Stanford

Rajat Rohatgi

Professor of Biochemistry and of Medicine (Oncology)

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Professor, Biochemistry
- Professor, Medicine - Oncology
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Fellowship Award, Damon Runyon Cancer Research Fund (2006)
- Howard Temin Pathway to Independance Award (K99/R00), NCI/NIH (2007)
- Young Investigator Award, American Society for Clinical Oncology (2007)
- Josephine Q. Berry Faculty Scholar in Cancer Research, Stanford University (2009)
- Martin D. Abeloff Scholar, V Foundation for Cancer Research (2009-2011)
- Distinguished Scientist Award, Sontag Foundation (2010)
- Basil O' Connor Starter Scholar Award, March of Dimes Foundation (2010-2012)
- Stand Up To Cancer Innovation Research Grant, American Association for Cancer Research (2010-2013)
- NIH Director's New Innovator Award, NIH (2012)
- Maximizing Investigators' Research Award (MIRA), NIGMS/NIH (2016)
- Member, American Society for Clinical Investigation (2018)

PROFESSIONAL EDUCATION

- Fellowship, Stanford Hospital , Medical Oncology (2008)
- Residency, Stanford Hospital , Internal Medicine (2004)
- Ph.D., Harvard Medical School , Cell Biology (2002)
- M.D., Harvard Medical School (2002)
- A.B., Harvard University , Biochemical Sciences (1994)

LINKS

- My Lab Website: http://rohatgilab.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Areas of research in the Rohatgi Lab:

1. The Hedgehog and WNT pathways, two cell-cell communication systems that regulate the formation of most tissues during development. These same pathways play central roles in tissue stem-cell function and organ regeneration in adults. Defects in these systems are associated with degenerative conditions and cancer.

2. Signal transduction at the primary cilium and the mechanism of cilia-associated human diseases. Primary cilia are solitary hair-like projections found on most cells in our bodies that function as critical hubs for signal transduction pathways (such as Hedgehog). Over fifty human genetic diseases, called “ciliopathies,” are caused by defects in cilia. Patients with ciliopathies can show phenotypes in nearly all organ systems, suffering from abnormalities ranging from birth defects to obesity.

3. Regulation of signaling pathways by endogenous lipids. The landscape of endogenous small-molecules and their biological functions remains a terra incognita, one that provides many opportunities to discover new regulatory layers in signaling pathways.

4. Phase separation in signal transduction. The formation of reversible, membrane-less compartments in cells by the segregation of proteins into liquid phases, hydrogels or amyloid-like assemblies is an emerging principle of cellular organization, with broad implications for areas that include signaling at the cell surface, stress response pathways, and neuro-degeneration.

5. Cellular responses to osmolar stresses. Maintaining a stable concentration of intracellular macromolecules and ions in a fluctuating environment is a universal challenge to homeostasis faced by all cells. In our own bodies, cells of the kidney and cells in inflammatory environments face tissue osmolality levels that are 3-fold higher than blood!

Strategies:

1. CRISPR/Cas9-based genome-wide, loss-of-function screens targeting signaling pathways.
• Enhancer and suppressor screens to comprehensively identify pathway components.
• Synthetic screens to identify the genetic vulnerabilities of cells carrying mutations in human oncogenes and tumor suppressor genes.
• Screens based on complex, physiological read-outs of signaling, such as differentiation.

2. Protein biochemistry: proteomics, structure-guided analysis, activity-based purification and cell-free reconstitution of signaling reactions in extracts and using purified components.

3. Chemical Biology: new probes to assay the interactions between proteins and small molecules.

4. Imaging: Live-cell imaging with innovative optical probes and genetically-encoded reporters to monitor the temporal and spatial progression of signaling, the quantitative phase separation behavior of proteins, and the dynamic, signal-regulated trafficking of proteins.

5. Collaborations: With experts in structural biology (Christian Siebold, Oxford, Elife 2013, 2016 and Nature 2016), genome-wide screening (Jan Carette, Stanford, Elife and Cancer Research 2016), protein and genome evolution (L. Aravind, NIH, Dev Cell 2014 and 2018), and developmental biology (James Briscoe, Francis Crick Institute, Dev Cell 2018).

