Integrin mediated adhesion as a regulator of cellular trafficking and function.

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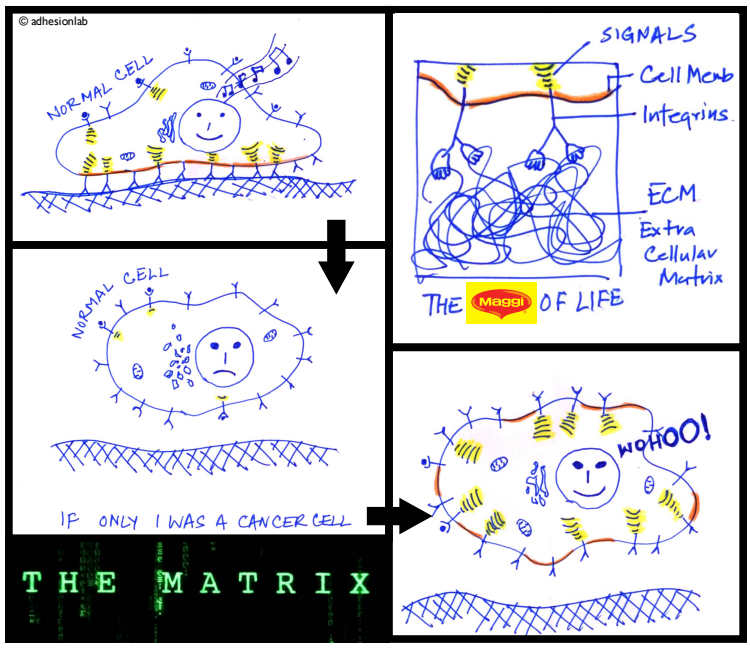
Growth factor mediated cell cycle progression and growth is dependent on the ability of cells to attach to the extracellular matrix (ECM). This phenomenon known as anchorage dependence and is primarily mediated by integrin receptors. Though growth factors and integrins can both independently propagate intracellular signals, their crosstalk allows for better and finer control of cell growth. Cancer cells overcome this need to be adherent to grow and become anchorage independent. Understanding how adhesion regulates growth signaling and how cancer cells overcome this regulation, is important to our knowledge of how cancers are caused and eventually treated.



Work in the recent past has revealed integrin mediated adhesion to regulate the plasma membrane targeting of membrane raft microdomains to drive anchorage dependent growth signaling (Erk, Akt, Rac signaling). On loss of adhesion membrane rafts are rapidly endocytosed, and cleared from the plasma membrane to turn off growth signaling. This is mediated by the stimulation of caveolar endocytosis and simultaneous inhibition of exocyst dependent exocytosis in non-adherent cells. Cancer cells smartly enough regulate both pathways to drive anchorage independent membrane raft trafficking and signaling.

Our studies have focused on understanding how these pathways are regulated and how they can be targeted in cancers. We are also exploring how these regulatory processes could differ in 3D vs 2D and also if and how integrins could play a role in organelle function. My talk will be discussing some of these aspects of integrin mediated adhesion.

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