CRC for Premium Quality Wool

Chemical Signalling - hormones and growth factors

Produced for the CRC for Premium Quality Wool undergraduate program by;
Dr. Janelle Hocking Edwards, The University of Western Australia.

Chemical Signals

- Hormones, growth factors, neurotransmitters
  - Steroids / hydrophobic - testosterone
  - Proteins (peptides) / hydrophilic - GH, IGF
  - Combination /partly hydrophilic/phobic - Thyroxine
- Produced by a number of cell types
- How do they convey specific signals?
  - through their unique structure
  - through receptors in target cells
    - these can affect gene expression or cell cycle

General properties of growth factors

- small proteins (5 - 30kDa)
- found in various animal tissues
- accelerate the transport of ions and nutrients
- stimulate growth and development
  - increase DNA, RNA, protein synthesis and lipogenesis
  - decrease protein breakdown and lipolysis

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Similarities of growth factors and hormones

- structural
- specific receptors
- use secondary messengers
- some functions

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Differences between growth factors and hormone properties

	Hormones	Growth factors
• Response	Rapid/Acute	Slower
• Action	Endocrine	Auto/para/endo.
• Production	Secretory cell	All cells
• Release	Bolus	Diffusion
• Receptors	Inter & extracellular	Cell membrane

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