You are
Cordially Invited
to Attend

the 24th Annual

Harry G. Fair Memorial Lecture

in Chemical Engineering
and Materials Science

**April 16, 1998,
3:30 P.M.**

The Lecture will be given
on campus,
in Sarkeys Energy Center,
Room A-235.

Coffee and Refreshments will be served

School of Chemical Engineering
and Materials Science
The University of Oklahoma
Sarkeys Energy Center
100 E. Boyd, Room T-335
Norman, Oklahoma 73019-0628

The University of Oklahoma
College of Engineering

the 24th Annual

Harry G. Fair Memorial Lecture

in

Chemical Engineering

1998

Harry G. Fair

Each year, a special lecture is given in memory of Harry G. Fair, an outstanding OU alumnus. Harry G. Fair was born in Okmulgee, Oklahoma, on June 3, 1916. He received his B.S. in Chemical Engineering in 1939. He joined Phillips Petroleum Company in 1939 and worked his way up to Vice President for Supply and Transportation, with responsibility for world-wide exchange of crude oil and all transportation facilities. In 1966, he joined the M.W. Kellogg Company as Executive Vice President, in charge of all engineering activities and became Executive Vice President of Coastal States Gas Corporation from 1971 until the time of his death on July 27, 1974. Harry G. Fair was active in service to society and to his alma mater. He was a member of a number of professional societies and was a licensed professional engineer.

This lecture is made possible by the Harry G. Fair Memorial Fund contributed by his widow, Jane Swift Fair. Arrangements are made by the School of Chemical Engineering and Materials Science.

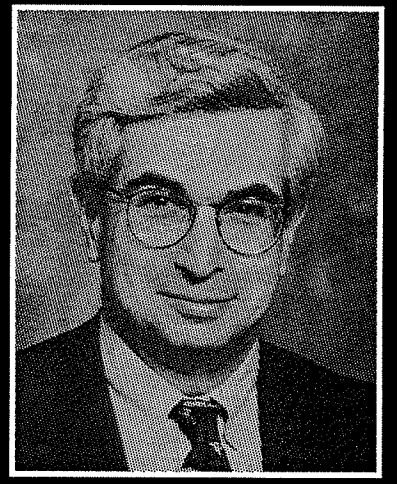
Cell Adhesion to Biomaterial Surfaces Under Well-Defined Flow Conditions

by Stuart L. Cooper
University of Delaware

The biocompatibility of an artificial surface can be characterized by the inflammatory response it induces, as well as its resistance to thrombosis and infection. Cell adhesion is an important phenomena in all these events, involving leukocytes, platelets and bacteria. The interactions of cells with a biomaterial exposed to circulating blood are mediated by an adsorbed protein layer. A novel experimental methodology has been developed to quantitatively characterize the attachment of cells to surfaces in a well-defined laminar flow field.

A radial flow chamber is used, in separate experiments, to study the attachment kinetics of human neutrophils and *Staphylococcus aureus* bacteria on surfaces over a range of shear rates. The spatial distribution of adherent cells on the biomaterial surface is directly observable and monitored via automated video microscopy. Cell-surface interactions are recorded for later digital image analysis.

In addition to cell-surface interactions, this technique also allows the observation of real time effects of the substrate on the morphology of adherent leukocytes under flow. To study the effect of biomaterial surface properties on leukocyte and bacterial cell adhesion, a family of functionalized polyurethanes containing anionic or cationic groups was examined. The role of plasma proteins on adhesion was also studied.



Stuart L. Cooper

Stuart L. Cooper is Dean of the College of Engineering and the H. Rodney Sharp Professor of Chemical Engineering. He is active in research supporting 10 graduate students and two postdoctoral fellows on projects ranging from polymer physics and physical chemistry, to biomaterials, with emphaiss on polyurethanes in medicine including cell and protein adsorption relating to infection and inflammation. He received his B.S. degree from MIT and his Ph.D. from Princeton. He has published more than 300 papers and is a Fellow in AIChE, APS, AAAS and the Society for Biomaterials. He won the Charles M. A. Stine Award from AIChE and the Clemson Award from the Society for Biomaterials. He is a founding Fellow of AIMBE and editor of the *Journal of Biomaterials Science, Polymer Edition.* Recently he received an International Achievement Award from the Japanese Society for Biomaterials.