CLINICAL TRIALS

- Molecular Analysis of Thoracic Malignancies, Recruiting
- Erlotinib in Patients With Resected, Early Stage NSCLC With Confirmed Mutations in the EGFR, Not Recruiting
- Erlotinib Plus Tivantinib (ARQ 197) Versus Single Agent Chemotherapy in Locally Advanced or Metastatic Non-Small Cell Lung Cancer, Not Recruiting
- Erlotinib With or Without Hydroxychloroquine in Chemo-Naive Advanced NSCLC and (EGFR) Mutations, Not Recruiting
- Identification of Circulating Tumor Cells in the Peripheral Blood of Lung Cancer Patients, Not Recruiting

Teaching

COURSES

2023-24

- Development of Thesis Research: BIOC 350 (Aut)

2022-23

- Development of Thesis Research: BIOC 350 (Aut)

2021-22

- Development of Thesis Research: BIOC 350 (Aut)

2020-21

- Advanced Cell Biology: BIO 214, BIOC 224, MCP 221 (Win)
- Development of Thesis Research: BIOC 350 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Rae Brown, Claire Chiang, Martha Kahlson

Postdoctoral Faculty Sponsor

Chandni Khandwala, Maia Kinnebrew, Mandi Ma, Laura Nocka, Parijat Sarkar, Yue Sun

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biochemistry (Phd Program)
- Cancer Biology (Phd Program)

Publications

PUBLICATIONS

- **Direct ionic stress sensing and mitigation by the transcription factor NFAT5.** *bioRxiv : the preprint server for biology*
  Khandwala, C. B., Sarkar, P., Schmidt, H. B., Ma, M., Kinnebrew, M., Pusapati, G. V., Patel, B. B., Tillo, D., Lebensohn, A. M., Rohatgi, R.
  2023
- **The Inseparable Relationship Between Cholesterol and Hedgehog Signaling.** *Annual review of biochemistry*
  Siebold, C., Rohatgi, R.
  2023

- **Oxaliplatin disrupts nucleolar function through biophysical disintegration.** *Cell reports*
  Schmidt, H. B., Jaafar, Z. A., Wulff, B. E., Rodencal, J. J., Hong, K., Aziz-Zanjani, M. O., Jackson, P. K., Leonetti, M. D., Dixon, S. J., Rohatgi, R., Brandman, O.
  2022; 41 (6): 111629

- **Patched 1 regulates Smoothened by controlling sterol binding to its extracellular cysteine-rich domain.** *Science advances*
  Kinnebrew, M., Woolley, R. E., Ansell, T. B., Byrne, E. F., Frigui, S., Luchetti, G., Sircar, R., Nachtergaele, S., Mydock-McGrane, L., Krishnan, K., Newstead, S., Sansom, M. S., Covey, et al
  2022; 8 (22): eabm5563

- **Patched 1 reduces the accessibility of cholesterol in the outer leaflet of membranes** *ELIFE*
  Kinnebrew, M., Luchetti, G., Sircar, R., Frigui, S., Viti, L., Naito, T., Beckert, F., Saheki, Y., Siebold, C., Radhakrishnan, A., Rohatgi, R.
  2021; 10

- **Gene-teratogen interactions influence the penetrance of birth defects by altering Hedgehog signaling strength.** *Development (Cambridge, England)*
  Kong, J. H., Young, C. B., Pusapati, G. V., Espinoza, F. H., Patel, C. B., Beckert, F., Ho, S., Patel, B. B., Gabriel, G. C., Aravind, L., Bazan, J. F., Gunn, T. M., Lo, et al
  2021

- **Cholesterol access in cellular membranes controls Hedgehog signaling.** *Nature chemical biology*
  Radhakrishnan, A., Rohatgi, R., Siebold, C.
  2020; 16 (12): 1303–13

- **Lipid droplets can promote drug accumulation and activation.** *Nature chemical biology*
  Dubey, R., Stivala, C. E., Nguyen, H. Q., Goo, Y., Paul, A., Carette, J. E., Trost, B. M., Rohatgi, R.
  2020

