

**THE
TRIANGLE
CYTOSKELETON
MEETING**

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Cytoskeleton, Inc.

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one protein at a time.

2017 PROGRAM

SCHEDULE

SEPTEMBER 24TH @ YESTERYEARS BREWERY

300 E Main St c, Carrboro, NC 27510
(Pre-meeting session)

6:00PM Registration

6:30PM Caroline Laplante - NCSU

7:00PM Unsupervised mingling

7:30PM Klaus Hahn - UNC Chapel Hill

8:00PM Unsupervised mingling

Local brews will be provided by
YesterYears Brewery

SEPTEMBER 25TH @ HAW RIVER BALLROOM

1711 Saxapahaw-Bethlehem Church Rd
Saxapahaw, NC 27340

8:00AM Breakfast/Registration

9:00 Mechanics and structure of
cytoskeletal complexes 1

10:00 Poster Session 1

11:00 Mechanics and structure of
cytoskeletal complexes 2

11:40 Lunch

Lunch will be provided by
The Eddy Pub

12:40 Cytoskeleton in
Development and Disease 1

1:20 Poster Session 2

2:20 Quantitative and Modeling
Approaches in Studying the
Cytoskeleton 1

3:10 Poster Session 3

4:10 Cytoskeleton in
Development and Disease 2

5:00 Happy Hour

Local brews, wine and snacks will
be provided by The Eddy Pub

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MEETING ORGANIZERS

Carlos Patiño Descovich
Rachel Battaglia
Melissa Plooster
Tanner Fadero
Dan Keeley

With special thanks to:
Delphine Bull - UNC-Chapel Hill
Sophia Tintori - UNC-Chapel Hill
Daniel Cortes - UNC-Chapel Hill

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PRE-MEETING SESSION

PUB-TECH

Registration

Quantitative single molecule localization microscopy: visualizing the organization of proteins in live fission yeast cells

INVITED SPEAKER: Caroline Laplante - NC State University

Building proteins to peek and poke at GTPase circuits in vivo

INVITED SPEAKER: Klaus Hahn - UNC Chapel Hill

Unsupervised mingling

MECHANICS AND STRUCTURE OF CYTOSKELETAL COMPLEXES 1

Opening remarks

The TOG Tales of the Tail of the XMAP215 Family

Rebecca C. Adikes, A. Xue, B F. Saway, Kevin C. Slep - UNC-Chapel Hill

Programmed Variations of Cytokinesis Contribute to Morphogenesis in the *C. elegans* embryo

Xiaofei Bai, B C. Chen, R. Simmons, C. Turpin, L. Uehlein, D. Mitchell, Eric Betzig, Joshua
N. Bembenek - University of Tennessee - Knoxville, Janelia Research Campus

Physical Confinement of Cells Induces Compression of the Focal Adhesion Protein Vinculin

Katheryn E. Rothenberg, A S. LaCroix, A R. Koss, S S. Neibart, Brenton D. Hoffman -
Duke University



POSTER SESSION 1

PPP1R2 interacts with AURK in vivo and its overexpression causes centrosomal abnormalities

Alan-Michael Bresch, Dr. Ann O. Sperry - East Carolina University

Polarized TOG domains cooperatively bind tubulin to promote MT dynamics

Amy E. Byrnes, Benjamin F. Lowe, and Kevin C. Slep - UNC Chapel Hill

Identification and characterization of a putative myosin-mediated contractile activity in sponges

Eric Chang, Chris Cotter, Malcolm S. Hill, Omar A. Quintero - University of Richmond

Modeling Condensin Protein Complex's Interactions with DNA in Different Arrangements Through Computational Simulations

Brandon Friedman, Ayush Doshi, Josh Lawrimore, Kerry Bloom - UNC Chapel Hill

Regulators of cellular metabolism during cell invasion in *C. elegans*

Aastha Garde and David Sherwood - Duke University

Rap1a/b isoforms differentially regulate megakaryocyte biology

Dorsaf Ghalloussi, Ellen C O'Shaughnessy, David S Paul, Klaus Hahn, Raymond Piatt, Lucia Stefanini, Robert Hugh Lee, Koji Eto, Wolfgang Bergmeier - UNC Chapel Hill

