-31. Jun 71.

- 332 Jungfer H.
The Subgroups Lgg I, II and 3 of Human Immunoglobulins G. II.
Characterization of the Subgroups with Immunoelectrophoresis, Heat
Denaturation and Quantitative Complement Fixation Test.
Ger. Z Immunitaetsforsch Allerg Klin Immunol. 141,191-200. 1971.
- 404 Ghetie V. Cnica D.
Extent of Immunoglobulin Light Chains Heterogeneity Revealed by
Isoelectric Focusing.
Eng. Experientia. 27,209-11. 15 Feb 71.
- 738 Williamson AR.
Antibody Isoelectric Spectra. Analysis of the Heterogeneity of
Antibody Molecules in Serum by Isoelectric Focusing in Gel and
Specific Detection with Hapten.
Eng. Eur J Immunol. 1,390-4. Nov 71.
- 771 Williamson AR.
Antibody Isoelectric Spectra. Analysis of the Heterogeneity of
Antibody Molecules in Serum by Isoelectric Focusing in Gel and
Specific Detection with Hapten.
Eng. Eur J Immunol. 1,390-4. Nov 71.
- 785 Gilgenkratz S. Stoltz JF. Streiff F. Larcan A.
Study of Electrophoretic Mobility of Human Lymphocytes Before and
After in Vitro Culture.
Fre. C R Soc Biol (Paris). 164,2605-8. 1970.
- 786 Stoltz JF. Genetet B. Peirron N. Streiff F. Larcan A.
Influence of Blood Group Antibodies on Electrophoretic Mobility of
Blood Platelets.
Fre. C R. Soc Biol (Paris). 164,2608-11. 1970.
- 936 Virella G. Freitas MM De.
Structural Characterization of Immunoglobulins Contained in
Polyacrylamide Gels.
Eng. Experientia. 29,142-4. 15 Feb 73.
- 962 Schuller E. Lefevre M. Tompe L.
Electroimmunodiffusion of
Eng. 2 M, Iga and Igm in Nanogram Quantities with a
Hydorxyethylcellulose-Agarose Gel- Application to Unconcentrated
CSF. Clin Chim Acta. 42,5-13.
- 969 Hughes-Jones NC. Gardner B.
Electrophoretic Precipitation and Radial Diffusion Methods for Assay
of Anti-D Immunoglobulin Preparations.
Eng. Vox Sang. 24,317-22. Apr 73.
- 992 Karmanov MI.
Use of Immunoelectrophoresis for the Control of the Purity of
Separation of Serum Immunoglobulins on Columns with Deae-Cellulose.
Rus. Lab Delo. 4,251-2. 1972.

IMMUNOLOGY

- 994 Komarmy L. Barnes MG.
Separation of Globin Chains by Rapid Cellulose Acetate
- 1044 Josephson RV. Mikolajick EM. Sinha DP.
Gel Isoelectric Focusing of Selected Bovine Immunoglobulins.
Eng. J Dairy Sci. 55,1508-10. Oct 72.
- 1055 Sxelsen NH. Book E.
Identification and Quantitation of Antigens and Antibodies by Means
of Quantitative Immunoelectrophoresis. A survey of Methods.
Eng. J Immunol Methods. 1,109-21. Jan 72.
- 1085 Zeiller K. Dolan L.
Thymus Specific Antigen of Electrophoretically separated rat
Lymphocytes. Tracting of the Differentiation Pathway of Bone
Marrow-Derived Thymocytes by Use of a Surface Marker.
Eng. Eur J Immunol. 2,439-44. Oct 72.
- 1092 Stephan W. Frahm U.
Quantitative Simulaneous Immunoelectrophoresis. A Micromethod for
The Simultaneous Determination of All Serum Proteins, Including the
Immunoglobulins.
Ger. Z Klin Chem Klin Biochem. 9,224-8. May 71.

REVIEW

- 87 Fateh-Moghadam A. Lamerz R.
Immunoelectrophoresis. Foundations--Methods--Evaluation.
Ger. Med Lab (Stuttgart). 22,219-31 Contd. Oct 69.
- 90 Roding H. Muller U.
Evaluation of Electropherograms According to the "Medium Information Content."
Ger. Z Med Labortechn. 10,208-14. 1969.
- 111 Mohos JZ. Cseh E.
Further Development of Immunoelectrophoresis- Micro and Semi-Micro Immunoelectrophoresis, Immunocataphoresis.
Hun. Orv Hetil. 110,2575-9. 2 Nov 69.
- 127 Matthaeus W.
Relative Mobility of Serum Proteins in Agar Gel Electrophoresis.
Ger. ZBL Veterinaarmed B. 16,553-62. 6 Aug 69.
- 150 Cannon DC.
Immunoglobulin Analysis in Clinical Diagnosis. 2. Immunoelectrophoresis.
Eng. Postgrad Med. 46,55-9. Sep 69.
- 194 Fisher MP. Dingman CW.
Role of Molecular Conformation in Determining the Electrophoretic Properties of Polynucleotides in Agarose-Acrylamide Composite Gels.
Eng. Biochemistry. 10,1895-9. 11 May 71.
- 263 Holper JC. Jambazian A.
Comparative Sensitivity of Complement Fixation, Counterimmunoelectrophoresis, Radial, and Double Diffusion for Detection of Australia Antigen.
Eng. Transfusion. 11,157-61. May-Jun 71.
- 265 Prochazka B. Barta V.
Determination of LDH Isoenzyme Pattern by Electrophoresis in Agar Gel-Methodical Comparative Study.
Eng. Acta Univ Carol Med (Praha). 14,199-217. 1968.
- 268 Porath J.
Recently Developed Fractionation Methods.
Jap. Protein Nucleic Acid Enzyme (Tokyo). 16,313-23. Apr 71.
- 291 Lyngbye J. Kroll J.
Quantitative Immunoelectrophoresis of Proteins in Serum from a Normal Population- Season-, Age-, and Sex-Related Variations.
Eng. Clin Chem. 17,495-500. Jun 71.
- 302 Williams JG. Gratzer WB.
Limitations of the Detergent-Polyacrylamide Gel Electrophoresis Method for Molecular Weight Determination of Proteins.
Eng. J Chromatogr. 57,121-5. 22 Apr 71.

REVIEW

- 312 Lunney J. Chrambach A. Rodbard D.
Factors Affecting Resolution, Band Width, Number of Theoretical Plates,
and Apparent Diffusion Coefficients in Polyacrylamide Gel Electrophoresis.
Eng. Anal Biochem. 40,158-73. Mar 71.
- 317 Chrambach A. Rodbard D.
Polyacrylamide Gel Electrophoresis.
Eng. Science. 172,440-51. 30 Apr 71.
- 341 Englhardt A.
Elution Solutions for Electrophoresis.
Ger. Dtsch Med Wochenschr. 95,2256. 30 Oct 70.
- 356 Pesendorfer F. Krassnitzky O. Wewalka F.
Immunodiffusion and Immunoelectrophoretic Techniques.
Eng. Vox Sang. 19,200-4. Sep-Oct 70.
- 439 Koziner VB. Papush ND. Cherniak VIA.
Use of the Method of Free Electrophoresis in Determining the Elimination
of Polyglucine from the Blood.
Rus. Probl Gematol Pereliv Krovi. 15,37-40. Nov 70.
- 444 Polonovski C. Perrain MF. Desquilbet N.
Value and Limitations of Micro-Immunoelectrophoresis of the Serum in
Pediatrics. Study of 1300 Pathological Cases.
Fre. Ann Pediatr (Paris). 17,809-27. 2 Nov 70.
- 451 Dyberg J. Hjerne N.
Lipoproteinelectrophorese--Technic and Quantitation.
Dane. Nord Med. 84,1538-9. 26 Nov 70.
- 460 Thiele HG. Stark R.
Critical Remarks on the Value of Autoradioimmuno-electrophoresis for
Studies of Protein Synthesis by Lymphocytes in Vitro.
Eng. Z Immunitaetsforsch Allerg Klin Immunol. 140,424-7. Oct 70.
- 481 Carruthers ME.
Flexible Electrophoresis Applicator for Use with the Autoanalyzer in
Routine Protein Analysis.
Eng. J Clin Pathol. 23,450-1. Jul 70.
- 487 Jennings RC. Brocklehurst D. Hirst M.
A Comparative Study of Alkaline Phosphatase Enzymes using Starch-Gel
Electrophoresis and Sephadex Gel-Filtration with Special Reference to
High Molecular Weight Enzymes.
Eng. Clin Chim Acta. 30,509-17. Nov 70.
- 511 Arcus AC.
Protein Analysis by Electrophoretic Molecular Sieving in a Gel of
Graded Porosity.
Eng. Anal Biochem. 37,53-63. Sep 70.

REVIEW

- 512 Rothfus JA.
Newer Techniques in Protein Isolation and Characterization.
Eng. J Am Oil Chem Soc. 47,316-25. Sep 70.
- 516 Krieg M. Weicker H.
The Immunologic Identification and Localization of Protein Fractions
Following Separation by Disc Electrophoresis on Polyacrylamide Gel.
Ger. Z Klin Chem Klin Biochem. 8,293-8. May 70.
- 572 Maurer HR. Allen RC.
Polyacrylamide Gel Electrophoresis in Clinical Chemistry- Problems of
Standardization and Performance.
Eng. Clin Chim Acta. 40,359-70. Sep 72.
- 590 Kapadia G. Chrambach A.
Recovery of Protein in Preparative Polyacrylamide Gel Electrophoresis.
Eng. Anal Biochem. 48,90-102. Jul 72.
- 811 Nerenberg ST. Demarco L. Granger C.
Rapid Large-Scale Screening of Blood Proteins by Use of Cellulose
Acetate Electrophoresis on a Solid Support.
Eng. Clin Chem. 18,145-9. Feb 72.
- 839 Lange CF.
Advances in Electrophoretic and Chromatographic Technics.
Eng. Prog Clin Pathol. 3,130-62. 1970.
- 842 Rible H.
Historical and Theoretical Aspects of Isoelectric Focusing.
Eng. Ann NY Acad Sci. 209,11-22. 15 Jun 73.
- 852 Latner AL.
Some Clinical Biochemical Aspects of Isoelectric Focusing.
Eng. Ann NY Acad Sci. 209,281-98. 15 Jun 73.
- 864 Strickler A. Sacks T.
Focusing in "Continuous-Flow" Electrophoresis Systems by Electrical
Control of Effective Cell Wall Zeta Potentials.
Eng. Ann NY Acad Sci. 209,497-514. 15 Jun 73.
- 865
Toward A Unified Electrophoretic Viewpoint
Eng. Ann NY Acad Sci. 209,515-29. 15 Jun 73.
- 903 Ravenni G.
Technical Progress in the Serum Electrophoresis.
Ita. Quad Sclavo Diagn. 7,1167-74. Dec 71.
- 909 Jonsson M. Pettersson S. Rilbe H.
Scanning Isoelectric Focusing in Small Density-Gradient Columns. I.
Use of a Standard Spectrophotometer Cuvette for Focusing. Chemical
Modification of Proteins by Migrating Reactive Ions.
Eng. Anal Biochem. 51,557-76. Feb 73.

REVIEW

- 933 Fike RM. Van Oss CJ.
Preparative Cell Electrophoresis.
Eng. Prep Biochem. 3,183-92. 1973.
- 1005 Angela GC.
Summary of Recent Data on the Evaluation and Interpretation of Electro-
phoretic and Immunoelectrophoretic Tracings of Human Biologic Fluids in
Normal Conditions and in Relationship to Various Morbid Situations.
Ita. Minerva Med. 63,4862-90. 12 Dec 72.
- 1013 Keyser JW.
Immunoelectrophoresis--Applications and Recent Developments.
Eng. Chem Br. 8,480-3. Nov 72.
- 1031 Kiriukhin IF.
Electrofocusing in a Horizontal Apparatus.
Rus. Biull Eksp Biol Med. 73,120-2. Sep 72.
- 1055 Axelsen NH. Bock E.
Identification and Quantitation of Antigens and Antibodies by Means of
Quantitative Immunoelectrophoresis. A Survey of Methods.
Eng. J Immunol Methods. 1,109-21. Jan 72.

DIAGNOSIS

1. McCombs M. Bowman Bh.
Demonstration of Inherited Ceruloplasmin Variants in Human Serum by Acrylamide Electrophoresis.
Eng. Texas Rep Biol Med. 27,769-72. Fall 69.
6. Augier J. Augier-Giecry S.
Analysis by Polyacrylamide Gel Isoelectric Focusing of Protein Fractions present in the purified Protein Derivatives (PPD).
Fre. Ann Inst Pasteur (Paris). 117,768-77 Dec. 69.
7. Aron E. Guttman N. Lamy Jn. Weill JD.
Electrophoresis of Serum Proteins on a Polyacrylamide Gel.
Application to Diagnosing Liver Cirrhosis.
Fre. Bull Acad Nat Med (Paris). 153, 543-7 1969.
21. Moggi C. Frangini V. Pratesi C.
Electrophoretic Behavior of the Ser8m Glycoproteins During Viral Hepatitis in Children.
Ita. Riv Clin Pediat. 81,691-5 Sep-Oct 68.
26. Frangini V.
Behavior of Electrophoretic Fractions of Serum Glycoproteins in Children with Asthma. Radial Cellulose Acetate Gel Electrophoresis
Ita. Riv Clin Pediat. 81,998-1001. Sep-Oct 68.
39. Sawada T. Dato K. Sato S.
Studies on the Purification of Skin Test Antigen SST for the Diagnosis of Schistosomiasis Japonica. I. The Characterization and Purification of Antigen SST By Zone Electrophoresis and Gel-Filtration Technique.
Eng. Jap J Exp Med. 39,339-45. Aug 69
40. Lochmann D. Vymola F. Buda J. Pillich J.
The Use of Electrophoresis for the Identification of Staphylococcal Toxins.
Ger. Z Immunitaetsforsch. 138,414-22. Nov 69
57. Biguet J. Capron A Tran Van Ky P.
Immunologic Diagnosis of Parasitoses.
59. Obiger G.
Electrophoretic Analysis of D Group Streptococci Sera and Conjugates For Testing Their Activity in Serological Diagnosis.
Ger. ZBL Bakt Orig. 210,158-80. Jun 69.
60. Vernes A. Fruit J. Bouthemy F. Capron A.
Indirect Immunofluorescence Applied to the Diagnosis of Bilharziasis Study of the Specificity of the Reaction on Frozen Sections and Comparison with Immunoelectrophoresis and Complement Fixation Technics.
Fre. Bull Soc Path Exot. 62,548-56. May-Jun 69.

DIAGNOSIS

- 62 Diessner H.
The Diagnostic Significance of Polyacrylamide Electrophoresis in Neuropsychiatry.
Ger. Psychiat Neurol Med Psychol (Leipzig). 21,384-6 Oct.
- 65 Golubev Am
Electrophoretic Characteristics of Nonspecific Esterases in Blood Serum in Myocardial Infarct.
Rus. Kardiologia. 9,65-7. Oct. 69.
- 72 Herzog A. Bruns J.
Cell Electrophoretic Studies on Lymphocytes of Cows with Blood Pictures Compatible with or Suspicious for Leucosis.
Ger. Deutsch Tieraerztl Wschr. 76,569-75. 1 Nov 69.
- 79 Terfloth HP.
Modified Technic of the Electrophoretic Separation of Erythrocyte Acid Phosphatase.
Ger. Beitr Gerichtl Med. 26,186-90 1969
- 83 Zapletalek M. Tabarka K.
Atropine and Electrophoretic Test of Autonomic Tone in Healthy Subjects.
Eng. Activ Nerv Sup (Praha). 11,303. 1969.
- 105 Ricco G. Gallo E. Mazza U. Bianco G. Prato V
The Starch Gel Quantitative Electrophoresis of Haemoglobin as Screening in the Thalassaemia Syndromes.
Eng. Acta Haemat (Basel). 42,99-105. 1969
- 113 Hatanaka M. Twiddy E. Gilden R.
Electrophoresis of Adenovirus-Specified Thymidine Kinase.
Eng. J. Virol. 4,801-3. Nov 69.
- 114 Iuchi I. Miyake H.
Analysis of Serum Lipoproteins by Electrophoresis and Ultracentrifugation.
Jap. Jap J Clin Path. 17,589-96. Aug 69.
- 115 Kaplan MM. Rogers L.
Separation of Human Serum-Alkaline-Phosphatase Isoenzymes by Polyacrylamide Gel Electrophoresis.
Eng. Lancet. 2,1029-31. 15 Nov 69.
- 117 Coulson Wf. Bender Da. Jepson JB.
Multiple Electrophoresis Peaks of Rat Liver Decarboxylases for 3,4-Dihydroxyphenylalanine and 5-Hydroxytryptophan.
Eng. Biochem J. 115,63P-64P. Dec 69.

DIAGNOSIS

- 123 Ianovskii DN. Galitskii IAD.
Analysis of Blood Serum Proteins by the Method of
Immuno-electrophoresis in Paraproteinemias.
Rus. Probl Gemat. 12,15-20. Sep 67.
- 124 Recavarren G. Lobe-Parga G. Del Solar V. Villanueva S.
Sysproteinemia in Liver Cirrhosis. Agar Electrophoresis and
Immuno-electrophoresis.
Spa. Rev Med Chile. 93,223-32. May 65.
- 141 Sehgal Vn.
Electrophoretic Patterns of Serum Proteins in Leprosy.
Eng. Int J. Leprosy. 36,413-6. Oct-Dec 68
- 149 King Jr. Theodore Is. Cole Rm.
Generic Identification of L-Forms by Polyacrylamide Gel
Electrophoretic Comparison of Extracts from Parent Strains and Their
Derived L-Forms.
Eng. J Bact. 100,7107. Oct. 69
- 155 Ripoll Gomez M. Barcelo P. Fargas R. Muriach V.
1st Personal Immuno-electrophoretic Experiences in Rheumatism of
Inflammatory Origin.
Spa. Rev Esp Reum. 12,296-7. Oct 68.
- 157 Saito T. Sato T. Yoshijima I. Hatakeyama T. Suzuki K.
Serum Protein Analysis by Immuno-electrophoresis in Patients with
Periodontal Diseases.
Eng. Arch Oral Biol. 14,1113-6. Sep 69.
- 162 Saint-Paul M. Derobert L. Peillet J. Labbe JP.
Value of Immuno-electrophoresis in Forensic Medicine.
Fre. Med Leg Domm Cropr (Paris). 4,126-9. Apr-Jun 71.
- 171 Greenwood BM. Whittle HC. Dominic-Rajkovic C.
Counter-Current Immuno-electrophoresis in the Diagnosis of
Meningococcal Infections.
Eng. Lancet. 2,519-21. 4 Sep 71.
- 172 Mital VP. Bochke RR. Srivastava VK.
Serum Electrophoresis in Marasmus.
Eng. Indian Pediatr. 8,160-2. Apr 71.
- 182 Alter HJ. Holland Pv. Purcell RH.
Counter-electrophoresis for Detection of Hepatitis--Associated
Antigen- Methodology and Comparison with Gel Diffusion and Complement
Fixation.
Eng. J Lab Clin Med. 77,1000-10. Jun 71.
- 186 Gadd KG.
Haemoglobin Electrophoresis as a Routine test for Sickleacmia.
Eng. Cent Afr J. Med. 17,55-77. Mar 71.

DIAGNOSIS

- 193 Schaeffer J. Taft DM.
Rapid Screening for Australia Antigen Using Countercurrent Electrophoresis.
Eng. Am J Med Technol. 37,325-8. Aug 71.
- 200 Urasawa S. Urasawa T. Kanamitsu M.
Radioimmuno-electrophoretic Identification of Poliovirus Inhibitors and Their Characteristic Mode of Action.
Eng. Arch Gesamte Virusforsch. 33,113-25. 1971.
- 201 Forsgren M.
Immuno-electrophoresis of Poliovirus Antigens.
Eng. Arch Gesamte Virusforsch. 33,27-36. 1971
- 205 Honjo T. Nishizuka Y. Kato I. Hayaishi O.
Adenosine Diphosphate Ribosylation of Aminoacyl Transferase II and Inhibition of Protein Synthesis by Diphtheria Toxin.
Eng. J. Biol Chem. 246,4251-60. 10 Jul 71.
- 226 Dalziel N.
The Improved Detection of Paraproteinaemia by Routine Cellulose Acetate Electrophoresis.
Eng. Med Lab Technol. 28,157-61. Apr 71.
- 247 Moggi C. Giovannucci ML. Calabri G. Berti S.
Behavior of Blood Proteins and Glycoproteins in the course of Meningococcal Disease in Childhood (Sepsis and Meningitis) (Cellulose Acetate Gel Radial Electrophoresis).
Ita. Riv Clin Pediatr. 82,412-6. Oct-Dec 69.
- 252 Petithory J. Feillet M.
Diagnosis of Cysticercosis by Immuno-electrophoresis and the Ouchterlony Technic.
Fre. Encephale. 60,24-35. Jan-Feb 71.
- 261 Biguet J. Tran-Van-Ky P. Andrieu S. Vaucelle T.
Initial Characterizations of Enzymatic Activities on Immuno-electrophoretograms of Antigenic Extracts of Histoplasma Capsulata. Practical Diagnostic Results.
Fre. Ann Soc Belg Med Trop. 47,425-33. 1967
- 262 Danieli G. Montroni M. Pignatari S.
Secondary Monoclonal Gammopathies.
Ita. Haematologica. 55,668-71. 1970
- 272 Rapid Identification of Hepatitis Virus Using Counter-Current Immuno-electrophoresis.
Ger. Med Monatsschr. 25,191-2. Apr 71.
- 276 Vergani C.
Cross-over Electrophoresis for the Rapid Detection of Serum Hepatitis (Australia) Antigen and Antibody.
Eng. J Clin Pathol. 24,86-7. Feb 71.

DIAGNOSIS

- 277 White GB. Lasheen RM. Baillie MB. Turner GC.
Comparison of Three Serological Methods for the Detection of
Hepatitis-Associated Antigen.
Eng. J. Clin Pathol. 24,8-12. Feb 71.
- 278 Baroncelli PG. Norelli MT. Ghidella G. Castello D.
The Behavior of the Beta-1-C Fraction in the Immunoelectrophoretic
Pattern of Glomerulonephritis in Childhood.
Ita. Minerva Pediatr. 21,1127-37. 23 Jun 69.
- 280 Kluikina SS. Shatuncva LV.
Method for the Determination of the Selectivity of Proteinuria.
Rus. Lab Delo. 9,542-6. 1970.
- 281 Huismans Bd.
Frequency of Double Pre-Beta Bands During Electrophoresis on Membrane
Foil of Lipids from Patients with Vascular Diseases.
Ger. Z Klin Chem Klin Biochem. 9,176-7 Mar 71.
- 289 Wallis C. Melnick JL.
Enhanced Detection of Australia Antigen in Serum Hepatitis Patients
By Discontinuous Counter-Immunoelectrophoresis.
Eng. Appl Microbiol. 21,867-9. May 71.
- 269 Leverenz S. Lafrenz M. Preussner S.
Significance of Immunoelectrophoresis in the Diagnosis of Paraprotein
Diseases.
Ger. Z Gesamte Inn Med. 25,630-5. 15 Jul 70
- 297 Merrill DA. Kohler PF. Singleton JW.
Quantitation of the Hepatitis-Associated Antigen by
Electroimmunodiffusion.
Eng. J Allergy. 47,315-20. Jun 71
- 301 Jaster D. Bergmann KC.
Immunoelectrophoretic Isolation of Synovial Proteins in Meniscus
Injuries.
Ger. Beitr Orthop Traumatol. 17,401-5 Jul 70.
- 305 Diessner H. Schmidt RM.
Polyacrylamide Electrophoresis and its Importance in the Diagnosis of
Plasmacytoma.
Ger. Dtsch Gerundheitsw. 26,756-7. 15 Apr 71.
- 306 Scavizzi Mr. Dodin A. Ryckner G. Wiart J.
A Sporadic Case of Cholera- The Problem of Rapid Bacteriological
Diagnosis.
Fre. Med Trop (Mars). 31,55-8. Jan-Feb 71.
- 308 Bedarida G. Trinchieri G. Carbonara A.
The Detection of Australia Antigen and Anti-Au Antibodies by a Rapid
Procedure Combining Electrophoresis and Immunoprecipitation.
Eng. Haematologica. 54,591-602. 1969.

DIAGNOSIS

- 309 Theodore TS. Tully JG. Cole RM.
Polyacrylamide Gel Identification of Bacterial L-Forms and Mycoplasma
Species of Human Origin.
Eng. Appl Microbiol. 21,272-7. Feb 71.
- 327 Kostic A. Cvoric M. Suvakovic V. Tedeski-Cvilicevic B. Bajic V.
Immuno-electrophoretic Studies and their significance in the followup
of the Evolution of Acute Infectious Hepatitis.
Ser. SRP Arh Celok Lek. 98,285-92. Feb 70.
- 334 Gouing HD. Bonk U. Simon A. Nause I.
Supplementary Facts on the Electrophoretic Demonstration of a
Pregnancy-Specific Protein.
Ger. Acta Biol Med Ger. 24,381-5. 1970.
- 343 Stamboliev PN.
Immuno-electrophoretic Analysis of Serum During Development of
Schizophrenia.
Rus. Zh Nevropatol Psikhiatr. 70,1339-43. 1970.
- 355 Bleumink E. Young E.
Studies on the Atopic Allergen in Hen's Egg. II. Further
Characterization of the skin-Reactive Fraction in Egg-White-
Immuno-Electrophoretic Studies.
Eng. Int Arch Allergy Appl Immunol. 40,72-88. 1971.
- 357 Prince Am.
The High Voltage Immuno-electrosmophoretic (IEOP) Technique for
Detection of SH Antigen-Application to Blood Donor Screening and to
Study of Liver Disease.
Eng. Vox Sang. 19,205-10. Sep-Oct 70.
- 358 Hansson BG. Kindmark CO. Johnsson T.
Comparison Between the Immuno-electrosmophoresis and the Ouchterlony
Precipitation Technique in Detecting Australia Antigen in Cases of
Hepatitis.
Eng. Vox Sang. 19,225-7. Sep-Oct 70.
- 359 Thulstrup H. Dybkjaer E.
Screening for Hepatitis Associated Antigen by Three Different
Methods.
Eng. Vox Sang. 19,234-8. Sep-Oct 70.
- 367 Dorff GJ. Coonrod JD. Rytel MW.
Detection by Immuno-electrophoresis of Antigen in Sera of Patients
with Pneumococcal Bacteraemia.
Eng. Lancet. 1,578-9. 20 Mar 71.

DIAGNOSIS

- 360 Biguet J. Fruit J. Vernes A. Capron A.
Complement Fixation Test and Immuno-electrophoresis Applied to the
Immunologic Diagnosis of Pulmonary Aspergillosis.
Fre. Rev Immunol (Paris). 34,193-203. Jul-Sep 70.
- 374 Leonardy JG.
Serum Protein Electrophoresis in Office Practice.
Eng. South Med J. 64,129-37. Feb 71.
- 392 Hsieh HS. Jaffe ER.
Electrophoretic And Functional Variants of NADH-Methemoglobin
Reductase in Hereditary Methemoglobinemia.
Eng. J Clin Invest. 50,196-202. Jan 71.
- 395 Seidel D.
A New Immunochemical Technique for a Rapid, Semi-Quantitative
Determination of the Abnormal Lipoprotein (LP-X) Characterizing
Cholesiasis.
Eng. Clin Chim Acta. 31,225-9. Jan 71.
- 396 Sachdev YR. Chandra H. Mathur YC.
Serum Proteins Electrophoresis in Liver Diseases.
Eng. Indian Pediatr. 7,571-6. Oct 70.
- 397 Sobotka J. Tesárova-Vechetova A.
Clinical Importance of Determination of the Pre-Beta Lipoprotein
Fraction with the Aid of Paper Electrophoresis.
Che. Vnitr Lek. 17,36-42. Jan 71.
- 408 Lane D.
The Early Detection of Gammopathies.
Eng. J Med Lab Technol. 27,447-50. Oct 70.
- 409 Dinu IV. Hristea R.
Uranyl-Resistant Paraproteins. Immunochemical Method of
Identification of Pathological Protein Fractions.
Rum. Med Interna (Bucur). 22,1063-70. Sep 70.
- 414 Selivanova KF. Gordeev IUN. Romaskevich AI.
Microelectrophoresis of Protein Fractions of Blood Serum in
Experimental Thyroid Toxicosis and Hypothyroidism.
Ukr. Ukr Biolhim Zh. 42,377-80. 1970.
- 417 Whitehead PH. Kind SS. Morris PA. Davies M. Cleevley R.
The Examination of Bloodstains by Laurell Electrophoresis
(Antigen-Antibody Crossed Electrophoresis).
Eng. J Forensic Sci Soc. 10,83-90. Apr 70.

DIAGNOSIS

- 429 Kindler U.
Lipoprotein Electrophoresis in the Diagnosis of
Hyperlipoproteinemias.
Ger. Dtsch Med Wochenschr. 95,1942. 18 Sep 70.
- 436 Eulitz M. Huhn D. Eulitz H.
Characterization of the Paraproteins from a Plasmacytoma With Osseous
and Extrasosseous Distribution.
Ger. Blut. 22,1-11. Jan 71.
- 445 Latner Al. Parsons ME. Skillen AW.
Isoelectric Focusing of Human Liver Alkaline Phosphatase.
Eng. Biochem J. 118,299-302. Jun 70-
- 453 Galdiero F. Tufano MA. Cerciello T.
Isoelectric Focusing of Clostridium Botulinum Type A Toxin.
Eng. Arch Mikrobiol. 74,101-2. 21 Oct 70.
- 456 Kohn J.
Method For The Detection and Identification of Alpha Fetoprotein in
Serum.
Eng. J Clin Pathol. 23,733-5. Nov 70.
- 471 Spedding DJ.
Detection of Latent Fingerprints With 35802.
Eng. Nature (Lond). 229,123-4. 8 Jan 71.
- 472 Oepen I.
Thin-Layer Starch Gel Electrophoresis for Determination of
Phosphoglucomutase Types in Blood Traces.
Ger. Z Rechtsmed. 67,399-12. 1970.
- 491 Gurova AI.
O-Reactive Protein and Blood Proteinogram in Toxicosis of the Second
Half-Time of Pregnancy.
Rus. Akush Ginekol (Mosk). 45,28-31. Sep 79.
- 493 Shapcott D. O'Brien C.
A Method for the Isolation of Insulin from Single Human Pancreas.
Eng. Diabetes. 19,831-6. Nov 70.
- 494 Mazurczak J. Woyciechowska J. Makuch-Korulska W. Tomankiewicz Z.
Immuno-electrophoretic Examinations of Serum Proteins in Patients With
Multiple Sclerosis.
Pls. Neurol Neurochir Pol. 4,501-5. Sep-Oct 70.
- 521 Bert G. Di Cossano DL. Pecco P.
Capacity of Peripheral Blood Lymphocytes to Recognize a Specific
Antigen. Usefulness of Cellular Electrophoresis.
Ita. Haematol Lat. 12,309-11. Jul-Dec 69.