- **A Membrane-Tethered Ubiquitination Pathway Regulates Hedgehog Signaling and Heart Development.** *Developmental cell*
  Kong, J. H., Young, C. B., Pusapati, G. V., Patel, C. B., Ho, S. n., Krishnan, A. n., Lin, J. I., Devine, W. n., Moreau de Bellaing, A. n., Athni, T. S., Aravind, L. n., Gunn, T. M., Lo, et al
  2020

- **R-spondins engage heparan sulfate proteoglycans to potentiate WNT signaling.** *eLife*
  Dubey, R. n., van Kerkhof, P. n., Jordens, I. n., Malinauskas, T. n., Pusapati, G. V., McKenna, J. K., Li, D. n., Carette, J. E., Ho, M. n., Siebold, C. n., Maurice, M. n., Lebensohn, A. M., Rohatgi, et al
  2020; 9

- **Phase separation-deficient TDP43 remains functional in splicing.** *Nature communications*
  Schmidt, H. B., Barreau, A., Rohatgi, R.
  2019; 10 (1): 4890

- **Biochemical mechanisms of vertebrate hedgehog signaling.** *Development (Cambridge, England)*
  Kong, J. H., Siebold, C. n., Rohatgi, R. n.
  2019; 146 (10)

- **Cholesterol accessibility at the ciliary membrane controls Hedgehog signaling.** *eLife*
  Kinnebrew, M. n., Iverson, E. J., Patel, B. B., Pusapati, G. V., Kong, J. H., Johnson, K. A., Luchetti, G. n., Eckert, K. M., McDonald, J. G., Covey, D. F., Siebold, C. n., Radhakrishnan, A. n., Rohatgi, et al
  2019; 8

- **The morphogen Sonic hedgehog inhibits its receptor Patched by a pincer grasp mechanism.** *Nature chemical biology*
  Rudolf, A. F., Kinnebrew, M. n., Kowatsch, C. n., Ansell, T. B., El Omari, K. n., Bishop, B. n., Pardon, E. n., Schwab, R. A., Malinauskas, T. n., Qian, M. n., Duman, R. n., Covey, D. F., Steyaert, et al
  2019

- **R-spondins can potentiate WNT signaling without LGRs.** *eLife*
  Lebensohn, A. M., Rohatgi, R. n.
  2018; 7

- **CRISPR Screens Uncover Genes that Regulate Target Cell Sensitivity to the Morphogen Sonic Hedgehog.** *Developmental cell*
  Pusapati, G. V., Kong, J. H., Patel, B. B., Krishnan, A. n., Sagner, A. n., Kinnebrew, M. n., Briscoe, J. n., Aravind, L. n., Rohatgi, R. n.

2018; 44 (1): 113–29.e8

- **Comparative genetic screens in human cells reveal new regulatory mechanisms in WNT signaling** *ELIFE*
  Lebensohn, A. M., Dubey, R., Neitzel, L. R., Tacchelly-Benites, O., Yang, E., Marceau, C. D., Davis, E. M., Patel, B. B., Bahrami-Nejad, Z., Travaglini, K. J., Ahmed, Y., Lee, E., Carette, et al
  2016; 5

- **Cholesterol activates the G-protein coupled receptor Smoothened to promote morphogenetic signaling.** *eLife*
  Luchetti, G., Sircar, R., Kong, J. H., Nachtergaele, S., Sagner, A., Byrne, E. F., Covey, D. F., Siebold, C., Rohatgi, R.
  2016; 5

- **In Vivo Formation of Vacuolated Multi-phase Compartments Lacking Membranes.** *Cell reports*
  Schmidt, H. B., Rohatgi, R.
  2016; 16 (5): 1228-1236

- **Structural basis of Smoothened regulation by its extracellular domains.** *Nature*
  Byrne, E. F., Sircar, R., Miller, P. S., Hedger, G., Luchetti, G., Nachtergaele, S., Tully, M. D., Mydock-McGrane, L., Covey, D. F., Rambo, R. P., Sansom, M. S., Newstead, S., Rohatgi, et al
  2016; 535 (7613): 517-522

