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This workshop defined the gaps in the research on alopecia areata and is defining future research in the field. The Fourth International Research Workshop on Alopecia Areata held on October 31, November 1 & 2, 2002, at the Renaissance Mayflower Hotel in Washington, DC and the Lister Hill Center at the National Library of Medicine brought together investigators for an exchange of recent findings in alopecia areata (an autoimmune disease causing hair loss) and related fields of hair biology. Topics included immunology, immunogenetics, genetics, hair cycle controls, gene profiling, animal models, and gene array. The format for this workshop, which included microphones at each table, encouraged animated and productive discussions.

The Workshop, was co-sponsored by the National Alopecia Areata Foundation (NAAF) and the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). Over 150 people attended this highly interactive workshop. Dr. Alan Moshell, Director of the Skin Disease Research at NIAMS, welcomed participants who included dermatologists, immunologists, geneticists, molecular biologists, biochemists, and pathologists. Dr. Robert Lavker, Chair of the National Alopecia Areata Foundation Fourth International Research Workshop Organizing Committee, reviewed the results of the last three previous workshops on alopecia areata. Sandra Frum, Chair of the NAAF Board of Directors, stressed the need to remember the patients for whom this research is being done and to encourage the participants to use this workshop to move the field forward to produce more short term results for those who have alopecia areata. She stated that NAAF has raised over four million dollars for research and that most of the presentations at the workshop represented NAAF-funded research. The NAAF Scientific Advisory Council members received praise and a new charge to set a research agenda for future alopecia areata research.

Organizers of the Workshop were Robert Lavker, Vicki Kalabokes, Alan N. Moshell, Vera H. Price, Jerry Shapiro, Kurt S. Stenn, and John Sundberg. The session chairs were Lloyd E. King, Jr., Maria Hordinsky, Amos Gilhar, Rolf Hoffmann, Satoshi Itami, Tung-Tien Sun, Valerie Randall, Anthony E. Oro, Paolo Dotto, Robert Lavker, Kurt S. Stenn, Lowell Goldsmith, Antonella Tosti, Elise A. Olsen, and George Costarelis. The speakers were Fred Nijhout, Richard S. Kalish, Jerry Y. Niederkorn, Ralf Paus, David Duggan, John Sundberg, Madeleine Duvic, Angela M. Christiano, Elaine Fuchs, Andrzej Dlugosz, Michael Detmar, Vladimir A. Botchkarev, Kevin J. McElwee, Desmond J. Tobin, Jerry Shapiro, Jonathan Vogel, Amy McMichael, Vera H. Price, and David Norris. The poster presenters were Thomas Andl, George Costarelis, Pia Freyschmidt-Paul, Andrew McDonagh, Deborah Philp, David Whiting, Nazila Barahmani, Tongyu Cao, Karsta Luettich, Stephen Lyle, Atsushi Tanemura, Kevin McElwee, Berna Remzi, Andrei Sharov, Lynne Steiner, Li-

ren Tang, Antonella Tosti, Daya Das Verma, Rudolf Schopf, Jeffrey Miller, and Sandy Venneman.

There were many highlights including fifteen, three minute poster presentations and lively discussion among the participants. Since the posters presented new or novel ideas, the interaction was exciting and thought-provoking.

Two noted researchers were keynote speakers: Fred Nijhout PhD, of Duke University, Durham, North Carolina and Elaine Fuchs, PhD, Professor and head of Mammalian Cell Biology and Development at the Howard Hughes Medical Institute and Rockefeller University, New York, New York.

Dr. Nijhout discussed that complex traits are influenced by many independent genetic and environmental factors. He explored how developmental mechanisms determine and alter correlation structure between genes and the traits they control, how is it that populations come to differ in their responses to the same genetic variables, and how environmental variations alter the correlation between genes and traits and can therefore be seen as a natural part of the determination of normal and abnormal functions.

Dr. Fuchs and her laboratory study the molecular mechanisms underlying the development and differentiation of the mammalian skin epidermis and its appendages, and how processes go awry in various human diseases of the skin, including genetic diseases and skin cancer. She utilizes mammalian epidermal stem cell culture and gene knockout technology as model systems. A major focus now is to understand at a molecular level how embryonic cells become committed to an epidermal or hair follicle cell fate and how the resulting cells respond to these various environmental cues. Such knowledge is essential to understanding how the epidermis is able to manifest the skin function as a barrier to keep harmful micro-organisms out and essential body fluids in. Transgenic and knockout mice are also being used to elicit the genetic bases for human diseases of the skin, resembling certain known genetic skin disorders in humans. DNA analysis of patients with these candidate diseases have led Fuchs' laboratory to the discovery of the genetic basis of a number of different human skin diseases, ranging from blistering human skin disorders to skin tumors. Utilizing this reverse genetic approach starting with a protein and working up to genetic diseases involving defects in the protein has proven to be a powerful approach, and one that the laboratory not only pioneered but continues to use successfully in their quest in understanding the fascinating biology of the skin, the natural process of wound healing, and the aberrations that lead to skin disorders, including skin cancers, the most common of human cancers.

The audience was enthusiastic about the great progress of research since the last workshop four years ago. Dr. David Norris, MD, Department of Dermatology, University of Colorado Health Sciences Center summarized the entire workshop with an on the spot power point presentation. He reviewed what we

learned from each presentation and outlined where he thought the gaps were and the aggressive strategy we can take for the future. A full audience participation discussion followed Dr. Norris' presentation and this discussion led to additional directions for alopecia areata research.

Generous support for the workshop was gratefully received from Fujisawa Healthcare, Inc., Bosley Medical, Merck & Company, Inc., Dermik Laboratories, Galderma Laboratories, Johnson & Johnson CPWW, Pharmacia Sirius Laboratories, and Summers Laboratories.