ROBERT E. CAMPBELL
CURRICULUM VITAE

Updated Jul 1, 2014

PRESENT ADDRESS

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ACADEMIC APPOINTMENTS

- 07/2013-present: Professor, Department of Chemistry, University of Alberta
- 07/2009-06/2013: Associate Professor, Department of Chemistry, University of Alberta
- 09/2009-08/2014: Tier II Canada Research Chair in Bioanalytical Chemistry (renewal)
- 07/2003-06/2009: Assistant Professor, Department of Chemistry, University of Alberta
- 07/2004-06/2009: Tier II Canada Research Chair in Bioanalytical Chemistry

OTHER AFFILIATIONS

- 01/2014-present: Adjunct member of the Alberta Glycomics Centre
- 1/2013-present: Member of the Neuroscience and Mental Health Institute

EDUCATION AND TRAINING

- 07/2000-06/2003: Postdoctoral fellow at the University of California, San Diego, Department of Pharmacology with Prof. Roger Y. Tsien
- 09/1994-07/2000: Ph.D. from the University of British Columbia, Department of Chemistry with Prof. Martin E. Tanner
- 09/1990-04/1994: B.Sc. from the University of British Columbia, Department of Chemistry.

AWARDS

- 2014: Boehringer Ingelheim Research Excellence Award
- 2013: Award for Excellence in Graduate Teaching
- 2012: Faculty of Science Research Award
- 2010: Martha Cook Piper Research Prize
- 2010: JSPS Fellowship with Prof. T. Nagai, Hokkaido U., Sapporo, JAPAN (July - Dec)
- 2009-2014: Tier II Canada Research Chair in Bioanalytical Chemistry (renewed).
- 2008: Petro-Canada Young Innovator Award
- 2004-2009: Tier II Canada Research Chair in Bioanalytical Chemistry.
- 2004-2006: Alberta Ingenuity New Faculty Award
- 2002: Boehringer Ingelheim Award for Organic or Bioorganic Chemistry for doctoral research of outstanding quality.

- 2000: Bio-Mega/Boehringer Ingelheim Scholarship for Organic Chemistry for excellence in graduate research.

PUBLICATIONS (names of trainees in **bold**, '*' denotes corresponding author)

