

Rajat Rohatgi MD, PhD
Curriculum Vitae

Associate Professor of Biochemistry and Medicine
279 Campus Drive
Beckman Center, Room B435
Stanford, CA 94305-5307
rrohatgi@stanford.edu

POSITION

6/1/16-present Associate Professor (with tenure)
Department of Biochemistry
Department of Medicine, Division of Oncology
Member, Stanford Cancer Institute
Member, Bio-X
Stanford University School of Medicine

EDUCATION

June 1994 A.B. *summa cum laude* in The Biochemical Sciences. Harvard College.
June 2002 M.D. Harvard Medical School.
June 2002 Ph.D. in Cell and Developmental Biology. Harvard Medical School.
2002-2003 Intern in Internal Medicine. Stanford University Medical Center.
2003-2004 Resident in Internal Medicine. Stanford University Medical Center.
2004-2008 Fellow in Oncology. Stanford University Medical Center.

LICENSURE AND CERTIFICATION

2003 Full California Medical License.
2005-2015 American Board of Internal Medicine Certification in Internal Medicine.
2008-2018 American Board of Internal Medicine Certification in Medical Oncology.

RESEARCH TRAINING

1992-1994 Undergraduate research and senior thesis. Laboratory of Jack W. Szostak, Professor of Genetics, Massachusetts General Hospital/Harvard Medical School. Thesis: *Non-Enzymatic Template-Directed Ligation Reactions of Ribooligonucleotides*.

1997-2000 Doctoral research. Laboratory of Marc W. Kirschner, Professor and Chairman. Department of Cell and Developmental Biology, Harvard Medical School. Thesis: *Biochemical Dissection of a Signaling Pathway that Controls Actin Assembly*.

2001-2002 Post-Doctoral Research. Laboratory of Marc W. Kirschner, Professor and Chairman. Department of Cell and Developmental Biology, Harvard Medical School. Project: *Biochemical purification of Toca-1, a Novel factor required for Cdc42-induced actin assembly*.

2005-2008 Post-Doctoral Fellow. Laboratory of Matthew P. Scott, Professor of Developmental Biology. Department of Developmental Biology, Stanford University School of Medicine. Project: *Biochemical mechanisms of Hedgehog signaling*.

HONORS AND AWARDS

- 1990 National Merit Scholarship.
- 1991 Detur Prize, Harvard College. Awarded to the top 50 students in the freshman class.
- 1991 CRC Freshman Chemistry Award, Harvard College.
- 1992 John Harvard Scholarship, Harvard College.
- 1993 *Phi Beta Kappa*. One of top 24 students at Harvard College, class of 1994.
- 1994 *Summa cum laude*. Harvard College.
- 1994 Thomas T. Hoopes Prize, Harvard College. Awarded for excellence in scholarly work and research based on the undergraduate senior thesis.
- 1994 Lawrence J. Henderson Prize, Harvard College. Awarded to the best undergraduate senior thesis in the Biochemical Sciences.
- 1994 Medical Scientist Training Program Grant, National Institutes of Health.
- 1999 Invited Minisymposium speaker at the American Society for Cell Biology Annual Meeting.
- 2002 Henry Asbury Christian Award for outstanding performance in research and scholarly activities, Harvard Medical School.
- 2002 Soma Weiss Prize. Harvard Medical School.
- 2006-2007 Damon Runyon Cancer Research Foundation Fellowship.
- 2007-2008 Pilot/Feasibility Award, Stanford Digestive Diseases Center.
- 2007-2009 Young Investigator Award, American Society for Clinical Oncology.
- 2007-2012 Howard Temin Pathway to Independence Award (K99/R00), National Cancer Institute.
- 2009 Josephine Q. Berry Faculty Scholar in Cancer Research. Stanford University
- 2009-2011 Martin D. Abeloff Scholar of the V foundation for Cancer Research. Research project received the highest rating from the Scientific Advisory Board in 2009.
- 2010-2013 Stand Up To Cancer Innovation Research Grant. American Association for Cancer Research.
- 2010-2012 Basil O' Connor Starter Scholar Award. March of Dimes Foundation.
- 2010-2014 Pew Scholar in the Biomedical Sciences.
- 2010-2014 Distinguished Scientist Award. The Sontag Foundation.
- 2012 Best poster prize (with student Karolin Dorn), Hedgehog 2012, Biopolis, Singapore.
- 2012 NIH Director's New Innovator Award, NIH Common Fund.
- 2014 Outstanding paper selection for "Structure and function of the Smoothened extracellular domain in vertebrate Hedgehog signaling." *eLife* editorial board.
- 2016 Maximizing Investigators' Research Award (MIRA) for outstanding established investigators from the National Institutes of General Medical Sciences.
- 2018 Member, American Society for Clinical Investigation (ASCI).

