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GERMAN SOCIETY OF ENDOCRINOLOGY

COMPETITIONS FOR 1976

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| Amount | DM 15.000.— | DM 15.000.— |
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| Subjects | all fields of endocrinology (except diabetes mellitus) | clinical and clinical-experimental endocrinology (except diabetes mellitus) |

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Endokrinologische Arbeitsgruppe der II. Medizinischen Klinik
der Universität München

A MODULAR ANALYZER SYSTEM FOR THE MECHANIZATION
OF DOUBLE ANTIBODY RADIOIMMUNOASSAYS

I. Marschner, F. W. Erhardt, I. Henner and P. C. Scriba

A project was set up to construct a multi-purpose analyzer system which would permit (1) the handling of large series, (2) the use of small volumes, and (3) the ready adaption of manually performed double antibody RIAs.

Pipetting and incubation steps are performed in conventional open vials aligned in chains of maximal 650 samples. The chains are spooled and may be covered during incubation periods with one common foil and screw cap. The pipetting stations are comparable in their performance with conventional machines. The essential part of the system is the filtering apparatus, used for the bound/free separation. Nuclepore filters of 20 mm diameter and 0.2 μ pore size are attached at 3 inches distance on a 35 mm triacetate film strip of 1000 feet length. The physical characteristics of the nuclepore membranes have thus far been found to be superior to all other tested materials. Sequentially, 6 samples of maximal 0.8 ml are simultaneously filtered by a vacuum pump. The vials can be washed once or twice. The filtering apparatus processes approximately 220 samples/hr. Subsequently, the filter positions are covered with adhesive labels from both sides to prevent radioactive contamination. The pipetting stations as well as the filter apparatus permit the handling of up to 650 samples each without any manual control.

The newly developed gamma-counter is charged by inserting the reel of film which has received the bound fraction of the samples, and positioning of the first sample. The filter membranes are counted between two detectors, which are at 3 mm distance from each other. The counting efficiency is 15% higher as compared with borehole counters, because of the better geometry. The time for the printout of the result and changing to the next sample is approximately 3 sec. The capacity of the counter is given by the reels of film (approximately 2500 samples).

Until now, seven RIAs with a total of about 4000 samples per week are performed routinely by this system: hGH, insulin, prolactin, LH, FSH, TSH, and gastrin. When compared to the manual methods (bound/free separation by cellulose acetate filtration or centrifugation and conventional gamma counting), the standard curves are identical, but the precision of the replicates is significantly improved.

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