61. P. Zou (equal contribution), **Y. Zhao** (equal contribution), A.D. Douglass, D.R. Hochbaum, D. Brinks, C.A. Werley, D.J. Harrison, R.E. Campbell (*correspondence regarding the library screen), A.E. Cohen*, "Bright and fast multi-colored voltage reporters via electrochromic FRET (eFRET)", *Nat. Commun.*, 2014, **Accepted** July 1, 2014.
60. B.G. Oscar, W. Liu, **Y. Zhao,** L. Tang, Y Wang, R.E. Campbell, and C. Fang*, "Excited state structural dynamics of a dual-emission calmodulin-green fluorescent protein sensor for calcium ion imaging", *Proc. Natl. Acad. Sci. U.S.A.*, 2014, **Accepted** June 6, 2014. Published online July 1, 2014. [2012 IF 9.74]
59. D.R. Hochbaum (equal contribution), **Y. Zhao** (equal contribution), S.L. Farhi, N. Klapoetke, C.A. Werley, V. Kapoor, P. Zou, J.M. Kralj, D. Maclaurin, N. Smedemark-Margulies, J. Saulnier, G.L. Boulting, Y. Cho, M. Melkonian, G.K-S. Wong, D.J. Harrison, V.N. Murthy, B. Sabatini, E.S. Boyden (equal contribution), R.E. Campbell (equal contribution; *correspondance related to directed evolution), and A.E. Cohen*, "All-optical electrophysiology in mammalian neurons using engineered microbial rhodopsins", *Nat. Methods*, 2014. **Accepted** May 29, 2014, Published online June 22, 2014. [2012 IF 23.57]
58. **Y. Zhao**, **A.S. Abdelfattah**, Y. Zhao, A. Ruangkittisakul, K. Ballanyi, R.E. Campbell*, D.J. Harrison*, "Microfluidic cell sorter-aided directed evolution of a protein-based calcium ion indicator with an inverted fluorescent response", *Integr. Biol. (Camb)*, 2014, **6**(7), 714-725. [Yongxin Zhao and Yufeng Zhao are two different authors of this manuscript] [2012 IF 4.32]
57. **H-w. Ai**, M.A. Baird, **Y. Shen**, M.W. Davidson*, and R.E. Campbell*, "Engineering and characterizing monomeric fluorescent proteins for live-cell imaging applications". *Nat. Protocols*, 2014, **9**, 910-928. [2012 Impact factor 7.96]
56. **A.S.F. Belal**, B.R. Sell, **H. Hoi**, M.W. Davidson, and R.E. Campbell*, "Optimization of a Genetically Encoded Biosensor for Cyclin B1-Cyclin Dependent Kinase 1". *Mol. Biosyst.*, 2014, **10**(2), 191-195. [2012 IF 3.35]
55. **H. Hoi**, **Y. Ding**, and R.E. Campbell*, "FRET with Fluorescent Proteins", in *FRET - Förster Resonance Energy Transfer: From Theory to Applications*. Eds. Igor Medintz and Niko Hildebrandt. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, November 2013, pages 431-473. [ISBN: 978-3-527-32816-1] [Book Chapter]
54. **H. Hoi**, E.S. Howe, **Y. Ding, W. Zhang**, M.A. Baird, B.R. Sell, J.R. Allen, M.W. Davidson, and R.E. Campbell*, "An engineered monomeric *Zoanthus* sp. yellow fluorescent protein", *Chem. Biol.*, 2013, **20**, 1296-1304. [Highlighted by Whittredge and Taraska in the same issue *Chem. Biol.*, 2013, **20**, 1203-1205] [2012 IF 6.16]
53. **H.J. Carlson** and R.E. Campbell*, "Mutational analysis of a red fluorescent protein-based calcium ion indicator", *Sensors*, 2013, **13**(9), 11507-11521. [2012 IF 1.95]
52. **H.J. Carlson** and R.E. Campbell*, "Circular permutated red fluorescent proteins and calcium ion indicators based on mCherry", *Protein Eng. Des. Sel.,* 2013, **26**(12): 763-772. [2012 IF 2.59]
51. E.M. Lynes, A. Raturi, M. Shenkman, C.O. Sandova, M.C. Yap, **J. Wu**, A. Janowicz, N. Myhill, M.D. Benson, R.E. Campbell, L. G. Berthiaume, G.Z. Lederkremer and T. Simmen*, "Palmitoylation is the Switch that Assigns Calnexin to Quality Control or ER Calcium Signaling", *J. Cell Sci.*, 2013, **126**, 3893-3903. [2011 IF 6.11]
50. **J. Wu**, L. Liu, T. Matsuda, **Y. Zhao**, A. Rebane, M. Drobizhev, Y-F. Chang, S. Araki, Y. Arai,

K. March, T. E. Hughes, K. Sagou, T. Miyata, T. Nagai*, W-h. Li*, R. E. Campbell*, "Improved orange and red Ca^{2+} indicators and photophysical considerations for optogenetic applications", *ACS Chem. Neurosci.*, 2013, **4**(6), 963-972. [2011 IF = 3.7]