TALKS

- 1999 American Society for Cell Biology Annual Meeting (selected).
- 2002 Soma Weiss Speaker Award, Harvard Medical School (selected).
- 2007 Regenerative Medicine at Stanford (REMS) Series. Stanford University (invited).
- 2007 Department of Hematology and Oncology, University of California, San Diego (invited).
- 2007 Massachusetts General Hospital Cancer Center (invited).
- 2007 Department of Biochemistry, Stanford University School of Medicine (invited).
- 2007 Department of Cancer Biology, Memorial Sloan Kettering Cancer Center (invited).
- 2008 Department of Hematology and Oncology, University of California, San Francisco (invited).
- 2008 Department of Molecular Biology, Massachusetts General Hospital (invited).
- 2008 Department of Stem Cell and Regenerative Medicine, Harvard University (invited).
- 2008 Department of Cell Biology, University of Texas Southwestern Medical Center (invited).

2009 13th World Conference on Lung Cancer, San Francisco, CA (invited).

2010 FASEB summer research conference: The Biology of Cilia and Flagella (invited).

2010 The Fourth Comprehensive Cancer Research Training Program at Stanford University (invited).

2011 Pew Scholars Annual Meeting, Cozumel, Mexico (grant related).

2011 Sontag Foundation Winter Retreat (grant related).

2011 Laboratory of Respiratory Biology, National Institute of Environmental Health Sciences, NIH (invited).

2011 Department of Biological Chemistry, Johns Hopkins University School of Medicine (invited).

2012 Sontag Foundation Winter Retreat (grant related).

2012 Regenerative Medicine at Stanford (REMS) Series. Stanford University (invited).

2012 Hedgehog 2012: Hedgehog Signaling in Development, Evolution and Disease (International Meeting), Biopolis, Singapore (invited).

2012 St. Jude's Children's Research Hospital Cancer Center (invited).

2012 Department of Cell and Developmental Biology, Vanderbilt University School of Medicine (invited).

2012 Early Research and Development, Genentech (invited).

2012 Special session on the Biology of Cilia and Flagella, American Society for Cell Biology (invited).

2013 Sontag Foundation Winter Retreat (grant related).

2013 Department of Developmental Biology, Washington University School of Medicine (invited).

2013 Molecular Biology Institute, UCLA (invited).

2013 Department of Molecular, Cellular and Developmental Biology, University of Colorado at Boulder (invited).

2014 Pew Scholars Annual Meeting, Costa Rica (grant related).

2014 Department of Physiological Chemistry, Genentech (invited).

2014 Broad Center for Regenerative Medicine and Stem Cell Research, University of Southern California (invited).

2014 Hedgehog 2014: Hedgehog Signaling in Development and Disease, Ann Arbor, Michigan (invited).

2014 Cell Press Lablinks meeting entitled "9+n in Health and Disease," Stanford University (invited).

2015 Integrated Biomedical Seminar Series, University of California at Davis School of Medicine (invited).

2015 Dana Farber/Harvard Cancer Center, Harvard Medical School (invited).

2015 Institute for Cellular and Molecular Biology, University of Texas at Austin (invited).

2015 Gordon Research Conference on the Cellular and Molecular Biology of Lipids, Waterville Valley, NH (invited).

2015 Hedgehog 2015: Mechanisms of Hedgehog Signaling in Development, Tissue Repair and Cancer, Puerto Varas, Chile (invited). *Declined due to conflict.*

2015 Department of Molecular and Cellular Oncology, MD Anderson Cancer Center (invited).

2015 Department of Developmental Biology, Washington University School of Medicine (invited).

2015 Department of Molecular Oncology, Genentech (invited).

- 2015 16'th Annual Great Lakes GPCR Retreat, Hockley Valley, Canada (invited).
Declined due to conflict.
- 2015 Fifth Annual International CAESAR Conference, "The Omnipresent Cilum—
Structure, Signalling and Motion," Bonn, Germany (invited).
Declined due to conflict.
- 2016 Regenerative Medicine at Stanford (REMS) Series. Stanford University.
2017 Department of Pharmacology, University of California, San Diego.

