

Phillip Karpowicz

1. Personal information

University of Windsor
Department of Biological Sciences
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2. Employment

University of Windsor, Windsor, ON, Canada 2014 – Present

- Associate Professor, Department of Biomedical Sciences
- Cross-appointed Department of Integrative Biology
- Chair, Biological Sciences Graduate Program (2017-present)
- Coordinator, Biological Sciences Honours Program (2015-16)

Harvard Medical School, Boston, MA, USA 2008 – 2014

- Postdoctoral Fellow (supervised by Dr. Norbert Perrimon)
- Intestinal stem cell biology (mouse and *Drosophila* systems)
- Intestinal organoid culture (collaboration with Dr. David Breault)

3. Education

University of Toronto, Toronto, ON, Canada 2003 - 2008

- Ph.D., Medical Science (supervised by Dr. Derek van der Kooy)
- Thesis on the extrinsic mechanisms of maintenance, and intrinsic mechanisms of differentiation in adult neural stem cells (Mouse)

University of Toronto, Toronto, ON, Canada 2001 - 2003

- M.Sc., Medical Science, with Collaboration in Bioethics
- Thesis on the use of human/nonhuman chimeras in stem cell research

Mount Allison University, Sackville, NB, Canada 1996 - 2000

- B.Sc. (Honors, First Class) in Biochemistry (thesis supervised by Prof. Jack Stewart)

4. Research funding history

- Ontario Early Researcher Award (2018-23)
- Natural Sciences and Engineering Research Council of Canada Discovery Grant (2015-2020)

- Canadian Institutes of Health Research Project Grant (2018-2023)
- Ontario Institute for Regenerative Medicine New Ideas Grant (2018-19)
- Crohn's and Colitis Foundation of Canada Innovations Grant (2018-19)
- Natural Sciences and Engineering Research Council of Canada Engage Grants (2018-2019)
- Canada Foundation for Innovation (John Evans Leadership Fund) / Ontario Research Fund (2015, 2017)
- Windsor Essex Cancer Centre Foundation Seeds4Hope Grant (2015-2017)
- Mitacs/JSPS and SWORP Student Training Grants (2016, 2017)
- Harvard Stem Cell Institute Cancer Pilot Grant (2011-2013)
- Human Frontier in Science Long Term Fellowship (2009-2012)

5. Awards

- Ontario Early Researcher Award (2018)
- Canadian Society for Chronobiology Junior Investigator Award (2019)
- University of Windsor Outstanding Faculty Research Award (2019)
- Departmental Nomination for Governor General's Gold Medal (2009)
- Vision Science Research Program OSOTF Scholarship (2006-2008)
- NSERC Postgraduate Scholarship (Ph.D. Program) (2004-2006)
- NSERC Postgraduate Scholarship (MSc. Program) (2002-2003)
- University of Toronto, Open Fellowship (2001, 2003)
- Stem Cell Network Trainee Award (2001-2002)

6. Professional activities

6.1 Editorial activities

- **Peer-reviewer for scientific journals (2010-present):**
 - *Nature Communications*
 - *Gastroenterology*
 - *Stem Cells*
 - *EMBO Reports*
 - *Developmental Biology*
 - *Oncogene*
 - *Nature Scientific Reports*
 - *Journal of Biological Rhythms*
 - *Cell Physiology and Biochemistry*
 - *Cell Research*
 - *Cell Cycle*
 - *PLoS Genetics*
 - *PLoS ONE*
 - *British Journal of Pharmacology*
 - *Theranostics*

- *Life Sciences*
- *G3, Genome*
- *Methods*
- **Co-reviewer for Journals (2008-2014):**
 - *Development*
 - *Science*
 - *Nature*
 - *EMBO Journal*
- **Peer-reviewer for grants (2014-present):**
 - NSERC Discovery Grant program
 - CIHR Graduate Scholarships
 - Human Frontier Science Program Research Grants
 - Ontario Institute for Regenerative Medicine Fellowship Awards
 - Broad Medical Research Program in IBD