- **A cholesterol-binding bacterial toxin provides a strategy for identifying a specific Scap inhibitor that blocks lipid synthesis in animal cells.** *Proceedings of the National Academy of Sciences of the United States of America*
  Xu, S., Smothers, J. C., Rye, D., Endapally, S., Chen, H., Li, S., Liang, G., Kinnebrew, M., Rohatgi, R., Posner, B. A., Radhakrishnan, A.
  2024; 121 (7): e2318024121

- **The USP46 deubiquitylase complex increases Wingless/Wnt signaling strength by stabilizing Arrow/LRP6.** *Nature communications*
  Spencer, Z. T., Ng, V. H., Benchabane, H., Siddiqui, G. S., Duwadi, D., Maines, B., Bryant, J. M., Schwarzkopf, A., Yuan, K., Kassel, S. N., Mishra, A., Pimentel, A., Lebensohn, et al
  2023; 14 (1): 6174

- **The USP46 complex deubiquitylates LRP6 to promote Wnt/#-catenin signaling.** *Nature communications*
  Ng, V. H., Spencer, Z., Neitzel, L. R., Nayak, A., Loberg, M. A., Shen, C., Kassel, S. N., Kroh, H. K., An, Z., Anthony, C. C., Bryant, J. M., Lawson, A., Goldsmith, et al
  2023; 14 (1): 6173

- **The energetics and ion coupling of cholesterol transport through Patched1.** *Science advances*
  Ansell, T. B., Corey, R. A., Viti, L. V., Kinnebrew, M., Rohatgi, R., Siebold, C., Sansom, M. S.
  2023; 9 (34): eadh1609

- **The Energetics and Ion Coupling of Cholesterol Transport Through Patched1.** *bioRxiv : the preprint server for biology*
  Ansell, T. B., Corey, R. A., Viti, L. V., Kinnebrew, M., Rohatgi, R., Siebold, C., Sansom, M. S.
  2023

- **Receptor control by membrane-tethered ubiquitin ligases in development and tissue homeostasis.** *Current topics in developmental biology*
  Lebensohn, A. M., Bazan, J. F., Rohatgi, R.
  2022; 150: 25-89

- **Measuring and Manipulating Membrane Cholesterol for the Study of Hedgehog Signaling.** *Methods in molecular biology (Clifton, N.J.)*
  Kinnebrew, M., Johnson, K. A., Radhakrishnan, A., Rohatgi, R.
  2022; 2374: 73-87

- **Hedgehog-Interacting Protein is a multimodal antagonist of Hedgehog signalling.** *Nature communications*
  Griffiths, S. C., Schwab, R. A., El Omari, K., Bishop, B., Iverson, E. J., Malinauskas, T., Dubey, R., Qian, M., Covey, D. F., Gilbert, R. J., Rohatgi, R., Siebold, C.
  2021; 12 (1): 7171

- **Human-chimpanzee fused cells reveal cis-regulatory divergence underlying skeletal evolution.** *Nature genetics*
  Gokhman, D. n., Agoglia, R. M., Kinnebrew, M. n., Gordon, W. n., Sun, D. n., Bajpai, V. K., Naqvi, S. n., Chen, C. n., Chan, A. n., Chen, C. n., Petrov, D. A., Ahituv, N. n., Zhang, et al
  2021

- **Mutations in GRK2 cause Jeune syndrome by impairing Hedgehog and canonical Wnt signaling** *EMBO MOLECULAR MEDICINE*

Bosakova, M., Abraham, S. P., Nita, A., Hruba, E., Buchtova, M., Taylor, S., Duran, I., Martin, J., Svozilova, K., Barta, T., Varecha, M., Balek, L., Kohoutek, et al
2020

- **High-throughput Flow Cytometry Assay to Investigate TDP43 Splicing Function.** *Bio-protocol*
  Schmidt, H. B., Rohatgi, R.
  2020; 10 (8): e3594

- **High-throughput Flow Cytometry Assay to Investigate TDP43 Splicing Function** *BIO-PROTOCOL*
  Schmidt, H., Rohatgi, R.
  2020; 10 (8)