DIAGNOSIS

- 550 Fan IC. De Boer CJ. Hess WR.
African Swine Fever- Application of Immunoelectroosmophoresis for the
Detection of Antibody.
Eng. Can J Comp Med. 36,309-16. Jul 72.
- 560 Fossati CJ.
Immunological Diagnosis of Parasitic Diseases.
Spa. Quad Sclavo Diagn. 7,507-18. Jun 71.
- 567 Pizzigallo E. Caramia P. Federico G.
Comparative Evaluation of the Technics of Immunodiffusion on Agar and
Counter-Electrophoresis in the Detection of Australia Antigen
Ita. Ann Solavo. 13,121-8. Mar-Apr 71.
- 568 Holland PV. Purcell RH. Smith H. Alter HJ.
Subtyping of Hepatitis-Associated Antigen (HB-Ag)-Simplified
Technique With Counterelectrophoresis.
Eng. J Immunol. 109,420-5. Sep 72.
- 571 Edwards EA. Muehl PM. Peckinpaugh RO.
Diagnosis of Bacterial Meningitis by Counterimmunoelectrophoresis.
Eng. J Lab Clin Med. 80,449-54. Sep 72.
- 574 Mason EC. Shaw AE. Harding MJ. Witney KJ.
High-Voltage Immunoelectroosmophoresis in Australia Antigen Screening
Of Blood Donors.
Eng. Med J Aust. 1,1020-3. 12 May 72.
- 575 Jeppsson JO. Berglund S.
Thin-Layer Isoelectric Focusing for Haemoblobin Screening and ITS
- 588 Klibansky C.
Separation of N-Acetyl- -D-Hexosaminamidase-Isoenzymes from Human
Brain and Leukocytes by Cellulose Acetate Paper Electrophoresis- A
Simple Procedure for the Diagnosis of Tay-Sachs Disease.
Eng. ISR J Med Sci. 7,1086-9. Sep 71.
- 592 Tilden RL. Deland FH.
Electroosmophoretic Radioimmunoassay- Application to
Hepatitis-Associated Antigen.
Eng. J Nucl Med. 13,599-603. Aug 72.
- 601 Charnyi VI.
Use of Counter Immunoelectrophoresis for Determining Species of Blood
in Stains.
Rus. Sud Med Ekspert. 14,16-9. Jul-Sep 71.

DIAGNOSIS

- 602 Masi M. Dallacasa P.
Proteinuria in Childhood. II. Differentiation of Proteinurias on the Basis of Electrophoresis and Immunoelectrophoresis of Urinary Proteins, Plasma Protein Clearance and Determination of the Selectivity Index.
Ita. Minerva Pediatr. 24,855-61. 9 Jun 72.
- 613 Kostner G. Holasek A. Schoenborn W. Fuhrmann W.
Immunochemical Study and Analytical Isoelectric Focusing of Serum of A Case of Tangier Disease.
Ger. Clin Chim Acta. 38,155-62. Apr 72.
- 619 Electro-Osmo-Immunodiffusion System for Detection of Australia Antigen and of Antibodies Against Australia Antigen
Fre. Pathol Biol (Paris). 20,329-30. Mar 72.
- 620 Lever JE.
Purification and Properties of a Component of Histidine Transport in Salmonella Typhimurium. The Histidine-Binding Protein J.
- 628 Jambazian A. Holper JC.
Rheophoresis- A Sensitive Immunodiffusion Method For Detection of Hepatitis Associated Antigen.
Eng. Proc Soc Exp Biol Med. 140,560-4. Jun 72.
- 630 Angeloni G. Iacobelli S. Garcea N. Papparatti L. Bompiani A.
Cervical Mucus. V: Electrophoretic Study of Proteins of Human Cervical Mucus.
Ita. Ann Ostet Ginecol. 92,887-92. Dec 71.
- 631 Tokarskaia ZB. Vedeneev VS.
Carbohydrate-Protein Relationship in Serum Electrophoretic Fractions In Pneumonia.
Rus. Lab Delo. 10,621-4. 1971.
- 632 Murray-Lyon IM. Clarke HG. Mopherson K. Williams R.
Quantitative Immunoelectrophoresis of Serum Proteins in Cryptogenic Cirrhosis, Alcoholic Cirrhosis and Active Chronic Hepatitis.
Eng. Clin Chim Acta. 39,215-20. Jun 72.
- 633 Hultbery B. Ookerman PA.
Artificial Substrates in the Assay of Acid Glycosidases.
Eng. Clin Chim Acta. 39,49-58. Jun 72.
- 635 Pringle RC. Ross CA. McMichael S.
Immunoelectro-Osmophoresis and Complement Fixation Tests for Detection of Hepatitis-Associated Antigen.
Eng. Med Lab Technol. 29,12-7. Jan 72.

DIAGNOSIS

- 638 Milner LV. Dobie JL. Grobbelaar BG.
An Inhibition Crossover Electrophoresis Technic For the Detection of
Hepatitis-Associated Antigen.
Eng. Transfusion. 12,273-5. Jul-Aug 72.
- 640 Banffer Jr.
Demonstration of Precipitins Against a Treponemal Antigen By
Counter-Immuno-electrophoresis
Eng. Lancet. 1,996-7. 6 May 72.
- 641 Dreisler E. Hemmingsen L. Rotbol Pedersen L.
Protein and LDH-Isoenzyme Pattern of Urine From Patients With Acute
and Chronic Pyelonephritis Determined by Isoelectric Focusing and
Disc-Electrophoresis.
Eng. Dan Med Bull. 19,99-102. May 72.
- 656 Sachdev YR.
Serum Protein Electrophoresis in Acute Infective Hepatitis.
Eng. J Assoc Physicians India. 20,289-92. Apr 72.
- 658 Waehneltd TV. Mandel P.
Isolation of Rat Brain Myelin, Monitored by Polyacrylamide Gel
Electrophoresis of Dodecyl Sulfate-Extracted Proteins.
- 659 Otto S
Dilution-Comparative Immuno-electrophoresis for the Investigation of
Double Paraproteinaemias.
Eng. Haematologia (Eudap). 5,447-9. 1971.
- 660 Becus T. Lukacs E. Frinou I.
Electrophoretic and Immuno-electrophoretic Studies in Multiple
Sclerosis.
Rum. Neurol Psihiatr Neurcchir. 17,169-78. Mar-Apr 72.
- 668 Gunther J. Gundlach HJ. Meyer-Reinecker H.
Disk Electrophoresis Study of Serum Proteins in Experimental Allergic
Encephalomyelitis.
Ger. Psychiatr Neurol Med Psychol (Leipz). 23,467-72. Aug 71.
- 669 Butnariu J. Grosu M. Macarovicí R.
Proteinemia and Electrophoretic Fractions of Serum Proteins in
Children with Bouillaud-Sokolski's Rheumatism.
Rum. Pediatria (Bucur). 21,39-47. Jan-Feb 72.
- 670 Coonrod JD. Rytel MW.
Determination of Aetiology of Bacterial Meningitis by
Counter-Immuno-electrophoresis.
Eng. Lancet. 1,1154-7. 27 May 72.

DIAGNOSIS

- 673 Petter O. Kipping D.
Immunoelectrophoretic Studies in Various Collagen Diseases in Dermatology.
Ger. Z Haut Geschlechtskr. 47,53-62. 15 Jan 72.
- 679 Melish JS. Waterhouse C.
Concentration Gradient Electrophoresis of Plasma From Patients with Hyperbetalipoproteinemia.
Eng. J Lipid Res. 13,193-200 Mar 72.
- 681 Yarzabal LA. Capron A.
Contribution of Immunoelectrophoresis to the Immunologic Diagnosis of Hydatidosis.
Spa. Torax. 20,168-74. Sep 71.
- 682 Castagnari L. Sorice F.
Immunoprecipitation Tests in the Diagnosis of Human Hydatidosis.
Eng. Folia Allergol (Roma). 18,511-7. Nov-Dec 71.
- 694 Ziegenfuss JF Jr. Burka ER. Byrne EB.
Australia Antigen Detection by 'Sandwich' Counterelectrophoresis.
Eng. Jama. 220,726-7. 1 May 72.
- 697 Porcelli G. Angelett M. Angeletti M. Marini-Bettolo GB.
Chromatographic and Electrophoretic Behavior of Chromogranine Obtained from Bovine and Equine Adrenal Medulla.
Eng. J Chromatogr. 66,162-6. 22 Mar 72.
- 699 Yamate E. Nagata Y. Dohi Y. Tsuchiya T.
Testing Method of Australia Antigen and Antibody by Cross-Over Electrophoresis.
Jap. Naika. 28,1142-4. Dec 71
- 702 Castagnari L. Sorice F.
Electrophoretic Immunoprecipitation (Crossed Over Electrophoresis) In The Diagnosis of Human Hydatidosis. II.
Ita. Boll Ist Siercter Milan. 50,99-106. Mar-Apr 71.
- 704 Varga JM. Ceska M.
Characterization of Allergen Extracts by Gel Isoelectrofocusing and Radioimmunosorbent Allergen Assay. Allergens in Timothy Pollen (Phleum Pratense) Extracts-
Eng. J Allergy Clin Immunol. 49,274-84. May 72.
- 707 Tanaka K. Mizuguchi N. Kimura N. Arima T. Yamazaki S.
Methodological Evaluation and Clinical Significance of Lipoprotein Fractionation by Filter Paper Electrophoresis, with Special Reference To Correlation Between Lipoprotein Patterns and Arteriosclerosis Acceleration Factors.
Jap. Jap J Clin Pathol. 19,Suppl-165-6. Aug 71.

DIAGNOSIS

- 747 Nemec J. Bednar J. Strasek J. Rohling S. Soumar J. Havelka J. Vana S. Zambrazil V.
Significance of Individual Diagnostic Tests in the Differential Diagnosis of Thyroid Function Disorders. VII. TBC Index in Vitro By Diagnostic Test Res-O-Mat and Electrophoretic Test of Binding Capacity of the Serum Proteins. Preliminary Report on a Small Number Of Patients.
Che. Cas Lek Cesk. 111,105-7. Feb 72.
- 756 Heer FE. Nakwacki J. Carlcs JA. Oyhamburu J.
Laboratory Technic for the Study of the Australian Antigen.
Spa. Arch Fund Roux Ocefa. 5,89-94. 1971
- 757 Barnes MG. Komarmy L. Novack AH.
A Comprehensive Screening Program for Hemoglobinopathies.
Eng. Jama. 219,701-5. Feb 72.
- 758 Change PC. Yano Y. Dighton M. Dickie N.
Fractionation of Staphylococcal Enterotoxin C 2 By Isoelectric Focusing.
Eng. Can J. Microbiol. 17,1367-72. Nov 71.
- 759 Hauschild AH. Hilsheimer R.
Purification and Characteristics of the Enterotoxin of Clostridium Perfringens Type A.
Eng. Can J Microbiol. 17,1425-33. Nov 71.
- 760 Lehmann H. Lines JG.
Hyperliporproteinaemia Classification- The Optimum Routine Electrophoretic System and Its Relevance to Treatment.
Eng. Lancet. 1,557-60. 11 Mar 72.
- 764 Nakagawa M.
Comparison Between Agarose Gel Electrophoresis and Disk Electrophoresis in Serum Lipoprotein Analysis and Its Fluctuation in Various Disease Conditions.
Jap. Jap J Clin Pathol. 19,Suppl-167-8. Aug 71.
- 767 Uyoshioka H. Shinoara K. Shono K. Isobe J. Yamanaka M.
Australia Antigen. 1. Comparison Between Immunolectrosyneresis and Single Radial Immunodiffusion Plate Method.
Jap. Jap J Clin Pathol. 19, Suppl-461. Aug 71.
- 778 Graham HA. Aldenderfer PH.
A Counterimmunolectrophoresis Inhibition Test for the Detection of Hepatitis-Associated Antigen.
Eng. Proc Soc Exp Biol Med. 139,414-6. Feb 72.

DIAGNOSIS

- 708 Sgouris TJ.
The Detection and Quantitation of Diphtheria and Tetanus Antibodies
In Human Plasma or Serum by Counterelectrophoresis.
Eng. Vox Sang. 22,359-61. 1972.
- 709 Wille LE.
Pre-Beta-Lipoproteins in Healthy Persons. A study of 224 Subjects
With Agarose Gel Electrophoresis.
Eng. Clin Genet. 2,228-38. 1971.
- 715 Urushizaki I. Kitago M. Fukuda M.
Isoelectric Focusing of Liver and Spleen Ferritins of Rats.
Jap. Med Biol (Tokyo). 82,225-7. 6 Jun 71.
- 722 Ursyn-Neimoewicz W.
Immuno-electrophoretic Patterns of Blood Serum Proteins and Especially
The C-Reactive Protein in Tuberculous Patients in the Course of
Treatment.
Pls. Roczn Akad Med Białymstoku. 16,55-71. 1971.
- 725 Pedio G. Ruttner JR.
Electrophoretic Changes of Serum and Virus Particles Type 'C' and 'A'
In a Plasmyocytoma of Balb-C Mice.
Eng. Experientia. 27,949-51. Aug 71.
- 730 Dutton GR. Barondes SH.
Macromolecular Behaviour of Gangliosides on Electrophoresis in Sodium
Dodecyl Sulphate.
Eng. J Neurochem. 19,559-62. Feb 72.
- 735 Davis PJ. Handwerger BS. Gregerman RI.
Thyroid Hormone Binding by Human Serum Prealbumin (TBPA).
Electrophoretic Studies of Triiodothyronine-TBPA Interaction.
Eng. J Clin Invest. 51,515-21. Mar 72.
- 736 Bechtel PJ. Pearson AM. Bodwell CE.
Isoelectric Focusing of S- - (4-Pyridylethyl)-L-Cysteine Myosin
Components on Polyacrylamide Gel.
Eng. Anal Biochem. 43,509-14. Oct 71
- 744 Toneva V.
Comparative Studies of the Aujeszky Virus and the Herpes Simplex
Virus with the Immuno-electrophoresis Method.
Fre. Bull Off Int Epizoot. 75,350-62. Jul-Aug 71.

DIAGNOSIS

- 780 Pitcher PM.
Crossed Immunoelectrophoresis for the Identification of Fibrinogen Degradation Products.
Eng. Scand J. Haematol. 13,229-31. 1971
- 784 Kojima M. Usui H. Ando T. Fukuda N. Matsumoto K.
Detection of Australia Antigen by Counter-Immunoelectrophoresis.
Jap. Jap J Clin Med. 29,2368-72. Oct 71.
- 796 Remington JS. Gaines JD. Gilmer MA.
Demonstration of Candida Precipitins in Human Sera By Counter Immunoelectrophoresis.
Eng. Lancet. 1,413. 19 Feb 72.
- 797 Burghart-Czaplinska M. Jarzebowska H. Czestochowska E.
Case of Waldenstrom's Macroglobulinemia with Atypical Serum Immunoelectrophoretic Pattern.
Pls. Pol Tyg Lek. 26,1744-6. 8 Nov 71.
- 798 Swanborg RH. Feldstein SR.
Molecular Weight of Encephalitogenic Protein by Electrophoresis in Sodium Dodecyl Sulfate (SDS)-Acrylamide Gels.
Eng. Proc Soc Exp Biol Med. 139,238-41. Jan 72.
- 799 Arsov D. Guceva B. Hrisoho R. Calaroski I.
Immunoelectrophoretic Changes in Rheumatic Diseases.
Cro. Acta Med Jugosl. 25,307-14. 1971.
- 801 Cuk V.
Electrophoretic Changes in Serum Proteins of Children with Rubeola.
Ser. Med Pregl. 24,309-10. 1971.
- 802 Van KY PT. Biguet J. Vaucelle T. Frutt J.
Immunoelectrophoretic Analysis and Characterization of Enzymatic Activities in Antigenic Extracts of Aspergillus Flavus. Reflection on The Differential Diagnosis of Human Aspergillosis.
Fre. Sabouraudia. 9,210-20. Nov 71.
- 806 Abdel-Aal MA. Sakr R. El-Hawary MF. Ibrahim MA.
Simple Agar Gel and Immuno Electrophoretic Studies on Serum Proteins In Nephritis and Nephrosis.
Eng. J Egypt Med Assoc. 53,649-61. 1970.
- 809 Torgyan S. Meretey K. Backhausz R.
Radioimmunological Studies in the Diagnosis of Thyroid Diseases.
Hun. Orv Hetil. 112,2875-9. 28 Nov 71.

DIAGNOSIS

- 814 Hoekstra J. Deinhardt F.
Counter-Immuno-electrophoresis- Rapid Method for Detecting Group-Specific Antigen and Antibodies Associated with Cncogenic Ribonucleic Acid Viruses.
Eng. Appl Microbiol. 22,1172-3. Dec 71
- 816 Mandel B.
Characterization of Type 1 Poliovirus by Electrophoretic Analysis.
Eng. Virology. 44,554-68. Jun 71.
- 817 Bodnar PN.
Changes in Immuno-electrophoresis Indices Under the Effects of Anabolic Steroids in Patients With Diabetes Mellitus.
Rus. Probl Endokrinol (Mosk). 17,28-30. May-Jun 71.
- 821 Hansson BG. Johnsson T.
Improved Technique for Detecting Australia Antigen By Immuno-electrosmophoresis.
Eng. Vox Sang. 21,531-9. Dec. 71.
- 826 Bogdal J. Wiernikowski A. Urasinski I.
Importance of Electrophoretic Tests in the Assessment of Some Cases of Hemorrhagic Diathesis.
Pls. Przegl Lek. 28,819-21. 1971.
- 832 Guillan RA. Hooker EV.
Zonal and Immuno-electrophoretic Patterns of Normal and Nephrotic Renal Extracts- A Preliminary Study.
Eng. Am J Clin Pathol. 56,699-706. Dec 71.
- 834 Micro-Crossover Electrophoresis for the Detection of Au-Sh-Antigen.
Ger. Zentralbl Bakteriол Orig A. 223,279-85. Mar 73.
- 850 Vesterberg O.
Physicochemical Properties of the Carrier Ampholytes and Some Biochemical Applications.
Eng. Ann Ny Acad Sci. 209,23-33. 15 Jun 73.
- 858 Wadstrom T.
Separation of Australia Antigen and Some Bacterial Proteins by Isoelectric Focusing in Polyacrylamide Gels.
Eng. Ann NY Acad Sci. 209,405-14. 15 Jun 73.
- 875 Axelsen NH.
Quantitative Immuno-electrophoretic Methods as Tools for a Polyvalent Approach to Standardization in the Immunochemistry of Candida Albicans.
- 876 Feldman SA. Du Olos T.
Diagnosis of Meningococcal Arthritis by Immuno-electrophoresis of Synovial Fluid.
Eng. Appl Microbiol. 25,1006-7. Jun 73.

DIAGNOSIS

- 877 Cejka J. Fleischmann LE.
Post- - Globulin- Isolation and Physicochemical Characterization.
Eng. Arch Biochem Biophys. 157,168-76. Jul 73.
- 878 Sweet GH. Wilson DE. Gerber JD.
Application of Electroimmunodiffusion and Crossed
Electroimmunodiffusion to the Comparative Serology of a Microorganism
(histoplasma Capsulatum).
Eng. J Immunol. 111,554-64. Aug 73.
- 885 Kyrikidou A. Kourea-Kremastinou T. Papaevangelou G. Vassiliadis P.
Detection of Vaccinia Antigen and Antibody by
Counterelectrophoresis.
Eng. Pathol Microbiol (Basel). 39,125-34. 1973.
- 891 Kjellin KG. Vesterberg O.
Thin Layer Isoelectric Focusing of Cerebrospinal Fluid Proteins. A
Preliminary Report with Special Reference to the Diagnostic
Significance in Multiple Sclerosis.
Eng. Acta Neurol Scand Suppl. 51,379-80. 1972.
- 892 Lindbak H. Scandsen S. Julsrud OJ.
Agarose-Electrophoresis of Spinal Fluid.
Eng. Acta Neurol Scand Suppl. 51,381-3. 1972.
- 893 Ben-David M. Rodbard D. Bates RW. Bridson WE. Chrambach A.
Human Prolactin in Plasma, Amniotic Fluid and Pituitary- Identity and
Characterization by Criteria of Electrophoresis and Isoelectric
Focusing in Polyacrylamide Gel.
Eng. J Clin Endocrinol Metab. 36,951-64. May 73.
- 894 Sepulveda B. Aubanel M. Landa L. Velazquez G.
Advances in the Counter-Immuno-electrophoresis Technic for the
Serologic Study of Amebiasis.
Spa. Arch Invest Med (Mex). 2,Suppl 2-363-70. 1972.
- 896 Rettenbacher F.
Immuno-electrophoresis. Technique and Utilization.
Ger. Med Lab (Stuttg). 26,33-42. Feb 73.
- 899 Gentilini M. Pinon JM.
Value of Electrosyneresis (Or Immuno-Electro-Diffusion) on A
Cellulose Acetate Membrane in Hydatidosis Diagnosis. Comparative
Study With Other Precipitation Tests.
- 900 Kimble CE. Anderson AW.
Rapid, Sensitive Assay for Staphylococcal Enterotoxin A By Reversed
Immuno-Osmophoresis.
Eng. Appl Microbiol. 25,693-4. Apr 73.
- 904 Kazarian AA.
Study of the Tissue Autoantibodies and Serum Protein Fractions
in Periodic Disease.
Rus. Zh Eksp Klin Med. 12,84-9. 1972.

DIAGNOSIS

- 917 Jeansson S. Vesterberg O. Wadstrom T.
Separation of Australia Antigen by Isoelectric Focusing in Acrylamide Gel.
Eng. Life Sci II. 11,929-37. 8 Oct 72.
- 919 Eder G. Molinari E.
Standardization of Au-Sh-HA Antigen and AU-SH-HA Antibody in Crossover-Electrophoresis.
Eng. Prog Immunobiol Stand. 5,38042. 1972.
- 920 Cohen E. Buchmeyer K.
Application of Paper Discs in Immuno-Electro-Osmophoresis for Detection of HAA (Hepatitis Associated Antigen).
Eng. Prog Immunobiol Stand. 5,67-9. 1972.
- 921 Jarosch K.
Comparative Studies of Pulmonary Edematous Fluid and Serum in the Pherogram and Immunoelectrophoresis.
Ger. Beitr Gerichtl Med. 30,197-203. 1973.
- 922 Prokop O. Rackwitz A.
Further Data on the Alpha 2-M-Feature of Children's Sera.
Ger. Beitr Gerichtl Med. 30,363-6. 1973.
- 926 Conti-Diaz IA. Somma-Moreira RE. Gezuele E. De Gimenez AC.
Pena MI. Mac Kinnon JE.
Immunoelectroosmophoresis-Immunodiffusion in Paracoccidioidomycosis.
Eng. Sabouraudia. 11,39-41. Mar 73.
- 927 Yarzabal LA. Luz S DA. Josef M. Torres JM. Vigna I. Muras O.
Immunoprecipitation Tests in the Diagnosis of Aspergillosis.
Por. Rev Inst Med Trop Sac Paulo. 15,1-9. Jan-Feb 73.
- 929 Morse DR. Patnik JW. Schacterle GR.
Electrophoretic Differentiation of Radicular Cysts and Granulomas.
Eng. Oral Surg. 35,249-64. Feb 73.
- 931 Davis GL Jr. Davis JS 4th.
Detection of Circulating DNA by Counterimmunoelectrophoresis (CIE).
Eng. Arthritis Rheum. 16,52-8. Jan-Feb 73.
- 937 Rhone DP. Mizuno FM.
Profiles of Alkaline Phosphatase Isoenzymes in Serum Using Cellulose Acetate Electrophoresis and Organ-Specific Inhibitors.
Eng. Am J Clin Pathol. 59,531-41. Apr 73.
- 938 Tripodi D. Hawk J. Gooke DJ. Redeker A. Starkovsky NA.
Detection of Antibody to Hepatitis-Associated Antigen by Indirect Counterimmunoelectrophoresis.
Eng. Am J Clin Pathol. 59,549-51. Apr 73.

DIAGNOSIS

- 941 Zaman V. Aschheim L. Yap EH. Simons MJ.
Detection of Malarial Antibodies by Counter Current
Immuno-electrophoresis.
Eng. Singapore Med J. 13,305-6. Dec 72.
- 944 Alpert E. Coston RL. Drysdale JW.
Carcino-Foetal Human Liver Ferritins.
Eng. Nature. 242,194-6. 16 Mar 73.
- 945 Axelsen NH. Kirkpatrick CH.
Simultaneous Characterization of Free Candida Antigens and Candida
Precipitins in a Patient's Serum by Means of Crossed
Immuno-electrophoresis with Intermediate Gel.
Eng. J Immunol Methods. 2,245-9. Apr 73.
- 946 Ward GW Jr. Kohler PF.
Counterelectrophoresis as a Rapid Method for the Detection of
Aspergillus Precipitins in Pulmonary Disease.
Eng. Chest. 63,Suppl-49S-51S. Apr 73.
- 949 Quentin CD. Nuehoff V.
Micro-Isoelectric Focussing for the Detection of LDH Isoenzymes
In Different Brain Regions of Rabbit.
Eng. Int J Neurosci. 4,17-24. Jul 72.
- 950 Keyser JW. Lewis K.
Simplified Procedure for the Detection of Antigens by Crossed
Immuno-electrophoresis.
Eng. J Clin Pathol. 26,160-1. Feb 73.
- 956 Kawai T.
Symposium of Clinical Application of Electrophoresis. Introduction.
Jap. Jap J Clin Pathol. 20,Suppl-15. 1972.
- 957 Sugano T. Tsukamoto H.
Symposium on Clinical Application of Electrophoresis. Clinical
Application of Lipoprotein Fractionation by the Acetate Membrane.
Jap. Jap J Clin Pathol. 20,Suppl-19. 1972.
- 960 Intorp HW. Schneeberger W. Losse H.
Immuno-electrophoretic Studies in Patients With Various Kidney
Diseases.
Ger. Med Welt. 23,1798-9. 25 Nov 72.
- 961 Niel G. Gentilini M. Charmot G. Couture J.
The Latex Test Applied to the Serologic Diagnosis of Amebiasis- Its
Value as Compared with Immunofluorescence and Immuno-electrophoresis.
Fre. Bull Soc Pathol Exot. 65,382-90. May-Jun 72.

DIAGNOSIS

- 963 Geserick G.
 Demonstration of Hepatitis-Associated Antigen (Au-SH)- Various
 Methodological Aspects of Immunoprecipitation Technics.
 Ger. Dtsch Z Verdau Stoffwechselkr. 32,75-81. 1972.
- 965 Stratton F. Rawlinson VI. Gunson HH. Phillips PK.
 The Role of Zeta Potential in RH Agglutination.
 Eng. Vox Sang. 24,273-9. Mar 73.
- 972 Klossner mL. Willman K.
 Latex Test, Complement Fixation, and Immuno-electro-osmophoresis in
 Detection of Australia Antigen.
 Eng. Lancet. 1,322-3. 10 Feb 73.
- 975 Matsuda S. Sukeno N. Ishida N.
 Different Types of Australia Antigen Detected by Radioimmunoassay and
 Immuno-electrosyneresis.
 Eng. Tohoku J Exp Med. 108,95-6 Sep 72.
- 980 Janicki BW. Aron SA. Berson AS.
 Technical Factors Affecting an Immuno-electrophoretic Reference
 System for Analysis of Mycobacterial Antigens.
 Eng. Appl Microbiol. 25,130-4. Jan 73.
- 984 Dreesman GR. Hollinger FB. Melnick JL.
 Detection of Hepatitis B Antigen by Counter-Immuno-electrophoresis-
 Enhancing Role of Homologous Serum Diluents.
 Eng. Appl Microbiol. 24,1001-2. Dec 72.
- 998 Ingram DL. Anderson P. Smith DH.
 Countercurrent Immuno-electrophoresis in the Diagnosis of Systemic
 Diseases Caused by Hemophilus Influenzae Type B.
 Eng. J Pediatr. 81,1156-9. Dec 72.
- 1000 Yamaoka K. Ota Y. Seita M.
 Thin Layer Starch Gel Electrophoresis.
 Jap. Jap j Clin Hematol. 13,800-4. Oct 72.
- 1004 Fossieck B Jr. Craig R. Paterson PY.
 Counterimmuno-electrophoresis for Rapid Diagnosis of Meningitis Due to
 Diplococcus Pneumoniae.
 Eng. J Infect Dis. 127,106-9. Jan 73.
- 1008 Laurell CB.
 Electrophoresis, Specific Protein Assays, or Both in Measurment of
 Plasma Proteins.
 Eng. Clin Chem. 19,99-102. Jan 73.
- 1014 Ceska M.
 Characterization of Allergen Extracts by Dose-Response Studies and by
 Polyacrylamide Gel Isoelectrofocusing Using the Paper Disc .
 Radioallergosorbent Test as the Assay Method. 3. Horse Dandruff
 Allergen.
 Eng. Int Arch Allergy Appl Immunol. 43,419-26. 1972.

