

BIM 222: Cytoskeletal Mechanics, Fall 2010

Department of Biomedical Engineering

CRN: 83357 (4 Units)

Schedule: Lectures: T, TH 10:00 – 11:50 AM, GBSF 2202

Instructor: So(ichiro) Yamada (syamada@ucdavis.edu)

Office: GBSF 2317, Phone: (530) 752-7251

Office Hours: By appointment

Textbook: Recommended: *Molecular Biology of the Cells*, Alberts et al., 5/e 2008 Garland Science

Grade: The course grade will be based on writing assignments (50%), student presentation (40%), and class participation (10%).

Course Schedule:

	Date	Topic	Presenter
1	Sept 23	Introduction	
2	Sept 28	Actin assembly and force generation	
	<i>Sept 30</i>	<i>Class Cancelled</i>	
3	Oct 5	<i>Capping protein increases the rate of actin-based motility by promoting filament nucleation by the Arp2/3 complex. Akin and Mullins. Cell. 133:841, 2008</i>	So Yamada
	<i>Oct 7</i>	<i>Annual BMES meeting</i>	
4	Oct 12	Force transmission at adhesive contacts	
5	Oct 14	<i>Traction dynamics of filopodia on compliant substrates. Chan and Odde. Science. 322:1687, 2008</i>	So Yamada
6	Oct 19	Contractile forces	
7	Oct 21	<i>A zyxin-mediated mechanism for actin stress fiber maintenance and repair. Smith et al. Dev Cell. 19:365, 2010</i>	Arisa Uemura
8	Oct 26	Physical properties of neighborhood and cell function	
9	Oct 28	<i>Mechanical regulation of cell function with geometrically modulated elastomeric substrates. Fu et al. Nat Methods. 7:733, 2010</i>	Tyler Tomita
10	Nov 2	Molecular mechanism of force sensing	
11	Nov 4	<i>Measuring mechanical tension across vinculin reveals regulation of focal adhesion dynamics. Grashoff et al. Nature. 466:263, 2010</i>	Tyler Tomita
	<i>Nov 9</i>	<i>Class Cancelled</i>	
	<i>Nov 11</i>	<i>Veterans Day</i>	
12	Nov 16	Force sensing machinery at the sites of cell-cell adhesion	
13	Nov 18	<i>Alpha-catenin as a tension transducer that induces adherens junction development. Yonemura et al. Nat Cell Biol. 12:533, 2010</i>	Wenting Shih
14	Nov 23	<i>Transient frictional slip between integrin and the ECM in focal adhesions under myosin II tension. Aratyn-Schaus and Gardel. Curr Biol. 20:1145, 2010</i>	Gina MacBarb
	<i>Nov 25</i>	<i>Thanksgiving</i>	
15	Nov 30	<i>Dynamics of shear-induced ATP release from red blood cells. Wan et al. PNAS, 105:16432, 2008</i>	Nancy Zeng
16	Dec 2	<i>Tensile forces govern germ-layer organization in zebrafish. Krieg et al. Nat Cell Biol. 10:429, 2008</i>	Pasha Hadidi