- **Flow Homogenization Enables a Massively Parallel Fluidic Design for High-Throughput and Multiplexed Cell Isolation** *ADVANCED MATERIALS TECHNOLOGIES*
  Ooi, C., Earhart, C. M., Hughes, C. E., Lee, J., Wong, D. J., Wilson, R. J., Rohatgi, R., Wang, S. X.
  2020

- **TDP-43 alpha-helical structure tunes liquid-liquid phase separation and function.** *Proceedings of the National Academy of Sciences of the United States of America*
  Conicella, A. E., Dignon, G. L., Zerze, G. H., Schmidt, H. B., D'Ordine, A. M., Kim, Y. C., Rohatgi, R., Ayala, Y. M., Mittal, J., Fawzi, N. L.
  2020

- **Mutations in GRK2 cause Jeune syndrome by impairing Hedgehog and canonical Wnt signaling.** *EMBO molecular medicine*
  Bosakova, M. n., Abraham, S. P., Nita, A. n., Hruba, E. n., Buchtova, M. n., Taylor, S. P., Duran, I. n., Martin, J. n., Svozilova, K. n., Barta, T. n., Varecha, M. n., Balek, L. n., Kohoutek, et al
  2020; 12 (11): e11739

- **Bile Acid Biosynthesis in Smith-Lemli-Opitz Syndrome Bypassing Cholesterol: Potential Importance of Pathway Intermediates.** *The Journal of steroid biochemistry and molecular biology*
  Abdel-Khalik, J. n., Hearn, T. n., Dickson, A. L., Crick, P. J., Yutuc, E. n., Austin-Muttit, K. n., Bigger, B. W., Morris, A. A., Shackleton, C. H., Clayton, P. T., Iida, T. n., Sircar, R. n., Rohatgi, et al
  2020: 105794

- **Mechanism, physiological and therapeutic implications of LGR-independent potentiation of WNT signaling by R-spondins**
  Lebensohn, A. M., Rohatgi, R.
  AMER ASSOC CANCER RESEARCH.2019

- **Dynamic Remodeling of Membrane Composition Drives Cell Cycle through Primary Cilia Excision** *CELL*
  Phua, S., Chiba, S., Suzuki, M., Su, E., Roberson, E. C., Pusapati, G. V., Schurmans, S., Setou, M., Rohatgi, R., Reiter, J. F., Ikegami, K., Inoue, T.
  2019; 178 (1): 261

- **Cholesterol Interaction Sites on the Transmembrane Domain of the Hedgehog Signal Transducer and Class F G Protein-Coupled Receptor Smoothened** *STRUCTURE*
  Hedger, G., Koldso, H., Chavent, M., Siebold, C., Rohatgi, R., Sansom, M. P.
  2019; 27 (3): 549-+

- **Discovery of gene regulatory elements through a new bioinformatics analysis of haploid genetic screens** *PLOS ONE*
  Patel, B. B., Lebensohn, A. M., Pusapati, G. V., Carette, J. E., Salzman, J., Rohatgi, R.
  2019; 14 (1)

- **Discovery of gene regulatory elements through a new bioinformatics analysis of haploid genetic screens.** *PloS one*
  Patel, B. B., Lebensohn, A. M., Pusapati, G. V., Carette, J. E., Salzman, J. n., Rohatgi, R. n.
  2019; 14 (1): e0198463

- **Structures of vertebrate Patched and Smoothened reveal intimate links between cholesterol and Hedgehog signalling.** *Current opinion in structural biology*
  Kowatsch, C. n., Woolley, R. E., Kinnebrew, M. n., Rohatgi, R. n., Siebold, C. n.
  2019; 57: 204–14

- **Cholesterol Interaction Sites on the Transmembrane Domain of the Hedgehog Signal Transducer and Class F G Protein-Coupled Receptor Smoothened.** *Structure (London, England : 1993)*
  Hedger, G., Koldso, H., Chavent, M., Siebold, C., Rohatgi, R., Sansom, M. S.
  2018

- **R-spondins can potentiate WNT signaling without LGRs** *ELIFE*
  Lebensohn, A. M., Rohatgi, R.
  2018; 7