DIAGNOSIS

- 1017 Hopkins R. Das PC.
Improved Sensitivity of the Electrophoresis Method by Tannic Acid for
Detection of Australia Antigen
Eng. J Clin Pathol. 25,832-3. Sep 72.
- 1022 Roberts DB. Wright GL Jr. Affronti LF. Reich M.
Characterization and Comparison of Mycobacterial Antigens by
Two-Dimensional Immunoelectrophoresis.
Eng. Infect Immun. 6,564-73. Oct 72.
- 1040 Hacker EJ Jr. Aach RD.
Detection of Hepatitis-Associated Antigen and Anti-HAA. Comparison of
Radioimmunoassay and Counterimmunoelectrophoresis.
Eng. jama. 223,414-7. 22 Jan 73.
- 1047 LA Cavera A
Medicolegal Identification of Blood Stains by Means of Precipitating
Serums.
Fre. Med Leg Domm Ccrpor (Paris). 5,41-2. Jan-Mar 72.
- 1049 Castilla J. Villanueva E. Gisbert-Calabuig JA.
Analysis of Haptoglobin Types by Means of Acrylamide Gel Disk
Vertical Electrophoresis. Application to the Diagnosis of Blood
Stains.
Fre. Med Leg Domm Ccropr 9Paris). 5,52-4. Jan-Mar 72.
- 1052 Mazzur S.
The Detection of Australia Antigen by Immunodiffusion and
Counter-electrophoresis.
Eng. Am J Med Technol. 38,343-9. Sep 72.
- 1051 Lobanov MM. Rozengart VI. Rubina KHNm
Electrophoretic and Chromatographic Characteristics of Different
Forms of Human Serum Cholinesterases.
Rus. UKR Biokhim ZH. 43,475080. Jul-Aug 71.
- 1053 Janicki BW. Aron SA. Raychaudhuri A.
Separation and Isolation of Mycobacterial Antigens by Continuous-Flow
Electrophoresis.
Eng. Am Rev Respir Dis. 106,779-83. Nov 72.
- 1054 Fletcher PL Jr. Hash JH.
Ribonuclease of Chalaropsis Species. I. Isolation and Physical
Properties.
Eng. Biochemistry. 11,4274-80. 7 Nov 72.
- 1056 Svendsen J. Axelsen NH.
A Modified Antigen-Antibody Crossed Electrophoresis Characterizing
The Specificity and Titre of Human Precipitating Against Candida Albicans.
Eng. J Immunol Methods. 1,169-76. Jan 72.

DIAGNOSIS

- 1070 Sviridov SM. Korochkin LI. Matveeva nM.
Use of Electrophoresis for Determination of Isoenzymes in Embryonic Material- A Chamber for microelectrophoresis in Starch and Polyacrylamide Gel.
Eng. Sov J Dev Biol. 2,352-4. Jul-Aug 71.
- 1073 Smeds S. Bjorkman U.
A Microgel Electrophoretic Analysis of the Proteins in Single Rat Thyroid Follicles. 3. Incorporation of (3 h) Leucine Into the Large Iodoproteins of the Colloid.
Eng. J Chromatogr. 73,292-5. 8 Nov 72.
- 1074 Girolami A Sticchi A. Bareggi G.
Crossover Electrophoresis (Electrosyneresis) Visualization of the Abnormal Factor X (Factor X Friuli).
Eng. j Lab Clin Med. 80,740-7. Nov 72.
- 1077 Oroszlan S. White MM. Gilden RV. Charman HP.
A Rapid Direct Radioimmunoassay for Type C Virus Group-Specific Antigen and Antibody.
Eng. Virology. 50,294-6. Oct 72.
- 1078 Simon KH.
Determination of Hepatitis Antigen Using Migration Electrophoresis.
Ger. Med Monatsschr. 26,442. Sep 72.
- 1079 Creason PL. Creason MT.
Alpha 1 - Antitrypsin PI Types by Crossed-Electrophoresis.
Eng. Am J Med Technol. 38,292-7. Aug 72.
- 1082 Moore BP. Meade D.
Counter-Immuno-electrophoresis for Detection of Hepatitis B Antigen and Antibody- A Technique for Large-Scale Use.
Eng. Can J Public Health. 63,453-9. Sep-Oct 72.
- 1084 Axelsen NH.
Antigen-Antibody Crossed Electrophoresis (Laurell) Applied to the Study of the Antigenic Structure of Candida Albicans.
Eng. Infect Immun. 4,525-7. Nov 71.
- 1091 Schutt KH. Hoffmeister H.
Continuous Polyacrylamide Electrophoresis. II. The Diagnosis of Malignant and Inflammatory Lung Conditions.
Ger. Z Klin Chem Klin Biochem. 9,201-6. May 71.
- 1093 Szekacs I. Bajor M.
An Improved Method for the Detection of Acid Phosphatases by Starch Gel Electrophoresis.
Ger. Z Klin Chem Lkin Biochem. 9,274. May 71.

DIAGNOSIS

- 1099 Hoffmeister H. Schutt KH.
Diagnostic Utilization of Polyacrylamide Electrophoresis.
Ger. Dtsch Med Wochenschr. 97,1464-6. 29 Sep 72.
- 1100 Tobin BM. Jones DM.
Immuno-electro-osmophoresis in the Diagnosis of Meningococcal Infections.
Eng. J Clin Pathol. 25,583-5. Jul 72.
- 1101 Grunbaum BW.
Recent Progress in the Individualization of Blood and the Adaptation of the Hyland Cross-Over Electrophoresis System in the Identification of Bloodstains.
Eng. J Forensic Sci Soc. 12,421-3. Apr 72.
- 1104 Zuidweg MH. Bus CJ. Welzer H Van.
Proteolytic Components of Alkaline Proteases of Bacillus Strains. Zymograms and Electrophoretic Isolation.
Eng. Biotechnol Biceng. 14,685-714. Sep 72.
- 1108 Lewis JH. Coram JE.
Australin Antigen Detection. Comparison of Results Obtained with Five Cep and One RIA Test Systems.
Eng. Transfusion. 12,301-5. Sep-Oct 72.
- 1113 Maisin J. Couvreur P. Ochrymowicz IP. Van Duyse E.
Electrophoretic Pattern of Sera of Normal and Cancer Patients.
Eng. Eur J Cancer. 8,217-9. Apr 72.
- 1121 Lajolo DI Cossand D.
Use of Some Immunological Technics in Clinical Diagnosis.
Ita. Recent Prog Med (Roma). 47,356-64. Oct 69.
- 1122 Barnes MG. Komarmy L. Wardlow SC. Kerson R.
A Simple Electrophoretic Apparatus for Rapid Hemoglobin Screening.
Eng. Am J Clin Pathol. 58,275-80. Sep 72.
- 1123 Schmidt NJ. Lennette EH.
Evaluation of Various Antisera and Gels for Detection of Hepatitis-Associated Antigen by Immunodiffusion and Immuno-electro-osmophoresis Tests.
Eng. Am J. Clin Pathol. 58,317-25. Sep 72.
- 1130 Gentilini M. Pinon JM. Niel G.
Immuno-electro-diffusion on a Cellulose Acetate Membrane- Application To Parasitology (Preliminary Results of 600 Experiments).
Fre. Bull Soc Pathol Exdt. 65,60-6. Jan-Feb 72.
- 1131 Gold JM. Freedman SC. Gold P.
Human Anti-CEA Antibodies Detected by Radioimmuno-electrophoresis.
Eng. Nature New Biol. 239,60-2. 13 Sep 72.

CELLULAR SEPARATION

- 16 Bert G. Lajolo Di Cossano D. Pecco P. Mazzei D.
Effect of A.L.S. and Prednisolone on the Electrophoretic Mobility of Lymphocytes
Eng. Lancet. 1,365. 14 Feb 70.
- 195 Stahn R. Maier KP. Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.
Eng. J Cell Biol. 47,576-91. Sep 70.
- 201 Forsgren M.
Immuno-electrophoresis of Poliovirus Antigens.
Eng. Arch Gesamte Virusforsch. 33,27-36. 1971.
- 202 Good AH. Ceverha BB.
Immunologic Assays for Identifying Single Components in Protein Mixtures after Isoelectric Focusing in Urea-Containing Acrylamide Gels.
Eng. J Immunol. 106,1677-80. Jun 71.
- 203 Caspary EA.
Lymphocyte-Antigen Interaction in Electrophoretic Mobility Test for Cellular Sensitization.
Eng. Nature New Biol. 231,24. 5 May 71.
209. Porembaska Z. Jachimowicz J. Gasiorowska I.
Arginase Isoenzymes in Electrophoresis.
Eng. Bull Acad Pol Sci Biol. 19,27-30. 1971.
- 213 Wellings FM. Sather GE. Hammon WM.
Immuno-electrophoretic Studies of the California Encephalitis Virus Group.
Eng. J Immunol. 107,252-9. Jul 71.
- 220 Amberson WR. Bauer AC.
Electrophoretic Studies of Muscle Proteins. II. Complex Formation Between Delta Protein, Myogen and Myosin.
Eng. J Cell Physiol. 77,281-300. Jun 71.
- 227 Grula EA. Savoy CF.
A Detergent-Polyacrylamide Gel System for Electrophoretic Resolution of Membrane and Wall Proteins.
Eng. Biochem Biophys Res Commun. 43,325-32. 16 Apr 71.
- 231 Bert G.
Some Applications of the Cell Electrophoresis Technique to the Study of the Lymphocytes.
Eng. Folia Allergol (Roma). 17,548-55. Nov-Dec 70.

CELLULAR SEPARATION

- 234 Winterhoff D. Drewitz B.
Method of Electrophoresis of 10MG Liver Tissue on Cellulose Acetate Strips.
Ger. Z Klin Chem Klin Biochem. 9,31-2. Jan 71.
- 250 Thobe J. Seiler N. Werner G.
Electrophoresis in a Carrier-Free Buffer Stream. 3. A Simple Apparatus
for the Optical Evaluation of Numerous Samples Simultaneously.
Ger. Hoppe Seylers Z Physiol Chem. 352,700-6. May 71.
- 258 Hantschel H.
Determination of the Size of Viruses using Gel Electrophoresis.
Ger. Arch Exp Veterinaermed. 24,571-80. 1970.
- 266 Roubaud P.
Definition of a Method of Histobiochemical Analysis--Making of Ordered
Clusters of Microtubes with Semi-Permeable Walls Intended for Electro-
phoresis on Cluster.
Fre. C. R. Acad Sci D (Paris). 272,1166-8. 22 Feb 1971.
- 318 Pistenma DA. Mel HC. Snapir N.
Biophysical Characterization of Fowl Spermatozoa. II. Interrelation-
ships between Intrinsic Motility and Electrophoretic Mobility
Eng. J Reprod Fertil. 24,161-9. Feb 71.
- 329 Richards EG. Lecanidou R.
Quantitative Aspects of the Electrophoresis of RNA in Polyacrylamide
Gels.
Eng. Anal Biochem. 40,43-71. Mar 71.
- 336 Dasgupta S. Kung-Ho C.
Electrophoretic Analysis of Cell Populations in Presumptive Epidermis
of the Frog, Rana Pipiens.
Eng. Exp Cell Res. 65,463-6. Apr 71.
- 348 Streiff F. Stoltz JF. Genetet B. Humbert JC.
Electrophoretic Mobility of Human Lymphocytes. Determination of Phi
and Effect of Cytotoxic Antibodies.
Fre. Rev Fr. Transfus. 13,285-91. Sep 70.
- 350 Lemp JF Jr. Ashbury ED. Ridenous EO.
Electrophoresis of Colloidal Biological Particles.
Eng. Biotechnol Bioeng. 13,17-47. Jan 71.
- 354 Elsayed S. Aas K.
Isolation of Purified Allergens (Cod) by Isoelectric Focusing.
Eng. Int Arch Allergy Appl Immunol. 40,428-38. 1971.

- 363 Johns EW. Forrester S.
The Identification of the Five Main Histone Fractions by Comparative Electrophoresis in Polyacrylamide Gel.
Eng. J Chromatogr. 55,429-30. 3 Mar 71.
- 373 Gorovsky MA.
Studies on Nuclear Structure and Function in Tetrahymena Pyriformis.
3. Comparison of the Histones of Macro- and Micronuclei by Quantitative Polyacrylamide Gel Electrophoresis.
Eng. J Cell Biol. 47,631-6. Dec 70.
- 379 Salach JI. Turini P. Seng R. Hauber J. Singer TP.
Phospholipase A of Snake Venoms. I. Isolation and Molecular Properties of Isoenzymes from NAJA JAJA and Vipera Russellii Venoms.
Eng. J Biol Chem. 246,331-9. 25 Jan 71.
- 398 Theodore TS. Tully JG. Cole RM.
Polyacrylamide Gel Identification of Bacterial L-Forms and Mycoplasma Species of Human Origin.
Eng. Appl Microbiol. 21,272-7. Feb 71.
- 420 Sass NL. Martin WG.
Separation of Sulfated Nucleotides using Polyacrylamide Gel Electrophoresis.
Eng. Anal Biochem. 38,559-64. Dec 70.
- 423 Belokon AN. Popov MP. Gubarev EA. Lakin KM. Efimov VS.
Device for the Determination of the Electrophoretic Mobility of Cellular Blood Elements.
Rus. Farmakol Toksikol. 33,634-8. Sep-Oct 70.
- 424 Karppinen K. Halonen PI.
Red Cell and Platelet Electrophoresis in Coronary Heart Disease.
Eng. Adv Cardiol. 4,175-8. 1970.
- 425 Balbierz H. Nikolajczuk M.
Immuno-electrophoretic Analysis (IEA) of Bull Semen Plasma (BSP).
Eng. Arch Immunol Ther Exp (Warsz). 18,537-42. 1970.
- 447 Hioki N. Kuragane K.
Fractionation of Thyroid Hormone Binding Protein by Polyacrylamide (PAA)-Ultramacro-Gel Electrophoresis.
Jap. Clin Endocrinol (Tokyo). 18,925-30. Nov 70.
- 450 Caspary EA. Knowles M.
Effect of Haemagglutinating and Mitogenic Fractions of Phytohaemagglutinin on Electrophoretic Mobility of Lymphocytes and Macrophages.
Eng. Experientia. 26,1258-9. 15 Nov 70.

CELLULAR SEPARATION

- 459 Teisberg P.
High Voltage Agarose Gel Electrophoresis in the Study of C 3 Polymorphism.
Eng. Vox Sang. 19,47-56. Jul 70.
- 463 Fossard C. Dale G. Latner AL.
Separation of the Proteins of Cerebrospinal Fluid using Gel Electrofocusing
Followed by Electrophoresis.
Eng. J Clin Pathol. 23,586-9. Oct 70.
- 467 Strauss EG. Kaesberg P.
Acrylamide Gel Electrophoresis of Bacteriophage Q Beta-Electrophoresis
of the Intact Virions and of the Viral Proteins.
Eng. Virology. 42,437-52. Oct 70.
- 474 Singh J. Wasserman AR.
Detection of Aggregation and Non-Destructive Disaggregation of Membranous
Proteins using Polyacrylamide Gel Electrophoresis with Non-Ionic Detergents.
Eng. Biochim Biophys Acta. 221,379-82. 17 Nov 70.
- 475 Kemp RB. Jones BM.
Aggregation and Electrophoretic Mobility Studies on Dissociated Cells.
I. Effects of P-Benzoquinone and Tannic Acid.
Eng. Exp Cell Res. 63,293-300. Dec 70.
- 476 Jones BM. Kemp RB.
Aggregation and Electrophoretic Mobility Studies on Dissociated Cells.
II. Effects of ADP and ATP.
Eng. Exp Cell Res. 63,301-8. Dec 70.
- 497 Razin S. Valdesuso J. Purcell RH. Chanock RM.
Electrophoretic Analysis of Cell Proteins of T-Strain Mycoplasmas
Isolated from Man.
Eng. J Bacteriol. 103,702-6. Sep 70.
- 500 Haslam EA. Hampson AW. Egan JA. White DO.
The Polypeptides of Influenza Virus. II. Interpretation of Polyacrylamide
Gel Electrophoresis Patterns.
Eng. Virology. 42,555-65. Nov 70.
- 501 Lesnaw JA. Reichmann ME.
Determination of Molecular Weights of Plant Viral Protein Subunits by
Polyacrylamide Gel Electrophoresis.
Eng. Virology. 42,724-31. Nov 70.
- 503 Winters WD. Brownstone A. Pereira HG.
Separation of Adenovirus Penton Base Antigen by Preparative Gel
Electrophoresis.
Eng. J Gen Virol. 9,105-10. Oct 70.

CELLULAR SEPARATION

- 534 Pavlik I.
Principles of Microbial Electrophoresis.
Che. Cas Lek Cesk. 109,981-5. 9 Sep 70.
- 537 Narurkar MV. Narurkar IM. Sahasrabudhe MB.
A New Technique of PH Gradient Electrophoresis as Applied to the
Separation of Nucleic Acid Bases.
Eng. Anal Biochem. 26,174-7. 10 Oct 68.
- 544 Bont WS. Geels J. Rezelman G.
An Apparatus for Preparative Polyacrylamide Electrophoresis--The Isolation
of a Ribonuclease Inhibitor.
Eng. Anal Biochem. 27,99-107. Jan 69.
- 546 Ibrahim AN. Sweet BH.
Application of Immunodiffusion Methods for Typing Members of the
Phelbotomus Group of Arboviruses.
Eng. Proc Soc Exp Biol Med. 135,23-9. Oct 70.
- 548 Hill BJ. Baxby D. Douglas HW.
Microelectrophoresis of Enzyme and Chemically Treated Viruses and Cores
of Vaccinia, Buffalopox, Variola and Alastrim.
Eng. J Gen Virol. 16,39-46. Jul 72.
- 551 Greene EL. Halbert SP. Jequier S.
Analysis of the Tissue Liver Constituents and Enzymes of Human Liver by
Crossed Immunoelectrophoresis--Comparison of Normal and Cystic Fibrosis.
Eng. Int Arch Allergy Appl Immunol. 42,751-63. 1972.
- 565 Rice RH. Horst J.
Isoelectric Focusing of Viruses in Polyacrylamide Gels.
Eng. Virology. 49,602-4. Aug 72.
- 588 Klibansky C.
Separation of N-Acetyl- -D-Hexosaminidase-Isoenzymes from Human Brain
and Leukocytes by Cellulose Acetate Paper Electrophoresis- A Simple Pro-
cedure for the Diagnosis of Tay-Sachs Disease.
Eng. Isr J Med Sci. 7,1086-9. Sep 71.
- 612 Koyanagi Y. Hara M. Inoue T. Goara K.
Isolation of Antigenic Component Specific for Human Seminal Plasma-
"Seminoprotein (-SM)" by Electrofocusing. Forensic Immunological Study
of Body Fluids and Secretions. 8.
Jap. Jap J Leg Med. 26,78-80. Mar 72.
- 616 Minderhoud JM. Smith JK.
Immunological Activity of Blood Lymphocyte Fractions. A Study by the
Macrophage Electrophoretic Mobility Method.
Eng. Clin Exp Immunol. 10,571-9. Apr 72.

CELLULAR SEPARATION

- 617 Eisenstadt M. Scheinberg IH.
Dielectrophoresis of Macromolecules--Determination of the Diffusion Constant of Poly- γ -Benzyl-L-Glutamate.
Eng. Science. 176,1335-7. 23 Jun 72.
- 630 Angeloni G. Iacobelli S. Garcea N. Papparatti L. Bompiani A.
Cervical Mucus. V. Electrophoretic Study of Proteins of Human Cervical Mucus.
Ita. Ann Ostet Ginecol. 92,887-92. Dec 71.
- 664 Landel AM. Aloni Y. Raftery MA. Attardi G.
Electrofocusing Analysis of Hela Cell Metaphase Chromosomes.
Eng. Biochemistry. 11,1654-63. 25 Apr 72.
- 667 Zeiller K. Holzberg E. Pascher G. Hanig K.
Free Flow Electrophoretic Separation of T and B Lymphocytes. Evidence for Various Subpopulations of B Cells.
Eng. Hoppe Seylers Z Physiol Chem. 353,105-10. Jan 72.
- 678 Zeiller K. Schubert JC. Walther F. Hannig K.
Free Flow Electrophoretic Separation of Bone Marrow Cells. Electrophoretic Distribution Analysis of In Vivo Colony Forming Cells in Mouse Bone Marrow.
Eng. Hoppe Seylers Z Physiol Chem. 353,95-104. Jan 72.
- 688 Hultin T. Sjoquist A.
Two-Dimensional Polyacrylamide Gel Electrophoresis of Animal Ribosomal Proteins Based on Charge Inversion.
Eng. Anal Biochem. 46,342-6. Mar 72.
- 721 Hashimoto N.
Isolation of Blood Cells by Electrophoresis.
Jap: Saishin Igaku. 27,612-21. Mar 72.
- 737 Zeiller K. Liebich HG. Hannig K.
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studies after Prolonged Cannulation and Immunization.
Eng. Eur J Immunol. 1,315-22. Nov 71.
- 741 Shishido H.
Cell Electrophoresis--With Special Reference to the Antibody-Sensitized Red Cells.
Jap. Jap J Clin Pathol. 19,811-4 Dec 71.
- 744 Toneva V.
Comparative Studies of the Aujeszky Virus and the Herpes Simplex Virus with the Immunoelectrophoresis Method.
Fre. Bull off Int Epizoot. 75,350-62. Jul-Aug 71.

CELLULAR SEPARATION

- 745 Field EJ.
Delayed Hypersensitivity Studies--Some Applications of Cell Electrophoresis.
Eng. J R Coll Physicians Lond. 6,316-26. Apr 72.
- 752 Barengo E. Itoiz JE.
Rapid Quantitative Evaluation of Serum LDH Isoenzyme Patterns After Agar Gel Electrophoresis.
Eng. Experientia. 28,19-20. 15 Jan 72.
- 753 Lepri L. Desideri PG. Coas V.
Chromatographic and Electrophoretic Behavior of Purines and Pyrimidines on Layers of Weak and Strong Cation Exchangers.
Eng. J Chromatogr. 64,271-84. 2 Feb 72.
- 770 Zeiller K. Liebich HG. Hannig K.
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studies after Prolonged Cannulation and Immunization.
Eng. Eur J Immunol. 1,315-22. Nov 71.
- 782 Maffezzoli RD. Kaplan GN. Chrambach A.
Fractionation of Immunoreactive Human Chorionic Gonadotropin and Luteinizing Hormone by Isoelectric Focusing in Polyacrylamide Gel.
Eng. J Clin Endocrinol Metab. 34,361-9. Feb 72.
- 788 Grigor'ev RN. Stepanova LA. Vorobeichikov VM.
Methods of Electrophoretic Concentration of Mycobacterium Tuberculosis.
Rus. Probl Tuberk. 49,64-8. 1971.
- 814 Hoekstra J. Deinhardt F.
Counter-Immuno-electrophoresis--Rapid Method for Detecting Group--Specific Antigen and Antibodies Associated with Oncogenic Ribonucleic Acid Viruses.
Eng. Appl Microbiol. 22,1172-3. Dec 71.
- 869 Guarriero-Bobyleva V. Volpi-Becchi MA. Masini A.
Parallel Partial Purification of Cytoplasmic and Mitochondrial Aconitate Hydratases from Rat Liver.
Eng. Eur J Biochem. 34,455-8. 2 May 73.
- 895 Stahn R. Maier KP. Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.
Eng. J Cell Biol. 46,576-91. Sep 70.
- 908 Shimada K. Sekikawa K. Fujinaga K. Ito Y.
A New Device of Preparative Polyacrylamide Gel Electrophoresis and Its Application to Analysis of Cellular RNA.
Eng. Anal Biochem. 51,456-65. Feb 73.

CELLULAR SEPARATION

- 928 Krichevskaja AA. Lukash AI. Sherstnev KB.
Separation of Brain Proteins by a Combination of Isoelectric Focusing and Polyacrylamide Gel Electrophoresis.
Rus. Dokl Akad Nauk SSSR. 209,1454-6. 21 Apr 73.
- 932 Conde RD. Paladini AC. Santome JA. Dellacha JM.
Isolation, Purification and Characterization of Equine Growth Hormone.
Eng. Eur J Biochem. 32,563-8. 1 Feb 73.
- 940 Obijeski JF. Palmer EL. Gafford LG. Randall CC.
Polyacrylamide Gel Electrophoresis of Fowlpox and Vaccinia Virus Proteins.
Eng. Virology. 51,512-6. Feb 73.
- 981 Barrett LD. Johns EW.
A Method for Differentiating Between Arginine-Rich Histones and Others in Polyacrylamide Gel.
Eng. J Chromatogr. 75,161-4. 3 Jan 73.
- 985 Vinik AI. Kaplan SL. Grumbach MM.
Purification, Characterization and Comparison of Immunological Properties of Monkey Chorionic Somatomammotropin with Human and Monkey Growth Hormone, Human Chorionic Somatomammotropin and Ovine Prolactin.
Eng. Endocrinology. 92,1051-64. Apr 73.
- 1046 Merz DC. Good RA. Litman GW.
Segregation of Membrane Components using Isoelectric Focusing in Polyacrylamide Gels.
Eng. Biochem Biophys Res Commun. 49,84-91. 6 Oct 72.
- 1085 Zeiller K. Dolan L.
Thymus Specific Antigen on Electrophoretically Separated Rat Lymphocytes. Tracing of the Differentiation Pathway of Bone Marrow-Derived Thymocytes by Use of a Surface Marker.
Eng. Eur J Immunol. 2,439-44. Oct 72.
- 1094 Barry J. Alberts B.
In Vitro Complementation as an Assay for New Proteins Required for Bacteriophage T4 DNA Replication- Purification of the Complex Specified by T4 Genes 44 and 62.
Eng. Proc Natl Acad Sci USA. 69,2717-21. Sep 72.
- 1098 Ventrelli I.
Electrophoretic Fractionation of Staphylococcus Aureus Extracts.
Ita. Boll Soc Ital Biol Sper. 48,314-8. 30 Jun 72.
- 1104 Zuidweg MH. Bos CJ. Welzen H Van.
Proteolytic Components of Alkaline Proteases of Bacillus Strains. Zymograms and Electrophoretic Isolation.
Eng. Biotechnol Bioeng. 14,685-714. Sep 72.

CELLULAR SEPARATION

- 1114 Paine PL. Feldherr CM.
Nucleocytoplasmic Exchange of Macromolecules.
Eng. Exp Cell Res. 74,81-98. Sep 72.
- 1115 Hiramatsu A. Ouchi T.
A Neutral Proteinase from *Streptomyces Naraensis*. 3. An Improved
Purification and Some Physicochemical Properties.
Eng. J Biochem (Tokyo). 71,767-81. May 72.
- 1118 Smeds S. Bjorkman U.
Micro-Scale Protein Separation by Electrophoresis in Continuous Poly-
acrylamide Concentration Gradients.
Eng. J Chromatogr. 71,499-505. 20 Sep 72.
- 1119 Vestermark A. Sjodin B.
Isotachophoresis Used Alone or in Two-Dimensional Combination with
Zone Electrophoresis for the Small-Scale Isolation of Labelled
Ribulose-1,5-Diphosphate.
Eng. J Chromatogr. 71,588-92. 20 Sep 72.
- 1126 Caspary EA. Field EJ.
Electrophoretic Slowing of Sensitized Lymphocyte-Macrophage Mixtures-
A Cellular Technique in Immunochemistry.
Eng. Biochem J. 126,4P-5P. Feb 72.

