

<<信号转导手册>>

图书基本信息

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作者：布拉德肖

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## <<信号转导手册>>

### 内容概要

Ralph

A.Bradshaw编著的《信号转导手册(1细胞内外信号转导机制原著第2版导读版)(精)》包含350个章节，全面涵盖细胞信号转导领域。

内容包括：细胞内外信号转导机制，蛋白质磷酸化和去磷酸化，钙离子信号转导、脂质介导的第二信使，蛋白质互作、环化核苷酸，G蛋白、发育生物学中的信号转导，转录与翻译：细胞核与细胞质事件，细胞内功能区隔信号转导、胞间和细胞基质的相互作用、疾病病理学。

《信号转导手册(1细胞内外信号转导机制原著第2版导读版)(精)》是生物学实验室不可或缺的工具用书，适用于生物化学与分子生物学、细胞生物学等相关专业的高年级本科生、研究生，也可作为教师的教学和科研参考书，亦可供生物医学、药理学、免疫学及相关领域的研究人员参考。

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## 章节摘录

**Mechanistic Features of Cell-Surface Adhesion Receptors** Living cells constantly interact with their environment. As a consequence, a number of sensory systems have evolved for the collection, processing, and integration of a remarkable range of environmental stimuli arising from cell-cell and cell-substrate interactions. For instance, developmental and morphological processes in higher eukaryotes rely on the orchestrated migration of cells in response to specific physical and chemical cues; T cell activation relies on the localization and compartmentalization of cell-adhesion and signaling molecules; and adherent cells must respond to a variety of intracellular and extracellular mechanical forces. All of these processes rely on the engagement of specific cell-surface receptors with the appropriate extracellular ligand to report on the immediate physical environment by transducing extracellular signals across the plasma membrane. This review examines the diversity of mechanisms thought to be involved in adhesion and signaling and highlights some of the shared principles that must be considered for all signaling pathways utilizing cell-surface receptors.

**MECHANOSENSORY MECHANISMS** The ability to detect and respond to alterations in applied mechanical force is required for a number of cellular and developmental functions. This is particularly critical for adherent cells that directly contact the extracellular matrix (ECM) and are subject to considerable physical deformation. For example, shear forces associated with blood flow are major determinants of arterial tone and vascular reorganization. At the cellular level, morphology and orientation are optimized to minimize mechanical stress and damage associated with variations in flow-related forces (see, for example, (1-31)). Similarly, fibroblasts must be highly responsive to the mechanical forces associated with alterations in the ECM (reviewed in 141).

Considerable evidence points to focal adhesions, the sites of cell-substrate contact, as the sensors of mechanical force. Central to focal adhesion assembly and function are the integrins, a family of  $\alpha$ - $\beta$  heterodimeric transmembrane glycoproteins that provide essential adhesive functions for cell migration and the establishment and maintenance of normal tissue architecture. At least 18  $\alpha$  and 8  $\beta$  chains allow for the formation of multiple integrin heterodimers that are able to display a spectrum of specificities for cell-surface adhesion molecules and for a range of ECM components, including laminin, collagen, and fibronectin. The integrin cytoplasmic domains bind a variety of scaffolding and actin regulatory proteins, which in turn recruit a large number of adaptor and signaling molecules. These physical links couple the integrins to the downstream activation of numerous signaling molecules, including MAP kinase, focal adhesion kinase, Src, and P13-kinase (see, for example, (4, 51)). Furthermore, integrin affinity is modulated by the activation state of the particular cell in question.

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