

Juxtacrine Signaling

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In juxtacrine interactions, proteins from the inducing cell interact with receptor proteins of adjacent responding cells. The inducer does not diffuse from the cell producing it. There are three types of juxtacrine interactions. In the first type, a protein on one cell binds to its receptor on the adjacent cell. We saw this type of juxtacrine interaction when we discussed the interaction between the Bride of sevenless protein and its receptor, Sevenless. In the second type, a receptor on one cell binds to its ligand on the extracellular matrix secreted by another cell. In the third type, the signal is transmitted directly from the cytoplasm of one cell through small conduits into the cytoplasm of an adjacent cell (Figure 1).

Intercellular interactions in which one cell sends a signal to another cell, inducing a change in function of the second cell, are common in morphogenesis, development, inflammation, and repair of the lung and other organs. In juxtacrine intercellular signaling, the molecule that induces the functional changes in the target cell remains associated with the plasma membrane of the signaling cell, rather than acting in the fluid phase. This feature distinguishes juxtacrine signaling from endocrine and paracrine stimulation and provides a mechanism for strict spatial control of activation of one cell by another. Juxtacrine signaling is likely to be common in physiologic events that require tight regulation, and disruption of juxtacrine signaling may lead to pathologic outcomes.

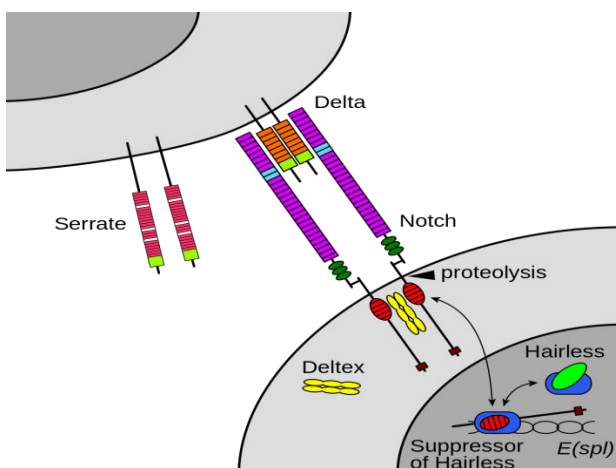


Figure 1: Juxtacrine Signaling.

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