Chemotropism in yeast

Debraj Ghose, Timothy Elston, and Daniel Lew - Duke University

Role of metavinculin in actin reorganization and force transmission

Hyunna T. Lee, Laura Kim, Muzaddid Sarker, Min-Qi Liu, Gregory Alushin, Keith Burridge, and Sharon L. Campbell - UNC Chapel Hill

An ankyrin-B and clathrin pathway regulates GLUT4 internalization in adipocytes

Damaris N. Lorenzo, Vann Bennett - UNC Chapel Hill

Dual roles of Afadin and α -catenin in spindle orientation and adhesion assembly

Kendall Lough, Kevin M. Byrd, Danielle Spitzer, Michelle Mac, Scott E. Williams - UNC Chapel Hill

A pair of E3 ubiquitin ligases coordinate responses of DCC to its ligand, netrin-1

Caroline Monkiewicz & Stephanie Gupton - UNC-Chapel Hill

Traction Force Microscopy on Soft Silicone substrates

Tim O'Brien, Tyler Brookshire, Mitchell Dudley, Jeremy Denenberg, Michael Falvo, Richard Superfine - UNC Chapel Hill

How is apical constriction triggered?

Mark M. Slabodnick, Timothy D. Cupp, Sophie Tintori, Bob Goldstein - UNC Chapel Hill

Cell-cell fusion facilitates aneuploidy tolerance in a developing organ

Nora Peterson, Kevin Schoenfelder, Benjamin Stormo, Rayson Lee, Donald Fox - Duke University

Developing and Characterizing an N-Cadherin FRET-based Tension Sensor

Ishaan Puranam, Aarti N. Urs, Brenton D. Hoffman - Duke University

Negative regulation of contractility by GCK-1 and CCM-3 during cytokinesis

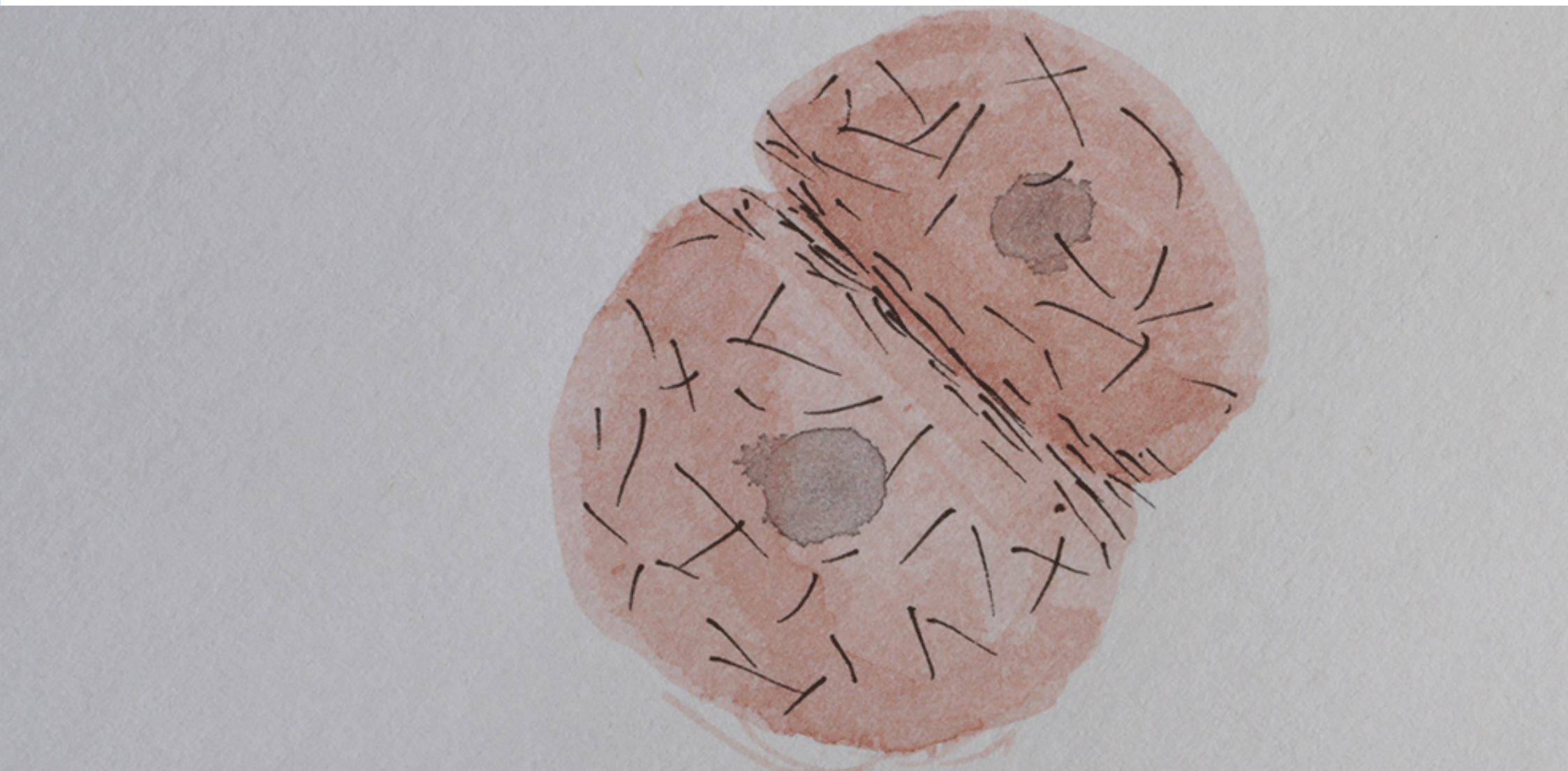
Kathryn Rehain-Bell, Anusha Doshi, Daniel B. Cortes, Michael E. Werner, and Amy Shaub Maddox - UNC Chapel Hill