6.2 International Collaboration

- Toshiro Sato, Keio University, Japan (developing circadian clock Cas9/CRISPR reagents for human intestinal organoids)
- John Hogenesch, Cincinnati Children's Hospital, USA (genomic expression analysis of the intestine and intestinal stem cells)
- David Weaver, University of Massachusetts Medical School, USA (studying circadian clock regulation of intestinal stem cells)
- David Breault, Harvard Stem Cell Institute / Boston Children's Hospital, USA (development of irradiation assays to test circadian intestinal regeneration)

6.3 Committee memberships

- *International Society for Stem Cell Research* (2003-present)
- *Ontario Institute for Regenerative Medicine* (2014-present)
- *Windsor Cancer Research Group* (2014-present)
- *Crohn's and Colitis Canada IBD Research Institute* (2014-present)
- *Canadian Society for Chronobiology* (2015-present)
- *Canadian Sleep and Circadian Network* (2015-present)
- *Association of Canadian Early Career Health Researchers* (2016-present).
- *Halifax Project – Broad-Spectrum Integrative Design for Cancer Prevention and Therapy* (2012-2015)
- *CHIMBRIDS (Chimeras and Hybrids in Comparative European and International Research)* International Working Group for Scientific and Legal Policy (2004-2008)

6.4 Professional service activities

- Organizing committee member Canadian Society for Chronobiology Conference, 2019
- Organizing committee member Conference of the Canadian Society of Zoologists, 2019
- Conference poster judge (Canadian Society for Chronobiology, 2017; Windsor Cancer Research Group, 2016; Till and McCulloch Meeting, 2015)

6.5 Professional service activities at the University of Windsor

- Member Research Ethics Board – Biomedical Projects (2018-present)
- Biological Sciences Graduate Committee (2016-present)
- Biological Sciences Faculty Appointments Committee (2015-16 and 2017-18)
- Panel Speaker at Let's Talk Cancer symposium (2017, 2019)
- Biological Sciences Curriculum Development Committee (2014-2015)
- Biological Sciences Space Committee (2016-present)
- Graduate Committee member for >20 students, and Thesis Defense Chair for >20 students (2015-present)
- Hosted visiting academic speakers for Biology Seminar Series (2015-2019)
- Moderator at Windsor Cancer Research Group conference session (2016)
- UWill Discover abstract reviewer (2016-present)
- Participant at New Faculty Lunch (2015-17)

7. Research activities

7.1 Publications >1000 citations, 2.46 relative citation ratio on NIH iCite (* indicates student under my supervision)

1. Parasram K. *, Karpowicz P. Circadian clock regulation of intestinal stem cells. **Cellular and Molecular Life Sciences** (2019 – in press, invited review)
2. Parasram K. *, Bernardon N. *, Li H., Hammoud M. *, Chang H. *, Perrimon N., Karpowicz P. *Intestinal stem cells exhibit conditional circadian clock function.* **Stem Cell Reports** 11(5): 1287-1301 (2018). (Journal Cover Image)
3. Thraya M. *, Hammoud M. *, Heath D., Karpowicz P. *Testing the expression of circadian clock genes in the tissues of Chinook salmon, *Oncorhynchus tshawytscha*.* **Chronobiology International** 36(8): 1088-1102 (2019).
4. Stokes K. *, Cooke A. *, Chang H. *, Weaver D.R., Breault D.T., Karpowicz P. *The circadian clock gene *BMAL1* coordinates intestinal regeneration.* **Cellular & Molecular Gastroenterology and Hepatology** 4(1): 95-114 (2017).
5. Amin R., Karpowicz P., Carey T.E., Arbiser J., Nahta R., Chen Z.G., Dong J-T., Kucuk O., Khan G.N., Huang G.S., Lee H-Y., Reichrath J., Honoki K., Georgakilas A.G., Amedei A., Amin A., Helferich B., Boosani C.S., Ciriolo M.R., Chen S., Mohammed S.I., Azmi A.S., Keith W.N., Bhakta D., Halicka D., Niccolai E., Fujii H., Aquilano K., Ashraf S.S., Nowsheen S., Yang X., Bilsland A, Shin D.M. *Evasion of anti-growth signaling: a key step in tumorigenesis and potential target for treatment and prophylaxis by natural compounds.* **Seminars in Cancer Biology** 35: S55-77 (2015).
6. Block K.I., *et al.* *Designing a broad-spectrum integrative approach for cancer prevention and treatment.* **Seminars in Cancer Biology** 35: S276-304 (2015). (>70 citations, Web of Science)