APPENDIX 4

STUDIED DURING PERFORMANCE OF THIS EVALUATION

(Reference numbers refer to Medlar Search)

<u>Substance Analyzed</u>	<u>Reference Number</u>
A-Component from Bovine Insulin	872
ABO Antigens on Human Lymphocytes	615
Abnormal Lipoprotein (LP-X)	395
Abnormal Fibrinogens	580
Acid Alpha L-Glycoprotein	121
Abnormal Factor X	1074
Acid Phosphatases	1093
Acidic Glycines	791
Aconitase	653
Acute Infectious Hepatitis	327
Acyl Phosphatase	389
Adenosine Deaminase Gene	514
Adenovirus Penton Base Antigen	503
Adenovirus-Specified Thymidine Kinase	113
Albumin	339
African Swine Fever-Antibody	550
Alcohol Dehydrogenase Isozymes	608
Aldehyde Dehydrogenase	690
Alkaline Phosphatase Enzymes	487
Alkaline Phosphatase Isoenzymes	937 1112 696
Alkaline Proteases	1104
Alkaloid Mixtures	378
Allergen Extracts	1014
Allergens	441 704
Alpha-Feto-Protein	138 456
Alpha-Lipoproteins	244
Alpha-Mannosidase	577
Alpha 1	1058

<u>Substance Analyzed</u>	<u>Reference Number</u>
	922
Alpha 2-M-Feature	16
ALS and Prednisolone	894
Amebiasis	961
	18
Amino Acid	23
	84
	160
	740
	930
	452
	713
	84
Amino Acid Patterns in Blood Serum	205
Aminoacyl Transferase	313
Amino Groups in Chymotrypsinogen A	1069
Aminopeptidases of Basidomycetes	556
Amphetamine Isomers	418
Ampholines	845
	197
Ampholytes	196
Amylase-Starch	594
Angiotensin I Converting Enzyme	738
Antibody	1055
	741
Antibody-Sensitized Red Cells	211
Anti-D Immunoglobulin	969
	225
Anti-Estradiol Antibodies	464
Anti-Gamma G-Globulin Blood Stains	802
Antigenic Extracts of Aspergillus Flavus	1055
Antigens	27
Antigens of Trichinella Spiralis Larvae	1057
Antihapten Antibodies	

<u>Substance Analyzed</u>	<u>Reference Number</u>
Anti-Lymphocyte Serum	48
Apoproteins	854
Arginase Isoenzymes	209
Arginine Esterase	596
Arginine-Rich Histones	981
Aromatic Amines	370
Arteriosclerosis	707
Aspartate Aminotransferase Isoenzymes	1002
Aspartate and Alanine Aminotransferase	698
Aspergillosis	927
Aspergillus Niger Beta-D-Xylosidase	242
Aspergillus Precipitins	946
Atopic Allergen in Hen's Egg	353
Atopic Individuals	298
Aujeszky Virus	744
Australia Antigen	193
	289
	308
	263
	358
	904
Autoantibodies	460
Autoradioimmuno-electrophoresis	762
Avian Ribonucleic Acid Tumor Virus Group-Specific Antigens	637
Bacteriophage DNA	398
Bacterial L-Forms and Mycoplasma	467
Bacteriophage Q Intact Virions and Viral Proteins	257
Beagle Serum Proteins	31
Beta-Glucuronidase in Human Sera	145
Beta-Hemolytic Streptococcus	835
	278
Beta-1-C Fraction	121
Beta 2-Glycoprotein	

<u>Substance Analyzed</u>	<u>Reference Number</u>
Bilharziasis	555
Biologically Active Hormone	166
Blastokinin	728
Blastokinin Amino Acid Composition	606
Blood Coagulation Factors	37
Blood Donor Screening	357
Blood Lymphocyte Fractions	616
Blood Platelets	466
B Cells	677
Blood Plasma and Lymph	178
Blood Proteins	127A 247 248 249
Blood Serum Albumin	366
Blood Stains	1047
Bone Marrow Cells	678
Bovine Allantoic Fluid	165
Bovine Corneal Epithelium	130
Bovine Milk Caseins	1024
Bovine Serum Proteins	139
Brain Acetylcholinesterase	954
Brain Myelin	658
Brain Proteins	17 928 952 428
Brucella Sonic Extract	326
Brucella Species	325
Bull Semen Plasma	425
Candida	796

<u>Substance Analyzed</u>	<u>Reference Number</u>
Candida Albicans	875 1056
Candida Antigens	945
Carbohydrate Half Sulphate Esters	671
Carbohydrate Protein	631
Carbonic Anhydrase Isozymes	1089
Carnitine Palmitoyltransferase	288
Carrier Ampholytes	850
Carrier Proteins	446
Cell Electrophoresis	745
Cell Organelles	895
Cell Proteins	693
Cellular Antigens in Myxo- and Paramyxoviruses	505
Cellular Blood Elements	423
Cellular Electrophoresis	71
Cellular RNA	908
Cerebrospinal Fluid	176 629
Cerebrospinal Fluid Proteins	893 1000A
Cervical Mucus	630
Chicken Serum	86
Chad Herbivora	449
Cholera	147
Cholestasis	395
Cholinesterases	1051
Chorionic Somatomammotropin	985
Chromogrannine	697
Chromophoric Amino Acid	648
Circulating Blood	75
Circulating DNA	931

<u>Substance Analyzed</u>	<u>Reference Number</u>
Cirrhosis	107
Clostridium Botulinum Type A Toxin	453
Coat Proteins	1076
Colostrum Immunoglobulins	554
C-Reactive Protein	491
C-Reactive Protein in Tuberculous	722
C 3 Polymorphism	459
Cutaneous Manifestations of Allergy	303
Cysticercosis	252
Cytochrome 553	168
Cytochrome C	515
Cytoplasmic and Mitochondrial Aconitate Hydratases	869
Definition of a Method of Histobiochemical Analysis	266
Deoxyribonucleic Acid Base Composition	542
Dermal Acid Mucopolysaccharides	1041
Determination of the Size of Viruses using Gel Electrophoresis	258
D Group Streptococci Sera	59
Diagnosis of Bilharziasis	60
Diagnosis of Meningococcal Infections	171
Diagnosis of Parasitoses	57
Diagnosis of Tay-Sachs Disease	588
Diagnostic Significance of Electrophoresis	62
Dioxygenase, Querecentinase	270
Dissociated Cells P-Benzoquinone, Tannic Acid	475
DNA Polymerase	64
Double Pre-Beta Bands	287
Dysproteinemia in Liver Cirrhosis	124
Ehrlich Ascites	64
Electrophoresis of Drugs	604
Electrophoretic Analysis of Cell Populations in Presumptive Epidermis	336

<u>Substance Analyzed</u>	<u>Reference Number</u>
Electrophoretic Extraction	173
Electrophoretic Separation of Lymphocytes	779
IIS Globulin Soybean Seeds	1042
Embryo Specific Alpha-Globulins	529
Encephalitis Virus	213
Encephalitogenic Protein	798
Cell Proteins of T-Strain Mycoplasmas	497
Encephalomyelitis	371
Enterotoxin Clostridium Perfringens Type A	759
Envelope Proteins	191
Enzyme	473
	611
Enzyme Electrophoretograms	97
Enzyme Typing of Bloodstains	108
Epidemic Parotitis	249
Equine Growth Hormone	932
Erythrocyte	582
Erythrocyte Acid Phosphatase	79
Erythrocyte Carbonic Anhydrases	198
Erythrocyte Peptidases	101
Escherichia Coli Exotoxin	362
Escherichia Coli K12 Soluble Proteins	128
Ewing's Sarcoma	78
Exoantigen	223
Fatty Acids	743
	989
Ferric Myoglobin	964
Ferritin	651
	714
	715
	716
	944

<u>Substance Analyzed</u>	<u>Reference Number</u>
Fibrinogen	781 993
Fibrinolytic	916
Fibrinopeptides	506
Five Main Histone Fractions	363
Foetal Hemoglobin	299
Follicle-Stimulating and Luteinizing Hormones	520
4S Antigens	680
Fowlpox and Vaccinia Virus Proteins	940
Fowl Spermatozoa	318
Fractional Methods	268
Fractionation of Proteins	237
Fructose-6-Phosphate Phosphoketolase	177
FSH in Swine	106
Galactose-1-Phosphate Uridyl Transferase	142
Galanthamine	624
Gamma-Globulins	151 307
Gammopathies	408
Gangliosides	730
GC Component in Human Serum	55
GC Types	212
Gene-Frequency	459
Generic Identification of L-Forms	149
Genetically Different Proteins	530
Globin	994
Globulin	339 877
Glomerulonephritis	278
Glucose Metabolites	1071 1072
Glucose-6-Phosphate Dehydrogenase	749

<u>Substance Analyzed</u>	<u>Reference Number</u>
Glucose-6-Phosphate Dehydrogenase Isoenzymes	30
Glucuronidase	739
Glyceraldehyde-3-Phosphate Dehydrogenase, Fructoaldolase, Glyoxalase II and Sorbitol Dehydrogenase	1116
Glycoprotein Hormones	795
Glycoproteins	132 185 247 248 249 335 774
Glycosidases	633
GOT Isoenzyme	136
Grain Proteins	846
Haemoglobin	105 575 732
Haemoglobin Electrophoresis	186
Haemoglobin Malmo	575
Halophilic Enzyme	528
Haptoglobins	1048
HCG	183
Heat-Labile Toxin of Bordetella Pertussis	102
Hela Cell Metaphase Chromosomes	664
Hemoglobin	32 515
Hemoglobin A2	241 513
Hemoglobin-Binding Protein	480
Hemoglobin Octamer	15
Hemoglobinopathies	757
Hemoglobin S	1027 1018A
Hemoglobin Solutions	369

<u>Substance Analyzed</u>	<u>Reference Number</u>
Hemophilus Infleunzae Type B	998
Heparin and Protamine Sulfate	9
Hepatic Phosphoenolpyruvate Carboxykinase	934
Hepatitis	273
Hepatitis-Associated Antigen	174
	182
	297
	359
	277
Hepatitis-Homologous	358
Herpes Simplex Virus	744
Hexokinase in Cell Homogenates from Baker's Yeast	251
Histidine-Binding Protein J	620
Histidine Transport	620
Histones	1060
Histoplasma Capsulata Practical Diagnostic Results	261
Horseradish Peroxidase	800
H 3-RNA	1010
Human Alpha-2 Lipoprotein Bands	126
Human and Animal Hemoglobins	328
Human Anti-CEA	1131
Human Blood Platelets	552
Human Chorionic Gonadotropin	479
Human Chorionic Gonadotropin Luteinizing Hormone	782
Human Chorionic Somatomammotropin	985
Human Erythrocuprein	8
Human Erythrocytes	655
Human Follicle Stimulating Hormone	986
Human Haptoglobin 1-1 Molecule	116
Human Hemoglobins	152
Human Liver Alkaline Phosphatase	445
Human Lymphocytes	71
	282
	348

<u>Substance Analyzed</u>	<u>Reference Number</u>
Hydroxyindole-O-Methyltransferase	206
Hyperlipoproteinaemia	760
Hyperlipoproteinemias	232 429
Hypoxanthine-Guanine	67
Phosphoribosyl Transferase	
IBR-Virus	1025
Identification of Antibiotics	82
IGG I, II, and III	332
IGG-Paraproteinemias	38
IGM-Fraction	170
Immune Globulins with Antitoxic Activity	77
Immuno-electrophoresis in Forensic Medicine	162
Immuno-electrophoretic	411
Immunoglobulin Analysis	150
Immunoglobulins	936 1044
Immunoglobulins G	332
Immunorheophoresis	119
Lactate Dehydrogenase	462 485 486 851
Lactogenic Factor	413
Lactoglobulin	1043
Lamb Fetuin	886
L-Arginase	729
L-Asparaginase	823
L-Cell Interferons	199
LDH-Isoenzymes	110 949
Leishmaniasis	519
Leucosis	72
Leukemia	264
Leukocyte Alkaline Phosphatase	340
L-Forms and Mycoplasma	309

<u>Substance Analyzed</u>	<u>Reference Number</u>
Lipid Electrophoresis	181
Lipoprotein Electrophoresis	47
Lipoproteins	222 422 451 887
Lipoproteins in Myocardial Infarct	146
Liver Catalase	465
Liver Lysosomes	895
Liver Polyribosomal RNA	792
Liver Tissue	234
Liver Tissue Constituents, Normal and Cystic Fibrosis	551
LP (A)-Protein	478
Lumbar Enlargement of the Spinal Cord	157A
Lymphocyte-Antigen Interaction	203
Lymphocytes and Macrophages	450
Lymphocytic Cytoplasmic RNA	246
Lymphocytes	72 231
Lysates of Mycoplasmas	385
Lysozyme	259
Macaca Irua Salivary Alpha Amylase	974
Macromethod	110
Maize Endopeptidase	593
Malarial Antibodies	941
Malic Enzyme	654
Malignant Transformation	570
Mammalian Cells	570
Marasmus	172
Membrane and Wall Proteins	227
Membrane Components	1046
Membrane Electrophoresis	42

<u>Substance Analyzed</u>	<u>Reference Number</u>
Membrane Enzymes	12
Membranous Proteins	474
Meningococcal Arthritis	876
Mercaptalbumin, and Beta-Lactoglobulins A and B	403
Metallothionein	1125
Microbial Electrophoresis	534
Mycoplasma Mycoides	874
Myosin	279 853
N-Acetyl-D-Hexosaminidase Isoenzymes	588
Neuraminidase	636 833
Neurospecific S-100 Protein Fractions	179
Nitrogen Compounds in Body Fluids	330
Nonhistone Chromosomal Proteins	783
Nonspecific Esterases in Blood Serum	65
Normal Human Lymphocyte	255
Normal Sera	46
Nucleic Acid	81 723
Nucleic Acid Bases	537
Nucleolar Proteins	892
Nucleosides Purines Pyrimidines	753
Numerous Samples Simultaneously	250
Microheterogeneity of Fetuin	184
Mitochondria	288
Monoclonal Gammopathies	262
Monospecific Antibody to Human Sulfatase	230
Motility	318
M-Proteins	274
Mucin Glycoproteins	774
Mucopolysaccharides	129 905
Multiple Molecular Forms	427

<u>Substance Analyzed</u>	<u>Reference Number</u>
Muscle Proteins	220 233 853
Muscular Parvalbumins	167
Mycobacteria	245 980
Mycobacterial Antigens	1022 1053 990
Mycobacterium Tuberculosis	788
Mycoplasma	884
Oligo Globulin	469
Oligonucleotide Isopliths	95
Oncogenic Ribonucleic Acid Viruses	814
Ophiobolus Graminis Sacc	457
Organelles	195
Ovomucoid Heterogeneity	256
Paracoccidioidomycosis	926
Parameters of Thyroid Function in Serum	33
Paraproteinaemia	226 659
Paraproteins	89 569 436
Paraproteinemias	123
Paraprotein Diseases	296
Paraproteins of Serum	272
Parotid Secretion	42
Partial Isolation of Human Renin	386
Pasteurella Pestis	148
Pathological Lymph Nodes	122
Penicillium Conidia	300

<u>Substance Analyzed</u>	<u>Reference Number</u>
Pepsinogen and Pepsin Fractions	432
Peptide Mixtures	164A
Periodontal Diseases	157
Peripheral Blood Lymphocytes	521
Peripheral Lymphocytes	122
Peromyscus 7S 1 Globulins	643
Peroxidases	683
Peroxidase Isozymes	684
Phenotyping of Hyperlipoproteinemias	94
Phialophora Verrucosa, Fonsecaea Pedrosoi and Cladosporium Carrioni	440
Phlebotomus Group of Arboviruses	546
Phosphoacetylglucosamine Mutase	239
Phosphoglucomutase Types	472
Phosphoglycerate Kinase	751
Phospholipid	76
Phythohaemagglutinin	450
	1102
Pituitary Gonadotropins	382
Pituitary Prolactin	925
Plant Viral Protein	501
Plant Viral RNA Plasma Albumin	403
Plasma and Urinary Amino Acids	20
Plasmacytoma	305
Plasma Hyperbetalipoproteinemia	679
Plasma Kinen-Forming System	857
Plasma Lipoproteins	260
	293
	484
Plasma Prekallikrein	825
Plasma Proteins	44
	995
Pneumococcal Bacteraemia	367
Poliovirus Antigens	201

<u>Substance Analyzed</u>	<u>Reference Number</u>
Poliovirus Inhibitors	200
Polyacrylamide	683
Polyglycine	439
Polymorphous Enzymes Glutamate Pyruvate Transaminase and Phosphoglucomutase	603
Polypeptides of Influenza Virus	500
Polysaccharides	405
Post-Albumin Proteins	66
Prealbumin	735
Pre-Beta Lipoprotein	397
	709
Preformed Antibody	173
Pregnancy-Specific Protein	334
Primary Cancer of the Liver	138
Primary Hyperlipidemia	627
Progesterone Binding Protein (PBP)	997
Prolactin	893
	985
Prolongation of Heterograft	173
Protein and LDH-Isoenzyme	641
Proteinase	1115
Protein Composition	470
Protein Detection and Isolation	109
Protein Fractions	414
	516
Protein, Myogen and Myosin	220
Protein Polymers	148
Protein Polymorphism	112
Protein Quantitation	292
Protein Separations	286
Proteins	1073
	125
	135
	905
	909
	923
	980

<u>Substance Analyzed</u>	<u>Reference Number</u>
Proteins (continued)	463
	511
	512
	647
Proteins and Carbohydrates	236
Proteins and Nuclear Acids	847
Proteins Extracted from Subcellular Structures of Brain	50
Proteins from Carrier Ampholytes	533
Influenza Virus	636
Insoluble Brain Proteins	1061
Insulin	493
	988
Interacting Protein Systems	848
Interferons	536
	790
Intestinal Mucosal Epithelial Cell	147
Investigation of Protein Drugs	591
IPV-Virus	1025
Isocitrate Dehydrogenase	935
Isoelectric Fractionation in Protein	240
Isoelectric Separation of Proteins	391
Isoenzyme Fructosephosphate Aldolase	96
Isoenzymes	1070
Isolation, Characterization of Two Phospholipase A's	228
Isolation of Blood Cells	721
Isomeric Chondroitin Sulfates	510
Jack Bean Proteins	706
Jack Bean Urease	807
Proteins in Serum	291
Proteins of Parainfluenza Virus SV5	100
Protein-Sodium Dodecyl Sulfate Complexes	576
Protein Synthesis by Lymphocytes	460

<u>Substance Analyzed</u>	<u>Reference Number</u>
Proteinuria	280
Proteolytic Enzymes	461
Pseudomonas Aeruginosa Haemolysin	337
Pseudoparaproteinemia	442
Psoriatic Epidermis	426
Pulmonary Aspergillosis	360
Pulmonary Edematous Fluid	921
Purified Allergens	354
Purines and Pyrimidines	753
Pyruvate Kinase	1033
Rabbit Antisera	76
Radicular Cysts and Granulomas	929
Rat Brain Proteins	889
Rat Liver Chromatin	726
Rat Liver Decarboxylases	117
Rat Liver Lysosomes	195
Rat Serum Lipoproteins	243
Recovery of Protein	590
Red Cell Enzyme Polymorphisms	563
Renin	553
Reverse Transcriptase	1020
Rheumatic Diseases	799
Rheumatism	155
Ribonuclease	1054
Ribonuclease Inhibitor	544
Ribonucleic Acid	255
	1039
	1128
Ribosomal Proteins	688
	851
Ribulose-1, 5-Diphosphate	1119
RNA	329
	978
	1009

<u>Substance Analyzed</u>	<u>Reference Number</u>
RNA-Rich Fraction	840
Sarcoplasmic and Mitochondrial Isoenzymes	49
Schistosoma Mansonii Alpha-Naphthyl Acetate Esterases	131
Scand J Clin Lab Invest 29, Suppl, 1972	584
Schistosomiasis	61
Securinin	624
Seminoprotein (-SM)	612
Separated Proteins	45
Separation of Proteins in Concentrated Cerebrospinal Fluid	285
Seric Proteins	238
Serum Alkaline Phosphatases	163
Serum Beta and Pre-Beta-Lipoproteins	271
Serum Beta Lipoproteins	70
Serum Glycoproteins	21
	26
Serum Hepatitis	276
Serum Lipoprotein Analysis	437
Serum Lipoproteins	507
	523
Serum Lipoprotein Patterns	134
Separation of Lymphocytes	737
Serum	708
Serum Immunoglobulins	992
Serum LDH Isoenzyme	752
Serum Protein Fractions	24
Serum Protein Electrophoresis	374
Serum Protein	1045
	1050
	820
	801
	733
	668
	667
	656
	632

<u>Substance Analyzed</u>	<u>Reference Number</u>
Serum Protein (continued)	563
	495
	494
	410
	333
	303
	180
	157
	156
	140
	127
	107
	43
	36
	11
Serum Lipoproteins	742
	666
	346
	275
	232
	114
Serum Proteins Electrophoresis in Liver Diseases	396
Serum Proteins in Leprosy	141
Serum Lipoproteins	267
Sheep Serum	103
16 Different Blood Proteins	489
Single Components in Protein Mixtures	202
Sickle anemia	186
Sickledex	804
Skin Test Antigen SST	39
Soluble Extracts of <i>Dirofilaria immitis</i>	210
Soluble Liver Proteins	820
Soluble Proteins	999
Some Proteins	269
Sonicated Human Serum Proteins	41
Sow Milk	991
Specific Enzyme of Human Sperm	338
Sperm in Sperm Stains	153

<u>Substance Analyzed</u>	<u>Reference Number</u>
Spinal Fluid	892 1001
Staphylococcal Enterotoxin	900
Staphylococcal Enterotoxin C2	758
Staphylococcus Aureus Extracts	1098
S-Sulfo Derivatives of Fibrinogen	29
Staphylococcal Toxins	40
Streptococcus Mutans	53
Streptolysin	836
Study of Liver Disease	357
Sulfated Nucleotides	420
Sulphur-Rich Proteins from Wool	578
Surface Antibodies	71
Synovia	188
Synovial Proteins	301
T and B Lymphocytes	677
Tears	482
T4 Genes 44 and 62	1094
Thalassaemia Syndromes	105
Thalassemia	25
32 P-Labeled RNA	1066
3,5,3-L-Tri-Iodothyronine-Binding, Proteins	483
Thrombocytic Properties	217
Thymus Specific Antigen	1085
Thyroid Diseases	809
Thyroid Follicles	1073
Thyroid Hormone	447 735
Thyroxine-Binding	883
Thyroxine-Binding Human Serum Proteins	133
Thyroxine-Binding Protein	458
Timothy Pollen Antigen	298
Tissue and Serum Creatine Kinase Isoenzymes	598

<u>Substance Analyzed</u>	<u>Reference Number</u>
208 TL and 207 TL	644
Tobacco Rattle Virus Protein	939
Toxicosis	339
Toxoplasma Gondii	518
Treponemal Antigen	640
Triiodothyronine-TBPA	735
Triprotamines	164
Trypanosoma Brucei	223
Trypanosoma Cruzi	51
Tryptophanyl Transfer RNA Synthetase from Lymphocytes	264
2M, IGA and IGM	962
Urinary Amino Acids	22
Urinary Delta-Aminolevulinic Acid	488
Urinary Proteins	448
Uranyl-Resistant Paraproteins	409
Vaccinia Antigen and Antibody	885
Viral Hepatitis	21
Virus	13
Viruses of Vaccinia, Buffalopox, Variola and Alastrim	548
Virus Particles Type C and A	725
Vitamin B 12-Binding Substances	175
Water-Soluble Proteins	157A
Weber-Edsall Extract and Actomyosin	347
S-(4-Pyridylethyl)-L-Cysteine Myosin	736
SH Antigen	357

APPENDIX 5

RESPONSE OF THE SCIENTIFIC COMMUNITY

Letters of inquiry were sent to the following members of the scientific community:

Dr. Eugene A. Arnold
Department of Pathology
Johns Hopkins University School of Medicine

Dr. J. Austin
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Barbara-Anne Battelle
Biology Department
Syracuse University

Dr. P. J. Bechtel
Department of Food Science and Human Nutrition
Michigan State University

Dr. H. N. Bhargava
Department of Pharmacology
University of California School of Medicine

Dr. C. E. Bodwell
Protein Nutrition Laboratory
Human Nutrition Research Division
Agricultural Research Service
United States Department of Agriculture

Dr. James Bonner
Division of Biology
California Institute of Technology

Dr. Rosaria P. Brivio
Biology Department
Syracuse University

Dr. N. Catsimpoilas
Laboratory of Protein Chemistry
Central Soya Research Center

Dr. S. L. Chan
Department of Pharmacology
University of California School of Medicine

Ms. Rosalyn Cleevey
The Home Office Central Research Establishment
Aldermaston
Berkshire, England

Ms. Mary Davies
The Home Office Central Research Establishment
Aldermaston
Berkshire, England

Dr. Paul J. Davis
Department of Medicine
Baltimore City Hospital

Dr. S. Dasgupta
Department of Biology
Saint Louis University

Dr. Friedrich Deinhardt
Department of Microbiology
Rush-Presbyterian-St. Lukes Medical Center

Dr. R. De Wachter
Laboratory of Physiological Chemistry
State University of Ghent
Ghent, Belgium

Dr. John T. Dulaney
Department of Molecular Biology
Vanderbilt University

Dr. Sarah C. R. Elgin
Division of Biology
California Institute of Technology

Dr. E. J. Field
Demyelinating Diseases Unit
Newcastle General Hospital
Newcastle-upon-Tyne, England

Dr. James R. Florini
Biology Department
Syracuse University

Dr. E. Gardner
Department of Pharmacology
University of California School of Medicine

Dr. Robert A. Good
Department of Pathology
University of Minnesota

Dr. Robert I. Gregerman
Gerontology Research Center
National Institute of Child Health and Human Development
National Institute of Health

Dr. A. L. Griffith
Department of Anatomy
University of Illinois at the Medical Center

Dr. E. A. Gula
Department of Microbiology
Oklahoma State University

Dr. Barry S. Handwerker
Department of Medicine
Johns Hopkins University School of Medicine

Dr. K. Hannig
Max-Planck-Institut für Eiweiss und Lederforschung
8 München
West Germany

Dr. John Hoekstra
Department of Microbiology
Rush-Presbyterian-St. Lukes Medical Center

Dr. John A. Illingworth
Department of Biochemistry
University of Cambridge
Cambridge CB2 1QW, United Kingdom

Dr. B. M. Jones
University College of Wales
Department of Zoology
Aberystwth, Wales

Dr. Paul Kaesberg
Biophysics Laboratory and Department of Biochemistry
University of Wisconsin

Dr. R. B. Kemp
Department of Zoology
University College of Wales
Aberystwth, Wales

Dr. S. S. Kind
Forensic Science Laboratory
Government Buildings
Broadway West
Gosforth
Newcastle-upon-Tyne, England

Dr. P. Kohler
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Arthur La Velle
Department of Anatomy
University of Illinois at the Medical Center

Dr. Gary W. Litman
Department of Pathology
University of Minnesota

Dr. K. P. Maier
Medizinische Universitäts
78 Freiburg
West Germany

Dr. David C. Merz
Department of Pathology
University of Minnesota

Ms. Patricia A. Morris
Home Office Central Research Establishment
Aldermaston
Berkshire, England

Dr. Neuwelt
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Gunner F. Nordberg
Department of Hygiene
Karolinska Institute
Stockholm, Sweden

Dr. Monica Nordberg
Department of Hygiene
Karolinska Institute
Stockholm, Sweden

Dr. Constance Molino Park
Albert Einstein College of Medicine

Dr. A. M. Pearson
Department of Food Science and Human Nutrition
Michigan State University

Dr. Magnus Piscator
Department of Hygiene
Karolinska Institute
Stockholm, Sweden

Mr. A. Plough
Plough Incorporated

Dr. C. F. Savory
Department of Microbiology
Oklahoma State University

Dr. D. Y. Schirachi
Department of Pharmacology
University of California School of Medicine

Dr. R. Stahn
Max-Planck-Institut für Eiweiss und Lederforschung
8 München
West Germany

Dr. Ellen Glowacki Strauss
Division of Biology
California Institute of Technology

Dr. D. Stumpee
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Oscar Touster
Department of Molecular Biology
Vanderbilt University

Dr. A. J. Trevor
Department of Pharmacology
University of California School of Medicine

Dr. Olof Vesterberg
National Institute of Occupational Health
S-104 01
Stockholm 60, Sweden

Dr. O. Vesterberg
Chemistry Department
National Institute
S-104 01
Stockholm 60, Sweden

Dr. P. H. Whitehead
Metropolitan Police Forensic Science Laboratory
Holborn
London WV, England

Dr. Takaski Yamada
National Cancer Research Institute
Division of Pathology
Tokyo, Japan

Dr. Keith E. Young
Department of Pathology
Johns Hopkins University School of Medicine



UNIVERSITAIRE INSTELLING ANTWERPEN

Dept. Celbiologie
D. Ref. RDW/VH 740263

Mrs. P.A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge
Massachusetts 02140 .(617)864-5770

Wilrijk, June 6, 1974.

Dear Mrs. Gempel,

I must first of all apologize for replying so late to your letter, dated april 19th, in which you ask me if I see any advantage in application of electrophoretic techniques in zero g surroundings. This is due to the fact that my address has changed and I only received your letter with much delay.

I am sorry to disappoint you, but although it may be true that electrophoresis carried out in space may not have some of the drawbacks of the technique as carried out on the surface of the earth, I would consider that it is not worthwhile investing in research on this subject at the moment.

I am convinced that spaceflight is a very far-reaching achievement, but that it can be better used for other and more important purposes than the improvement of separation techniques.

Sincerely yours,

Dr. R. De Wachter
Department of cell biology.

CALIFORNIA INSTITUTE OF TECHNOLOGY

PASADENA, CALIFORNIA 91109

DIVISION OF BIOLOGY

May 20, 1974

Ms. Patricia Gempel:
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Ms. Patricia Gempel:

In reply to your letter of April 19, 1974, I do not feel at this time that the electrophoretic separation of viral proteins, or whole virus particles in space at zero gravity would be a feasible project. Although such an experiment would be interesting in a theoretical sense, the increased resolution would probably not justify the expense involved. Moreover, most biological procedures (unlike certain experiments in physics or astronomy) need to be available on a routine basis in order to be valuable to the research worker.

I have also sent a copy of this letter to Dr. Paul Kaesberg, who is still working with bacterial viruses, and with Q β in particular. I am no longer working with this type of virus. The Group A arbovirus which I am currently using is too large for this approach.

I thank you for your interest; however, for the reasons listed above I am not interested in collaboration at this time.

Sincerely yours,

Ellen G. Strauss

Ellen G. Strauss

EGS:rt
cc: Dr. Paul Kaesberg

SYRACUSE UNIVERSITY

DEPARTMENT OF BIOLOGY | 209 LYMAN HALL

108 COLLEGE PLACE | SYRACUSE, NEW YORK 13210

TELEPHONE 315 | 423-2021

April 26, 1974

Dr. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, Mass. 02140

Dear Dr. Gempel:

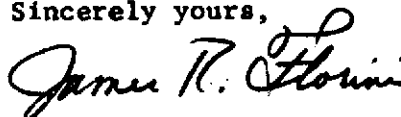
Your letter has caused me a crisis of conscience. As a long time aviation-space fan (I built model airplanes as a boy, and now I am a Flight Instructor with about 850 hours flight time), the prospect of doing anything even remotely associated with the Skylab system is very appealing, and I am greatly tempted to bend my scientific judgment on this matter.

However, try as I might - and I certainly do - I cannot find persuasive advantages for analyses of myosin by isoelectric focusing under zero gravity. In part, this may be because I have never thought of this aspect of things. Even such an elementary and obvious point as the effects on convection did not occur to me until you raised it in your letter, so there may be other factors I have not considered. Frankly, I hope so - I would be delighted if you could persuade me that some of our samples should be analyzed at zero gravity.

There is one other snag, however. Now that Drs. Brivio and Battelle have left my lab, we are not doing IEF of myosin any longer. If you are interested only in having a myosin sample to try, there are many people (some of them in Boston) better qualified than I to furnish it. And Barbara Battelle is currently on a post-doc in Sidman's lab at Harvard Medical, so she is conveniently nearby if you want to talk with her.

On the other hand, if you feel that my lab may be able to make some contributions to the zero gravity approach, I would be delighted to have you attempt to persuade me. My phone is AC315, 423-2510.

Sincerely yours,

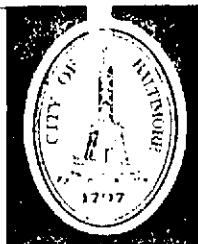


James R. Florini, Ph.D.
Professor of Biochemistry

JRF:ef

CITY OF BALTIMORE

WILLIAM DONALD SCHAEFER, Mayor



DEPARTMENT OF HOSPITALS

FREDERIC C. HUBBARD, Director
1340 Eastern Avenue, Baltimore, Maryland 21221

April 26, 1974

Ms. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Ms. Gempel:

I am writing in reply to your letter of April 19, in which you suggested that an electrophoresis system we described several years ago might have improved resolution of proteins in a "zero g" atmosphere. As you probably know, the technique we reported (*J Clin Endocrinol Metab* 30:237, 1970; *ibid.*, 33:699, 1971; *J Clin Invest* 51:515, 1972) depends upon the buffers developed by N.E. Good (*Biochemistry* 5:467, 1966); such buffers were constructed for use in the "physiologic pH range," and indeed have proved to be quite ^{satisfactory} electrophoresis buffers. Andreas Chrambach at NIH has written about the use of these buffers in several long papers. As you no doubt noted from the reading of the JCI paper, the electrophoresis system we used was a continuous one.