Defining how the PXXP-binding partner, Crk, works with Abl to regulate cell adhesion and actin dynamics during morphogenesis

Andrew J. Spracklen, Alison N. Bonner, and Mark Peifer - UNC Chapel Hill

Obesity disrupts tight junctions in the mammary gland

Iliana Tenvooren, Monica Z. Jenks, Katherine L. Cook, Kevin Wang, Keith Bonin, and Pierre-Alexandre Vidi - Wake Forest University Health Sciences



MECHANICS AND STRUCTURE OF CYTOSKELETAL COMPLEXES 2

Crosstalk between the Cdc42 GEFs Gef1 and Scd1 comprise a signaling network that coordinates sequential cytokinetic events

Brian Hercyk & Maitreyi Das - University of Tennessee - Knoxville

How yeast cells find their mates: tracking pheromone gradients with mobile polarity protein clusters

INVITED SPEAKER: Daniel Lew - Duke University

Lunch

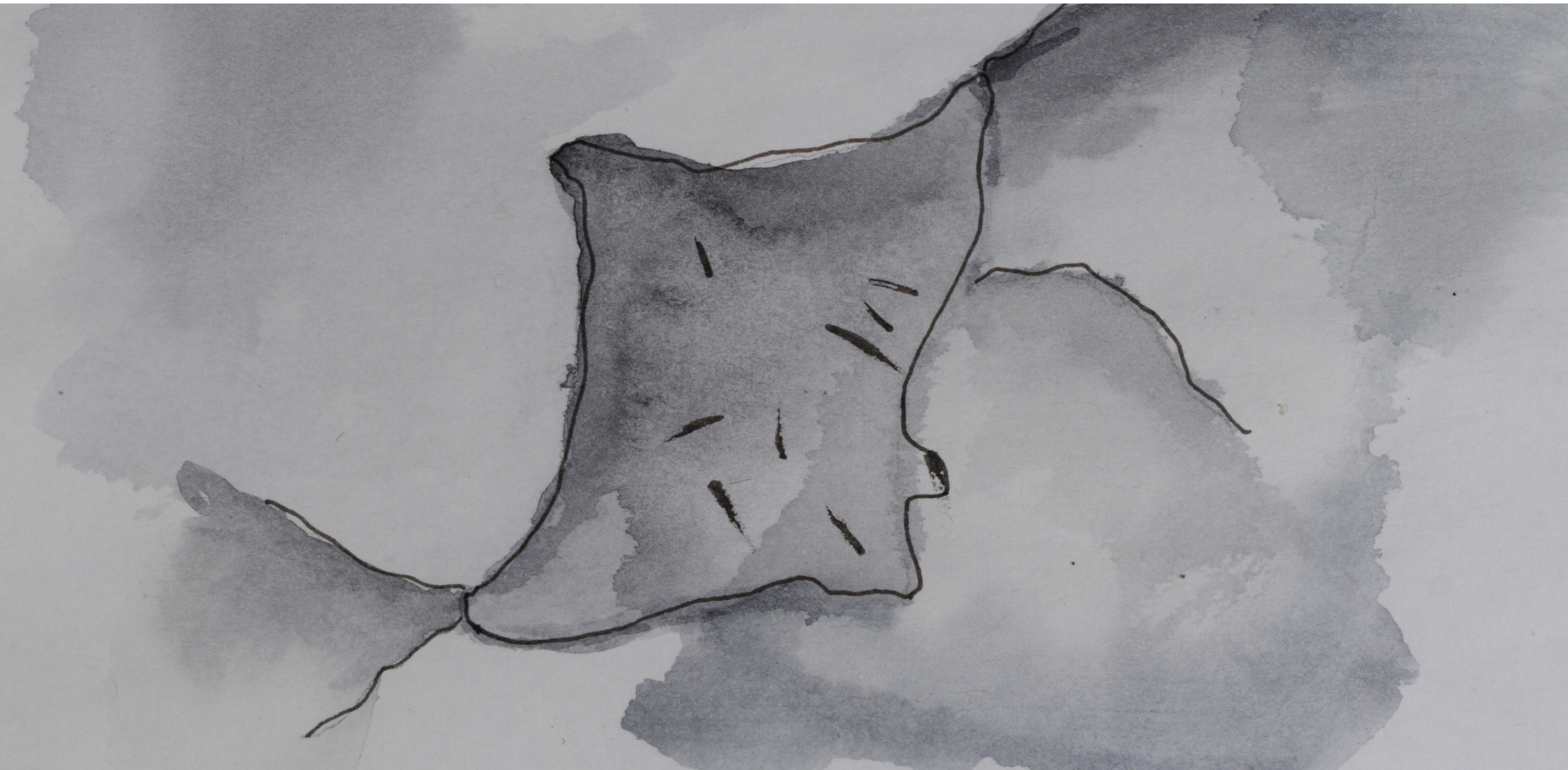
CYTOSKELETON IN DEVELOPMENT AND DISEASE 1

Actin assembly through CRMP-1 via Arp2/3-dependent and -independent mechanisms

Hui-Chia Yu-Kemp, J P. Kemp Jr., William M Brieher - UNC-Chapel Hill

TRIM proteins: Connecting filopodia to axon guidance

INVITED SPEAKER: Stephanie L. Gupton - UNC-Chapel Hill



POSTER SESSION 2

Investigating the role of Numb's polarity in EGFR signaling and ependymal development

Khadar Abdi, Chun-Hsiang Lai, Joon Pyun, and Chay Kuo - Duke University

Defining the network of proteins driving apical-basal polarity establishment in early *Drosophila* development

T. Bonello and M. Peifer - UNC Chapel Hill

The Brain-Enriched E3 Ubiquitin Ligase TRIM67 Regulates the Axonal Growth Cone Cytoskeleton

Boyer NP, Monkiewicz C, Menon S, Gupton SL - UNC Chapel Hill

Cdc42 GEF Gef1 coordinates actomyosin ring constriction and septum ingression during cytokinesis

B. Wei, P. Mlynarczyk, U. Onwubiko, J. Habiyaemye, A. Clack, S. Abel, M. Das - University of Tennessee

Modeling Condensin Protein Complex's Interactions with DNA in Different Arrangements Through Computational Simulations