7. Karpowicz P., Zhang Y., Hogenesch J.B., Emery P., Perrimon N. *The circadian clock gates the intestinal stem cell regenerative state*. **Cell Reports** 3(4): 996-1004 (2013). (>40 citations, Web of Science)
8. DeVeale B., Bausch-Fluck D., Seaberg R., Runciman S., Akbarian V., Karpowicz P., Yoon C., Song H., Zandstra P., Wollscheid B., van der Kooy D. *Surfaceome profiling reveals regulators of neural stem cell function*. **Stem Cells** 32(1): 258-68 (2013).
9. Smukler S.R., Arntfield M.E., Razavi R., Bikopoulos G., Karpowicz P., Seaberg R., Dai F., Lee S., Ahrens R., Fraser P., Wheeler M., van der Kooy D. *The Adult Mouse and Human Pancreas Contain Rare Multipotent Stem Cells that Express Insulin*. **Cell Stem Cell**. 8(3): 281-93. (2011). (>100 citations, Web of Science)
10. Ni J.Q., Zhou R., Czech B., Liu L., Holderbaum L., Yang-Zhou D., Shim H.S., Tao R., Handler D., Karpowicz P., Binari R., Booker M., Brennecke J., Perkins L.A., Hannon G.J., Perrimon N. *A Genome-Scale shRNA Resource for Transgenic RNAi in Drosophila*. **Nature Methods**. 8(5): 405-7. (2011). (>300 citations, Web of Science)
11. Karpowicz P., Perez J. *, Perrimon N. *The Hippo Tumor Suppressor Pathway Regulates Intestinal Stem Cell Regeneration*. **Development** 137(24): 4135-45 (2010). (>160 citations, Web of Science)
12. Karpowicz P., Perrimon, N. *All for One and One for All: The Clonality of the Intestinal Stem Cell Niche*. **F1000 Biology Reports** 2:73 (2010).
13. Karpowicz P., *Biased DNA Segregation*. **Encyclopedia of Life Sciences**. John Wiley & Sons, Ltd: [DOI: 10.1002/9780470015902.a0022543] (2010).
14. Karpowicz P., *Response to Letter from Renata Maas*. **DNA Repair**. 9: 1024-25 (2010).
15. Karpowicz P., Willaime-Morawek S., Inoue T., Deveale B., Hitoshi S., van der Kooy D. *E-Cadherin Regulates Neural Stem Cell Self-Renewal*. **Journal of Neuroscience**. 29(12): 3885-96. (2009). (>60 citations, Web of Science)
16. Karpowicz P., Pellikka M., Godt D., Tepass U., van der Kooy D. *The germline stem cells of Drosophila melanogaster partition DNA non-randomly*. **European Journal of Cell Biology**. 88(7): 397-408. (2009).
17. Coles-Takabe B.L., Brain I., Purpura K.A., Karpowicz P., Zandstra P.W., Morshead C.M., van der Kooy D. *Don't Look: Growing clonal versus non-clonal neural stem cell colonies*. **Stem Cells**. 26(11): 2938-44. (2008). (>80 citations, Web of Science)
18. Karpowicz P., Inoue T., Runciman S., Chaddah R., Seaberg R., Gertsenstein M., Byers L., Yamanaka Y., Tondat S., Slevin J., Hitoshi S., Rossant J., van der Kooy D. *Adhesion Is Prerequisite But, Alone, Is Insufficient for Neural Stem Cell Pluripotency*. **Journal of Neuroscience**. 27(20): 5437-47. (2007).
19. Karpowicz P., Morshead C., Kam A., Jervis E., Cheng V., van der Kooy D. *Support for the Immortal Strand Hypothesis: Neural Stem Cells Partition DNA Asymmetrically in vitro*. **Journal of Cell Biology**. 170(5): 721-32. (2005). (>140 citations, Web of Science)
20. Karpowicz P., Cohen C., van der Kooy D. *Developing Human/Nonhuman Chimeras in Human Stem Cell Research: Ethical Issues and Boundaries*. **Kennedy Institute of Ethics Journal**. 15(2): 107-34. (2005). (>40 citations, Web of Science)