PUBLICATIONS (an asterisk * denotes co-first or co-corresponding authors)

1. **Rohatgi R**, Bartel DP, and Szostak JW. Kinetic and mechanistic analysis of non-enzymatic, template-directed oligoribonucleotide ligation. *Journal of the American Chemical Society* 118, 3332-3339 (1996).
2. **Rohatgi R**, Bartel DP, and Szostak JW. Non-enzymatic, template-directed ligation of oligoribonucleotides is highly regioselective for the formation of 3'-5'-Phosphodiester bonds. *Journal of the American Chemical Society* 118, 3340-3344 (1996).
3. Ma L, **Rohatgi R**, and Kirschner MW. The Arp2/3 complex mediates actin polymerization induced by the small GTP-binding protein Cdc42. *Proceedings of the National Academy of Sciences USA* 95, 15362-15367 (1998).
4. **Rohatgi R***, Ma L*, Miki H, Lopez M, Kirchhausen T, Takenawa T, and Kirschner MW. The interaction between N-WASP and the Arp2/3 complex links Cdc42-dependent signals to actin assembly. *Cell* 97, 221-231 (1999).
Selected by the "The Scientist" magazine as one of the most frequently cited papers in the field.
5. **Rohatgi R***, Ho HY*, and Kirschner MW. Mechanism of N-WASP activation by CDC42 and phosphatidylinositol 4, 5-bisphosphate. *Journal of Cell Biology* 150, 1299-1310 (2000).
6. Martinez-Quiles N, **Rohatgi R**, Anton IM, Medina M, Saville SP, Miki H, Yamaguchi H, Takenawa T, Hartwig JH, Geha RS, and Ramesh N. WIP regulates N-WASP-mediated actin polymerization and filopodium formation. *Nature Cell Biology* 3, 484-91 (2001).
7. **Rohatgi R**, Nollau P, Ho HY, Kirschner MW, and Mayer BJ. Nck and phosphatidylinositol 4,5 bisphosphate synergistically activate actin polymerization through the N-WASP-Arp2/3 pathway. *Journal of Biological Chemistry* 276, 26448-52 (2001).
8. Ho HY*, **Rohatgi R***, Ma L, and Kirschner MW. CR16 forms a complex with N-WASP in brain and is a novel member of a conserved proline-rich actin-binding protein family. *Proceedings of the National Academy of Sciences USA*. 98, 11306-11311 (2001).
9. Eden S, **Rohatgi R**, Podtelejnikov AV, Mann M, and Kirschner MW. The mechanism of regulation of WAVE1-induced actin nucleation by Rac1 and Nck. *Nature* 418, 790-793 (2002). *Selected as "Must Read" by The Faculty of 1000.*

10. Feldheim DA, Nakamoto M, Osterfield M, Gale NW, DeChiara TM, **Rohatgi R**, Yancopoulos GD, and Flanagan JG. Loss-of-function analysis of EphA receptors in retinotectal mapping. *Journal of Neuroscience*. 24, 2542-50 (2004).
11. Ho HY*, **Rohatgi R***, Lebensohn A, Ma L, Li L, Gygi SP, Kirschner MW. Toca-1 mediates Cdc42- dependent actin nucleation by activating the N-WASP-WIP complex. *Cell* 118, 203-216 (2004).
12. Ho HY, **Rohatgi R**, Lebensohn A, Kirschner MW. In vitro reconstitution of cdc42-mediated actin assembly using purified components. *Methods in Enzymology* 406, 174-90 (2006).
13. **Rohatgi R***, Milenkovic L*, and Scott MP. Patched1 regulates Hedgehog signaling at the primary cilium. *Science* 317, 372-376 (2007). *Highlighted in Science, Cell, and Nature Reviews in Cell and Molecular Biology*.
14. **Rohatgi R** and Scott MP. Patching the gaps in Hedgehog signaling. *Nature Cell Biology* 9, 1005-1009 (2007).
15. **Rohatgi R** and Scott MP. Arrestin' Movement in Cilia. *Science* 320, 1726 – 1727 (2008).
16. **Rohatgi R***, Milenkovic L*, Corcoran RB, and Scott MP. Hedgehog signal transduction by smoothed: pharmacological evidence for a two-step activation process. *Proceedings of the National Academy of Sciences USA* **106**:3196-201 (2009).

