

# Lecture 17

Thursday, July 15, 2021 01:17

## Inflammatory Physiology

- DOMS caused by prostaglandins, bradykinins (among many others)
- Macrotrauma: result of a single event such as a car accident or falling down
- Microtrauma: cumulative effect from simple acts of daily living over a period of time
- Indication: a valid reason to use a certain test, medication, procedure, or surgery
- Contraindication: a condition that serves as a reason to not take a certain medical treatment due to the harm that it would cause the patient
- Dislocation: when the bones in a joint become separated or knocked out of their usual/normal positions
- Subluxation: a partial dislocation
- Sprain vs. strain:
  - o Sprain - injures the bands of tissue that connect two bones together
  - o Strain - an injury to a muscle or to the band of tissue that attaches a muscle to a bone
- Scab:
  - o Insoluble fibronectin is already hanging out in the extracellular matrix
  - o Soluble fibronectin is a major component of blood plasma
  - o There's a hemorrhage into the tissue; the extravasated fibronectin cross-links to fibrin, collagen, and other ECM stuff
  - o This cross-linkage provides a provisional mechanical stabilization of the wound
- Platelets adhere to exposed ECM via von Willebrand factor (vWF) and are activated
- Matrix itself becomes a hub for chemotactic signaling
- Some resident macrophages will already be in the area, ready to put out chemotactic signals

- All this stuff helps direct a bunch of cells and chemicals to the site of the injury
  - o First to show up: neutrophils
- These cells, proteins, chemicals, and other incoming stuff cause the local vasculature to become porous and leaky
  - o When platelets are in the tissue, those pro-inflammatory cytokines they're releasing regulate inflammation
- Vascular leakiness
  - o Damage itself might get leakiness started, but once pro-inflammatory cytokines show up (especially IL-1, IL-6, and TNF-alpha), it gets much *more* leaky
  - o Leakiness is: a) how the migrating cells get to the site of damage, b) why you swell; proteins leak out and water follows
- Summary so far:
  - 1) Injury
  - 2) Blood and lymphatic vessels are disrupted
  - 3) A few macrophages are already in the area
  - 4) Platelets are the first responders
  - 5) Both secrete pro-inflammatory cytokines
  - 6) Vascular endothelium starts to get a bit leaky
  - 7) Leakiness is why you swell (which isn't inflammation)
  - 8) Leakiness also allows migrating immune cells into the area
  - 9) Those incoming cells (first: neutrophils) show up by "chemotaxis"
  - 10) Platelets and macrophages are *both* responsible for chemotaxis
- Reason stuff gets all leaky (enabling the arrival of inflammation and swelling) is not just the cytokines
- Complement proteins - complement your phagocytic cells; make it easier for those cells to do their phagocytizing