21. Karpowicz P., Cohen C., van der Kooy D. *It is Ethical To Transplant Human Stem Cells into Nonhuman Embryos*. **Nature Medicine**. 10(3): 331-5. (2004). (>40 citations, Web of Science)
22. Stewart J.M., Blakely J.A., Karpowicz P., Martin B.M., Thatcher B. *Unusually weak oxygen binding, physical properties, partial sequence, autoxidation rate and a potential phosphorylation site of beluga whale (*Delphinapterus leucas*) myoglobin*. **Comp Biochem Physiol B Biochem Mol Biol**. 137(3): 401-12. (2004).
23. Karpowicz P. *In Defense of Stem Cell Chimeras: A Response to 'Crossing Species Boundaries'*. **American Journal of Bioethics**. 3(3): w17-19. (2003).

7.2 Invited lectures

1. Chronic Inflammation, Immunity, and Cancer Meeting, Orford, Canada. "*Circadian rhythms in the intestinal epithelium*." Oct 4, 2019.
2. Canadian Society for Chronobiology Meeting, Montreal, Canada. "*The Use of Model Organisms and Various Genetic Approaches in Biological Rhythms Research*." May 26, 2019.
3. Ontario Institute of Regenerative Medicine, Toronto, Canada. "*Circadian rhythms in organoid culture: regulation of stem cells by the circadian clock*." May 15, 2019.
4. University of Cincinnati College of Medicine, Cincinnati, USA. "*Circadian rhythms in the intestinal epithelium regulate inflammation*." Mar 5, 2019.
5. Wayne State University, Detroit, USA. "*Circadian rhythms in regeneration*." Jun, 2018.
6. Farncombe Institute, McMaster University, Hamilton, Canada. "*Circadian control of intestinal physiology and health*." Nov, 2017.
7. Canadian Developmental Biology Meeting, Banff, Canada. "*The circadian clock regulates a conserved regeneration program*." Mar, 2016.
8. Wayne State University, Detroit, USA. "*Circadian rhythms in intestinal healing*." Dec, 2015.
9. Gordon Research Conference: Chronobiology, Girona, Spain. "*The Role of the Circadian Clock in Regeneration*." Jun, 2015.
10. Harvard Digestive Diseases Center, Boston, USA. "*The Timing of Intestinal Regeneration*." Jan, 2014.
11. Harvard Medical School: HSCI Cancer Program, Boston, USA. "*Intestinal Regeneration and Circadian Rhythms*." Nov, 2013.
12. University of Massachusetts Medical School, Worcester, USA. "*Intestinal Regeneration*." Oct, 2013.
13. Atlantic Cancer Research Institute, Moncton, Canada. "*Intestinal Regeneration, Cancer and Circadian Rhythms*." Aug, 2012.
14. Till and McCulloch Meeting, Montreal, Canada. "*Intestinal Regeneration is Gated by Circadian Rhythms*." May, 2012.