Ayush Doshi & Brandon Friedman - UNC Chapel Hill

Importance of vinculin tension and cadherin turnover during collective cell migration

Evan M. Gates, Aarti Urs, Brenton D. Hoffman - Duke University

Analysis of the role of microtubules in controlling cotton fiber diameter

Benjamin P. Graham, Ethan T. Pierce, Michael R. Stiff, Robin E. Grant, and Candace H. Haigler - NCSU

Cerebral Organoids Model the Development of Autism Pathology

Colin Johnson, Pranaya Pakala, Karen Litwa PhD - East Carolina University

The C-terminal of Troponin T moves relative to tropomyosin, actin and troponin I in going from activating to relaxing conditions

Dylan Johnson, Li Zhu, Joseph M. Chalovich - East Carolina University

Improved and tunable FRET-based molecular tension sensors

Andrew S. LaCroix, Andrew D. Lynch, Matthew E. Berginski, PhD, Brenton D. Hoffman, PhD - Duke University

Joint mechanical injury in Osteoarthritis: chondrocyte mechanotransduction via Piezo ion channels and its regulation by a calcium-responsive dynamic actin cytoskeleton

Whasil Lee, Holly Leddy, Andrea Schwartz, Amy L. McNulty, Farshid Guilak, Wolfgang Liedtke - Duke University

The Enzymatic Activity and Cellular Localization of Drosophila Myosin 7a Is Regulated By a Novel Binding Protein

Rong Liu, Verl Siththannandan, Yi Yang, Amy Hong, Fang Zhang, Xufeng Wu, Neil Billington, Yasuharu Takagi and James R. Sellers - NIH

Force spectroscopy of phagocytosis with 3D light sheet imaging

E. Nelsen, J. Hsiao, E.T. O'Brien, M. Falvo, R. Superfine- UNC Chapel Hill

A reaction-diffusion model explains amplification of the phospholipase C/protein kinase C pathway in fibroblast chemotaxis

Jamie Nosbisch, Krithika Mohan, Timothy Elston, James Bear, and Jason Haugh - NCSU

Rap1 acts via multiple mechanisms to position CnA/Afadin and adherens junctions and mediate apical-basal polarity establishment

Kia Z. Perez-Vale, Teresa T. Bonello, Kaelyn D. Sumigra, Mark Peifer - UNC Chapel Hill

Understanding How CENP-N Specifically Binds Centromeric Nucleosomes

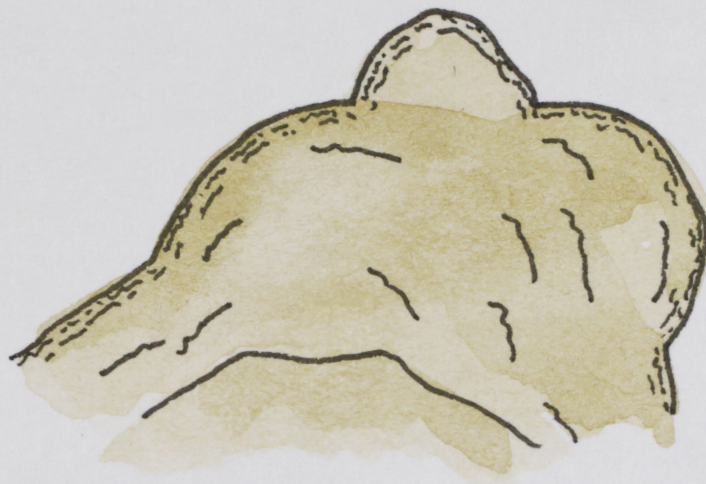
Saunders H, Hong J, Bai Y, Kelly AE - NIH

Regulators of the septin cytoskeleton

Ben Woods - UNC Chapel Hill

A Novel Function of Primary Cilia in Breast Cancer Recurrence

Jason Davis, Dulcemaria Hernandez, Andrea Walens, Nathaniel Mabe, James Alvarez, and Sarah Goetz - Duke University



QUANTITATIVE AND MODELING APPROACHES IN STUDYING THE CYTOSKELETON

PP2A-B55 and Lamin B collaborate in regulating centrosome migration during mitotic spindle formation

