

Research Area

Orthopaedic and Vascular Cellular Tissue Engineering

Tissue Engineering, Cell Engineering, Angiogenesis, Orthopedics, Bone Remodeling, Wound Healing, Mechanotransduction, Signal Transduction, Cell Adhesion, Cell Migration.

Research Details

Investigating the interrelationship of angiogenesis and osteogenesis in the development, remodeling and wound repair of bone. Specifically studying the roles of cell adhesion and cell migration at the blood-bone interface and the influence of environmental signaling on these cellular functions.

Selected peer-reviewed publications (in chronological order)

1. Hung , CT , Allen, FD, Pollack, SR, and Brighton , CT : What is the role of convective current density in the real-time calcium response of cultured bone cells to fluid flow? *J. Biomechanics* , 29(11):1403-1409, 1996.
2. Hung , CT , Allen, FD, Pollack, SR, and Brighton CT : Intracellular Ca²⁺ stores and extracellular Ca²⁺ are required in the [Ca²⁺]_i response of bone cells experiencing fluid flow. *J. Biomechanics* , 29(11): 1411-1417,1996.
3. Allen, FD, Hung , CT , Pollack, SR, and Brighton CT : Comparison of the [Ca²⁺]_i response of cultured primary, MC3T3-E1 and ROS 17/2.8 osteoblast-like cells to fluid flow. *Cellular Eng.* , 1:117-124, Summer 1996.
4. Hung , CT , Allen, FD, Pollack, SR, Attia, ET, Hannafin, JA, and Torzilli , PA : Medial collateral and anterior cruciate ligament fibroblasts exhibit different [Ca²⁺]_i responses to fluid flow. *Cell Signal* , December 9(8):587-594, 1997.
5. Hung , CT , Allen, FD, Mansfield, KD, and Shapiro, IM: Extracellular ATP modulates [Ca²⁺]_i in retinoic acid-treated embryonic chondrocytes. *Am. J. Physiol.* , May 272(5 Pt 1):C1611-C1617, 1997.
6. Gupta, R, Allen, FD, Tan, V, Bozentka, DJ, Bora, FW, and Osterman , AL : The effect of shear stress on fibroblasts derived from Dupuytren's tissue and normal palmar fascia. *J. Hand Surg. - American*, 23A:(5)945-950, Sep. 1998.

Selected peer-reviewed publications (in chronological order) *continued*

7. Lauffenburger, DA, Ware MF, Allen, FD, and Wells, A: Shaping Up for Shipping Out: PLC γ Signaling of Morphology Changes in EGF-stimulated Fibroblast Migration, *Cell Motility and the Cytoskeleton*, 44:227- 233, 1999.

8. Allen, FD, Hung, CT, Pollack, SR, and Brighton, CT : Serum modulates the intracellular calcium response of primary cultured bone cells to shear flow, *J. Biomechanics*, 33(12):1585- 15 91 , Nov. 2000 .

9. Allen, FD, Asnes, CF, Chang, P, Elson, EL, Lauffenburger, DA, Wells, A: Epidermal growth factor induces acute matrix contraction and subsequent calpain-modulated relaxation, *Wound Repair and Regeneration* , 10 (1):67-76, Jan-Feb 2002 .

10. Amir Rezvan, Fred D. Allen and Peter I. Leikes, Steady Unidirectional Laminar Flow Inhibits Monolayer Formation by Human and Rat Microvascular Endothelial Cells, *Endothelium* , 11:1-6, 2004.

11. Akihiro Iwabu, Kirsty Smith, Fred Allen, Douglas A. Lauffenburger and Alan Wells, EGF induces fibroblast contractility and motility via PKC γ dependent pathway, *JBC* , April/May, 2004.