While the pH 7.4 method was satisfactory for resolving the three thyroid hormone-binding proteins in human serum, it is poor at protein resolution in general. The method can be improved by introducing some discontinuities (of pore size, molarity), but we have insisted on homogeneous pH. Protein-protein interactions may be more prominent at pH 7.4, impeding resolution. We are now investigating the electrophoretic characteristics of soluble intracellular proteins which bind thyroid hormones and are interested in improved resolution of such proteins at physiologic pH. (Such soluble proteins focus as three peaks on isoelectric fractionation, but we have been able to demonstrate only one moiety in various polyacrylamide gel electrophoresis systems; it is unclear whether the isoelectric focusing studies represent a phenomenon of buffer ampholyte interaction with one protein or whether there are in fact more than one binding protein in cytoplasm.)

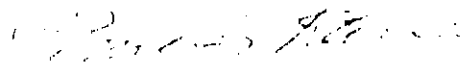
In any event, I would be interested in talking at the issue of improving resolution in the physiologic pH electrophoresis systems. My telephone number here is 342-5400, extension 1331 (area code 301).

April 26, 1974

2

I appreciate your interest.

Sincerely,



Paul J. Davis, M.D., Head
Endocrinology Division

Associate Professor of Medicine
Johns Hopkins University

PJD:chm

CALIFORNIA INSTITUTE OF TECHNOLOGY

PASADENA, CALIFORNIA 91109

DIVISION OF BIOLOGY

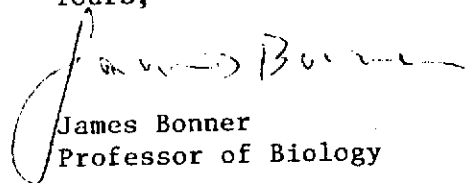
April 30, 1974

Dr. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Dr. Gempel:

As you have no doubt learned, Dr. Sarah Elgin is now Professor Sarah Elgin, Dept. of Biochemistry and Molecular Biology, Harvard University. Write her there.

Yours,


James Bonner
Professor of Biology

JB:ds

NEWCASTLE GENERAL HOSPITAL

WESTGATE ROAD NEWCASTLE UPON TYNE NE4 6BE

DEPARTMENT OF PATHOLOGY

PROFESSOR B. E. TOMLINSON
Dr. B. J. SMITH
Dr. T. BIRD
Dr. A. J. CASSELS-SMITH
Dr. R. O. K. SCHADE
Dr. J. B. SELKON
Dr. A. R. MORLEY

TELEPHONE
NEWCASTLE 38811
STD 0632

9th May, 1974.

Mrs. Patricia A. Gempel,
Chemical Systems Section,
Arthur D. Little, Inc.,
Acorn Park,
CAMBRIDGE,
Massachusetts,
U.S.A.

Dear Mrs. Gempel,

Thank you for your letter of April 22nd (/ks)

Certainly a "zero g" environment would be helpful in overcoming some of the difficulties in making measurement. Drift (thermal or mechanical) as well as sedimentation would be eliminated, and this would much alleviate the tax on the patience of the observer.

But, frankly, I do not see how one is going to look down a microscope and "time" cells in a "zero g" environment. Or have you ingeniously catered for this? I would be most interested to hear.

Yours sincerely,



E. J. Field
Professor of Experimental Neuropathology



Home Office

CENTRAL RESEARCH ESTABLISHMENT

Aldermaston Reading Berkshire RG7 4PN

Telephone Tadley 3833 (STD Code 0735 6) extension 5853
Director A S Curry MA PhD FRIC FRCPATH

Dr Patricia A Gempel
Chemical Systems Section
Arthur D Little Inc
Acorn Park
Cambridge Mass 02140
USA

Please reply to The Director
Your reference

Our reference CRE/PHW

Date 8 May 1974

Dear Dr Gempel

Thank you for your recent letter concerning electrophoresis in a "zero g" atmosphere.

While we have considerable experience in electrophoresis of red cell enzymes and serum proteins using most of the conventional media (and more recently iso-electric focusing), the prospect of carrying out experiments in a zero-gravity atmosphere is one that, I confess, had not crossed my mind.

I regret I am not familiar with work carried on under such conditions but would be interested to hear of any results. It may be that if "zero g" conditions are easily obtained in the laboratory and greater resolution is obtained of enzyme variants, for example, then it may be interesting for us to investigate.

I would be interested to hear further of your work and discuss the possible forensic implications, if any, with you or your people.

I understand you have an office in London - perhaps I could have a chat with someone there?

I look forward to hearing from you.

Yours sincerely

Dr P H Whitehead

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FOOD SCIENCE AND HUMAN NUTRITION

EAST LANSING • MICHIGAN • 48824

May 10, 1974

Ms. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, MA 02140

Dear Ms. Gempel:

Thank you for your letter of April 19 to Dr. P. J. Bechtel, who is now working with Dr. E. G. Krebs in the Medical School at the University of California in Davis. In his absence, I am replying to your letter.

I would be very pleased to visit with you further on the possibility of increasing the solubility of proteins by working at zero gravity. The procedure certainly sounds interesting, and I would be happy to talk to you more concerning it. If you should be able to visit us on campus, Dr. J. R. Brunner of this Department who is well versed in electrophoretic techniques would also like to visit with you.

Will look forward to hearing from you.

Sincerely yours,

A. M. Pearson, Professor
Food Science & Human Nutrition

AMP/lk

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

SCHOOL OF MEDICINE
DEPARTMENT OF PHARMACOLOGY

SAN FRANCISCO, CALIFORNIA 94143

April 29, 1974

Ms. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Cambridge, Mass. 02140

Dear Ms. Gempel:

I have read your letter with considerable interest although with some puzzlement. It would be nice to know in somewhat more detail the nature of your deliberations. At this moment it is difficult for me to visualize any particular advantage to be derived from performing electrophoresis in a "zero g" environment. This is a technique with which I have had considerable experience and your implications have piqued my curiosity.

The article which you refer to on "Purification and..." relies mainly on liquid chromatography, a technique which depends largely on gravitational forces for its success. In two subsequent publications the use of electrophoretic techniques are described in somewhat more detail.

Needless to say I would be interested in the opportunity to explore this subject further with you.

Cordially,

Eugene Gardner, Ph.D.



THE UNIVERSITY COLLEGE OF WALES
DEPARTMENT OF ZOOLOGY

Telephone : 3111

PENGLAIS
ABERYSTWYTH
SY23 3DA

PROFESSOR BRYN M. JONES

17th June 1974

Miss P.A. Gempel,
Chemical Systems Section,
Arthur D. Little Inc.,
Acorn Park,
Cambridge, Massachusetts 02140.

Dear Miss Gempel,

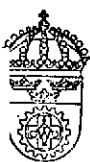
I am sorry for the delay in replying to your letter of 22nd April 1974 but I was absent from Aberystwyth for a considerable period of time. I can see the value of "Zero-G" for electrophoretic separation especially of heavy particles for instance cells in suspension. In fact, I discussed with Bier his attempted experiment in one of the Appollo Spacecrafts.

You are perhaps right in thinking that aggregation might be decreased in "Zero-G" conditions but I have no idea how "Zero-G" might affect the Physiochemical parameters (Vander Waal's forces, electrostatics etc.) responsible for adhesion, the mechanism of cell aggregation. Of course, cells have to make contact to adhere and "Zero-G" would affect this. It might also affect the movement of cells within an aggregate or their movement on artificial surfaces, dependent upon production of cellular processes (altered by "Zero-G"?). In fact the general question of the effect of such conditions on the ultrastructure of cells in culture might be worth considering.

I would certainly be interested in considering this possibility with you.

Yours sincerely,

Dr. R.B. Kemp.



SAFETY AND HEALTH

Department of Occupational Health

Chemical Division

Associate Professor Olof Vesterberg, LE

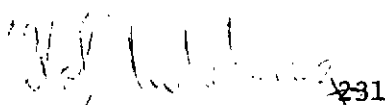
Dr. Patricia A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge Mass. 02140
USA

Dear Dr. Gempel,

This is a reply to your letter of April 19, 1974. Without question you raise an interesting approach to electrophoretic procedures. I have been working with isoelectric focusing for more than 10 years. In ^{these} technique convection as well as sedimentation has to be counteracted by one means or another. Earlier density gradients or gels such as polyacrylamide have been used for this purpose, however, these solutions are not ideal and there exist really a need for a means were these agents can be avoided. Other reason for this is that they might interfere with the determination of isoelectric points of protein. As you might know isoelectric focusing is very unique, because it makes possible the determination of isoelectric points (pI) of proteins in the simple way. Isoelectric points determined in this way are very valuable physico-chemical constant of proteins of an importance that can be compared ^{with} molecular weight data. The reason why these pI values have not yet become into more general use is that they can be influenced by various factors, e.g. ionic strength when determined by older technique such as electrophoresis, but they seem to be determinable with the high degree of reproducibility by isoelectro focusing.

For the reasons mentioned above I would be very interested in discussing with you the possibility to performe focusing in zero gravity atmosphere as you propose in your letter. For your information I can give you references to other articles on isoelectric focusing that are of more general value than the one you mentioned in your letter. I send you some copies of reprints and would be glad to supply you with more references also from other authors in forthcoming letters.

Yours sincerely,


Olof Vesterberg 231

APPENDIX 6

SURVEY OF DIAGNOSTIC LABORATORY TESTS

MICROBIOLOGY - IMMUNOLOGY

1. Rubella Antibody Detection

Methods:

- Hemmagglutination inhibition (HI)
- Complement fixation (CF)
- Indirect fluorescent antibody
- Neutralization tests (takes 7-11 days)

Clinical Use:

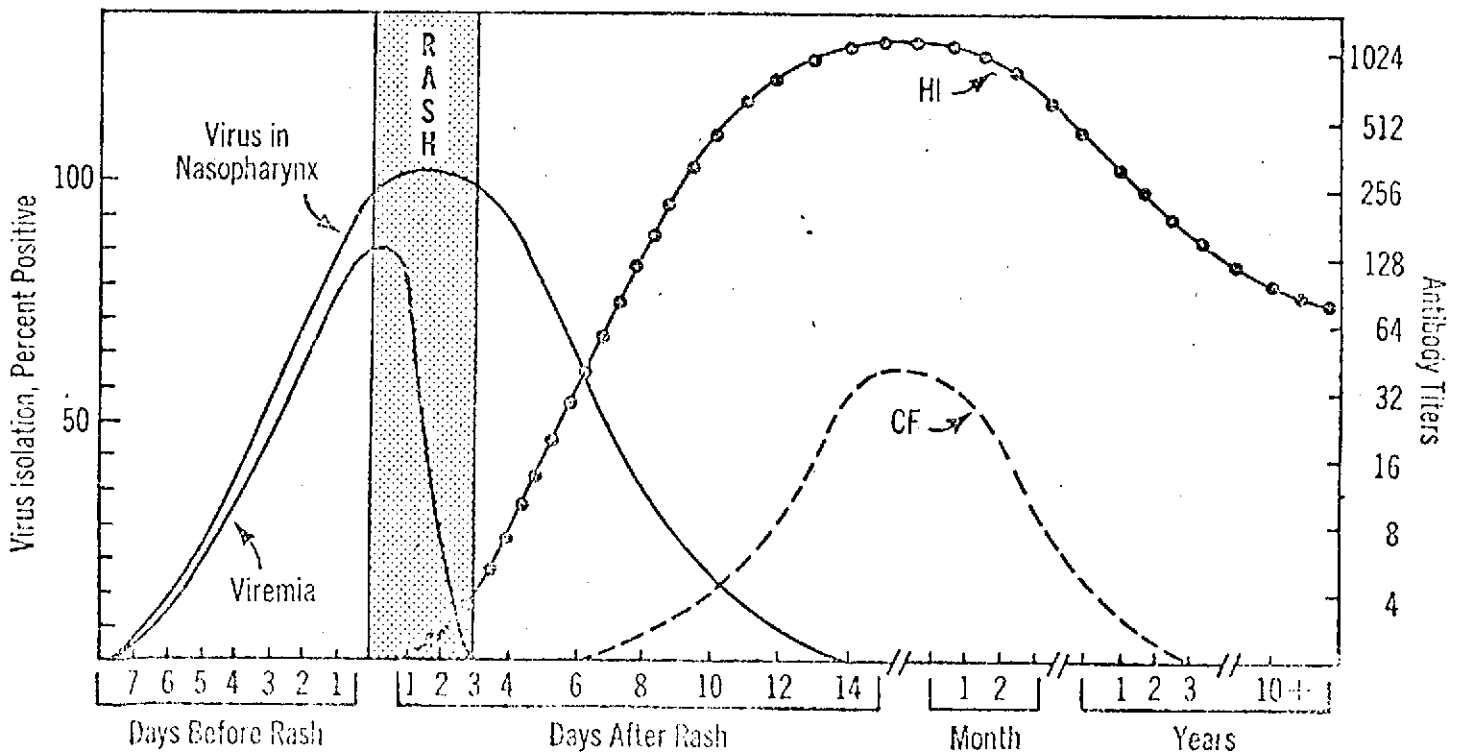
- Determination of immunity status - HI suggested
- Diagnosis of Etiology of viral exanthemata - CF or HI test on acute serum with a follow-up test on convalescent serum.

Comments:

Purified antigens are needed for all these assays. The present detection systems are sufficient to diagnose the disease 4-7 days following the appearance of a rash. The infective stage has passed by this time. Refer to Figure 1 below:

FIGURE 1

The appearance and disappearance of Rubella virus, HI and CF antibody.
(Abstracted from a teaching slide from the Center For Disease Control.)



2. Australia, SH or Hepatitis - Associated Antigen

Methods (arranged in order of decreasing sensitivity):

Radioimmunoassay
Hemagglutination inhibition
Complement fixation (CF)
Counter-electrophoresis (CEP)
Agar gel diffusion (AGD)

Clinical Use:

Used for detection of 30-40% of serum hepatitis cases.

Comments:

1. Lag between initial infection and the appearance of circulating antibody similar to rubella.
2. Antigen and antibody excess zones which will inhibit a positive reaction in all assays except the radioimmunoassay.
3. Lack of purified antigens.

3. Coccidiomycosis Antibody

Method:

Delayed hypersensitivity test
Slide Latex agglutination test
Immunodiffusion test

Clinical use:

Diagnosis of coccidiomycosis

Comments:

The delayed hypersensitivity test is specific, first to become positive and will remain positive life long.
Circulating antibody is only detectable 12 to 16 weeks following infection.
All serological tests for coccidiomycosis cross react with histoplasmosis and blastomycosis.

4. Treponema Pallidum Antibody Detection

Method:

Fluorescent Treponemal Antibody Absorption Test (FTA-ABS).

Clinical Use:

Diagnosis of syphilis > 90% effective.

Comments:

The FTA test uses specific T. pallidum antigen. There are some false positives related to cross reactivity between these antigens and similar, but undefined, determinates.

5. Toxoplasma Antibody Detection

Method:

Indirect hemagglutination (IHA)
Fluorescent antibody (FA)

Clinical Use:

Diagnose toxoplasmosis

Comments:

20-80% of the population has a positive titer (16-256).
Rising titers are indications of active infection. New borns usually have a titer equivalent to the mother because of passive transfer.

6. Mycoplasma CF Test

Comment:

Antigens are cell extracts and cells are difficult to culture.

7. Endamoeba Histolytica

Method:

Direct exam of feces
Indirect Hemagglutination Test (IHA)
Complement Fixation Test (CF)

Comment:

Serum assays are good, but this microorganism is so distinctive and so easily identified that serum assays are probably unnecessary.

STEROID HORMONES

A. ANDROGENIC HORMONES

1. 17-Ketosteroids (17-KS)

Methods:

Colorimetric determination of all 17-Ketosteroids whether androgenic or not (Zimmermann test) (Refr.: Dreker, J. J. et al., J. Clin. Endocr. and Metab., 12:55, 1952)

Clinical Use:

- a) Increased excretion occurs in:
 - Interstitial cell tumor of testes, very high
 - Simple hirsutism, occasionally
 - Cushing's syndrome due to adrenal hyperplasia
 - Adrenal hyperplasia-female pseudohermaphroditism or adrenogenital syndrome.
 - Adrenal cancer, virilism (not Cushing's syndrome), very high
 - Adrenal tumor, virilism, not malignant (?)
 - Arrhenoblastoma and lutein cell tumor of the ovary, when androgenic
 - Treatment with ACTH; Severe stress; Treatment with testosterone

- b) Decreased excretion occurs in:
 - Thyrotoxicosis, Female hypogonadism, diabetes mellitus, hypertension, debilitating disease of mild to moderate severity - slight decrease.
 - Eunuchoidism or castration of male, gout, moderate to severe debility from any chronic illness - moderate decrease.
 - Addison's disease, panhypopituitarism, myxedema, nephrosis - severe decrease.

Comments:

If total 17-KS are normal there is little practical value to run either the DHA (dehydroepiandrosterone) determination by the Allen "blue" test or $\beta:\alpha$

determination. The 17-KS can be grouped into the alpha fraction (principally androsterone and etiocholanolone) and the beta fraction (principally dehydroepiandrosterone.) The interpretation of a total 17-KS level in terms of androgenic activity must be made with consideration of the age, sex and clinical state of the patient. In most adult cases of adrenal carcinoma, the ratio of $\beta:\alpha$ ranges from 0.28-4.0. Most cases in children show a significant elevation of the ratio. A ratio of 0.4 or above indicates strongly carcinoma. Caution: there is a significant daily variation in 17-KS excretion.

Normal values:

Children:

Excretion rates are the same for both sexes through childhood. The following table indicates the range of values found:

Up to 1 yr.	= less than 1 mg. per day
1 - 4 yrs.	= less than 2 mgs. per day
5 - 8 yrs.	= less than 3 mgs. per day
13-16 yrs.	= 2.5-10 mgs. per day

Adult males:

9-22 mgs. per day. After about age 60 the rate of excretion progressively declines.

Adult females:

6-15 mgs. per day. After about age 60 the rate of excretion progressively declines.

The normal ratio of beta to alpha 17-ketosteroids is usually less than 0.2, i.e., there are at least five times as much alpha ketosteroids as beta ketosteroids by weight.

determination. The 17-KS can be grouped into the alpha fraction (principally androsterone and etiocholanolone) and the beta fraction (principally dehydroepiandrosterone.) The interpretation of a total 17-KS level in terms of androgenic activity must be made with consideration of the age, sex and clinical state of the patient. In most adult cases of adrenal carcinoma, the ratio of $\beta:\alpha$ ranges from 0.28-4.0. Most cases in children show a significant elevation of the ratio. A ratio of 0.4 or above indicates strongly carcinoma. Caution: there is a significant daily variation in 17-KS excretion.

Normal values:

Children:

Excretion rates are the same for both sexes through childhood. The following table indicates the range of values found:

Up to 1 yr.	= less than 1 mg. per day
1 - 4 yrs.	= less than 2 mgs. per day
5 - 8 yrs.	= less than 3 mgs. per day
13-16 yrs.	= 2.5-10 mgs. per day

Adult males:

9-22 mgs. per day. After about age 60 the rate of excretion progressively declines.

Adult females:

6-15 mgs. per day. After about age 60 the rate of excretion progressively declines.

The normal ratio of beta to alpha 17-ketosteroids is usually less than 0.2, i.e., there are at least five times as much alpha ketosteroids as beta ketosteroids by weight.

2. Testosterone

Methods:

Measurements of testosterone in plasma or serum determined by following techniques: bioassay, enzymatic-fluorescence, double isotope derivatization, partition chromatography, gas chromatography, competitive protein-binding radio assay, radioimmunoassay.

Clinical Use:

a) Adult Males:

Orchidectomy - concentration of testosterone drops down to 1/4 - 1/20 of the original level of the patient after being orchidectomized for neoplastic disease of the prostate or breast.

Estrogen Therapy - Patients with prostatic carcinoma treated with estrogen show a marked decrease in circulating testosterone.

Klinefelter's Syndrome - level of testosterone below lower limit of adult male.

Testosterone Therapy - patients with adult Leydig-cell failure or eunuchoidism treated with long-acting testosterone esters show normal level for 2-3 weeks.

Primary and secondary hypopituitarism and hypogonadism - testosterone level below 200 nanograms/100 ml.

Hepatic cirrhosis - testosterone level between 110-550 nanograms/100 ml, but majority of cases are below 220 nanograms/100 ml.

b) Adult Females:

Polycystic Ovary (Stein-Leventhal Syndrome) - testosterone level between 100-300 nanograms/100 ml. ACTH or glucocorticoid treatment drops level of testosterone.

Idiopathic Hirsutism - testosterone level between 30-200 nanograms/100 ml. Synthetic glucocorticoid or estrogen-progesterone combinations reduce level to normal.

Virilizing Tumors - Arrhenoblastomas, dermoids, malignant teratomas and other tumors may secrete testosterone.

c) Prepubertal children:

Delayed puberty in young adults (15-17 years old): testosterone level below 100 nanograms/100 ml. Treatment possible (7-12 days) with human chorionic gonadotropism which increased the concentration 6-to 20-fold.

Pituitary infantilism in young adults: testosterone level below 100 nanograms/100 ml. Treatment showed no elevation of testosterone.

Comments:

Normal testosterone levels in men range from 300-1200 nanograms/100 ml. Studies show very little correlation of age and plasma testosterone.

Normal testosterone levels in women extend from 30-95 nanograms/100 ml. Levels are greater during the ovulatory and luteal phases of the menstrual cycle. During pregnancy concentration increases significantly (no relation to the sex of the fetus).

Concentration of plasma testosterone in children (4-10 years old) ranges for girls between 1-34 ng/100 ml and for boys 20-80 ng/100 ml.

Plasma testosterone level reflects a result of alterations of both the production rate and the metabolic clearance rate.

B. ESTROGENIC HORMONES

1. Total Estrogens Determination

Methods:

Fluorometric analysis - because of small quantities of the estrogens and interfering substances in the urine a purification utilizing gel filtration is necessary to obtain a sensitive and accurate measurement on a spectrophotofluorimeter.

Clinical Use:

a) Decreased Estrogen Values:

Agenesis of the ovaries
Primary ovarian malfunction
Dysfunction of the pituitary or other metabolic disturbances
Hypoestrogenism (absence of ovulation and corpus luteum function)
Inadequate sexual maturation or regression of previously occurring sexual maturation
Non-occurrence or cessation of menstruation
Absolute sterility
Hypofunction of the pituitary and adrenal glands may lead to low estrogen levels.

b) Increased Estrogen Values:

Ovarian tumors (cystic tumors comprise about two-thirds of all ovarian tumors, solid tumors are mostly granulosa- and theca-cell types).
A tumor or hypoplasia of the adrenal cortex may increase level. Cases in male may give rise to feminization with gynecomastia, impotence, azoospermia and testicular atrophy.

Comments:

The hyperestrogenism of a granulosa-cell or theca-cell tumor of the ovary during childhood should be differentiated from hyperovarianism.

Total urinary estrogen for non-pregnant or post-menopausal women and adult men are:

Non-pregnant women-preovulatory phase: 5-25 micrograms/24 hr.

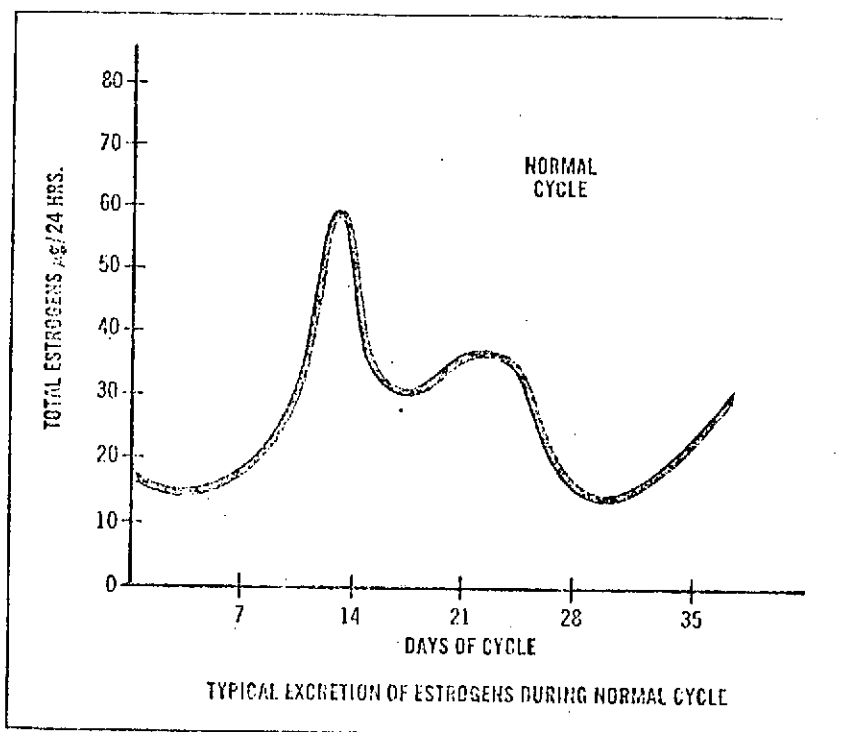
Non-pregnant woman-ovulatory phase: 24-100 micrograms/24 hr.

Non-pregnant women-luteal phase: 12-80 micrograms/24 hr.

Post-menopausal women: Less than 10 micrograms/24 hr.

Adult males: 4-25 micrograms/24 hr.

During pregnancy the estrogen level can rise as high as 45 milligrams per 24 hours.



2. Placental Estriol

Methods:

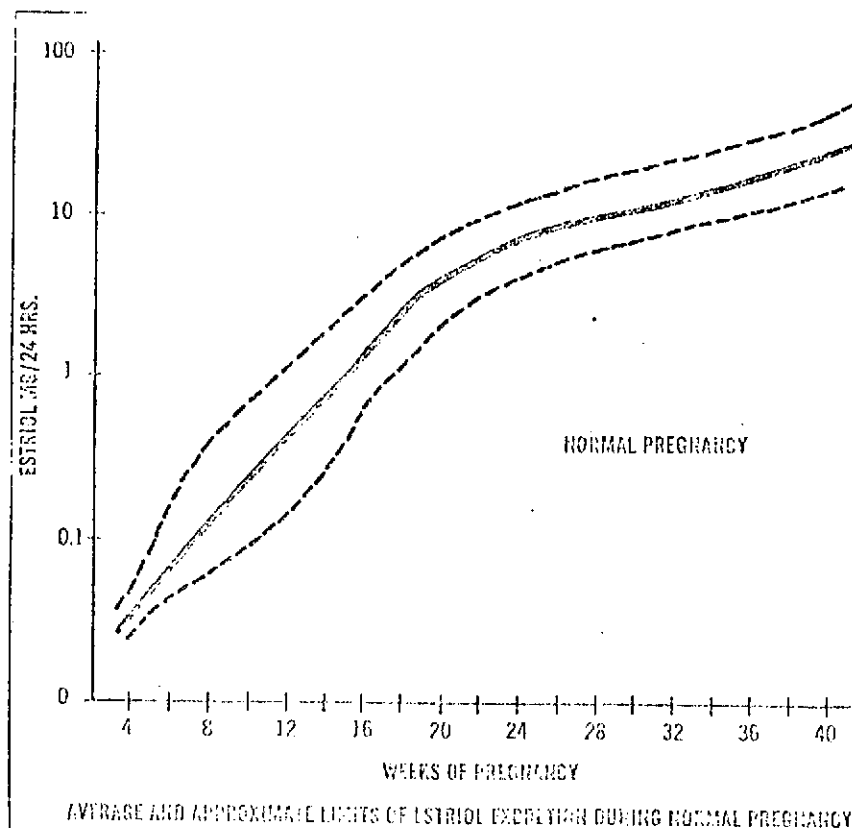
Chemical determination - high estriol content of pregnancy urine eliminates some of the complex purification procedures required in the Total Estrogen method.

Clinical Use:

Maternal urinary estriol excretion is a reliable index for assessment of the fetal placental complex. Decrease of estriol excretion during second and third trimesters may indicate placental dysfunction or other abnormalities of pregnancy.

Comments:

Serial determinations are essential since daily estriol values vary considerably. If estriol excretion curve declines constantly of more than 70% of previous values, placental insufficiency is probable.



Estriol excretion for the 2nd and 3rd trimester of pregnancy.

<u>WEEKS OF PREGNANCY</u>	<u>RANGE OF ESTRIOL VALUES</u>
16	Up to 3 mg/24 hrs.
20	1-9
24	4-12
28	5-17
32	6-22
36	8-32
40	9-37

C. PROGESTATIONAL HORMONES

1. Plasma Progesterone

Methods:

Specific binding of the hormone by corticosteroid-binding globulin (test is based on selective extraction of progesterone from plasma).

Clinical Use:

a) Females:

Infertility problems due to either Anovulatory Menstrual Cycles, Polycystic Ovary (Stein-Leventhal) Syndrome or Hypoplastic Secretory Endometrium (inadequate luteal phase) show low level of progesterone.

Adrenal Hyperplasia - uncomplicated virilizing adrenal hyperplasia (21-hydroxylase deficiency) elevates progesterone level.

Pregnancy - first trimester progesterone levels are equal or slightly higher as in the luteal phase of the normal menstrual cycle, thereafter, gradual increase occurs.

Threatened or Recurrent Abortion, Intrauterine Death - levels of plasma progesterone falls but in some cases of intrauterine death level remains normal for a period of time.

Poor Fetal Growth - no increase in progesterone values over a period of time may indicate poor fetal growth.

b) Males:

Virilizing Adrenal Hyperplasia - elevated progesterone levels, after ACTH stimulation level increases even more and may remain elevated if conversion to cortisol is impaired.

Comments:

Plasma progesterone levels are a more sensitive measure of corpus luteum formation than urinary pregnanediol.

Normal range of plasma progesterone in females:

Follicular phase - under 150 ng/100 ml.

Luteal phase - at least 300 ng/100 ml.

Peak levels at about mid-luteal phase may exceed 2,000 ng/100 ml.