Vincent Boudreau, R. Chen, V. Archambault & Paul Maddox - UNC Chapel Hill

Size and Mechanical Scaling of Blood Platelets

KEYNOTE SPEAKER: François Nédélec - European Molecular Biology Laboratory

POSTER SESSION 3

Proximity Labeling Proteomics of Desmosomes Reveals Novel Components Essential for Epidermal Integrity

Kwabena Badu-Nkansah, Julie Underwood, Terry Lechler - Duke University

Development and Use of an Ezrin Tension Sensor to Measure Load Between the Cytoskeleton and Plasma Membrane

Matthew E Berginski, Andrew S LaCroix, Brenton D Hoffman - Duke University

Mechanisms controlling micron-scale membrane curvature recognition by septins

Kevin Cannon and Amy Gladfelter - UNC Chapel Hill

Principles that govern competition or co-existence in Rho-GTPase driven polarization

Jian-geng Chiou, Timothy C. Elston, Thomas P. Witelski, David G. Schaeffer, and Daniel J. Lew - Duke University

Mechanisms regulating the emergence of tissue-wide synchrony in *Drosophila* early embryos

Victoria E. Deneke, Alberto Puliafito, Stefano Di Talia - Duke University

Analysis of how yeast cells track pheromone gradients

Katherine Jacobs, Samuel Ramirez, Daniel Lew - Duke University

An optogenetic approach to control microtubule acetylation in living cells

Neha Kaul, Hui Wang, Onur Dagliyan, Klaus M. Hahn - UNC Chapel Hill

Two Distinct Roles of the Chromosomal Passenger Complex in the Detection of and Response to Errors in Kinetochore-Microtubule Attachment

Julian Haase, Mary Kate Bonner, Hyunmi Halas, Alexander E Kelly - NIH/NCI

Temporal regulation of morphogenesis in the budding yeast

Helen Lai, Trevin Zyla, and Daniel Lew - Duke University

Chromosome dynamics simulations reveal the role of condensin and cohesin in building the bottle-brush chromosome architecture

Josh Lawrimore, Ayush Doshi, Brandon Friedman, Alyona Fulp, Elaine Yeh, Kerry Bloom - UNC Chapel Hill

TRIM9 and TRIM67: master regulators of developing and adult-born neurons

Shalini Menon & Stephanie Gupton - UNC Chapel Hill

Cytoskeletal and chromatin organization defects in *C. elegans* spe-6 mutants disrupt the transition from meiotic prophase into the meiotic divisions.

Elena Parcell, Jackson Peterson, Diane C. Shakes - College of William & Mary

Characterization of MYO19 knockdown phenotype in a cultured neuron-like cell line

J.L. Bocanegra, J.L. Hawthorne, B.M. Fujita, A. Li, O.A. Quintero - University of Richmond

Disruption of the division-to-growth transition in fission yeast yields a novel phenotype of precocious cell growth without cell separation

Julie Rich, Maitreyi Das - University of Tennessee, Knoxville

Pharmacological Regulation of Neural Circuit Formation in hPSC-Derived Neurons and 'Mini-Brains'

Taylor Rudisill and Karen Litwa - East Carolina University

Intranuclear Diaphanous Formin mDia2 Regulates Stem Cell Differentiation

Jeyant S. Sankaran*, Buer Sen, Zhihui Xie, Cody McGrath, Maya Styner, Janet Rubin - UNC Chapel Hill

