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FINAL REPORT

JAN HERMANS

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# 1988 GORDON RESEARCH CONFERENCE ON PROTEINS

## Final Report

Army Grant No. DAMD17-88-Z-8026

The Gordon Conference on "Proteins" was held from the 20th to the 24th of June, 1988 at Salve Regina College in Newport, Rhode Island. The conference had 103 participants; nine were from foreign countries. There was a good mixture of scientists from universities, national laboratories, and private industries. Many younger scientists, including graduate students and postdoctoral fellows, attended.

Several subjects related to structure and function of proteins were discussed in the sessions at this conference. Topics included: What Can Peptides Tell Us About Proteins (and Vice Versa)?, New Methods in Structure Determination; The Life and Death of a Protein, Serine Proteases, Paradigm Shifts, Holes and Loops in Proteins, Membrane Proteins and Receptors; and G Proteins. The Thursday evening slot was filled by Don Wiley, who spoke on structures of membrane proteins. There were thirty speakers and eight discussion leaders, and although the meeting as a whole seemed to go well, fewer talks, especially in the evening sessions, would be preferable. Nonetheless, there was ample discussion after each talk and in the free time. Questions posed of the speakers were generally penetrating and enhanced the scientific exchange appreciably.

While there were many outstanding talks and results presented, particularly significant were the successful design of proteins *de novo*, either as a linear chain (Lynn Regan's work) or in a "template-directed" manner (Manfred Mutter's work), the characterization of a domain of BPTI that mimics one of the folding intermediates of the whole protein (P. Kim), new methods including IR-CD (Keiderling), and new structures including a chemotactic protein (A. Stock) and arepressor-operator complex (Pabo). In the choice of topics for this meeting, a conscious effort was made to include more biological issues related to proteins, and this effort paid off in three very successful sessions: the *in vivo* story of protein folding and degradation (Fred Goldberg, discussion leader), membrane proteins and receptors (Catherine Strader, discussion leader), and G proteins (Irving Sigal, discussion leader).

Poster sessions were held every afternoon, with about 50 participants presenting work. The posters were mounted all week, giving ample time for everyone to see and discuss posters. Feedback from the poster sessions was uniformly enthusiastic.

Overall, response to this meeting has been very positive.

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"Proteins" Gordon Conference, June 20-24, 1988, Salve Regina College, Rhode Island  
Lila Gierasch and Jan Hermans, Co-Chairs

Monday Morning: What can Peptides Tell us About Proteins (and Vice Versa)?

Peter Kim, MIT (Discussion Leader) "Synthetic Protein Folding Intermediate Analogs"  
Manfred Mutter, Basel "Construction of Artificial Proteins"  
George Rose, Penn. State, Hershey "Helices in Peptides and Proteins"  
Tom Alber, Univ. of Utah "Effects of Mutations on Protein Stability and Structure"

Monday Evening: New Methods in Structure Determination

Stan Opella, Univ. of Pennsylvania (Discussion Leader) "Solid State NMR"  
Angela Gronenborn, NIH "2D and 3D NMR of Proteins"  
Tim Keiderling, Univ. of Illinois, Chicago "Vibrational Circular Dichroism"  
Elisha Haas, Weizmann Institute "Fluorescence Energy Transfer Studies of Protein Folding"

Tuesday Morning: The Life and Death of a Protein

Fred Goldberg, Harvard Medical (Discussion Leader) "ATP-Dependent Proteases"  
Aaron Ciechanover, Technion-Israel Institute "Ubiquitin-Dependent Protein Breakdown"  
Steve Clarke, UCLA "Repair Mechanisms for Aging Proteins"  
Martin Eilers, UCSF "Protein Unfolding During Transport into Organelles"

Tuesday Evening: Serine Proteases

Jonathan Greer, Abbott (Discussion Leader) "Homology-Based Structure Prediction"  
Robert Fletcher, UCSF "Enzyme Studies by Mutagenesis"  
Arieh Warshel, USC "Computer Simulation of Genetically-Modified Serine and Cysteine Proteases"  
Mike James, Univ. of Alberta "Computer Modeling of Serine Proteases"

Wednesday Morning: Paradigm Shifts

C. Schutt, Princeton (Discussion Leader)  
Anne Stock, Princeton "Structure of A Phosphorylated Response Regulator"  
Lynne Regan, DuPont "A Helical Protein Designed from First Principles"  
Maria Maa, Beckman Research Institute "Mutagenesis as a Probe of Functionally Important Conformational Changes"  
Carl Pabo, Johns Hopkins "Structure of the Lambda Repressor-Operator Complex"  
Philip Bryan, Genex "Analysis of an Engineered Thermally Stable Mutant of Subtilisin"

Wednesday Evening: Holes and Loops in Proteins

George Rose, Penn State, Hershey (Discussion Leader)  
Jacque Fetrow, MIT "Loops in Globular Proteins"  
Jay Ponder, Yale "Tertiary Templates for Protein Design"  
Bob Tilton, Scripps "Cavities in Proteins by Gas Binding"  
Tony Kossiakoff, Genentech "Solvent Structure in Natural and Engineered Cavities in Proteins"

Thursday Morning: Membrane Proteins and Receptors

Catherine Strader, Merck (Discussion Leader)  
Michael Schimerlik, Oregon State "Atrial Muscarinic Acetylcholine Receptor"  
Leland Ellis, UT Southwestern, Dallas "Structure-Function of Insulin Receptor"  
Nigel Unwin, MRC "Receptors and Channels"  
Catherine Strader, Merck "Structure-Function of  $\beta$ -Adrenergic Receptor"

Thursday Evening:

Business meeting  
Don Wiley, Harvard "Recognition at Membrane Surfaces: Influenza Virus HA, Human HLA"

Friday Morning: G Proteins

Irving Sigal, Merck (Discussion Leader)  
Fran Jurnak, UC Riverside "Structural Studies of EF-Tu"  
Susan Masters, UCSF "Mutational Analysis of G Proteins"  
Abraham DeVos, UC Berkeley "The Structure of the  $\alpha$  Oncogene Protein"  
Irving Sigal, Merck "Mutagenesis Studies of  $\alpha$  Protein"

# GORDON RESEARCH CONFERENCES

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June 20-24, 1988  
Salve Regina College  
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