Editorial

The form and function of all multicellular organisms is critically dependent upon adhesive interactions of their component cells. In the past 15 years, a revolution in the understanding of cell adhesion has sprung from the recognition that cell interaction events are ascribable to specific molecular interactions of cellular receptors. These adhesion receptors seem to be members of a relatively limited number of gene families, delineating central themes of research relevant to broad areas of biology. At the same time, the use of recurrent structural motifs, (e.g., fibronectin Type III repeats, immunoglobulin constant domains, cadherin extracellular domains) in proteins not previously thought to be homologous, has provided another level of generality in cell adhesion research.

With this enormous expansion in molecular understanding has come an unprecedented opportunity for elucidating the regulation of cell adhesion. This has been stimulated by the realization that some of the underlying interactions can be manipulated by use of small organic "mimics," i.e., antiadhesive drugs. Further, the appreciation that cell adhesion receptors can themselves be regulated by cellular signaling reactions (inside-out signaling) and can, in turn, regulate important cellular processes (outside-in signaling) has become a current focus of research in this field. Finally, with the explosive growth in molecular means to alter the genomes of complex organisms, experiments to confirm the biological roles of cell adhesion events in biology and pathology have become feasible.

As with other organ systems, the development and functioning of the vasculature is centrally regulated by cell adhesive interactions. For example, the maintenance of endothelial integrity and the migration of vascular cells in response to vessel injury are critically adhesion dependent. Both of these processes have enormous consequences for the functioning and remodeling of blood vessels, and for their pathophysiology. Finally, the formation of new blood vessels is dependent on cell adhesive interactions and can, in some cases, be blocked by adhesion inhibitors.

Diseases of the vasculature, e.g., atherosclerosis and thrombosis, are responsible for most deaths in the Western world, and blood vessels play central pathophysiologic roles in other diseases, e.g., inflammation and malignancy. Consequently, research on adhesive interactions in the vasculature may have therapeutic significance. Since the *JCI* is devoted to publishing fundamental investigations of relevance to human biology and pathophysiology, the editors believe that the area of cell adhesion in the context of the vasculature is ripe for a Perspective series. In this series (see box below), acknowledged leaders in the field will discuss fundamental issues of cell adhesion including the structure, functioning, and biology of these receptors, how they recognize ligands, and how they interact with cellular signaling machinery. Other experts will discuss use of the tools of modern molecular biology to probe the functional roles of cell adhesion in vascular biology, in pathophysiology, vascular development, and angiogenesis. The goal is to acquaint the general reader with current issues in cell adhesion research in general, in the specific context of vascular biology and human disease.

Mark H. Ginsberg, Zaverio M. Ruggeri, and Ajit P.Varki,
Series Editors

"Cell Adhesion In Vascular Biology"

Series Editors, Mark H. Ginsberg, Zaverio M. Ruggeri, and Ajit P. Varki

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J. Clin. Invest.

0021-9738/96/10/1505/01 $2.00
Volume 98, Number 7, October 1996, 1505