15. Department of Genetics, Harvard Medical School, Boston, USA. "*Intestinal Stem Cell Regeneration.*" Jul, 2011.
16. 2nd Annual Hippo Workshop, Rome, Italy. "*The Hippo Tumor Suppressor Pathway Requires Jak/STAT Activity to Regulate Tissue Stem Cell Regeneration.*" Nov, 2010.
17. Mount Allison University, Sackville, Canada. "*Adhesion Proteins Regulate Stem Cell Activity.*" Feb, 2010.
18. Dalhousie University, Halifax, Canada. "*Adhesion Proteins Regulate Stem Cell Activity.*" Feb, 2010.
19. St. Francis Xavier University, Antigonish, Canada. "*Adhesion Proteins Regulate Stem Cell Activity.*" Feb, 2010.
20. Abcam Stem Cell Research Conference, Cancun, Mexico. "*DNA Is Partitioned Asymmetrically in the Germline Stem Cells of Drosophila Melanogaster.*" Dec, 2006.
21. MaRS Centre, University of Toronto, Toronto, Canada. "*Technical Issues Pertaining to the Introduction of Cells into Ultrasound Guided Chimeras.*" Feb, 2006.
22. Developmental Biology Program, University of Toronto, Toronto, Canada. "*Support for the Immortal Strand Hypothesis: Asymmetric DNA Partitioning is Evidenced In Vitro.*" Sep, 2005.
23. Christopher Reeve Hot Topics in Stem Cell Biology, New Orleans, U.S.A. "*Neural Stem Cells Cosegregate Immortal Strand Bearing Chromosomes During Asymmetric Divisions.*" Nov, 2003.
24. Stem Cell Network Annual General Meeting, Vancouver, Canada. "*Neural Progenitors Exhibit Cosegregation of Chromosomes.*" Oct, 2003.
25. Stem Cell Network Annual General Meeting, Toronto, Canada. "*The Human/Macaque Retinal Stem Cell Chimera.*" Sep, 2002.

7.3 Presentations at conferences (* indicates student under my supervision)

1. Canadian Society for Chronobiology, Montreal, Canada. "*Green Guts: Development of Circadian Rhythms in the Drosophila Intestine.*" Parasram K *, Zuccato A *, Karpowicz P. May, 2019.
2. Canadian Society for Chronobiology, Montreal, Canada. "*A Dive into the Circadian Clock of Chinook Salmon.*" Thraya M *, Hammoud M *, Stephens A *, Chang H *, Heath D, Karpowicz P. May, 2019.
3. Canadian Society for Chronobiology, Montreal, Canada. "*The effect of BMAL1 on colorectal tumourigenesis.*" Trombley C *, Nunes M *, Stokes K *, Curran C *, Karpowicz P. May, 2019.
4. Canadian Society for Chronobiology, Montreal, Canada. "*Inflammatory bowel disease pathogenesis in the absence of the clock gene BMAL1.*" Taleb Z *, Stokes K *, Wang H, Khan W, Collins S, Karpowicz P. May, 2019.