- **A single N-terminal phosphomimic disrupts TDP-43 polymerization, phase separation, and RNA splicing.** *The EMBO journal*
  Wang, A. n., Conicella, A. E., Schmidt, H. B., Martin, E. W., Rhoads, S. N., Reeb, A. N., Nourse, A. n., Ramirez Montero, D. n., Ryan, V. H., Rohatgi, R. n., Shewmaker, F. n., Naik, M. T., Mittag, et al
  2018; 37 (5)

- **Spatiotemporal manipulation of ciliary glutamylation reveals its roles in intraciliary trafficking and Hedgehog signaling.** *Nature communications*
  Hong, S. R., Wang, C. L., Huang, Y. S., Chang, Y. C., Chang, Y. C., Pusapati, G. V., Lin, C. Y., Hsu, N. n., Cheng, H. C., Chiang, Y. C., Huang, W. E., Shaner, N. C., Rohatgi, et al
  2018; 9 (1): 1732

- **G protein-coupled receptors control the sensitivity of cells to the morphogen Sonic Hedgehog.** *Science signaling*
  Pusapati, G. V., Kong, J. H., Patel, B. B., Gouti, M. n., Sagner, A. n., Sircar, R. n., Luchetti, G. n., Ingham, P. W., Briscoe, J. n., Rohatgi, R. n.
  2018; 11 (516)

- **Dynamic Remodeling of Membrane Composition Drives Cell Cycle through Primary Cilia Excision.** *Cell*
  Phua, S. C., Chiba, S., Suzuki, M., Su, E., Roberson, E. C., Pusapati, G. V., Setou, M., Rohatgi, R., Reiter, J. F., Ikegami, K., Inoue, T.
  2017; 168 (1-2): 264-279 e15

- **Multiple ligand binding sites regulate the Hedgehog signal transducer Smoothened in vertebrates.** *Current opinion in cell biology*
  Byrne, E. F., Luchetti, G. n., Rohatgi, R. n., Siebold, C. n.
  2017; 51: 81–88

- **Chromatin-Remodeling Complex SWI/SNF Controls Multidrug Resistance by Transcriptionally Regulating the Drug Efflux Pump ABCB1** *CANCER RESEARCH*
  Dubey, R., Lebensohn, A. M., Bahrami-Nejad, Z., Marceau, C., Champion, M., Gevaert, O., Sikic, B. I., Carette, J. E., Rohatgi, R.
  2016; 76 (19): 5810-5821

- **An essential role for Grk2 in Hedgehog signalling downstream of Smoothened** *EMBO REPORTS*
  Zhao, Z., Lee, R. T., Pusapati, G. V., Iyu, A., Rohatgi, R., Ingham, P. W.
  2016; 17 (5): 739-752

- **Functional Divergence in the Role of N-Linked Glycosylation in Smoothened Signaling.** *PLoS genetics*
  Marada, S., Navarro, G., Truong, A., Stewart, D. P., Arensdorf, A. M., Nachtergaele, S., Angelats, E., Opferman, J. T., Rohatgi, R., McCormick, P. J., Ogden, S. K.
  2015; 11 (8)

- **Notch Activity Modulates the Responsiveness of Neural Progenitors to Sonic Hedgehog Signaling** *DEVELOPMENTAL CELL*
  Kong, J. H., Yang, L., Dessaud, E., Chuang, K., Moore, D. M., Rohatgi, R., Briscoe, J., Novitch, B. G.
  2015; 33 (4): 373-387

- **Rapid Screening of Gli2/3 Mutants Using the Flp-In System** *HEDGEHOG SIGNALING PROTOCOLS, 2ND EDITION*
  Niewiadomski, P., Rohatgi, R., Riobo, N. A.
  2015; 1322: 125-130

- **Measuring Gli2 Phosphorylation by Selected Reaction Monitoring Mass Spectrometry.** *Methods in molecular biology (Clifton, N.J.)*
  Ahrends, R., Niewiadomski, P., Teruel, M. N., Rohatgi, R.
  2015; 1322: 105-123

- **Measuring Expression Levels of Endogenous Gli Genes by Immunoblotting and Real-Time PCR** *HEDGEHOG SIGNALING PROTOCOLS, 2ND EDITION*
  Niewiadomski, P., Rohatgi, R., Riobo, N. A.
  2015; 1322: 81-92

