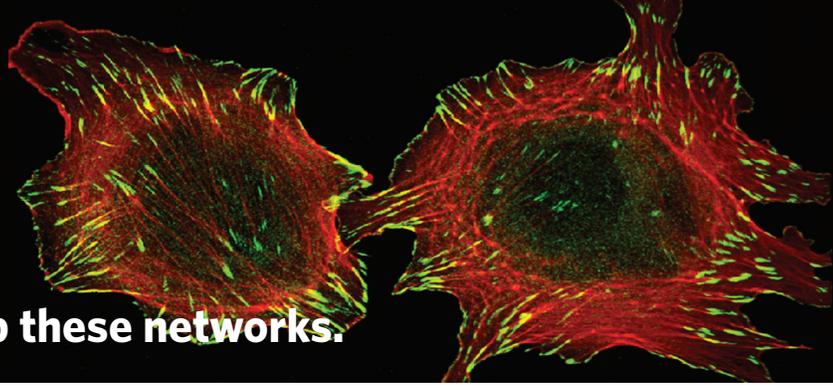


# Cellular networks are the basis of human health & disease.



**Our aim is to fully map these networks.**

## Graduate Programs

Biochemistry & Molecular Biology (MSc, PhD)

Cell & Developmental Biology (MSc, PhD)

Dental Sciences (MSc, PhD)

Microbiology & Immunology (MSc, PhD)

Neuroscience (MSc, PhD)

Zoology (MSc, PhD)

## Major research themes:

### 1-How signals move within cells

Drs. Pante, Church, Gold, Loewen, Matsuuchi

### 2-How signals move between cells

Drs. Matsuuchi, Naus, Roskelley

### 3-How cells interact with each other

Drs. Vogl, Naus, Roskelley, Tanentzapf

### 4-How cells interact with extracellular matrix

Drs. Tanentzapf, Moukhles, Moerman, Nabi

### 5-How cells move within and between tissues

Drs. Nabi, Roskelley, Richman, Gold, Church, Matsuuchi

### 6-How cellular compartments and membranes are organized

Drs. Loewen, Nabi, Pante, Moerman

### 7-How stem cells develop

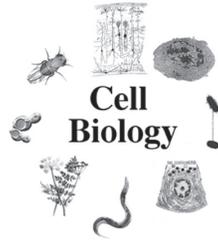
Drs. Richman, Tanentzapf

### 8-How cells are organized into tissues

Drs. Roskelley, Richman, Vogl, Moerman

### 9-How tissues communicate with each other

Drs. Roskelley, Matsuuchi, Gold, Naus



## Research Strengths & Facilities

The sequencing of the human genome has generated a 'parts list' that members of the CELL Research Group are using to construct cellular networks that underpin tissue structure and function. Therefore, these processes form the basis of human health and, when dysfunctional, human disease. The experimental tools being

used to construct these networks are cell biology, multi-modal microscopic imaging, molecular genetics, proteomics and bioinformatics together with cell culture, tissue engineering, model organisms and transgenic animals.

The experiments are being carried out in a highly collaborative multidisciplinary environment in which **10 scientists** are working with more than 80 trainees and research assistants to address fundamental questions at the interface of science and medicine that cannot be answered in classical, single discipline environments. <http://celldevelopment.ubc.ca/>

## Fundamental questions being addressed by the group include:

- How do cells receive and translate signals that regulate tissue-specific gene expression?
- How do cells transport their gene products to the appropriate destination within a tissue?
- How do cells interact during the generation of specific tissues?
- How do cells respond to and integrate signals from other cells?



Cell and Developmental Biology Retreat at UBC Research & Education Centre, Loon Lake



a place of mind  
THE UNIVERSITY OF BRITISH COLUMBIA

Life Sciences Institute  
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web: [lsi.ubc.ca](http://lsi.ubc.ca)  
web: [celldevelopment.ubc.ca](http://celldevelopment.ubc.ca)

# Our goal is to understand the mechanisms that direct cellular function and interactions during development and to determine how these interactions may be disturbed in a wide range of diseases.



## RECENT PUBLICATIONS:

Freeman SA, Lei V, Dang-Lawson M, Mizuno K, Roskelley CD, Gold MR. (2011). Cofilin-mediated f-actin severing is regulated by the rap GTPase and controls the cytoskeletal dynamics that drive lymphocyte spreading and BCR microcluster formation. *J Immunology* 187: 5887-5900.