The papers listed following this were published as an independent investigator.

17. Milenkovic L, Scott MP*, and **Rohatgi R***. Lateral Transport of Smoothed from the plasma membrane to the membrane of the cilium. *Journal of Cell Biology* 187(3), 365-374 (2009).
18. Humke EW, Dorn KV, Milenkovic L, Scott MP, and **Rohatgi R**. The output of Hedgehog signaling is controlled by the dynamic association between Suppressor of Fused and the Gli proteins. *Genes and Development*. 24(7):670-82 (2010).
19. **Rohatgi R** and Snell WJ. The Ciliary Membrane. *Current Opinion in Cell Biology* 22(4):541-6 (2010).
20. Yavari A, Nagaraj R, Owusu-Ansah E, Follick A, Ngo K, Hillman T, Call G, **Rohatgi R**, Scott MP, Banerjee U. Role of lipid metabolism in smoothed derepression in hedgehog signaling. *Developmental Cell*. 20;19(1):54-65 (2010).
21. Smith EF and **Rohatgi R**. Cilia 2010: The surprise organelle of the decade. *Science Signaling* 4(155):mr1 (2011).

22. Nachtergaele S, Mydock L, Krishnan K, Rammohan J, Schlesinger P, Covey DF*, **Rohatgi R***. Oxysterols are allosteric activators of the oncoprotein Smoothened. *Nature Chemical Biology* 8(2): 211-220 (2012).
23. Briscoe J and **Rohatgi R**. Singapore Signalling: the 2012 Hedgehog pathway cocktail. *EMBO Rep.* 13(7):580-3 (2012).
24. Dorn K, Hughes C and **Rohatgi R**. A Smoothened-Evc2 complex transduces the Hedgehog signal at primary cilia. *Developmental Cell* 23(4):823-35 (2012).
25. Carragee EJ, Chu G, **Rohatgi R**, Hurwitz EL, Weiner BK, Yoon ST, Comer G, Kopjar B. Cancer risk after use of recombinant bone morphogenetic protein-2 for spinal arthrodesis. *Journal of Bone and Joint Surgery* 95(17), 1537-45 (2013).
26. Earhart CM, Hughes CE, Gaster RS, Ooi CC, Wilson RJ, Zhou LY, Humke EW, Xu L, Wong DJ, Willingham SB, Schwartz EJ, Weissman IL, Jeffrey SS, Neal JW, **Rohatgi R**, Wakelee HA, Wang SX. Isolation and mutational analysis of circulating tumor cells from lung cancer patients with magnetic sifters and biochips. *Lab on a Chip.* 14(1), 78-88 (2013).
27. Lin YC, Niewiadomski P, Lin B, Nakamura H, Phua SC, Jiao J, Levchenko A, Inoue T, **Rohatgi R**, Inoue T. Chemically inducible diffusion trap at cilia reveals molecular sieve-like barrier. *Nature Chemical Biology* 9(7):437-443 (2013).
28. Nachtergaele S, Whalen DM, Mydock LK, Zhao Z, Malinauskas T, Krishnan K, Ingham PW, Covey DF, Siebold C*, **Rohatgi R***. Structure and function of the Smoothened extracellular domain in vertebrate Hedgehog signaling. *Elife* 2:e01340 (2013).
29. Niewiadomski P*, Kong JH, Ahrends R, Ma Y, Humke EW, Khan S, Teruel MN, Novitch BG, **Rohatgi R***. Gli protein activity is controlled by multi-site phosphorylation in vertebrate Hedgehog signaling. *Cell Reports* 6(1):168-81 (2014).
30. Pusapati GV, Hughes CE, Dorn KV, Zhang D, Sugianto P, Aravind L*, and **Rohatgi R***. EFCAB7 and IQCE regulate Hedgehog signaling by tethering the EVC-EVC2 complex to the base of primary cilia. *Developmental Cell* 28(5):483-496 (2014).
31. Montgomery SR, Nargizyan T, Meliton V, Nachtergaele S, **Rohatgi R**, Stappenbeck F, Jung ME, Johnson JS, Aghdasi B, Tian H, Weintraub G, Inoue H, Atti E, Tetradis S, Pereira RC, Hokugo A, Alobaidan R, Tan Y, Hahn TJ, Wang JC, Parhami F. 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* 29(8):1872-85(2014).
32. Peyrot SM, Nachtergaele S, Luchetti G, Mydock-McGrane LK, Fujiwara H, Scherrer D, Jallouk A, Schlesinger PH, Ory DS, Covey DF, **Rohatgi R**. Tracking the Subcellular Fate of 20(S)-hydroxycholesterol with Click Chemistry Reveals a Transport Pathway to the Golgi. *Journal of Biological Chemistry*, 289(16):11095-11110 (2014).