Pregnancy values during first trimester range from 1500 - 5000 ng/100 ml and continues to rise and reaches values between 8,000 - 20,000 ng/ml in the third trimester.

Normal range of plasma progesterone in males: under 100 ng/100 ml.

2. Pregnanediol

Methods:

Quantitative assay of pregnanediol in urine using the chromatographic technic (Klopper, Midice, Brown, J. Endocr. 12 :209, 1955).

Clinical Use:

Threatened Abortion - lowered levels of pregnanediol, and if followed by high levels an abortion is very likely to happen.

Corpus Luteum Cysts - elevated levels of pregnanediol.

Remains of placental tissue in the uterus following parturition - elevated levels of pregnanediol.

Some cases of Adrenal-Cortical Tumors - show high levels.

Comments:

Degeneration of the corpus luteum and the onset of menstruation is evidenced by a precipitous decrease in urinary pregnanediol.

Proliferative phase: 0.5 - 1.5 mg/24 hrs.

Luteal phase: 2 - 7 mg/24 hrs.

Post menopausal levels range from 0.2 - 1.0 mg/24 hrs.

In pregnant females the pregnanediol excretion rises steady and at about the 32nd week it levels off. After 24 hrs. following parturition there is a drop to non-pregnancy levels by the 5th to the 10th day post-partum.

WEEKS OF PREGNANCY	RANGE OF PREGNANEDIOL IN URINE (MG./24 HRS.)
16	5-21
20	6-26
24	12-32
28	19-51
32	22-66
36	13-77
40	23-63

D. ADRENAL CORTICAL HORMONES - I: GLUCOCORTICOIDS

1. Urinary 17-OH-Corticosteroids

Methods:

- a) 17-OH-corticosteroids may be determined as:
 17-Ketogenic steroids (17-KGS)
 Porter-Silber chromogens (e.g., Glenn-Nelson method)
- b) 17-Ketogenic steroids include the 17-OH-corticosteroids with the dihydroxyacetone side-chain AND the pregnanetriol types of compounds.
- c) Porter-Silber chromogens (Glenn-Nelson method) determine only the dihydroxyacetone side-chain compounds, e.g., THE, THF, and THS.

Clinical Use:

These hormones regulate gluconeogenesis (production of sugar to protein) which results in:
 negative nitrogen balance
 loss of potassium from tissues
 decreased peripheral utilization of carbohydrate
 insulin resistance (producing a diabetes)
 increased uric acid excretion
 increased circulating neutrophils, eosinopenia, lymphopenia.
 Overproduction or therapeutic administration of these hormones may result in the physical changes of Cushing's syndrome (thinning of skin, muscular wasting and weakness, osteoporosis and ecchymoses).

Comments:

The 17-KGS procedure is recommended for screening purposes from the standpoint of cost and the fact that it includes more 17-OH-corticosteroids.

NORMAL RANGE:

Urine:

BY 17-KETOGENIC STEROID METHOD:

AGE GROUP	MALE	MGS./24 HRS.	FEMALE
Under 1 year	Less than 1		Less than 1
Up to 10 years	Less than 5		Less than 5
Adults	5-23		3-15
Over 70 years	3-12		3-12

BY GLENN-NELSON METHOD:

Adults	3-10	2-6
--------	------	-----

2. Plasma Cortisol (Plasma 17-OH-Corticosteroids)

Method:

Fluorescence technic - caution: plasma must be separated from the cells immediately after obtaining the heparinized blood; the fluorescence characteristics of the plasma cortisol are stable for at least 7 days at R.T. (30° C).

Clinical Use:

17-OH-CORTICOSTEROID LEVEL	CLINICAL CONDITION
Low or low normal	Addison's disease
	Anterior pituitary hypofunction
Slight increase	Pregnancy (first trimester)
	Severe hypertension
	Virilism
Moderate increase	Stress: infectious disease, surgery, burns, etc.
	Pregnancy (third trimester)
Marked increase	Cushing's syndrome, most cases
	Extreme stress: Pancreatitis, eclampsia

Comment:

Normal range of adults: 5-20 ng/100 ml plasma

The plasma cortisol determination may show spuriously elevated values if contraceptive drugs taken (increase in cortisol-binding protein from the use of estrogenic compounds).

3. Urinary "Free" (Unconjugated) Cortisol:

Methods:

Fluorimetric analysis - caution: spironolactone, an aldosterone antagonist, is a known interfering substance; estrogens and oral contraceptives may lead to elevated levels of urinary "free" cortisol.

Clinical Use:

Cushing's syndrome

Comment:

The procedure is primarily for uncovering elevations, low values do not necessarily indicate adrenal hypofunction. If high levels are found in patients taking contraceptive pills or other estrogenic material medication should be withheld and another estimation performed at least one month later.

Normal ranges:

Female: 78-365 $\mu\text{g}/24$ hours

Male: 108-409 $\mu\text{g}/24$ hours

D. ADRENAL CORTICAL HORMONES - II: MINERALOCORTICIDS

I. Aldosterone

Methods:

Radioimmunoassay procedure for urinary aldosterone - method involves purification by extraction, followed by acid hydrolysis and re-extraction, and chromatography to remove naturally occurring steroids in potentially interfering levels. Radioimmunoassay involves the specific binding of aldosterone in competition with ³H-aldosterone to an anti-aldosterone antiserum produced in sheep.

Clinical Use:

Secondary Aldosteronism - (aldosterone output is elevated due to a greater activity in the renin-angiotensin system or external stimuli).

- a. Salt depletion, affecting the ECF.
- b. Potassium loading, possibly through a transmembrane phenomenon.
- c. ACTH in large doses, causing a transient rise.
- d. Cardiac failure, effecting sodium retention and expansion of ECF. "Right-sided" heart failure apparently results in higher aldosterone levels.
- e. Cirrhosis of liver with ascites formation.
- f. Nephrotic syndrome.
- g. Idiopathic cyclic edema, abnormal capillary permeability.
- h. Pregnancy, increasing to term, followed by rapid decrease after delivery.
- i. Bartter's syndrome, renal juxtaglomerular hyperplasia.
- j. Post surgical syndrome.
- k. Hypovolemia, hemorrhage, transudation and posture.

Primary Aldosteronism - high aldosterone output caused by an adrenocortical tumor in the face of low plasma renin activity. Hypertension, intermittent muscular pains, cramps, weakness, tetany, "paralysis" and polyuria.

Comment:

Normal range of urinary aldosterone at "Bio-Science" :2-26, μ g per 24 hours (Note: assure adequate sodium intake).

The determination of plasma aldosterone is valuable in diagnosis and localization in primary aldosteronism. Plasma aldosterone is unstable at R.T., it is stable if kept frozen. Normal ranges are not precisely defined yet.

D. ADRENAL CORTICAL HORMONES - III: PREGNANETRIOL

Method:

Cox procedure - measuring the acetaldehyde formed upon oxidation of pregnanetriol with periodic acid.

Clinical Use:

Adrenogenital syndrome (e.g., congenital adrenal hyperplasia) - excessive excretion of pregnanetriol.

Comment:

Cases of adrenogenital syndrome often show a moderately elevated 17-Ketosteroid and a considerably increased 17-Ketogenic steroids (major fraction constituted by pregnanetriol) level. Pregnanetriol is measured when urine is analyzed for 17-OH-corticosteroids by the 17-Ketogenic steroid procedure. By performing the 17-Ketogenic steroid test along with a pregnanetriol assay, information becomes available both as to the adrenal activity and metabolism.

Normal range found in urine of normal adults is 0.2 - 4 mgs/day. Children usually show less than 0.5 mgs/day. Pregnanetriol excretion is increased as a result of ACTH stimulation.

PROTEIN HORMONES

1. Chorionic Gonadotropin (CG)

Methods:

- a) Bioassay - an aliquot of the urine is purified and concentrated by means of kaolin adsorption and elution at proper pH's. The extract is injected at various concentrations into immature (21 day old) female rats. After 24 hrs. the rats are sacrificed and the ovaries are examined for hyperemia as a positive response.
- b) Immunoassay - assays for CG have been performed by:
 - complement-fixation
 - precipitin tests
 - hemagglutination-inhibition tests with either sensitized erythrocytes or latex particles

Clinical Use:

Testicular tumors (usually mixed epithelioma type)
- large amounts of CG (1,000 - 50,000 units) found in urine.

Chorionepithelioma - 100,000 units or more excreted CG.

Hydatidiform Mole - 100,000 units or more excreted CG.

Pregnancy test - hormone appears soon after the first missed menstruation in human pregnancy, reaches a peak between the 50th and 80th day of gestation then decreases until partially disappearing a few days after parturition.

Comment:

CG levels determined by immunological tests are somewhat higher than levels determined by bioassay. Normal range in male and non-pregnant female: none detected. In pregnant female CG levels in the immunoassay method reach 1,000 iu/liter between 35 to 40 days after the last normal menstrual period. Then level increases rapidly, peaking at about the 50th to 80th day. Decrease occurs and the level of 2,000 - 10,000 are maintained until parturition after which the hormone disappears within a few days.

2. Pituitary Gonadotropins

Methods:

Several methods have been employed for the bioassay of the pituitary gonadotropins, using as end points uterine enlargements, ovarian growth, vaginal patency, vaginal cornification, and seminal vesicle weights. The increase in uterine weight of the immature rat or mouse is the most widely used criterion and measures the combined FSH (Follicle Stimulating Hormone) and ICSH (Interstitial Cell Stimulating Hormone) effect on total gonadotropins.

Clinical Use:

Increased levels in:

Menopause, including premature menopause, Ovarian agenesis
Klinefelter's syndrome; Adult seminiferous tubule failure
Male climacteric

Decreased levels in:

Children before puberty; Hypogonadotropic eunuchoidism
Anorexia nervosa; Estrogen administration
Neoplasms of the adrenal, ovary or testis which secrete
estrogens or androgens

Comment:

NORMAL RANGE:

Urine by Bioassay:

Adults: Approximately 6-50 mouse uterine units (MUU) per 24 hours.

Children: (before puberty): Less than 6 MUU per 24 hours.

Menopausal: Greater than 50 MUU per 24 hours.

Serum or Plasma by EIA:

Male: 4-25 milli-IU/ml.

Female: Premenopausal-- 4-30 milli-IU/ml.

Postmenopausal-- 40-250 milli-IU/ml.

Midcycle peak-- 2x the baseline.

(Diurnal variations from high in the morning to low in the evening have been observed)

3. Luteinizing Hormone (LH)

Methods:

Radioimmunoassay procedure

(by Schalch, D.S., et al., J. Clin. Invest. 47:665, 1968)
- the method utilizes serum as the specimen but is also capable of measuring LH in unconcentrated urine. Caution: Interfering substance is variably present in urine, so that a concentration and purification procedure would be necessary.

Clinical Use:

Amenorrhea due to ovarian failure - basal plasma LH levels are elevated (but not in case of amenorrhea secondary to pituitary failure) Caution: The mid-cycle peak is completely obliterated in normal women using oral contraceptives.

An ovulatory fertility problem - presence or absence of a mid-cycle peak can be established by analysis of a series of daily serum specimens. Caution: Difficulties in deciding when and how many specimens to collect. Schalch et al shows the mid-cycle to occur around the 11th - 17th day.

Postmenopausal state - testosterone and estrogen administered depresses LH levels.

Comment:

Normal Ranges:

Range in m I.U./ml. Serum

Men	Less than 11
Women, pre-menopausal	Less than 25
Women, mid-cycle peak	Greater than 3 times baseline value
Women, post-menopausal	Greater than 25

4. Insulin

Methods:

Radioimmunoassay determination - radioisotope-labeled insulin is added to sample with unlabeled insulin and the total insulin is reacted with a potent anti-insulin serum to form an insulin/anti-insulin complex. This complex is isolated by precipitation and the radioactivity determined of the unknown specimen.

Clinical Use:

Diagnosis of insulinoma - increase in plasma insulin level is greater after tolbutamide administration than after glucose.

Maturity-onset diabetes - the serum insulin level is higher than normal after ingestion of 100 grams of glucose between the 1 and 2 hour period.

Reactive hypoglycemia - elevated plasma insulin level along with normal blood glucose levels.

Acromegaly - elevated serum insulin level.

Comment:

X
NORMAL RANGE:

TIME (min)	INSULIN (μ U/ml)
0	4 -- 24
30	25 -- 231
60	18 -- 276
120	16 -- 165
180	4 -- 38

*Based on a statistical analysis of the data of Morgan and Holland.⁽⁵⁾

(5) Morgan, C.R., and Holland, W.M. III, Diabetes, 1966.

5. Growth Hormone

Method:

Radioimmunoassay technique - the hormone from the unknown specimen is made to compete with a fixed amount of isotope-labeled hormone (added to the unknown serum) for binding sites on

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

antibodies contained in a highly specific antiserum. Quantitated in a radiation counter, counts are fewer or greater in number depending upon the amount of growth hormone in unknown specimen.

Clinical Use:

Less than normal growth of humans or Dwarfism - hyposecretion of growth hormone by the pituitary gland.

Pituitary Giantism - hypersecretion of growth hormone.

Acromegaly - hypersecretion of growth hormone, characterized by gradual deformation of the bones particularly of the face, hands and feet.

Comment:

10% of dwarfism in childhood may be caused by hyposecretion of growth hormone. It is important to distinguish these as early as possible since therapy with human growth hormone is effective. Since low levels are not significant, response to a challenge test is required.

A single, individual result is not significant in hypopituitarism, more information is usually obtained by the challenge tests.

Normal Range: The literature to date gives the following information for the fasting state.

BASAL:	Adult Male:	0.8 nanograms/ml.
	Adult Female:	0.30 nanograms/ml.*
	Children:	0.10 nanograms/ml.

*(Lowest levels are found during basal conditions. Values in the upper end of this range may occur with special conditions such as Turner's syndrome, malnutrition, anorexia nervosa, obesity, or when high free fatty acid levels are present in the fasting state.)

FOLLOWING CHALLENGE: (The GH response to challenge is usually less in children than in adults)
INSULIN: 30 min. to 2 hrs. after satisfactory insulin challenge: Baseline value increases 3-50 fold.
ARGININE: 30 min. to 1 hr. after appropriate arginine monohydrochloride* infusion: Male: Baseline value increases up to 3 fold. Female: Baseline value increases up to 10 fold. In general a rise in growth hormone concentration of 5 to 10 nanograms is considered a positive response to insulin and arginine stimulation tests. ⁽¹⁾
GLUCOSE: 30 min.-2 hrs. after 100g. glucose ingestion: Male or Female: Baseline value decreases to 0.3 nanograms/ml.

*Available from Cutter Laboratories as R-Gene®

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS 100%

6. Renin

Methods:

Bioassay - measures the amount of angiotensin II formed in the patient's plasma "in vitro" during a fixed time - temperature period.

Radioimmunoassay - the angiotensin I formed is incubated with specific antibody and ^{125}I -angiotensin I. The amount of ^{125}I -angiotensin I bound to antibody decreases with an increase in plasma angiotensin I as a result of competition for antibody sites.

Clinical Use: (See Page 20)

Clinical Use:

Recent reports on the renin-angiotensin system in various conditions in man*

Condition	PRA	Remarks
Physiologic		
Na depletion	+	—
Thiazide, short-term	+	—
long-term	0	—
long-term	+	Added sodium restriction
Cold pressor stimulation	+	—
Upright posture	+	—
Pharmacologic		
Catecholamines	+	—
Reserpine	—	—
Clonidine HCl (Catapres)	—	—
Hydralazine	+	—
Furosemide	+	—
Oral contraceptives	0, +	Also increases renin substrate
Sodium nitroprusside	+	—
Pregnancy		
Normal	+	—
Toxic	+	Less than normal increase seen
Renal disease		
Glomerulonephritis	0	Canine experimental
Glomerulonephritis	0	Human nephritis
Nephrosis	+	—
Bilateral ectomy	—	—
Transplant	0	Normal response to stimuli
Obstructive nephropathy with hypertension	+	—
Hypertension		
Renovascular	±	—
	+	Renal vein difference significant
Essential	—, 0	Response to stimuli sluggish in 25% of cases, especially in Negro
Malignant	+	—
Coarctation	0	—
Hypotension		
Postural	—	No rise with posture
Endocrine diseases		
Primary aldosteronism	—	—
Licorice hypertension	—	—
Bartter's syndrome	+	—
"Pseudoaldosteronism"	—	—
Pheochromocytoma	+	—
Congenital adrenal hyperplasia	+	Aldosterone secretion decreased DOC formed by lack of 11-hydroxylase
Miscellaneous diseases		
Cirrhosis with edema	+	—

PRA: + == increased; — == decreased; 0 == no change.

DOC == desoxycorticosterone.

* Drawn in most part from the medical literature, 1968 to 1969.

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

Comment:

NORMAL RANGES:
Bioassay:

PURPOSE AND CLINICAL CONDITION	Values in nanograms/100 ml. plasma	
	RECUUMBENT (before arising, 7-8 A.M.)	UPRIGHT (following 4 hrs. of quiet, upright activity, about 12 noon)
To screen hypertensive patients:	(pt. off medication and on normal diet and salt as recommended below for three days prior to sampling)	
Normal	30-330*	73-450*
"Idiopathic" hypertension	Values usually fall within above range	Values usually fall within above range
Renovascular hypertension	335-870†	Usually elevated†
Frank primary aldosteronism	Very low (approaches zero)	Very low (approaches zero)
Malignant hypertension	450-4000‡	Markedly elevated
To support tentative diagnosis of primary aldosteronism:	(pt. on low salt diet; no more than 10 meq./day for three days prior to sampling)	
Normal Response	25%-1000% ** increase over baseline values obtained under screening conditions above	20%-225% ** increase over baseline values obtained under screening conditions above
Frank primary aldosteronism	Very low (approaches zero)	Very low (approaches zero)
Possible primary aldosteronism	Low values	Low values

*95% confidence limits calculated by log transformation from the data of Gunnells, et al (1)
 †Range (not statistical limits) found by Gunnells, et al (2) on patients evaluated, for renovascular hypertension, 13 patients; for malignant hypertension, 13 patients.
 **Range (not statistical limits) found by Gunnells for 16 patients.
 ‡Brown, et al (3) report that 75% of pts. with renal artery stenosis exhibit elevated renin levels, with severity correlating with degree of renin elevation.

Radioimmunoassay:

Renin activity is expressed as ng of angiotensin I released per ml of plasma per hour. For the upright position and normal salt intake in adults, the following range was established at Bio-Science Laboratories:

Normal Range = 0.4 - 4.5 ng/ml/hr.

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

7. Gastrin

Methods:

Radioimmunoassay - the serum gastrin is made to compete with a fixed amount of isotope - labeled synthetic gastrin for binding sites in an antiserum containing antibodies of high specificity.

Clinical Use:

Zollinger-Ellison (Z-E) syndrome - elevated serum gastrin levels, cases have been reported between 600-300,000 pg per ml.

Peptic ulcer disease - serum gastrin level of 400 pg/ml is not exceeded normally.

Pernicious anemia - elevated serum gastrin levels, disorder is characterized by the inability to secrete gastric HCl which can be quickly repaired by the intragastric infusion of 0.1N HCl.

Comment:

Normal range: Non-detectable to 300 pg gastrin/ml serum. Levels are considered elevated when clearly over 500 pg/ml. There is no statistically significant difference between the mean fasting serum gastrin level in patients with ulcer disease other than the Z-E syndrome and a population of patients without recognized ga-trointestinal diseases matched for age and sex.

ADRENAL MEDULLARY HORMONES

1. Catecholamines

Methods:

Determination of both the activation on fluorescence spectra with a recording spectrofluorometer of the urinary catecholamines.

Clinical Use:

Pheochromocytoma - elevated levels of urinary catecholamines.

Progressive muscular dystrophy - increased output of catecholamines.

Myasthenia gravis - increased output of catecholamines.

Comment:

The determination of urinary catecholamines correlates well with the clinical state but there are situations which may lead to elevated levels not related to pheochromocytoma such as vigorous exercise prior to urine collection.

Medications which will lead to fluorescent urinary products are:

- antihypertensive drugs of the alphas-methyl dopa configuration
- tetracycline antibiotics
- large doses of the B vitamin complex
- adrenaline and adrenaline-like drugs used in asthmatic seizures
- carbon tetrachloride
- erythromycin
- hydralazine, quinine, quinidine, methenamine and formaldehyde.

Patients should be off such medications at least for one week.

2. Vanillylmandelic Acid (VMA)

Methods:

VMA is extracted from urine, oxidized to vanillin with periodate, vanillin is then purified by solvent partition and quantitated by its absorbance in the near ultraviolet (360 m μ).

Clinical Use:

- a) confirmation of elevated catecholamine excretion
- b) unexplained hypertension with normal catecholamine levels.
- c) Neuroblastoma - produces high levels of VMA

Comment:

Medications, i.e. anilevidine, aspirin and methocarbamol and foods, i.e. coffee, fruits (bananas) and substances containing vanilla should be excluded before collecting sample.

Normal Range: 0.7-6.8 mg/24 hrs.

3. Metanephrines

Methods:

Urine is hydrolyzed, the metanephrines are separated by Amberlite CG-50 cation exchange resin and oxidized by periodate to vanillin which is assayed spectrophotometrically at 360 ~~nm~~.

Clinical Use:

Parameter for determining the abnormal catecholamine production.

Comment:

Normal range: 0.3-0.9 mg/24 hrs.

4. Homovanillic Acid (HVA)

Methods:

Colorimetric determination - HVA reacts with nitrosonaphthol in nitrous acid and produces the color.

Clinical Use:

Neuroblastomas
Ganglioneuromas

Comment:

Certain cases of neurological tumors show that the urinary abnormality consists almost entirely of excessive excretion of dopamine and its metabolite, HVA.
Normal range: up to 15 mg/24 hrs.

ENZYMES

1. Glutamic-Oxalacetic-Transaminase (SGO-T)

Method:

Clinical Use:

Myocardial infarction - following infarction serum SGO-T level begins to rise in about 4-6 hours. A peak level ranging from 2-20 times the upper limit of normal occurs within 24-48 hours after the onset.

Pulmonary embolism - increased levels.

Congestive failure with infarcts and other organs - increased levels.

Pancreatitis - increased levels

Skeletal muscle damage (including post-surgery) - increased levels.

Myositis - increased levels.

Liver diseases - SGP-T is actually more sensitive than SGO-T to hepatocellular damage.

Neurological disorders - increased levels, they are not consistently altered in cases of brain tumors.

Comment:

Since SGO-T is found in all tissues, it is not unexpected that a false positive would occur in certain disease states. In a suspected case of myocardial infarction a sample should be taken as soon as possible to use as a baseline, and to take serial determinations for several days.

Normal values: in serum 12-40 units
in spinal fluid 5-73 units.

2. Serum Glutamic-Pyruvic Transaminase (SGP-T)

Methods:

Clinical Use:

Liver disease - in acute hepatitis or carbon tetrachloride poisoning values over 500 units are usually found.
Acute myocardial infarction - increased levels except in extensive necrosis or hepatic damage resulting from congestive heart failure.

Comment:

In hepatitis the elevations of SGP-T and SGO-T begins several weeks before other tests indicate liver damage. In cirrhosis and metastatic carcinoma levels are quite variable.
Normal values: 11-66 units in male, 5-53 units in female.

3. Lactic Dehydrogenase (LDH)

Methods:

Clinical Use:

- a) Serum LDH elevations in: cirrhosis, hepatitis, metastatic involvement of the liver, pulmonary embolism, progressive muscular dystrophy, megaloblastic anemia, infectious mononucleosis, infarction, transplantation and homograft rejection.
- b) LDH increases in cerebrospinal fluid in: degenerative diseases of the central nervous system, convulsive disorders, head injuries, subarachnoid hemorrhage, meningitis, lymphoma, leukemia, carcinoma.
- c) LDH activity of pleural and peritoneal effusions increased in: containing or in contact with malignant cells.
- d) Elevated levels in urine LDH in: cancer of kidneys or bladder, in glomerulonephritis, malignant hypertension, lupus nephritis, acute tubular necrosis, renal transplantations and homograft rejection, sometimes in pyelonephritis.

Comment:

Normal values of LDH:

- a) in serum - 63 to 155 units in male; 62-131 units in female.
- b) in spinal fluid - 13 to 80 units.
- c) in urine - up to 8300 units/8 hrs.

4. LDH Isoenzymes

Methods:

Clinical Use:

Myocardial infarction - isoenzymes one and two increases in serum.

Liver disease - isoenzyme five increases

Comment:

Normal values:

ISOENZYME	% OF TOTAL ACTIVITY	TYPE
1	15-30	Cardiac
2	22-50	Cardiac
3	15-30	---
4	0-15	---
5	0-15	Hepatic

5. Aldolase

Methods:

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

Clinical Use:

Acute viral hepatitis - markedly elevated levels.

Progressive muscular dystrophy - high elevated levels.

Myocardial infarction - elevated levels.

Acute pancreatitis - elevated levels.

Diseases involving tissue damage - elevated levels.

Comment:

Normal range: 13-31 units in male, 11-22 units in female.

6. Creatine Phosphokinase

Methods:

Clinical Use:

Myocardial infarction
Progressive muscular dystrophy
Polymyositis
Hypothyroidism
Muscular trauma
Myonecrosis
Myoglobinuria
Severe physical exertion

Comment:

Normal range: up to 4.3 units in male, up to 2.5 units in female.
No elevated levels in pulmonary infarction or in parenchymal liver damage.

7. α -Hydroxybutyric Dehydrogenase (HBD)

Methods:

Clinical Use:

Myocardial infarction

Large increase in HBD - activity:
Progressive muscular dystrophy
Nephrotic syndrome
Malignant melanoma
Lymphoma
Leukemia
Megaloblastic anemia

Chronic and acute liver diseases

Comment:

Normal range: 140-350 units. It has been reported that elevation of HBD is more specific and prolonged than that of SGO-T or LDH in cases of myocardial infarction.

8. Isocitric Dehydrogenase (ICD)

Methods:

Clinical Use:

Liver diseases - ICD levels are sensitive reflections of acute hepatic necrosis.

Comment:

Normal range: 50-260 units.

9. 5'-Nucleotidase

Methods:

Clinical Use:

Liver diseases

Comment:

Normal range: 0-1.6 units. In liver diseases the activity of 5'-Nucleotidase parallels the serum alkaline phosphatase but does not increase in rickets or Paget's disease.

10. Alkaline Phosphatase Isoenzymes

Methods:

Determination of the percent thermostable fraction of serum AP - an aliquot of serum is heated for 10' at 56°, the AP concentration of unheated and heat treated serum is then determined.

Clinical Use:

The percent thermostable fraction has no significance for serum AP values in the normal range, but for elevated serum AP levels.

- a) Values of greater than 35%. Hepatic disease or disease with liver being the predominant tissue involved.
- b) Values of 25% to 35%. A combination of hepatic and skeletal disease in various proportions.
- c) Values of less than 25%. Skeletal disease with increased osteoblastic activity.

Paget's disease of bone - liver isoenzyme responsible for elevated AP.

Malabsorption - bone isoenzyme elevated.

Cirrhotics - intestinal isoenzyme mostly responsible for elevated AP.

Tumors - the so-called Regan isoenzyme has been found in about 3% of patients with variety tumors.

Comment:

Normal range: total serum AP activity is 4-17 (King-Armstrong Units).

Revealing the thermolability of bone enzyme and the relative thermostability of liver AP, it was concluded that hypatobiliary enzyme could be distinguished from skeletal enzyme by heating for 10 min. at 56°.

11. Gamma Glutamyl Transpeptidase (GGT)

Methods:

Note: GGT enzyme test is an exquisitely sensitive measure of pathological processes occurring in the liver.

Clinical Use:

Note: GGT enzyme test is an exquisitely sensitive measure of pathological processes occurring in the liver.

Chronic and subacute hepatitis - increased GGT - level.

Cirrhosis of the liver - increased GGT - level.

Intra- or extrahepatic obstruction disease - elevated GGT - level.

Malignancies in liver, bile ducts, head of the pancreas - markedly increased GGT-level.

Detection of liver damage due to alcoholism - GGT determination is more sensitive than the transaminases.

Comment:

Normal range in serum is for males under 28 mU/ml, for females under 18 mU/ml, for adolescents under 45 mU/ml.

12. Red Cell Enzymes

Methods:

G-6-PD Quantitative test

Red Cell Enzyme Screening Tests (G-6-PD Screening test - visual detection of a fluorescent spot is consistent with the presence of the enzyme in the hemolysate, while a dark UV-adsorbing spot indicates absence of the enzyme).

Clinical Use:

Glucose-6-Phosphate Dehydrogenase (G-6-PD) Deficiency - three major types of G-6-PD-deficiency:

- a) type A, found in black subjects
- b) Mediterranean type, found in Caucasians and Orientals
- c) the rare congenital, non-spherocytic anemia

Pyruvate Kinase deficiency - hemolytic anemia, no additional distinguishing or pathognomonic clinical features.

Triosephosphate Isomerase (TPI) deficiency - red cell TPI deficiency shows a severe hemolytic anemia together with a progressive neurologic disorder.

NADH Diaphorase deficiency - accumulation of methemoglobin which is characterized in life-long cyanosis.

Glutathione Reductase - congenital non-spherocytic hemolytic anemia.