5. Canadian Society for Chronobiology, Montreal, Canada. "*Testing Circadian Regulation of the JAK/STAT Signaling Pathway.*" Bachetti D *, Parasram K *, Hammoud M *, He L, Perrimon N, Karpowicz P. May, 2019.
6. Canadian Society for Chronobiology, Montreal, Canada. "*Evaluating circadian rhythms in adenoma organoids.*" Stokes K *, Naula N, Karpowicz P. May, 2019.
7. Canadian Society of Zoologists, Windsor, Canada. "*A Dive into the Circadian Clock of Chinook Salmon.*" Thraya M *, Hammoud M *, Stephens A *, Chang H *, Heath D, Karpowicz P. May, 2019.
8. Ontario Biology Day, London, Canada. "*The Effects of Bmal1 on Intestinal Tumour Characteristics.*" Curran C. *, Stokes K. *, Zhao T, Nunes M *, Karpowicz P. Mar, 2019.
9. Ontario Biology Day, London, Canada. "*Studying the Impact of Photoperiod and Feeding Time on Circadian Rhythms in Chinook Salmon.*" Stephens A. *, Thraya M. *, Hammoud H. *, Karpowicz P. Mar, 2019.
10. UWill Discover Undergraduate Conference, Windsor, Canada. "*A Dive into the Circadian Clock of Chinook Salmon.*" Thraya M. *, Hammoud M. *, Stephens A. *, Chang H. *, Heath D., Karpowicz P. Mar, 2019.
11. Society for Research of Biological Rhythms, Florida, USA. "*Single-cell analysis of circadian clock activity in the Drosophila intestine.*" Parasram K. *, Bernardon N. *, Hammoud M. *, Chang H. *, He L., Perrimon N., Karpowicz P. May, 2018. (travel awards from *Canadian Society for Chronobiology* and UWindsor)
12. Society for Research of Biological Rhythms, Florida, USA. "*Testing circadian regulation of stem cell growth and Wnt signaling.*" Stokes K. *, Nunes M. *, Weaver D., Karpowicz P. May, 2018. (travel awards from *Canadian Society for Chronobiology* and UWindsor)
13. UWill Discover Undergraduate Conference, Windsor, Canada. "*Investigating the effect of circadian rhythm regulator Bmal1 on tumorigenesis in APCmin/- mice.*" Zhou T. *, Stokes K. *, Nunes, M. *, Curran C. *, Karpowicz, P. Mar, 2018.
14. Gordon Research Conference: Chronobiology, Vermont, USA. "*Circadian regeneration in the intestinal epithelium.*" Stokes K. *, Cooke A. *, Chang H. *, Weaver D.R., Breault D.T., Karpowicz P. Jul, 2017.
15. Canadian Society for Chronobiology, Toronto, Canada. "*BMAL1 and colorectal cancer progression.*" Nunes M. *, Stokes K. *, Cooke A. *, DeBiasio C. *, Karpowicz P. May, 2017. (travel awards from *Canadian Society for Chronobiology*)
16. Canadian Society for Chronobiology, Toronto, Canada. "*Circadian interdependence in the Drosophila midgut.*" Bernardon N. *, He L., Perrimon N., Karpowicz P. May, 2017. (travel awards from *Canadian Society for Chronobiology*)
17. Canadian Society for Chronobiology, Toronto, Canada. "*Intestinal inflammation: a circadian regenerative response.*" Stokes K. *, Cooke A. *, Chang H. *, Weaver D., Breault D., Karpowicz P. May, 2017. (travel awards from *Canadian Society for Chronobiology*)

18. UWill Discover Undergraduate Conference, Windsor, Canada. "*Time will Tell: The Involvement of the Circadian Clock in Colorectal Cancer.*" Cooke A. *, Nunes M. *, Stokes K. *, Karpowicz P. Mar, 2017 (2nd place winner).
19. UWill Discover Undergraduate Conference, Windsor, Canada. "*Clock work: the role of the circadian clock in colorectal cancer.*" DeBiasio C. *, Nunes M. *, Stokes K. *, Karpowicz P. Mar, 2017 (3rd place winner).
20. 3rd Biennial International WCRG Conference, Windsor, Canada. "*The circadian clock gene BMAL1 coordinates intestinal regeneration.*" Stokes K. *, Cooke A. *, Chang H. *, Weaver D., Breault D., Karpowicz P. Nov, 2016.
21. CIHR New Principal Investigators Meeting, Montreal, Canada. "*The Circadian Rhythms of Intestinal Regeneration.*" Stokes K. *, Weaver D., Breault D., Karpowicz P. Oct, 2015.
22. Till and McCulloch Meeting, Toronto, Canada. "*A Time to Divide: Circadian Gated Proliferation.*" Stokes K. *, Chang H. *, Weaver D., Breault D., Karpowicz P. Oct, 2015.
23. Gordon Research Conference: Chronobiology, Newport, USA. "*Intestinal Regeneration is Gated by the Circadian Clock.*" Karpowicz P., Zhang Y., Emery P., Hogenesch J., Perrimon N. Jul, 2013.
24. Abcam Stem Cell Research Conference, Punta Cana, Dominican Republic. "*Neural Stem Cell Self-Renewal is Dependant on E-Cadherin.*" Karpowicz P., Willaime-Morawek S., Inoue T., van der Kooy D. Dec, 2007.
25. Society for Neuroscience, San Diego, U.S.A. "*Neural Stem Cell Self-Renewal is Dependant on E-Cadherin.*" Karpowicz P., Willaime-Morawek S., Inoue T., van der Kooy D. Nov, 2007.
26. International Society for Stem Cell Research, Cairns, Australia. "*DNA Is Partitioned Asymmetrically in the Germline Stem Cells of Drosophila Melanogaster.*" Karpowicz P., Pellika M., Godt D., Tepass U. van der Kooy D. Jun, 2007.
27. Society for Neuroscience, Atlanta, U.S.A. "*E-Cadherin Regulates Neural Stem Cell Self-Renewal.*" Karpowicz P., Willaime-Morawek S., Inoue T., Deveale B., Hitoshi S., van der Kooy D. Oct, 2006.
28. International Society for Stem Cell Research, Toronto, Canada. "*DNA Is Partitioned Asymmetrically During Adult Stem Cell Divisions But Not Embryonic Blastomere Divisions.*" Karpowicz P., Morshead C., Kam A., Pellikka M., Godt D., Tepass U., van der Kooy D. Jul, 2006.
29. Society for Neuroscience, Washington DC, U.S.A. "*DNA is Partitioned Asymmetrically in Adult Stem Cell Divisions But Not Embryonic Blastomere Divisions.*" Karpowicz P., Morshead C., Kam A., Godt D., Tepass U., van der Kooy D. Oct, 2005.
30. Society for Neuroscience, Washington DC, U.S.A. "*Adhesion is Prerequisite But, Alone, Is Insufficient for Neural Stem Cell Multipotency.*" Karpowicz P., Inoue T., Runciman S., Chaddah R., Gertsenstein M., Yamanaka Y., Hitoshi S., Rossant J., van der Kooy D. Oct, 2005.
31. Society for Neuroscience, San Diego, U.S.A. "*E-Cadherin Maintains Neural Stem Cells.*" Karpowicz P., Runciman S., Inoue T., Byers L., Gertsenstein M., Hitoshi S., Rossant J., van der Kooy D. Oct, 2004.