Machtaler S, Dang-Lawson M, Choi K, Jang C, Naus CC, Matsuuchi L. (2011). The gap junction protein Cx43 regulates B-lymphocyte spreading and adhesion. *J Cell Science* 124:2611-21.

Young BP, Shin JJ, Orii R, Chao JT, Li SC, Guan XL, Khong A, Jan E, Wenk, MR, Prinz WA, Smits GJ, Loewen CJ. (2010). Phosphatidic acid is a pH biosensor that links membrane biogenesis to metabolism. *Science* 329: 1085-1058.

Warner A, Qadota H, Benian GM, Vogl AW, Moerman DG. (2011). *The Caenorhabditis elegans* paxillin orthologue, PXL-1, is required for pharyngeal muscle contraction and for viability. *Mol Biol Cell* 22:2551-63.

Shankar J, Messenberg A, Chan J, Underhill TM, Foster LJ, Nabi IR. (2010). Pseudopodial actin dynamics control epithelial-mesenchymal transition in metastatic cancer cells. *Cancer Research* 70: 3780-3790.

Cohen S, Marr AK, Garcin P, Panté N. (2011). Nuclear envelope disruption involving host caspases plays a role in the parvovirus replication cycle. *J Virology* 85:4863-74.

Ellis SJ, Pines M, Fairchild MJ, Tanentzapf GJ. (2011). In vivo functional analysis reveals specific roles for the integrin-binding sites of talin. *Cell Science* 124:1844-56.

Young JS, Guttman JA, Vaid KS, Vogl AW. (2009). Cortactin (CTTN), N-WASP (WASL), and clathrin (CLTC) are present at podosome-like tubulobulbar complexes in the rat testis. *Biol Reprod* 80:153-161.

Joshi B, Bastiani M, Strugnell SS, Boscher C, Parton RG, Nabi IR. (2012). Phosphocaveolin-1 is a mechanotransducer that induces caveola biogenesis via Egr1 transcriptional regulation. *J Cell Biol* 199:425-35

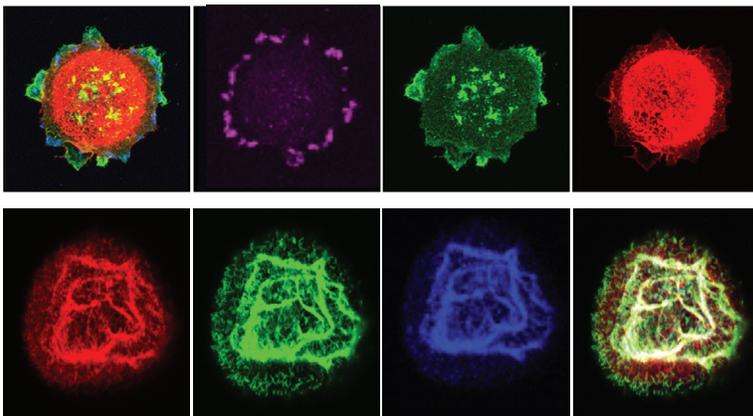
Pines M, Das R, Ellis SJ, Morin A, Czerniecki S, Yuan L, Klose M, Coombs D, Tanentzapf G. (2012). Mechanical force regulates integrin turnover in *Drosophila* in vivo. *Nat Cell Biol* 14:935-943.

Pyenson ND, Goldbogen JA, Vogl AW, Szathmary G, Drake RL, Shadwick RE. (2012). Discovery of a sensory organ that coordinates lunge feeding in rorqual whales. *Nature* 485:498-501.

Cipollone JA, Graves ML, Köbel M, Kalloger SE, Poon T, Gilks CB, McNagny KM, Roskelley CD. (2012). The anti-adhesive mucin podocalyxin may help initiate the transperitoneal metastasis of high grade serous ovarian carcinoma. *Clin Exp Metastasis* 29:239-52.

Naus CC, Laird D. (2010). Implications and challenges of connexin connections to cancer. *Nature Reviews Cancer* 10:435-441.

Handrigan GR, Leung KJ, Richman JM. (2010). Identification of putative dental epithelial stem cells in a lizard with life-long tooth replacement. *Development* 137:3545-3549.



## Graduate Studies Admission

UBC Faculty of Graduate Studies establishes common minimum academic requirements. One of the major academic requirements for LSI graduate programs is having a research supervisor.

## Contact

Recruitment & Outreach Coordinator  
lsi.grad@ubc.ca  
website: grad.lsi.ubc.ca

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