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Synopsis: International Symposium on Iron Transport, Storage and Metabolism

The International Symposium on Iron Transport, Storage and Metabolism II was held in Austin, Texas, June 20–22, 1990. The symposium was hosted by the Department of Microbiology of The University of Texas at Austin. These meetings, which were originated by G. Winkelmann at the University of Tübingen in 1985, are designed to bring together scientists working on diverse biological aspects of iron. The international flavor of the meeting was maintained; scientists from 12 countries were present and 50 of the approximately 130 conferees were non-US citizens.

The meeting was dedicated to the memory of Dr Charles E. Lankford (1912–1989), Professor Emeritus of The University of Texas at Austin Department of Microbiology. His interests in medical microbiology and microbial metabolism led to his pioneering studies on microbial iron assimilation. His seminal contributions and his influence on the development of the field are perhaps best portrayed in his comprehensive 1973 review *'Bacterial assimilation of iron'*, in which he coined the word 'siderophore'.

The meeting began Wednesday morning with a welcome by William Livingston, Vice-President and Dean of Graduate Studies at The University of Texas. Recollections and a perspective on the work of Dr Lankford were presented by Richard Finkelstein, former student of Dr Lankford and Professor and Chairman of the Department of Molecular Microbiology and Immunology at the University of Missouri-Columbia School of Medicine. The remarkable personal qualities of Dr Lankford as well as his creativity and insightfulness as a scientist were emphasized. Neilands (University of California, Berkeley), who along with Theil did double duty at the symposium, initiated the scientific portion of the meeting by providing an historical review and overview of iron in biology. The remainder of the first session features position papers on the diverse areas of iron research represented at the conference. Thus, Braun (Tübingen, FRG), S. Leong (University of Wisconsin, Madison), Romheld (Stuttgart, FRG) and Theil (North Carolina State University) spoke about ferrisiderophore transport across the outer membrane of enteric bacteria, fungal siderophore synthesis, plant iron nutrition, and the in vivo secondary structure of ferritin mRNA, respectively. Most of the remaining sessions featured one or two position paper speakers plus six to ten briefer reports. Poster sessions were held Thursday and Friday afternoon.

The afternoon session was devoted to siderophores and their transport through the outer membrane. Shanzer (Weizmann Institute, Israel) described his work with biomimetic siderophores and how these analogs can be used in growth stimulation and inhibition. Siderophore derivatives for drug delivery are being developed by Miller (University of Notre Dame, Indiana). It appears that the enterobactin receptor, FepA, will be the first outer-membrane receptor protein for siderophores to be characterized structurally and perhaps functionally. This protein has been purified and crystallized by van der Helm (University of Oklahoma, Norman). In conjunction with genetic and immunological studies underway in other laboratories, this work should prove most informative.

McIntosh (University of Columbia, Missouri) opened a diverse Thursday morning session with an update on the ferrienterobactin system of *Escherichia coli;* within the enterobactin gene cluster, there are three regulatory regions with bi-directional promoters. The afternoon session concerned regulation of iron assimilation and storage in prokaryotes and eukaryotes. Neilands described molecular and genetic studies of the *E. coli* Fur repressor protein. Theil organized and chaired a subsession concerned with the post-transcriptional regulation of ferritin and transferrin receptor expression; speakers included Harford (National Institutes of Health), Walden (University of Illinois at Chicago) and Lin (Washington University, Missouri).

Friday sessions covered pathogenic aspects of iron utilization. The morning session dealt with iron and microbial pathogens and the formal portion of the meeting concluded with papers on the relationship between iron and diseases of plants and animals. Position paper speakers included Crosa (Oregon Health Sciences University), who described the plasmid-mediated iron

transport system of the fish pathogen *Vibrio anguillarium,* Griffiths (National Institute for Biological Standards and Control, England), who provided an overview of iron and infection, and Leong (University of Utrecht, The Netherlands), who described iron transport in a *Pseudomonas putida* strain that promotes plant growth.

The conference concluded with a riverboat ride and dinner Friday night. This casual event gave the hard-working conferences an opportunity to see some of the hill country west of Austin as well as to taste some Texas-style barbecue and to alleviate their thirst.

I would like to thank all the conferees, particularly the program committee (Drs Payne, Szaniszlo and Theil), the various session chairmen, and the advisory committee (Drs Byers, Finkelstein, Hemming, Neilands, van der Helm, Weinberg and Winkelmann). The meeting was sponsored by Ciba-Geigy Corporation, Pharmaceuticals Division, Summit, New Jersey, and by the Microbiology Department of The University of Texas at Austin. I regard it as a serendipitous and pleasing fact that the Microbiology Department Chairman, James R. Walker, is a former student of Dr Lankford.

Charles F. Earhart
Austin, September 1990