32. Society for Neuroscience, New Orleans, U.S.A. "*Neural Stem Cells Cosegregate Immortal Strand Bearing Chromosomes During Asymmetric Divisions.*" Karpowicz P., Morshead C., Cheng V., van der Kooy D. Nov, 2003.

33. International Society for Stem Cell Research, Washington DC, U.S.A. "*A Case for Human Retinal Stem Cell Transplants into Non-Human Chimeras.*" Karpowicz P., Cohen C., van der Kooy D. Jun, 2003.

8. Teaching activities

8.1 Courses taught

- Stem cell biology 55-405: 4th year seminar course (~30 students per year, 2015-present).
- Homeostasis and cell physiology 55-365: 3rd year course (~50 students per year, 2018-present).
- Graduate course in stem cell biology 55-603 (2015-16).
- Graduate course in circadian rhythm biology 55-603 (2016-17).
- Guest lectures for evolution 55-341, and environmental Physiology 55-310
- SET scores ≥ 6.0 (all years)

8.2 Curriculum development and contribution

- Developed 55-405 undergraduate course in stem cell biology
- Developed 55-365 undergraduate course in homeostasis and cell physiology
- Developed 55-603 graduate course in stem cell biology
- Developed 55-603 graduate course in circadian biology
- Biological Sciences Graduate Curriculum Chair (2017-present)
- Biological Sciences Curriculum Development Committee (2014-2015)
- Assisted in updating/revising Molecular Biology and Biotechnology program curriculum (2015)
- Participant in CTL summer series (2014-15)

8.3 Past teaching experience

- Teaching Assistant for Howard Hughes Medical Institute, and Harvard Stem Cell Institute Internship Students, Boston (2010-2014)
- Teaching Assistant for Massachusetts Institute of Technology Internship Students, Boston (2009-2011)
- Teaching Assistant for University of Toronto Institute of Biomaterials and Biomedical Engineering, Toronto (2002-2007)
- Instructor for Mt. Allison University Biology and Chemistry Departments, Sackville (1998-2001)

9. Volunteer and outreach activities

- Mentor for grade 8 students and high school students / science fair (2015, 2016, present)
- Let's Talk Science Program speaker (2016, 2019)
- March for Science speaker (2017)
- Detroit Kendo Club, instructor (2014-present), Shufukai Kendo Club (2008-2014), Toronto Kendo Club (2003-2007)