APPENDIX 7

VIRUSES WHICH REQUIRE PURIFICATION

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/Test/Titer)	Bacterial Sterility	Mycoplasma	Refer.
V-001-511-553	Picornavirus Enterovirus Poliovirus	1	LSc 2ab	Other viruses (Virus/test/titer) Coxsackie A-9 (Griggs) Coxsackie B-3 (Nancy) ECHO 4 (DuToit) ECHO 11 (Gregory)	ECHO 11/SN/10 vs 26TCID ₅₀ Neg	--	44, 47
V-002-511-560	Picornavirus Enterovirus Polio	2	P-712	Other viruses (Virus/test/titer) Polio Types 1, 3 Coxsackie A Types 7, 9 Coxsackie B Types 1-6 ECHO Types 1-32	Polio 1/SN/1:58 Polio 3/SN/1:20 Neg	--	44, 47
V-005-501-563	Picornavirus Enterovirus Coxsackie	A-2	Fleetwood	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1, 2, 3 Simian-27 Types	SV-6/SN/1024 SV-19/SN/128 Neg	--	28, 145*
V-006-501-563	Picornavirus Enterovirus Coxsackie	A-3	Antiserum	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1, 2, 3 Simian Types-27 types	Coxsackie A-8/SN≥16 SV-19/SN/256 Coxsackie A-17/CF/17 SV-29/SN/2048 Coxsackie A-19/CF/16 Coxsackie A-20/CF/24 Coxsackie A-24/CF/32 SV-32/SN/1:32 Neg SV-37/SN/1:32	--	28, 145*
V-007-501-563	Picornavirus Enterovirus Coxsackie	A-4	Alabama 4-CDC	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1, 2, 3 Simian-27 Types	Coxsackie A-5/CF/32 Neg SV-32/SN/64 SV-37/SN/32 SV-19/SN/760	--	28, 145*

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	References	
V-008-501-563	Picornavirus Enterovirus Coxsackie	A-5	Swartz	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A3/SN/1:32 Coxsackie A-12/SN(both M&TC)/ \leq 1:80 Coxsackie A-12/CF/1:28 (recip cross) ECHO 18/SN/1:16 Coxsackie A-18/CF/1:30 (recip cross) Coxsackie A-14/CF/1:64 Coxsackie A-17/CF/1:32 (recip cross) Coxsackie A-20/CF/1:16 (recip cross) SV-27/SN/1:64 SV-37/SN/1:25 SV-19/SN/1:32	Neg --	28, 145*	
V-009-501-563	Picornavirus Enterovirus Coxsackie	A-6	Gdula	Other Viruses(Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-2/CF/1:128 Coxsackie A-4/CF/1:128 Coxsackie A-5/CF/1:128 Coxsackie A-12/CF/1:128 Coxsackie A-14/CF/1:128 Coxsackie A-16/CF/1:90	Neg --	28, 145*	
V-010-501-563	Picornavirus Enterovirus Coxsackie	A-7	AB-IV (USSR)	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-5/SN inM/ \geq 1:80 Coxsackie A-8/SN(both M&TC) \geq 1:20 ECHO 23/SN/1:16 SV-32/SN/1:32 Coxsackie A-14/CF/1:45 SV-37/SN/1:64 Coxsackie A-16/CF/1:32 SV-6/SN/1:1600 Coxsackie A-17/CF/1:20 SV-25/SN/1:512 Coxsackie A-20/CF/1:20 SV-35/SN/1:5000	Neg --	28, 145*	
V-011-501-563	Picornavirus Enterovirus Coxsackie	A-8	Donovan	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Cox A-3/SN/1:20 (recip cross) Cox A-3/CF/1:90 Cox A-5/SN/ \geq 1:120 Cox A-5/CF/1:56 Cox A-10/SN/1:175 (recip cross) Cox A-10/CF/1:45 Cox A-12/SN/1:24 Cox A-12/CF/1:256	Cox A-14/CF/1:128 Cox A-20/CF/1:32 SV-30/SN/1:25 SV-32/SN/1:32 SV-37/SN/1:32 SV-6/SN/1:800	Neg --	28, 145*

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	References
V-012-501-563	Picornavirus Enterovirus Coxsackie	A-9	P.B(Bozek)	Other viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1-18 Simian - 27 Types	Coxsackie A-6/CF/1:24 Coxsackie A-10/CF/1:24 Coxsackie A-11/CF/1:32 Coxsackie A-23/CF/1:24 Coxsackie A-24/CF/1:24 SV-32/SN/1:32 SV-29/SN/1:40	Neg	-- 28, 145*
V-013-501-563	Picornavirus Enterovirus Coxsackie	A-10	Kowalik	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-8/SN/1:24 (recip cross) Coxsackie A-24/SN/≥1:16 ECHO 21/SN/1:16 Coxsackie A-5/CF/1:24 (recip cross) Coxsackie A-7/CF/1:24 Coxsackie A-14/CF/1:32 SV-32/SN/1:64 SV-37/SN/1:25 SV-6/SN/1:800 SV-29/SN/1:128 Neg	Neg	-- 28, 145*
V-014-501-563	Picornavirus Enterovirus Coxsackie	A-11	Belgium-1	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-17/SN/1:16 ECHO 23/SN/1:16 Coxsackie A-2/CF/1:16 SV-32/SN/1:100 Neg SV-37/SN/1:25 SV-6/SN/1:800 SV-19/SN/1:32 SV-40/SN/1:40	Neg	-- 28, 145*
V-015-501-563	Picornavirus Enterovirus Coxsackie	A-12	Texas-12	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A5/CF/1:128 (recip cross) Coxsackie A-14/CF/1:45 SV-32/SN/1:64 SV-37/SN/1:128 Neg SV-4/SN/1:64	Neg	-- 28, 145*
V-016-501-563	Picornavirus Enterovirus Coxsackie	A-13	Flores	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-5/CF/1:16 Neg Coxsackie A-11/SN/1:16 Coxsackie A-18/SNinTC/1:100 (recip cross) Coxsackie A-18/SNinM/1:570 (recip cross) SV-32/SN/1:32 SV-19/SN/1:64 SV-4/SN/1:32	Neg	-- 28, 145*

Catalog #	Virus Group	Type Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	References
V-017-501-563	Picornavirus Enterovirus Coxsackie	A-14 G-14	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	ECHO 23/SN/1:16 SV-27/SN/1:24 SV-32/SN/1:32 SV-37/SN/1:32 SV-29/SN/1:100	Neg	-- 28, 145
V-018-501-563	Picornavirus Enterovirus Coxsackie	A-15 G-9	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	SV-27/SN/1:32 SV-32/SN/1:32 SV-36/SN/1:40 SV-37/SN/1:32 SV-19/SN/1:32 SV-4/SN/1:64	Neg	-- 28,145 *
V-019-501-563	Picornavirus Enterovirus Coxsackie	A-16 G-10	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-4/CF/1:128 Coxsackie A-15/CF/1:32 Coxsackie A-23/CF/1:128 SV-32/SN/1:32 SV-37/SN/1:25 SV-19/SN/1:25 SV-29/SN/1:640 SV-4/SN/1:50	Neg	-- 28, 145
V-020-501-563	Picornavirus Enterovirus Coxsackie	A-17 G-12	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Coxsackie A-24/SNinTC/≥1:16 (recip cross) Coxsackie A-24/SNinM/1:28 ECHO 17/SN/≅1:20 ECHO 21/SN/1:16 Coxsackie A-5/CF/1:32 (recip cross) SV-17/SN/1:25 SV-37/SN/1:32	Neg	-- 28, 145
V-021-501-563	Picornavirus Enterovirus Coxsackie	18 G-13	Simian-27 Types Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3	Coxsackie A-13/SN(TC)/≥1:256 (recip cross) Coxsackie A-13/SN(M)/1:2100 (recip cross) Coxsackie A-11/SN/1:17 Coxsackie A-14/SN/1:32 ECHO 5/SN/≥1:16 SV 32/SN/1:32 SV 37/SN/1:100 SV 4/SN/1:128	Neg	-- 28, 145*

Catalog #	Virus Group	Type Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	References
V-023-501-563	Picornavirus Enterovirus Coxsackie	A-20 I.H.35	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian-27 Types	Neg Cox A-8/SNinTC≥1:32 ⁸ Cox A-17/SNinSM/1:80 Cox A-20a/SNinSM/>1:2000 Cox A-20a/CF/1:28 (recip cross) Cox A-20b/SNinSM/>1:1260 Cox A-5/CF/1:16 (recip cross) Cox A-6/CF/1:64 SV-32/SN/1:25 SV-37/SN/1:40 SV-6/SN/1:250 SV-4/SN/1:64	-- Cox 8-8/SNinM/1:20 ^{28, 145*} Cox A-20a/SNinTC/1:800 Cox A-20b/SNinTC/1:1600 ECHO 31/SN/1:32	
V-023A-501-563	Picornavirus Enterovirus Coxsackie	A-20a Tulane 1623	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3	Coxsackie A-20/SN(TC)/1:40 (recip cross) Coxsackie A-20/SN(M)/1:130 (recip cross) Coxsackie B-20b/SN(TC)/1:125 (recip cross) Coxsackie B-20b/SN(M)/1:400 (recip cross) SV-32/SN/1:25 SV-29/SN/1:320 SV-4/SN/1:128 Neg	-- 28, 145*	
V-023B-501-560	Picornavirus Enterovirus Coxsackie	A-20b Cecil	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1,2,3 Simian 27 Types	Coxsackie A-20/SNinTC/1:400 Coxsackie A-20/SNinM/≥1:1260 Coxsackie A-20/CF/1:80 Coxsackie A-20a/SNinM≥1:2000 Coxsackie A-20a/CF/1:64 (recip cross) SV-32/SN/1:40 SV-37/SN/1:128 SV-35/SN/1:50 Neg	-- 28, 145*	
V-024-501-563	Picornavirus Enterovirus Coxsackie	A-21 Kuykendall	Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1, 2, 3 Simian-27 Types	ECHO 23/SN/≤1:16 Neg Coxsackie A-5/CF/1:32 Coxsackie A-12/CF/1:32 Coxsackie A-14/CF/1:20 SV-15/SN/1:32 SV-37/SN/1:25 SV-37/SN/1:64 SV-19/SN/1:100 SV-29/SN/1:128	-- 28, 145*	
V-025-501-563	Picornavirus Enterovirus Coxsackie	A-22 Chulman	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1, 2, 3 Simian-27 Types	Coxsackie A-20a/CF/1:24 Neg	-- 28, 145*	

Catalog #	Virus Group	Type	Strain	Other Viruses (Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.
V-027-501-563	Picornavirus Enterovirus Coxsackie	A-24	Joseph	Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-32 Adeno Types 1-18 Reovirus Types 1, 2, 3 Simian-27 Types	Coxsackie A-17/SN in TC/ 1:24 (recip cross) Coxsackie A-17/SN in SM/1:16 (recip cross) ECHO 23/SN/1:32 Coxsackie A-4/CF/1:32 SV-27/SN/1:25 SV-37/SN/1:64	Neg	-- 28, 145*
V-028-501-563	Picornavirus Enterovirus Coxsackie	B-1	Conn-5	Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-30 Adeno Types 1-18 Simian-27 Types	Coxsackie B-5/SN/1:160 SV-4/SN/1:32 SV-23/SN/1:20 SV-32/SN/1:25 Coxsackie B-6/CF/1:16	Neg	-- 102, 117* 152*
V-029-501-563	Picornavirus Enterovirus Coxsackie	B-2	Ohio-1	Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-30 Adeno Types 1-18 Simian-27 Types	SV-4/SN/1:32 SV-23/SN/1:16 SV-27/SN/1:20 SV-31/SN/1:16 Coxsackie B-2/CF/1:32 Coxsackie B-6/CF/1:32	SV-19/SN/1:40 SV-26/SN/1:20 SV-29/SN/1:16 SV-32/SN/1:32 Neg	-- 102, 117* 152*
V-030-501-563	Picornavirus Enterovirus Coxsackie	B-3	Nancy	Polio Types 1, 2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-30 Adeno Types 1-18 Simian-27 Types	ECHO 7/SN/1:16 SV-19/SN/1:100 SV-27/SN/1:20 SV-32/SN/1:40 Coxsackie B-17/CF/1:16 Coxsackie B-6/CF/1:16	SV-4/SN/1:32 SV-24/SN/1:20 SV-31/SN/1:18 Neg	-- 102, 117* 152*
V-031-501-563	Picornavirus Enterovirus Coxsackie	B-4	JVB	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-30 Adeno Types 1-18 Simian-27 Types	SV-1/SN/1:16 SV-20/SN/1:16 SV-26/SN/1:20 Coxsackie B-1/CF/1:16 Coxsackie B-6/CF/1:16	SV-4/SN/1:32 SV-24/SN/1:20 SV-32/SN/1:25 Neg	-- 102, 117* 152*
V-032-501-563	Picornavirus Enterovirus Coxsackie	B-5	Faulkner	Polio Types 1, 2, 3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-30 Adeno Types 1-18 Simian-27 Types	SV-4/SN/1:40 SV-23/SN/1:20 SV-26/SN/1:20 SV-27/SN/1:20 SV-32/SN/1:16 Coxsackie B-1/CF/1:16 Coxsackie B-6/CF/1:16	Neg	-- 102, 117* 152*

Catalog #	Virus Group	Type Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	References	
V-033-501-563	Picornavirus Enterovirus Coxsackie	B-6 Schmitt	Polio Types 1,2,3 Coxsackie A Types 1-24 Coxsackie B Types 1-6 ECHO Types 1-30 Adeno Types 1-18 Simian-27 Types	SV-30/SN/1:16 SV-31/SN/1:32 SV-32/SN/1:40 Coxsackie B01/CF/1:64	Neg	--	102, 118*, 152*
V-034-501-560	Picornavirus Enterovirus ECHO	1 Farouk	Polio Types 1,2,3 Coxsackie A Types 7,9 Coxsackie B Types 1-6 ECHO Types 2-32	ECHO 8/SN/1:300	Neg	--	
V-034-501-563	Picornavirus Enterovirus ECHO	1 Farouk	Polio Types 1,2,3 Coxsackie A Types 7, 9, 11, 13, 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	ECHO 8/CF/1:128 (recip cross) ECHO 8/SN/1:1000 SV-20/SN/1:20 SV-25/SN/1:20 Sv-34/SN/1:20	Neg	--	99*
V-036-501-563	Picornavirus Enterovirus ECHO	3 Morrisey	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 7,9,11 13, 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	ECHO 7/SN/1:100 SV-10/SN/1:32	Neg	--	99*
V-037-501-563	Picornavirus Enterovirus ECHO	4 Pesascek	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 7, 9, 11 13, 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	Adeno 8/SN/1:320 SV-19/SN/1:80 SV-23/SN/1:16	Neg	--	99*

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Reference
V-038-501-560	Picornavirus Enterovirus ECHO	5	Noyce	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 7, 9 Coxsackie B Types 1-6 ECHO Types 1-4, 6-32	ECHO 3/SN/1:200 ECHO 8/SN/1:56 ECHO 11/SN/1:16 ECHO 12/SN/1:250 ECHO 19/SN/1:23	Neg	--
V-038-501-563	Picornavirus Enterovirus ECHO	5	Noyce	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 7,9,11, 13, 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	SV-19/SN/1:80	Neg	-- 99 *
V-039-501-563	Picornavirus Enterovirus ECHO	6	D'Amori	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7,9,11,13 15, 18 Coxsackie B Types 1-25 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	ECHO 19/SN/1:30 Cox B3/SN1:40 SV-17/SN/1:20 SV-19/SN/1:20	Neg	-- 99*
V-039B-501-563	Picornavirus Enterovirus ECHO	6	Burgess	Other Viruses (Virus/test/titer) Polio Types 1,2,3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types	ECHO 14/SN/<1:32 SV-19/SN/1:32 SV-22/SN/1:20 SV-23/SN/1:16	Neg	-- 71, 99*
V-041-501-563	Picornavirus Enterovirus ECHO	8	Bryson	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types	ECHO 1/SN/1:3000 ECHO 1/CF/1:32 SV-17/SN/1:24 SV-22/SN/1:20 SV-23/SN/1:80 SV-26/SN/1:20	Neg	-- 99*

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial			Refer.
					Sterility	Mycoplasma		
V-042-511-563	Picornavirus Enterovirus ECHO	9	Visop	Other Viruses(Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 3, 7-18, 20a, 20b, 20c, 21, 23, 24 Coxsackie B Types 1-6 ECHO Types 1-28 Reovirus Types 1, 2, 3 Enterovirus Type 59+Candidates Caldwell & Pett	Coxsackie A-23/SN/1:4096	Neg	Neg	145*
V-044-501-563	Picornavirus Enterovirus ECHO	11	Gregory	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 12 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	ECHO 17/SN/<1:128 ECHO 19/SN/<1:32 SV-12/SN/1:20 SV-15/SN/1:20 SV-17/SN/1:20 SV-18/SN/1:20 SV-22/SN/1:16 SV-26/SN/1:20	Neg	--	99*
V-045-501-563	Picornavirus Enterovirus ECHO	12	Travis	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 3, 7 - 18, 20a, 20b, 20c, 21, 23, 24 Coxsackie B Types 1-6 ECHO Types 1-28 Reovirus Types 1, 2, 3 Enterovirus Type 59 + Candidates Caldwell + Pett	ECHO 1/SN/1:256 ECHO 1/CF/1:128	Neg	--	99* 156
V-046-501-563	Picornavirus Enterovirus ECHO	13	DelCarmen	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian - 21 Types	Coxsackie A-7/SN/1:25 SV-19/SN/1:20 SV-22/SN/1:20 SV-23/SN/1:16	Neg	--	99*

Catalog #	Virus Group	Type Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.
V-049-501-563	Picornavirus Enterovirus ECHO	16 Harrington	Other Viruses(Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	ECHO 17/SN/1:40 Adeno 3/SN/1:16 SV-15/SN/1:20 SV-17/SN/1:16 SV-18/SN/1:16	Neg	-- 99*
V-050-501-563	Picornavirus Enterovirus ECHO	17 CHHE 29	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types	Adeno7/SN<1:16 SV-17/SN/1:20 SV-19/SN/1:20	Neg	-- 99 *
V-052-501-563	Picornavirus Enterovirus ECHO	19 Burke	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15,18 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types	ECHO 7/SN/<1:16 ECHO 11/SN<1:40 SV-17/SN/1:16	Neg	-- 99*
V-053-501-563	Picornavirus Enterovirus ECHO	20 JV-1	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13, 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types	SV-12/SN/1:23 SV-18/SN/1:20 SV-20/SN/1:20 SV-23/SN/1:20 ECHO 21/CF/1:64	Neg	SV-17/SN/1:32 SV-19/SN/1:20 SV-22/SN/1:20 SV-27/SN/1:16 -- 99*

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref
V-055-501-563	Picornavirus Enterovirus ECHO	22	Harris	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1 - 6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	Coxsackie B-4/SN/≤1:64 SV-17/SN/1:24 SV-27/SN/1:20	Neg	-- 99*
V-056-501-563	Picornavirus Enterovirus ECHO	23	Williamson	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian - 21 Types	ECHO 11/SN/≤1:16 ECHO 22/SN/ 1:256 Coxsackie A-9/SN/≥1:16 Coxsackie B-4/SN≥1:16	Neg	-- 99*
V-057-501-563	Picornavirus Enterovirus ECHO	24	DeCamp	Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	ECHO 19/SN/1:63 Coxsackie B-4/SN/≥1:50 SV-17/SN/1:32 SV-27/SN/1:20	Neg	-- 99*
V-058-501-563	Picornavirus Enterovirus ECHO	25	JV-4	Other viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxsackie A Types 7, 9, 11, 13, 15, 18 Coxsackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types	Coxsackie B-4/SN/≥1:16 SV-1/SN1:25	--	-- 99*
V-113-501-053	Picornavirus Rhinovirus	1B	B-632	Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(k779), 2, 3, 4, 5, 6, 12, 14, 15, 16, 17, 23 (100319), 34, 35, 36, 37, 39, 40, 41, 42, 42(248A0, 44, 49.	Rhinovirus type 1B(K778)/SN/1:192	Neg	-- --

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref.
V-107-501-053	Picornavirus Rhinovirus	2	HGP	Other viruses (Virus/Test/Titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 56, 37, 39, 40, 41, 42, 42(248A), 44, 49.	Rhinovirus type 2/SN/1:64 Neg	--	--
V-119-501-053	Picornavirus Rhinovirus	3	Antiserun	Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26 (127-1), 29(179E), 30, 31, 32, 33, 34, 35, 56, 37 39, 40, 41, 42, 42(248A), 44, 49	Rhinovirus type 17/SN/1:48 Neg	--	--
V-120-501-053	Picornavirus Rhinovirus	6	Thompson	Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.	Rhinovirus type 35/SN/1:48 Neg	--	--
V-102-501-053	Picornavirus Rhinovirus	13	353	Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.	Rhinovirus type 41/SN/1:48 Neg	--	--
V-140-511-053	Picornavirus Rhinovirus	23	100319	Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (1000319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.	Rhinovirus type 49/SN/1:256 30/SN/1:48 Neg	--	--
V-108-501-053	Picornavirus Rhinovirus	32	363	Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(779), 2, 3 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.	Rhinovirus type 1A/SN/1:384 Neg	--	--

Catalog #	Virus Group	Type Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref.
V-167-511-053	Picornavirus Rhinovirus	42 248A	Other viruses (virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16 17, 23(100319), 26(127-1), 29,(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43(248A), 44, 49.	Rhino.-5/SN/52 13/SN/>16 42/SN/512 17/SN/48 4/SN/48 26(127-1)/SN/32	Neg	-- 97, 119, 127, 134, 140, 147, 149, 155
V-116-501-053	Picornavirus Rhinovirus	49 8213	Other viruses (Virus/test/titer)	Rhinovirus type 2/SN/1:192 Neg	--	--
V-148-501-057	Picornavirus Rhinovirus	-- 611-CV35	Other viruses (Virus/test/titer) Coryzavirus Types 34 thru 54	CV41/SN/1:40	--	154A
V-207A-501-565	Adenovirus (Human)	7a S-1058	Other viruses (Virus/test/titer) Adeno Types 1 - 30	Adeno 11/HI/1:20-40 Adeno 14/HI/1:20-320	Neg	Neg 93, 138*
V-208-501-565	Adenovirus (Human)	8 Trim	Other viruses (Virus/test/titer) Adeno Type 1-30	Adeno 9/HI/1:320-1:640 Adeno 10/HI/1:40-1:80	Neg	Neg 93 138*
V-209-501-565	Adenovirus (Human)	9 Hicks	Other viruses (Virus/test/titer) Adeno types 1-30	Adeno 8/HI/1:60-1:320	Neg	Neg 93 138*
V-210-501-565	Adenovirus (Human)	10 J.J.	Other viruses (Virus/test/titer) Adeno Types 1 - 30	Adeno 19/HI1:160-1:820	Neg	Neg 92 138*
V-211-501-565	Adenovirus (Human)	11 Slobitski	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 7a/HI/1:40 Adeno 7a/SN/1:20-1:40 Adeno 14/HI/1:160-1:640 Adeno 14/SN/1:20-1:160 Adeno 21/SN/1:16-1:80	Neg	Neg 93 138*
V-212-501-565	Adenovirus (Human)	12 Huie	Other viruses (Virus/test/titer) Adeno Types 1-28	Adeno Type 18/SN/1:10-1:150 Neg	Neg	93 138*

Catalog #	Virus Group	Type Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref.	
V-214-501-565	Adenovirus (Human)	14 DeWit	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 7a/HI/1:10-1:160 Adeno 7A(SN)1:20-1:40 Adeno 11/HI/1:40 Adeno 11/SN/1:20-1:40	Neg	Neg	93 138*
V-215-501-565	Adenovirus (Human)	15 CH. 38	Other viruses (Virus/test/titer) Adenovirus type 1-30	Adeno 22/HI/1:20-1:80 Adeno 29/SN/1:160-1:640	Neg	Neg	93 138*
V-216-501-565	Adenovirus (Human)	16 CH79	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 4/SN/1:120-1:1280	Neg	Neg	93 138*
V-219-501-565	Adenovirus (Human)	19 3911	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 10/HI/indication of cross by some labs.	Neg	Neg	93 138*
V-223-501-565	Adenovirus (Human)	23 2732	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 15/SN1:30-1:256 Adeno 29/SN/indication of cross by some labs	Neg	Neg	93 138*
V-224-502-565	Adenovirus (Human)	24 3153	Other viruses (Virus/test/titer) Adenovirus types 1-30	Adeno 8/HI/1:40 Adeno 19/HI/1:40 Adeno 21/SN/1:20-1:80	Neg	Neg	93 138*
V-225-501-565	Adenovirus (Human)	25 BP-1	Other viruses (Virus/test/titer) Adenovirus types 1-30	Adeno 15/SN/Indication of cross by some labs	Neg	Neg	93 138*
V-229-501-565	Adenovirus (Human)	29 BR-6	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 15/SN/1:32-1:2560 Adeno 23/SN/1:16-1:160 Adeno 9 + Adeno/25/SN - indicated cross by some labs	Neg	Neg	93 138*
V-230-501-565	Adenovirus (Human)	30 BP-7	Other viruses (Virus/test/titer) Adeno Types 1-30	Adeno 13/SN/indicated cross by some labs	Neg	Neg	93 138*
V-231-501-565	Adenovirus (Human)	31 1315	Other viruses (Virus/test/titer) Adenovirus Types 1-30	Adeno T-12/SN/1:320 Adeno T-18/SN/1:20	Neg	Neg	41, 106, 124 148

Catalog #	Virus Group	Type Strain	Other Viruses (virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.	
V-301-501-552	Myxovirus	Infl.A Swine/ 1976/31	Other viruses (Virus/test/titer) Infl. A-PR-8, FM-1, Jap/305, Jap/305 Lot 2, Jap/170 Infl. B - Lee, GL, Md, Taiwan Infl. C - Taylor Para 1-HA-2, Sendai Para 2-Greer, SV-5 Para 3-SF-4, Mumps, NDV, Measles	A-PR-8/HI/1:20 A-FM-1/HI/1:20 B-Taiwan/HI/1:10 (K10 ₄) C-Taylor/HI/1:20 (RDE) 1:20 (K10 ₄)	Neg	Neg	--
V-301-511-552	Myxovirus	Infl.A PR-8/34	Other viruses (Virus/test/titer) Infl. A - Swine, FM-1, Jap/305 Jap/305 lot 2, Jap/170 Infl. B - Lee, GL, Md, Taiwan Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	B-Taiwan/HI/1:10 (RDE) 1:10 (K10 ₄) C-Taylor/HI/1:40 (RDE) 1:40 (K10 ₄)	Neg	Neg	--
V-301-521-552	Myxovirus	Infl. A-1 FM-1/47	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, Jap/305, Jap/305 lot 2, Jap/170 Infl. B - Lee, GL, Md, Taiwan Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	B-Taiwan/HI/1:10 (K10 ₄) C-Taylor/HI/1:20 (RDE) 1:20 (K10 ₄)	Neg	Neg	--
V-301-531-552	Myxovirus	Infl. A-2 Japan/305/ 57	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, FM-1, Jap/170 Infl. B - Lee, GL, Md, Taiwan Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	A-Jap/170/HI/1:800 B-Taiwan/HI/1:10 (K10 ₄) C-Taylor/HI/1:20 (RDE)	Neg	Neg	--

Catalog #	Virus Group Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.
V-301-541-552	Myxovirus	Infl. A-2 Japan/ 170/62	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, FM-1, Jap/305, Jap/305 lot Infl. B - Lee, GL, Md, Taiwan Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	A-Jap/305/HI/1:160 Neg A-Jap/305 lot 2/HI/1:160 B-Taiwan/HI/1:10 (K10 ₄) C-Taylor/HI/1:20 (RDE) 1:20 (K10 ₄)	Neg	--
V-301-551-552	Myxovirus	Infl. A-2 Taiwan/ 1/64	Other viruses (Virus/test/titer) Influ A: PR8/1-M-1/Swine/Equine-1 Equine-2/WS/Japan 170 Japan 305/Taiwan Influ B: Lee/Maryland/GreatLakes/ Taiwan/Singapore Influ C: Taylor Para 1 : HA-2 Para 2 : Greer/SV-5 Para 3 : S1--4 NDV	A-Japan-305/HI/1:80, SN/1:20 Japan-170/HI/1:40, SN/1:20	Neg	--
V-301-561-552	Myxovirus	Infl. A Equine- 1/Prague 56	Other viruses (Virus/test/titer) Influ A: PR8/FM-1/Swine/Equine-1 Equine-2/WS/Japan 170 Japan 305/Taiwan Influ B: Lee/Maryland/Great Lakes/ Taiwan/Singapore Influ C: Taylor Para 1 : HA-2 Para 2 : Greer/SV-5 Para 3 : SF-4	A-Japan-305/HI/1:30, SN/1:20 Japan-170/HI/1:40, SN/1:20	Neg	Neg
V-301-571-552	Myxovirus	Infl. A Equine- 2/Miami/ 1/63	Other viruses (Virus/test/titer) Influ A: PR8/FM-1/Swine/Equine-1 Equine-2/WS/Japan 170 Japan 305/Taiwan Influ B: Lee/Maryland/Great Lakes/ Taiwan/Singapore Influ C: Taylor Para 1 : HA-2 Para 2 : Greer/SV-5 Para 3 : SF-4	A-Japan-305/HI/1:80, SN/1:20 Japan-170/HI/1:40, SN/1:20	Neg	--

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

Catalog #	Virus Group Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.	
V-301-581-552	Myxovirus	Infl. A	WS/33	Other viruses (Virus/test/titer) Influ A: PR8/FM-1/Swine/Equine-1 Equine-2/WS/Japan 170 Japan 305/Taiwan Influ B: Lee/Maryland/Great Lakes/ Taiwan/Singapore Influ C: Taylor Para 1: HA-2 Para 2: Greer/SV-5 Para 3: SF-4 NDV	Neg	--	--
V-301-591-552	Myxovirus	Infl. A-2	Aichi/2/ 68	Other viruses (Test/Virus/Titer) SN/flu A-Swine, PR8, FM, B Lee, B Md., B Taiwan, B Sing, B Mass., P1, P2 (Greer & SV-5), P3, C Taylor, A equi/1:<10; A2 Japan 170, A Equi, NDV; A2 Japan 305, A2 Taiwan/ 1:20; HI/ flu A-Swine, PR8, FM, WS, A equi Prague; B Lee, B Md, B Taiwan, B Sing, B Mass, C Taylor/ <10; A2 Japan 305 & 170, A2 Taiwan/1:40; A equi 2 Maimi/1:10; NDV/1:20	Neg	Neg	--
V-301-591-558	Myxovirus	Infl. A-2	Aichi/ 2/68	Other viruses (Test/virus/titer) SN/flu A-Swine, PR8, FM, Equi, flu B Md, TW, Sing, NDV, P1 (C-35), P2 (Greer & SV-5), P3 flu C/<10, flu B Lee/1:10; flu B Mass/ 1:20; flu A Jap 305, Jap 170/1:40; flu A equi 2/1:80; flu A Tw/1:160. CF/A (Soluble)/1:64; B(Soluble), C(GL), P1, P2, P3, Mumps, P2(SV-5), NDV, NAF/<8 HI/flu A-Swine, A-WS-33, A-PR-8-34, A1-FM-1-47, A-Equi 1 Prague, A-Equi 2 Miami, B Lee, B Md, B Taiwan, B Sing, B Mass, NDV, C Taylor/<10; A2 Japan-305, A2 Japan 170/1:10;A2 Taiwan 1:80	Neg	Neg	--