33. Mukhopadhyay S and **Rohatgi R**. G-protein-coupled receptors, Hedgehog signaling and primary cilia. *Seminars in Cell and Developmental Biology* 33C:63-72 (2014).
34. Pusapati GV and **Rohatgi R**. Location, location and location: compartmentalization of Hedgehog signaling at primary cilia. *EMBO Journal* 33(17): 1852-1854 (2014).
35. Kong JH, Yang L, Dessaud E, Chuang K, Moore DM, **Rohatgi R**, Briscoe J, Novitsch BG. Notch activity modulates the responsiveness of neural progenitors to sonic hedgehog signaling. *Developmental Cell* 33(4):373-87 (2015).
36. Niewiadomski P, **Rohatgi R**. Measuring Expression Levels of Endogenous Gli Genes by Immunoblotting and Real-Time PCR. *Methods in Molecular Biology* 1322:81-92 (2015).
37. Niewiadomski P, **Rohatgi R**. Rapid Screening of Gli2/3 Mutants Using the Flp-In System. *Methods in Molecular Biology* 1322:125-130 (2015).
38. Ahrends R, Niewiadomski P, Teruel MN, **Rohatgi R**. Measuring Gli2 Phosphorylation by Selected Reaction Monitoring Mass Spectrometry. *Methods in Molecular Biology* 1322:105-123 (2015).
39. Marada S, Navarro G, Truong A, Stewart DP, Arensdorf AM, Nachtergaele S, Angelats E, Opferman JT, **Rohatgi R**, McCormick PJ, Ogden SK. Functional Divergence in the Role of N-Linked Glycosylation in Smoothened Signaling. *PLoS Genetics* 20;11(8):e1005473 (2015).
40. Zhao Z, Lee RT, Pusapati GV, Iyu A, **Rohatgi R**, Ingham PW. An essential role for Grk2 in Hedgehog signalling downstream of Smoothened. *EMBO Reports* 17(5):739-52 (2016).
41. Byrne EF, Sircar R, Miller PS, Hedger G, Luchetti G, Nachtergaele S, Tully MD, Mydock-McGrane L, Covey DF, Rambo RP, Sansom MS, Newstead S, **Rohatgi R***, Siebold C*. Structural basis of Smoothened regulation by its extracellular domains. *Nature* 535(7613):517-22 (2016).
42. Schmidt HB*, **Rohatgi R***. *In Vivo* Formation of Vacuolated Multi-phase Compartments Lacking Membranes. *Cell Reports* 16(5):1228-36 (2016).
43. Dubey R, Lebensohn A, Bahrami-Nejad Z, Marceau C, Champion M, Gevaert O, Sikic BI, Carette JE*, **Rohatgi R***. Chromatin-remodeling complex SWI/SNF controls multidrug resistance by transcriptionally regulating the drug efflux pump ABCB1. *Cancer Research* 76(19):5810-5821 (2016).
44. Luchetti G, Sircar R, Kong JH, Nachtergaele S, Sagner A, Byrne EF, Covey DF, Siebold C*, **Rohatgi R***. Cholesterol activates the G-protein coupled receptor Smoothened to promote Hedgehog signaling. *ELife* 20304 (2016).

