

CELL-MATRIX MECHANICS

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Homework #2  
Solutions

1. The ligand for the  $\alpha_6\beta_1$  integrin is laminin, not fibronectin. Therefore, one might not expect much binding of the cells to the fibronectin-coated dish.
  
2. The cells are attaching to the conventional dishes, even though the dishes are not pre-coated with an adhesion protein, because the cells are synthesizing their own adhesion proteins, which are becoming adsorbed to the dish and subsequently serve as binding sites for the cells; the cells have integrins to the adhesion proteins that they make. The new dishes may not have a chemical composition that allows for adsorption of the adhesion proteins produced by the cells.
  
3. a) One explanation for the inability of the dermis to heal by contraction like it normally does is that the fibroblasts are not able to bind to the matrix molecules (*viz.*, collagen). The likely missing cell adhesion molecule is an integrin for fibronectin (or collagen).  
  
b)
  - 1) Tissues that you would expect to be abnormal would be connective tissues requiring cell adhesion to fibronectin and collagen, and 2) tissues that would likely heal normally would be tissues in which cells bind to basement membrane (*i.e.*, in which laminin is the ligand).

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