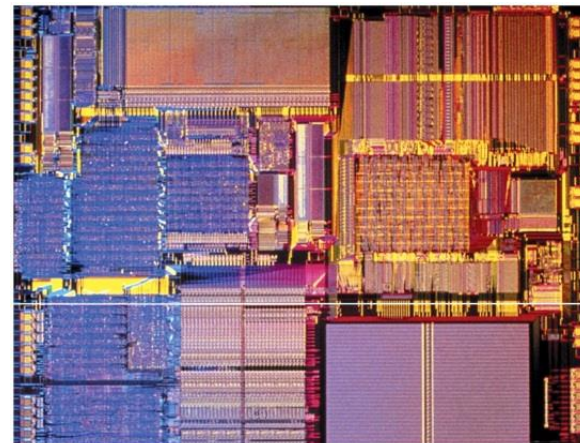
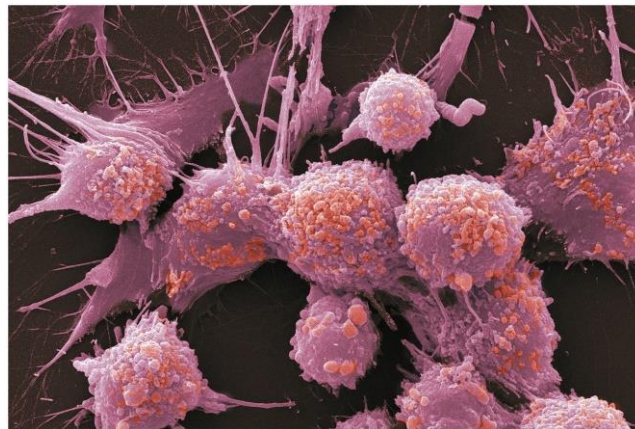
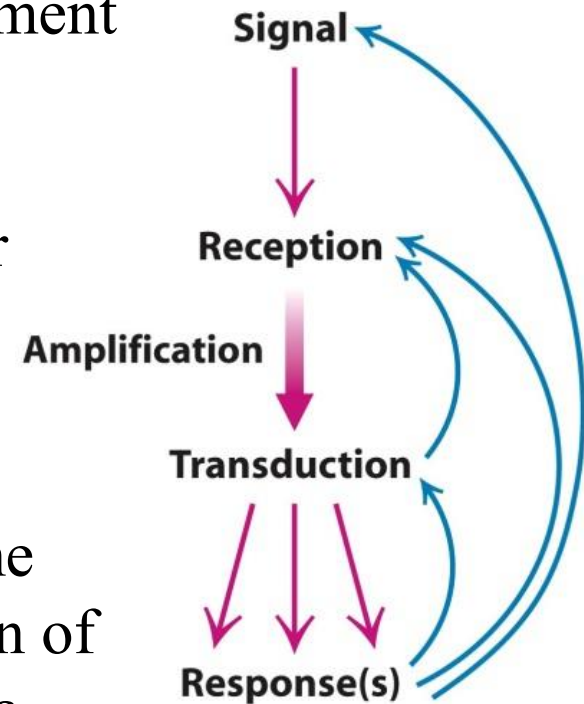


Ch 20.1 Signal transduction pathways

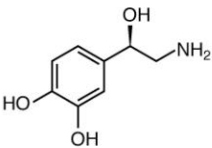
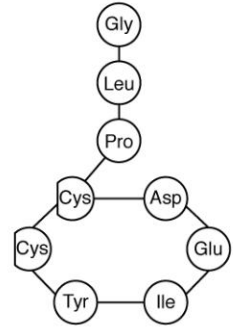
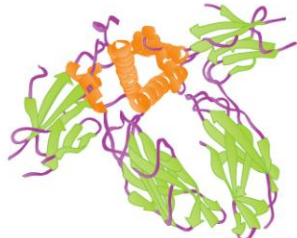
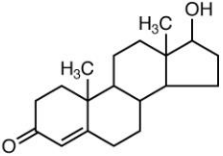
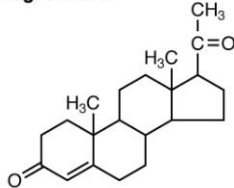
- Allows cells to respond to an ever changing environment
 - Chemical signals are crucial for coordinating physiological responses
- Signal transduction pathways function like computer chips
 - Components have ON/OFF switches
- To create a robust response, the hormone that is released/stimulated must increase to and exceed some “threshold concentration” which then triggers a chain of events that converts the message being presented to a physiological response. This is called **signal transduction**



Overview of Hormone Action

3 Examples of vertebrate hormonal signals:

- Amino acid derivatives
 - When a mammal is threatened epinephrine (adrenaline) stimulates mobilization of energy stores and leads to improved cardiac and respiratory function
 - Catecholamines, thyroxine
- Peptides or polypeptides
 - Insulin is secreted after you eat to ensure glucose is taken up from bloodstream and stored as glycogen
 - glucagon
- Steroids
 - Epidermal growth factor (EGF) stimulates specific cells to grow and divide after a wound
 - Glucocorticoids and sex hormones

Hormone Class	Components	Example(s)
Amine Hormone	Amino acids with modified groups (e.g. norepinephrine's carboxyl group is replaced with a benzene ring)	Norepinephrine 
Peptide Hormone	Short chains of linked amino acids	Oxytocin 
Protein Hormone	Long chains of linked amino acids	Human Growth Hormone 
Steroid Hormones	Derived from the lipid cholesterol	<div style="display: flex; justify-content: space-around;"> <div> Testosterone  </div> <div> Progesterone  </div> </div>