45. Lebensohn AM, Dubey R, Neitzel LR, Tacchelly-Benites O, Yang E, Marceau CD, Davis EM, Patel BB, Bahrami-Nejad Z, Travaglini KJ, Ahmed Y, Lee E, Carette JE*, **Rohatgi R***. Comparative genetic screens in human cells reveal new regulatory mechanisms in WNT signaling. *ELife* 21459 (2016).
46. Phua SC, Chiba S, Suzuki M, Su E, Roberson EC, Pusapati GV, Setou M, **Rohatgi R**, Reiter JF, Ikegami K, Inoue T. Dynamic Remodeling of Membrane Composition Drives Cell Cycle through Primary Cilia Excision. *Cell* 168(1-2):264-279 (2017).
47. Byrne EF, Luchetti G, **Rohatgi R***, Siebold C*. Multiple ligand binding sites regulate the Hedgehog signal transducer Smoothed in vertebrates. *Current Opinion in Cell Biology* 51: 81-88 (2017).
48. Pusapati GV*, Kong JH, Patel BB, Krishnan A, Sagner A, Kinnebrew M, Briscoe J, Aravind L, **Rohatgi R***. CRISPR Screens Uncover Genes that Regulate Target Cell Sensitivity to the Morphogen Sonic Hedgehog. *Developmental Cell* 44(1): 113-129 (2018).
49. Lebensohn AM*, **Rohatgi R***. R-spondins can potentiate WNT signaling without LGRs. *ELife* 33126 (2018).
50. Pusapati GV, Kong JH, Patel BB, Gouti M, Sagner A, Sircar R, Luchetti G, Ingham PW, Briscoe J, **Rohatgi R**. G protein-coupled receptors control the sensitivity of cells to the morphogen Sonic Hedgehog. *Science Signaling* 11(516) eaao5749 (2018).
51. Wang A, Conicella AE, Schmidt HB, Martin EW, Rhoads SN, Reeb AN, Nourse A, Ramirez Montero D, Ryan VH, **Rohatgi R**, Shewmaker F, Naik MT, Mittag T, Ayala YM, Fawzi NL. A single N-terminal phosphomimic disrupts TDP-43 polymerization, phase separation, and RNA splicing. *EMBO Journal* 37(5) e97452 (2018).

GRANT SUPPORT
PRESENT

- 6/1/13-5/31/18 March of Dimes Foundation (6-FY13-104)
Title: The Pathophysiology of Cilia-related Skeletal Dysplasias
Role: PI
- 10/1/2014-8/31/18 NIH/NIGMS (R01GM106078)
Title: Signal Transduction by Oxysterols
Role: co-PI with Douglas Covey
- 07/2/2016-06/31/21 NIH/NIGMS Maximizing Investigators Research Award (R35 GM118082)
Title: Biochemical and Cell Biological Mechanisms of Signaling Through the Hedgehog Pathway
Role: PI

COMPLETED

- 9/30/12-7/31/17 Innovator Award, NIH Common Fund (DP2 GM105448)
Title: Reconstructing Primary Cilia
Role: PI
- 9/01/09-8/31/12 NCI/NIH (R00 CA129174)
Title: Biochemical Mechanisms of Hedgehog Signaling
Role: PI
- 10/01/09-9/30/12 V Foundation for Cancer Research (Scholar Award)
Title: Dissecting the Role of the Tumor Suppressor Sufu in Hedgehog-driven Cancers
Role: PI
- 1/01/10-12/31/12 Stand Up to Cancer Foundation/AACR (Innovation Award)
Title: Endogenous Small Molecules that Regulate Signaling Pathways in Cancer Cells
Role: PI
- 2/01/10-1/31/13 March of Dimes Foundation (Basil O'Connor Award)
Title: Primary Cilia: Nerve Centers for Developmental Signaling
Role: PI
- 4/01/10-3/31/13 NCI/NIH (R33 CA138330)
Title: Cancer Sample Preparation with Micromachined Magnetic Sifter and Nanoparticles
Role: Co-investigator (PI is Shan X. Wang)
- 4/01/11-3/01/13 NINDS/NIH (R21 NS074091)
Title: High-Throughput Imaging of Hedgehog Pathway Components at Primary Cilia.
Role: PI
- 7/1/10-6/30/14 Pew Scholars Award, Pew Charitable Trusts
Title: Signal Transduction at Primary Cilia
Role: PI
- 10/1/10-9/30/14 Distinguished Scientist Award, Sontag Foundation
Title: Regulation of Gli proteins in Medulloblastoma
Role: PI
- 07/1/2014-6/30/17 NIH/NCI (R15 CA186046)
Title: Mode of Action of the Amaryllidaceae Alkaloid Lycorine - Promising Anticancer Agent
Role: co-Investigator (PI is Alexander Kornienko)

1/1/2015-12/31/17 NIH/NIGMS (RO1 GM112988)

Title: Molecular Dissection of Signal Transduction at Primary Cilia

Role: PI