- **Location, location, and location: compartmentalization of Hedgehog signaling at primary cilia.** *EMBO journal*
  Pusapati, G. V., Rohatgi, R.
  2014; 33 (17): 1852-1854

- **Frontiers in hedgehog signal transduction** *SEMINARS IN CELL & DEVELOPMENTAL BIOLOGY*

Guerrero, I., Rohatgi, R.
2014; 33: 50-51

- **G-protein-coupled receptors, Hedgehog signaling and primary cilia.** *Seminars in cell & developmental biology*
  Mukhopadhyay, S., Rohatgi, R.
  2014; 33: 63-72

- **G-protein-coupled receptors, Hedgehog signaling and primary cilia** *SEMINARS IN CELL & DEVELOPMENTAL BIOLOGY*
  Mukhopadhyay, S., Rohatgi, R.
  2014; 33: 63-72

- **A Novel Osteogenic Oxysterol Compound for Therapeutic Development to Promote Bone Growth: Activation of Hedgehog Signaling and Osteogenesis Through Smoothened Binding** *JOURNAL OF BONE AND MINERAL RESEARCH*
  Montgomery, S. R., Nargizyan, T., Meliton, V., Nachtergaele, S., Rohatgi, R., Stappenbeck, F., Jung, M. E., Johnson, J. S., Aghdasi, B., Tian, H., Weintraub, G., Inoue, H., Atti, et al
  2014; 29 (8): 1872-1885

- **Tracking the Subcellular Fate of 20(S)-Hydroxycholesterol with Click Chemistry Reveals a Transport Pathway to the Golgi** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Peyrot, S. M., Nachtergaele, S., Luchetti, G., Mydock-McGrane, L. K., Fujiwara, H., Scherrer, D., Jallouk, A., Schlesinger, P. H., Ory, D. S., Covey, D. F., Rohatgi, R.
  2014; 289 (16): 11095-11110

- **EFCAB7 and IQCE Regulate Hedgehog Signaling by Tethering the EVC-EVC2 Complex to the Base of Primary Cilia** *DEVELOPMENTAL CELL*
  Pusapati, G. V., Hughes, C. E., Dorn, K. V., Zhang, D., Sugianto, P., Aravind, L., Rohatgi, R.
  2014; 28 (5): 483-496

- **Gli protein activity is controlled by multisite phosphorylation in vertebrate hedgehog signaling.** *Cell reports*
  Niewiadomski, P., Kong, J. H., Ahrends, R., Ma, Y., Humke, E. W., Khan, S., Teruel, M. N., Novitch, B. G., Rohatgi, R.
  2014; 6 (1): 168-181

- **Isolation and mutational analysis of circulating tumor cells from lung cancer patients with magnetic sifters and biochips** *LAB ON A CHIP*
  Earhart, C. M., Hughes, C. E., Gaster, R. S., Ooi, C. C., Wilson, R. J., Zhou, L. Y., Humke, E. W., Xu, L., Wong, D. J., Willingham, S. B., Schwartz, E. J., Weissman, I. L., Jeffrey, et al
  2014; 14 (1): 78-88

- **Isolation and mutational analysis of circulating tumor cells from lung cancer patients with magnetic sifters and biochips.** *Lab on a chip*
  Earhart, C. M., Hughes, C. E., Gaster, R. S., Ooi, C. C., Wilson, R. J., Zhou, L. Y., Humke, E. W., Xu, L., Wong, D. J., Willingham, S. B., Schwartz, E. J., Weissman, I. L., Jeffrey, et al
  2013; 14 (1): 78-88

- **Cancer risk after use of recombinant bone morphogenetic protein-2 for spinal arthrodesis.** *journal of bone and joint surgery. American volume*
  Carragee, E. J., Chu, G., Rohatgi, R., Hurwitz, E. L., Weiner, B. K., Yoon, S. T., Comer, G., Kopjar, B.
  2013; 95 (17): 1537-1545

- **Cancer Risk After Use of Recombinant Bone Morphogenetic Protein-2 for Spinal Arthrodesis** *JOURNAL OF BONE AND JOINT SURGERY-AMERICAN VOLUME*
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