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref	
V-302-501-552	Myxovirus	Infl. B	Lee/40	Other viruses (Virus/Test/Titer) Infl. A - Swine, PR-8, FM-1, Jap/305, Jap/305 lot 2, Jap/170 Infl. B - GL, Md, Taiwan Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	B-GL/HI/1:40 B-Md/HI/1:40 B-Taiwan/HI/1:80 (RDE) 1:10 (K10 ₄) C-Taylor/HI/1:40 (RDE)	Neg	Neg	--
V-302-511-552	Myxovirus	Infl. B	GL/1739 54	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, FM-1, Jap/305, Jap/305 lot 2, Jap/170 Infl. B - Lee, Md, Taiwan Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	B-Lee/HI/1:40 B-Md/HI/1:300 B-Taiwan/HI/1:80 (RDE) 1:80 (K10 ₄) C-Taylor/HI/1:40 (RDE) 1:20 (K10 ₄)	Neg	Neg	-
V-302-521-552	Myxovirus	Infl. B	Maryland 1/59	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, FM-1, Jap/305, Jap/305 lot 2, Jap/170 Infl. B - Lee, GL, Taiwan Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5	B-Lee/HI/1:80 B-GL/HI/1:320 B-Taiwan/HI/1:320 (RDE) 1:60 (K10 ₄) C-Taylor/HI/1:40 (RDE) 1:20 (K10 ₄)	Neg	Neg	-
V-302-531-552	Myxovirus	Infl. B	Taiwan 2/62	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, FM-1, Jap/305, Jap/305 lot 2, Jap/170 Infl. B - Lee, GL, Md Infl. C - Taylor Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	B-Lee/HI/1:40 B-GL/HI/1:80 B-Md/HI/1:80 C-Taylor/HI/1:40 (RDE) 1:20 (K10 ₄)	Neg	Neg	-

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref.		
V-302-541-552	Myxovirus	Infl. B	Singapore 3/64	Other Viruses (virus/test/titer) Influ A: PR8/FM-1/Swine/Equine-1 Equine-2/WS/Japan 170 Japan 305/Taiwan Influ B: Lee/Maryland/Great Lakes/ Taiwan/Singapore Influ C: Taylor Para 1: HA-2 Para 2: Greer/SV-5 Para 3: SH-4 NDV	Neg	Neg	--		
V-303-501-552	Myxovirus	Infl. C	Taylor 1233/47	Other viruses (Virus/test/titer) Infl. A - Swine, PR-8, FM-1, Jap/305, Jap/305 lot 2, Jap.170 Infl. B - Lee, GL, Md, Taiwan Para 1 - HA-2, Sendai Para 2 - Greer, SV-5 Para 3 - SF-4, Mumps, NDV, Measles	A-Jap/170/HI/1:40	Neg	Neg	--	
V-321-501-558	Myxovirus Parainfluenza	1	HA-2 C-39	Other viruses (Virus/test/titer) Influenza A, B, & C Para 1-Sendai Para 2-Greer, SV-5 Para 3-SF-4, HA-1 Para 4-M-25 Mumps, RSV Measles, CD, NDV, ICH	Neg	Neg	--		
V-321-511-558	Myxovirus Paramyxovirus Parainfluenza	1	Sendai	Other Viruses (Virus/test/titer) Para 1 - HA ₂ Para 3 - SF-4 Mumps	Para 1-HA ₂ /HI/1:10 Para 1-HA ₂ /CF/1:80 Para 1-HA ₂ /SN/1:10 Mumps/SN/1:20	Para 3-SF-4/HI/1:20 Para 3-SF-4/CP/1:10 Mumps/CF/1:10	Neg	Neg	--

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Ref.
V-322-503-558	Myxovirus Parainfluenza	2	Greer, CA	Other Viruses (Test/Virus/Titer)	Neut, CF, HI/P1(HA-2), P1(Sendai), P2(SV-5), P3(HA1), P3(SF), Mumps, Measles, NDV, Flu A, Flu B/<1:10		
					Neut, CF/P4A(M-25), P4B(19503), RS(Long) RS(18537)/<1:10		
					CF. HI/Flu C/<=1:10		
					HI/Adeno Grp., Eaton Agent/> 1:10		
					Neg	Neg	83, 116A
V-322-502-558	Myxovirus Parainfluenza	2	Greer, CA	Other Viruses (Test/Virus/Titer)	Neut CF, HI/P1(HA-2), P1(Sendai), P3(HA-1) P3(SF), Flu A, Flu B, Mumps, Measles, NDV/<=1:10		
					Neut, CF/P2(SV-5), P4A(M-25), P4B(19503), RS(Long), RS(19537)/1:10		
					CF, HI/Flu, C/<=1:10		
					HI/P2(SV-5)/<=1:40		
					CF/Adeno Grp, Eaton Agent/<=1:10		
					Neg	Neg	83, 116A
V-322-512-558	Myxovirus Parainfluenza	2-SV ₅	21005- 2WR	Other Viruses (Test/Virus/Titer)	Neut, CF, HI/P1(Sendai), P1(HA-2), P2(Greer), P3(HA-1), P3(SF), NDV, Mumps, Flu A, Flu B/<=1:10		
					Neut, CF/P4A(M-25), P4B(19503), RS(Long) RS(19537)/<=1:10		
					CF/Adeno Group, Eaton Agent/<=1:10		
					CF, HI/Flu C/<=1:10	Neg	Neg
							144A 156

Catalog #	Virus Group Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.		
V-323-502-558	Myxovirus Parainfluenza	3	HA-1	Other Viruses (Test/Virus/Titer)	Neut,CF, HI/P1(Sendai), P1(HA-2), P2 (Greer), P2(SV-5), NDV, Measles, Flu A, Flu B/<1:10 Neut, CF/P4A(M-25), P4B(19503), Mumps, RS(Long), RS(19537)/<1:10 Neut/P3(SF)/1:20 CF/P3(SF)/1:80 Flu C, Adeno Grp. Eaton Agent/ <1:10 HI/P3(SF)/1:320 Mumps/1:40 Flu C/<1:10	Neg	Neg	--
V-325-502-558	Myxovirus Paramyxovirus Mumps	--	Enders	Other Viruses (Virus/Test/Titer) Para 2 - (SV-5) Para 2 - (Greer) Para 3 - (HA-1)	Para 2-SV-5/HI/1:10-1:20 Neg	Neg	--	
V-326-501-558	Myxovirus Paramyxovirus	Newcastle Disease Virus	Roakin	Other viruses (Virus/Test/Titer) Para 1 - Sendai Para 2 - SV-5	Para 2-SV-5/HI/1:80 Para 2-SV-5/CP/1:10 Para 1 - Sendai/CH/1:20	Neg	Neg	--
V-327-501-558	Myxovirus	Respiratory syncytial	Long	Other Viruses (Test/Virus/Titer)	--	Neg	--	
					P1(Sendai), P2(HA-2), P2(SV-5), P2(Greer) P3(HA-1), P3(SF), P4A(M-25), P4B(19503), Mumps Measles, NDV, Flu A, Flu B/<1:10 Neut/RS(18537), RS(1075)/1:10 CF/Flu C, Adeno Grp. Eaton Agent/<1:10, RS(18537)/1:40, RS(1075)/1:80			

Catalog #	Virus Group Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.
V-329-501-555	Myxovirus, -- Canine Distemper Virus	Lenderle Avirulent	Other viruses (Virus/test/titer) Measles Infectious Canine Hepatitis	Neg	Neg	--
V-346-501-558	Herpesvirus Herpes Simplex	Mayo 1814	Other viruses (Virus/test/titer) Herpes simplex (HF) Herpes simplex (McIntyre) B Virus (E-2490) B Virus (Sabin) Pseudorabies (Aujeszky)			Herpes simplex (HF)/SN/1:128 Herpes simplex (McIntyre)/SN/1:128 B Virus (E-2490)/SN/1:4 potentiated B Virus (Sabin)/SN/1:4 potentiated Neg Neg --
V-347-501-558	Herpesvirus B	Lilly E-2490	Other viruses (Virus/test/titer) Herpes simplex (HF) Herpes simplex (McIntyre) B Virus (E-2490) B Virus (Sabin) Pseudorabies (Aujeszky)			Neg. B virus (Sabin)/SN/1:8 nonopotiated Herpes simplex (McIntyre)/SN/1:128 B Virus (E-2490)/SN/1:4 potentiated B Virus (Sabin)/SN/1:4 potentiated Neg.: Neg -- B Virus (Sabin)/SN/ 1:16 potentiated
V-348-501-558	Herpesvirus Pseudorabies Aujeszky		Other viruses (Virus/Test/Titer) Pseudorabies (Kaplan) Herpes simplex (Mayo 1814) Herpes simplex (MF) Herpes simplex (McIntyre) B Virus (E-2490) B Virus (Sabin)			Pseudorabies (Kaplan)/SN/1:64 B Virus (E-2490)/SN/1:4 potentiated B Virus (Sabin)/SN/1:4 potentiated Neg Neg --

Catalog #	Virus Group Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.	
V-501-701-562	Bwamba	Bwamba Smithburn (M459)	Other Arboviruses (Test/Virus/Titer)	CF/Bunyamwera - unassigned 1 Neg; Group Capim 1 Neg; Group Patois 1 Neg; Group Guama 1 Neg; Small Groups 6-8, 9a, 9d, 10, 10a, 11a, 13, 14a, 16, 16a, 16b Neg; Group VSV 4 Neg; Ungrouped 1, 2, 8, 10-13, 15, 16, 19, 20, 28, 29, 31, 32, 35-51 Neg; HI/Group A 1, 2, 4, 5 Neg; Group B 3, 7, 11, 15, 17, 23, 26, 27, 31, 33, 35, 37 Neg; Group C 6, 8, Neg; 7 (+1/10); Group Patois 1, 2, Neg; Group Bunyamwera 1-3, 6-10, 13 Neg; 12 (+1/10); Group Phlebotomus 1, 2, 4-6, 8, 11 Neg; Group Simbu 2-4 Neg; 8 (+1/10); Minor Groups 2, 2b, 3, 4, 4a, 10a, 15, 15a, 15b Neg; Ungrouped 32, 36, 43 Neg; Group California 2, 6, 9, 10 Neg; Group Capim 4 Neg;	Neg	Neg	--
V-502-701-562	California	California Encephalitis BFS 283	Other arboviruses (Test/Virus/Titer)	CF Bunyamwera-Unassigned 1 Neg; Group Capim 1 Neg; Group Patois 1 Neg; Group Guama 1 Neg; Small Groups 6-8, 9a, 9d, 10, 10a, 11a, 13 14a, 16, 16a, 16b Neg; Group VSV 4 Neg; Ungrouped 1, 2, 8, 10-13, 15, 16, 19, 20, 28, 29, 31, 32, 35-51 Neg; HI/Group A 1, 2, 4, 5 Neg; Group B 3, 7, 11, 15, 17, 23, 26, 27, 31, 33, 35, 37 Neg; Group C 6, 8 Neg 7 (+1/10); Group Patois 1, 2, Neg; Group Bunyamwera 1-3, 6-10, 13 Neg; 12 (+1/10); Group Phlebotomus 1, 2, 4-6, 8, 11 Neg; Group Simbu 2-4 Neg, 8 (+1/10); Minor Groups 2, 2b, 3, 4, 4a, 10a 15, 15a 15b Neg; Ungrouped 32, 36, 43, Neg; Group Capim 4 Neg;	Neg	Neg	--

Catalog #	Virus Group Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.	
V-503-701-562	Phlebotomus Sicilian Fever	Sabin	Other arboviruses (Test/Virus/Titer)	CF/Group Simbu 1-9 Neg; Group Bunyamwera 2, 3, 6-9, 11, 16 Neg; Group Tacaribe 1, 2, 5-7 Neg; Group Phlebotomus 2 (8/8), 1, 5-7, 11 Neg; HI/Group A 1-10, 12, 13, 15, 16, 19 Neg Group B 2-7 Neg; Group C 3, 5-10 Neg; Group Simbu 3, 4, 8, 10 Neg; Group Phlebotomus 1, 2, 4-6, 8, 11, Neg; Group Guama 3, 4 Neg; Group California 2 Neg; Group Tutlock 15 Neg; Group Capim 4 Neg;	Neg	Neg	--
V-505-701-562	Simbu	Oropouche	TRV1 9760 Other arboviruses (Test/Virus/Titer)	CF/Bunyamwera - unassigned 1 Neg; Group Capim 1 Neg; Group Patois 1 Neg; Group Guama 1 Neg; Small Groups 6-8, 9a, 9d, 10, 10a, 11a, 13, 14a, 16 16a, 16b, Group VSV 4 Neg; Ungrouped 1, 2, 8, 10-13, 15, 16, 19, 20, 28, 29 31, 32, 35-51 Neg; HI/Group A 1, 2, 4, 5 Neg; Group B 3, 7, 11, 15, 17 23, 26, 27, 31, 33, 35, 37 Neg; Group C 6, 8, Neg; Group Patois 1, 2, Neg; Group Bunyamwera 1-3, 6-10, 12, 13 Neg; Group Phlebotomus 1, 2, 4-6, 8, 11 Neg; Group Simbu 2, 3, 8 Neg; Minor Groups 2, 2b, 3, 4, 4a, 10a, 15, 15a, 15b Neg; Ungrouped 32, 36, 43, Neg; Group California 2, 6, 9, 10 Neg; Group Capim 4 Neg.	Neg	Neg	--
V-506-701-562	Ungrouped	Colorado Tick Fever	Florio Other Arboviruses (Virus/Test/Titer)	CF/Group Simbu 1-9 Neg; Group Bunyamwera 2, 3, 6, 8, 9, 11, 16 Neg; Group Tacaribe 1, 2, 5, 7 Neg.	Neg	Neg	--

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial			
					Sterility	Mycoplasma	Refer.	
V-509-701-562	B	Ilheus	TRVL 5800	Other viruses (Test/Virus/Titer)	CF/Group B 3 (4/4); 1, 4, 7 (8/4); 31 (8/16); 17, 23 (16/16); 6, 11, 35, 36, 37 (<1/4) Group A 3, 4, 6, 17, 20 Neg; Group Bunyamwera 2, 3, 9, 11, 16 Ngg; Group C 7 Neg; Group Guama 1-5 Neg; Group Patois 1 Neg; Group Changuinola 1, 2 Neg; Group Simbu 2, Neg; Group Phlebotomus 4, 7 Neg; Minor Groups 2, 3, 3a, 7, 8, 13, 15, 16 16a, 16b, 24 Qalyub Neg; Ungrouped 11 Neg; HI/Group B 7 (640); 23 (320); 31, 33 (160); 1, 3, 36 (80); 4 (40); 11, 17 (10); 6, 35, 37 (<10)	Neg	--	--
V-510-701-562	Guama	Guama	TRVL 33579	Other viruses (Test/Virus/Titer)	CF/Group A 3, 4, 6, 17, 20 Neg; Group B 7, 11, 15, 27, 28, 31, 33, 35-37 Neg; Group C 7 Neg; Group Patois 1, 2 Neg; Group Bunyamwera 2, 3, 9, 11, 13, 16 Neg; Group Simbu 2 Neg; Group Phlebotomus 4, 7 Neg; Group Changuinola 2 Neg; Minor Groups 2, 3, 3a, 7, 8, 13, 15, 16, 16a, 16b Neg; Ungrouped 11 Neg;	Neg	--	--
V-511-701-562	California	Melao	TRVL 9375	Other viruses (Test/Virus/Titer)	CF/Group California: 7(4/64); 2-4, 9, 10 (8/64) Group A: 3, 4, 6, 17, 20 Neg; Group B 7, 11, 27, 28, 31, 33, 35-37 Neg; Group C 7 Neg; Group Bunyamwera 2, 3, 9, 11, 13, 15, 16 Neg; Group Guama: 2-5 Neg; Group Patois 1, 2 Neg; Group Simbu 2 Neg; Group Phlebotomus 4, 7 Neg Group Chinguinola 2 Neg; Minor Groups 2, 3, 3a, 7, 8, 15 Neg; Ungrouped 11 Neg;	Neg	--	--

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.
V-534-70;-562	Simbu	Buttonwillow	A7956	Other arboviruses (Test/Virus/Titer)	CF/Group Simbu 3, 4, 5, 7 Neg. Turlock, EEE, SLE Neg Neg	--	--
V-701-511-570	Reovirus	1	Hull-5727	Other viruses (Test/Virus/Titer)	SN/Reo 2/1:32 - Reo 3/< 1:16 HI/Reo 2/1:16 - Reo 3/1:16 Neg	--	--
V-702-501-570	Reovirus	2	Jones	Other viruses (Test/Virus/Titer)	Sn/Reo 1/<1:16 - Reo 3/<1:16 HI/Reo 1/1:16 - Reo 3/<1:8 Neg	--	--
V-703-501-570	Reovirus	3	Abney	Other viruses (Test/Virus/Titer)	SN/Reo 1/1:128 - Reo 2/1:32 HI /Reo 1/1:16 - Reo 2/1:16 Neg	--	--

Catalog #	Virus Group	Type	Strain	Other Viruses (Virus/test/titer)	Bacterial Sterility	Mycoplasma	Refer.
G-201-701-567	C	Grouping Ascitic Fluid	--	Other arboviruses (Test/Virus/Titer)	CF/Group Simbu: 1-9-Neg (1:16)*; Group Bunyamwera: 2, 3, 6-9, 11, 16 Neg (1:10) Neg	--	--
G-203-701-567	Simbu	Grouping Ascitic Fluid	--	Other arboviruses (Test/Virus/Titer)	CF/Group Bunyamwera 2, 3, 6-9, 11, 16 Neg; Group Tacaribe 1, 2, 5-7, Neg. Neg	Neg	--
G-205-701-567	Bunyamwera	Grouping Ascitic Fluid	--	Other arboviruses (Test/Virus/Titer)	CF/Group Simbu 1-3, 5-9 Neg; 4(1/4); Group Tacaribe 1, 2, 5-7 Neg. HI/Group A 1-10, 12, 13, 15, 16, 19 20 Neg; Group B 2-7 Neg; Group C 3, 5-10 Neg; Group Phlebotomous 1, 2, 4-6, 8, 11, Neg; Group Guama 3, 4 Neg; Group Simbu 3, 4, 8, 10, Neg; Group Capim 4 Neg; Neg	Neg	--
G-209-701-567	A	Grouping Ascitic Fluid	--	Other arboviruses (Test/Virus/Titer)	CF/Group Simbu 4, 8 Neg; 1, 6-(1/4); 2, 3, 5, 7 9-(1/4); Group Bunyamwera 3, 6, 8, 11, 16-(1/4); 2, 9-(1/4); Group Tacaribe 1, 2, 5-7 Neg; HI/Group B 2-7 Neg; Group C 3, 5-9 Neg; Group California 2 Neg; Group Simbu 3, 4, 8 Neg; Group Phlebotomus 1, 2, 4-7, 8, 11, Neg; Group Bunyamwera 1-3, 6-18, 17 Neg Group Guama 3, 4 Neg; Group Turlock 1 Neg; Group Capim 4 Neg; Group Simbu 10 Neg; Neg	Neg	--
G-215-701-567	Group Capim	Grouping Ascitic Fluid	--	Other arboviruses (Test/Virus/Titer)	CF/Group Bunyamwera 2, 11, 16 Neg; California, Quarantil, Guama, Ilheus Neg; Neg	--	--

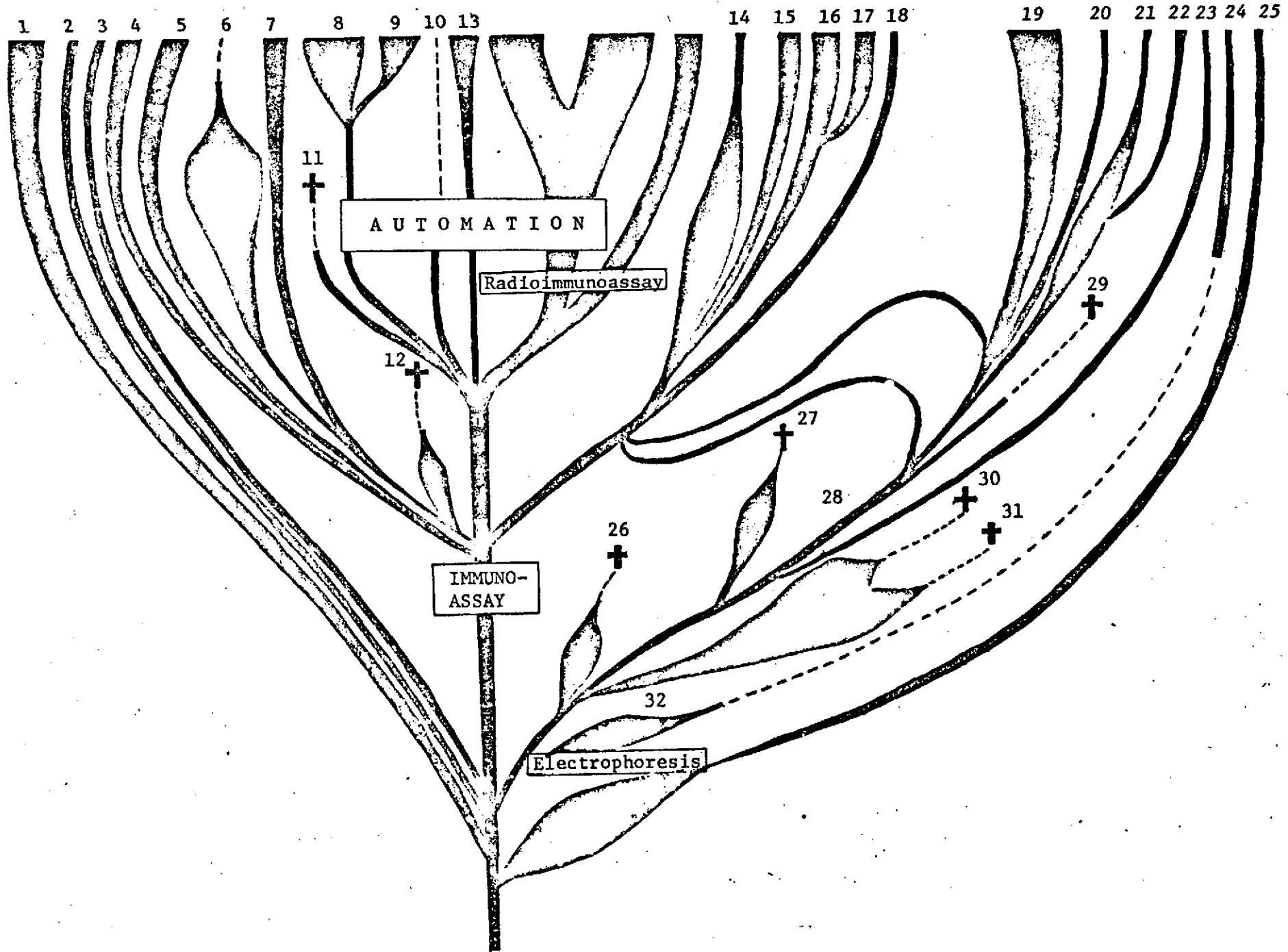
REFERENCES TO VIRUS LIST

28. Melnick, Joseph L. and Nada Ledinko. 1950. Immunological reactions of the coxsackie viruses. I. The neutralization test: technic and application. *J. Exptl. Med.* 92:463-482.
41. Huebner, P. J., W. P. Rowe, T. G. Ward, R. H. Parrott, and J. A. Bell. 1954. Adenoidal-Pharyngeal-Conjunctival Agents: A newly recognized group of common viruses of the respiratory system. *New England J. Med.* 251:1077-1086.
44. Wenner, Herbert A., C. Arden Miller, Paul Kamitsuka, and James C. Wilson. 1954. Preparation and standardization of antiserums prepared with the three known types of poliomyelitis viruses. *Am. J. Hygiene* 59(2):221-235.
47. Kibrick, Sidney, John F. Enders, Frederick C. Robbins. 1955. An evaluation of the roller-tube tissue culture for the isolation of poliomyelitis viruses from feces. *J. of Immunol.* 75:391-400.
71. National Foundation for Infantile Paralysis, Committee on the Enteroviruses. 1957. The Enteroviruses. *Am. J. Public Health Assoc.* 47:1556-1566.
83. Cook, M. Katherine, Basil E. Andrews, Herson H. Fox, Horace C. Turner, Walter D. James, Robert M. Chanock. 1959. Antigenic relationships among the "newer" myxoviruses (parainfluenza). *Am. J. Hygiene* 69:250-264.
93. Rosen, Leon. 1960. A hemagglutination-inhibition technique for typing adenoviruses. *Am. J. Hygiene* 71:120-128.
97. Hamparian, V. V., A. Ketler, and M. R. Hilleman. 1961. Recovery of new viruses (coryzavirus) from cases of common cold in human adults. *Proc. Soc. Exptl. Biol. Med.* 108:444-453.
- 99.* Kamitsuka, P. S., M. E. Soergel, H. A. Wenner, and others. 1961. Production and Standardization of ECHO Reference Antisera. I. For 25 Prototypic ECHO Viruses. *Am. J. Hygiene.* 74:7-25.
102. Rosen, L., and J. Kern. 1961. Hemagglutination and Hemagglutination-Inhibition with coxsackie B viruses. *Proc. Soc. Exptl. Biol. Med.* 107:626-628.
106. Ginsberg, Harold S. 1962. Identification and classification of adenoviruses. *Virology* 18:312-319.
- 116A. Sever, John Louis, 1962. Application of a microtechnique to viral serological investigation. *J. Immunol.* 88:320.

- 117.* Wenner, Herbert A., and Margaret E. Lenahan. 1961-1962. Propagation of group A coxsackie viruses in tissue cultures. II. Some interactions between virus and mammalian cells. *Yale J. Biol. Med.* 34:421-438.
119. Johnson, Karl M., and Leon Rosen. 1963. Characteristics of five newly recognized enteroviruses recovered from the human oropharynx. *Am. J. Hygiene* 77:15-25.
124. Pereira, H. G., R. J. Huebner, H. S. Ginsberg, and J. van Der Veen. 1963. A short description of the adenovirus group. *Virology* 20:613-620.
127. Tyrell, D. A. J. 1963. Rhinoviruses: A description. *Science* 141:152-153.
134. Hamparian, V. V., M. B. Leagus, and M. R. Hilleman. 1964. Additional rhinovirus serotypes. *Proc. Soc. Exptl. Biol. Med.* 116:976-984.
- 138.* Rafajko, Robert R. 1964. Production and standardization of adenovirus types 1 to 18 reference antisera. *Am. J. Hygiene* 79(3):310-319.
140. Webb, P. A., K. M. Johnson, and M. A. Mufson. 1964. A description of two newly-recognized rhinoviruses of human origin. *Proc. Soc. Exptl. Biol. Med.* 116:845-852.
- 144A. Husing, G. D., P. W. Chang, R. R. Cuarado and P. Isacson, 1965. Studies parainfluenza viruses. III. Antibody responses of different animal species after immunization. *J. Immunol.* 94: 67-73.
- 145.* Kamitsuka, P. S., T. Y. Lou, A. Fabiyi, and H. A. Wenner, 1965. Preparation and standardization of coxsackievirus reference antisera. I. For twenty-four group A viruses. *Am. J. Epidemiology* 81(3):283-306.
147. Mufson, M. A., R. Kawana, H. D. James, Jr., L. W. Gauld, H. H. Bloom, and R. M. Chanock. 1965. A description of six new rhinoviruses of human origin.
148. Pereira, M. S., H. G. Pereira, and S. K. R. Clarke. 1965. Human adenovirus type 31: a new serotype with oncogenic properties. *Lancet* 1:21-25.
149. Phillips, C. Allan, Joseph L. Melnick, and Catherine A. Grim. 1965. Characterization of three new rhinovirus serotypes. *Proc. Soc. Exptl. Biol. Med.* 119:798-801.
- 152.* Wenner, H. A., A. M. Behbehani, and P. S. Kamitsuka. 1965. preparation and standardization of coxsackievirus reference antisera. II. for six group B viruses. *Am. J. Epidemiology* 82(1):27-39.
- 154A. Fenters, J. D.; Fordyce, P. A., Gerin, J. L., and Holper J. C.; 1966. Serotypic relationship among rhinoviruses. *Am J. Epidemiology* 84: 10-20
155. Kapikian, A. Z. (chairman), R. M. Conant, V. V. Hamparian, R. M. Chanock, P. J. Chapple, E. C. Dick, J. D. Fenters, J. M. Gwaltney, Jr., D. Hamre, J. C. Hooper, W. S. Jordan, Jr., E. H. Lennette, J. L. Melnick, W. J. Mogabgab, M. A. Mufson, C. A. Phillips, J. H. Schieble, and D. A. J. Tyrell. 1967. Rhinoviruses: A numbering system. *Nature* 213 (5078):761-763.
156. Hara, M., T. Komatsu, M. Sasaki and I. Tagaya, 1968. Lack of serological relationship of Echo virus types 1 and 12. *Proc. Soc. Exptl. Biol. Med.* 122:683-687.

APPENDIX 8

GRAPH OF ELECTROPHORESIS EVOLUTION



1. assay of specific properties
2. viscometry
3. refractometry
4. hemagglutination
5. immunofluorescence
6. radioimmunoassay diffusion
7. ouchterlong
8. direct nephelometry
9. inhibition nephelometry
10. hemagl. inhibition
11. turbidimetry
12. oudin
13. polarization fluorescence
14. immunoelectrophoresis
15. immunofixation
16. counter electrophoresis
17. "capture zone"
18. crossed antigen-antibody electrophoresis
19. rehydratable film
20. variable EOM
21. acrylamide
22. isotachophoresis
23. pevicon
24. isoelectric focusing
25. chemical and precipitation techniques
26. paper
27. agar
28. agarose gel
29. starch
30. cellulose acetate "mini"
31. cellulose acetate "standard"
32. free