TBD

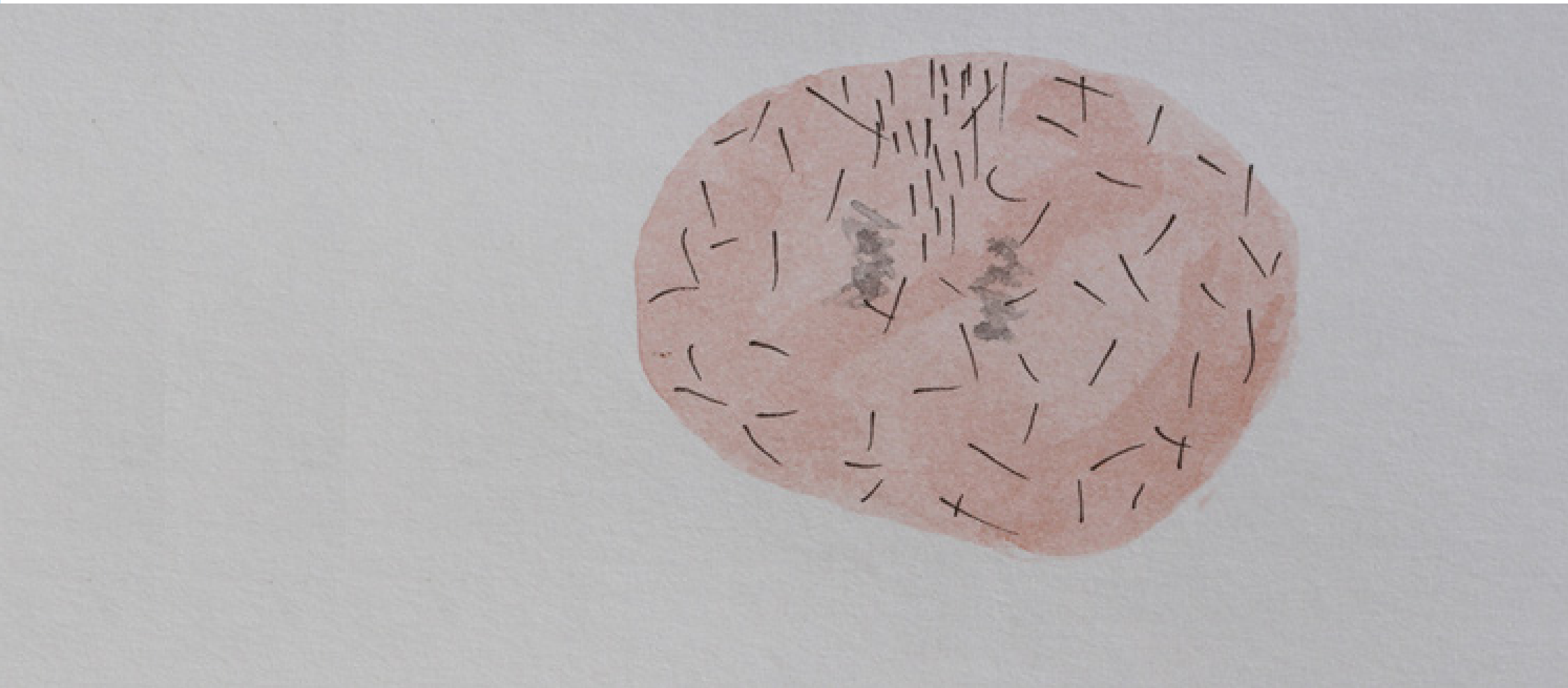
Pranaya Pakala- East Carolina University

Mechanism of movement of chromosomes by kinetochores

Janczyk PŁ, Skorupka KA, Tooley JG, Matson DR, Kestner CA, West T, Pornillos O, Stukenberg PT - University of Virginia

A role of Kinesin-5 in controlling Ndc80 functions at kinetochores

Aussie Suzuki, Gupta Amitabha, Sue Biggins, Kerry Bloom, E. D. Salmon - UNC Chapel Hill



CYTOSKELETON IN DEVELOPMENT AND DISEASE 2

Genomic knockout of Myosin-X in mouse results in semi-lethality and decreased filopodia

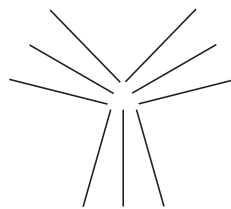
Ernest Heimsath, Y I. Yim, M. Mustapha, J. Hammer III, Richard Cheney - UNC Chapel Hill

A microtubule depolymerase regulates stem cell number and position in the skin

Rebecca Moreci & Terry Lechler - Duke University

Closing remarks + Travel award announcements

Happy hour



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