Microvesicles from macrophages as modulators of inflammation

Inventor: Kodi S. Ravichandran, Claudia Han
Cell communication and its influence on inflammation

- Professional phagocytes (e.g. macrophages) and non-professional phagocytes (e.g. epithelial cells) work in concert to clear billions of apoptotic cells and particles on a daily basis.
- During apoptotic cell engulfment or in response to inflammation-associated cytokines, macrophages release insulin-like growth factor 1 (IGF-1) and also microvesicles.
- **Clinical Problem:**
  - Although professional and non-professional phagocytes reside in proximity in most tissues, it is unknown whether they communicate and how this might impact inflammation.

Adapted from Kaur et al. Euro Resp Rev 2015
Microvesicles from macrophages modulate inflammation

Solution: Researchers at the University of Virginia have discovered a novel IGF-1 and microvesicle-dependent communication between macrophages and epithelial cells.

- Delineate macrophage-epithelial cell communication
- Can critically influence the magnitude of tissue inflammation
- Microvesicles can be used to dampen various inflammatory disorders
IGF-1 impacts phagocytosis

IGF-1 produced by macrophages can redirect phagocytosis by non-professional phagocytes, suppressing uptake of larger apoptotic cells and enhancing internalization of smaller particles.
IGF-1/IGF-1R signaling in inflammation

Upon introduction of allergen HDM, mice lacking IGF-1R have exacerbated inflammation in the airway epithelial cells and lungs.
Relevant Publications

Intellectual Property

• UVA Tech ID: RAVI-MICROVE
  – Title: Macrophages redirect phagocytosis by non-professional phagocytes and influence inflammation