49. **H. Hoi**, T. Matsuda, T. Nagai, and R.E. Campbell*, "Highlightable Ca^{2+} indicators for live cell imaging", *J. Am. Chem. Soc.*, 2013, **135**(1), 46-49. [2011 IF = 9.9]
48. **S.C. Alford**, **J. Wu**, **Y. Zhao**, R.E. Campbell, and T. Knöpfel*, "Optogenetic Reporters". *Biol. Cell.*, 2013, **105**, 14-29. [2011 IF = 3.6]
47. A.L. McEvoy*, **H. Hoi**, M. Bates, E. Platonova, P.J. Cranfill, M.A. Baird, M.W. Davidson, H. Ewers, J. Liphardt, and R.E. Campbell*, "mMaple: a photoconvertible fluorescent protein for use in multiple imaging modalities". *PLoS ONE*, 2012, **7**(12): e51314. [2011 IF = 4.1]
46. **S.C. Alford, Y. Ding**, T. Simmen, and R.E. Campbell*, "Dimerization-Dependent Green and Yellow Fluorescent Proteins". *ACS Synth. Biol.*, 2012, **1**(12), 569-575. [Cover art] [Journal established 2011, no IF yet]
45. M. Funes-Huacca, A. Wu, E. Szepesvari, P. Rajendran, N. Kwan-Wong, A. Razgulin, **Y. Shen**, J. Kagira, R.E. Campbell and R. Derda*, "Portable self-contained cultures for phage and bacteria made of paper and tape". *Lab Chip*, 2012, **12**, 4269-4278. [2011 IF = 6.5]
44. P. Tewson, M. Westenberg, **Y. Zhao**, R.E. Campbell, A.M. Quinn, T.E. Hughes,* "Simultaneous detection of Ca^{2+} and diacylglycerol signaling in living cells". *PLoS ONE*, 2012, **7**(8): e42791. [2011 IF = 4.1]
43. R.E. Campbell*, "New Bioanalytical Tools and Devices: Chemistry leads the way". *Biotechnology Focus (Bioscienceworld)*, 2012, **16**(4), 7-9. [Highlighting the research of Drs. Gibbs-Davis, Serpe, and Derda] [IF not tracked]
42. K.D. Daze, T. Pinter, **C.S. Beshara**, **A. Ibraheem**, S.A. Minaker, M.C.F. Ma, R.J.M. Courtemanche, R.E. Campbell, and F. Hof*, "Supramolecular hosts that recognize methyllysines and disrupt the interaction between a modified histone tail and its epigenetic reader protein". *Chem. Sci.*, 2012, **3**, 2695-2699. [2011 IF = 7.5]
41. **S.C. Alford**, **A.S. Abdelfattah**, **Y. Ding**, and R.E. Campbell*, "A Fluorogenic Red Fluorescent Protein Heterodimer". *Chem. Biol.*, 2012, **19**, 353-360. [Featured with cover art and highlighted in *Nature Methods*, 2012, **9**, 432–433.] [2011 IF = 5.8]
40. **Y. Ding, H-w. Ai**, **H. Hoi**, R.E. Campbell*, "FRET-based biosensors for multiparameter ratiometric imaging of Ca^{2+} dynamics and caspase-3 activity in single cells". *Anal. Chem.*, 2011, **83**, 9687–9693. [2011 IF = 5.9]
39. **A. Ibraheem**, **H. Yap**, **Y. Ding**, R.E. Campbell*, "A bacteria colony-based screen for optimal linker combinations in genetically encoded biosensors". *BMC Biotechnol.*, 2011, **11**, 105. [2011 IF = 2.0]
38. **Y. Zhao**, S. Araki, **J. Wu**, T. Teramoto, Y-F. Chang, M. Nakano, **A.S. Abdelfattah**, M. Fujiwara, T. Ishihara, T. Nagai, and R.E. Campbell*, "An Expanded Palette of Genetically Encoded Ca^{2+} Indicators". *Science*, 2011, **333**, 1888-1891. [Highlighted in multiple places including C&EN Concentrates and the November 2011 issue of Biophotonics.] [2011 IF = 31.2]
37. **H. Hoi**, N.C. Shaner, M.W. Davidson, C.W. Cairo, J. Wang, R.E. Campbell*, "A Monomeric Photoconvertible Fluorescent Protein for Imaging of Dynamic Protein Localization". *J. Mol. Biol.*, 2010, **401**, 776-791. [2011 IF = 4.0]
36. **H.J. Carlson**, **D. Cotton**, and R.E. Campbell*, "Circularly permuted monomeric red fluorescent proteins with new termini in the β-sheet", *Protein Sci.*, 2010, **19**, 1490-1499. [2011 IF = 2.8]

35. R.E. Campbell and M.W. Davidson*, “Fluorescent reporter proteins”, Molecular Imaging with Reporter Genes. Eds. Sanjiv S. Gambhir and Shahriar S. Yaghoubi. Cambridge University Press, New York, NY, July 2010: 3 - 40. [ISBN: 9780521882330] [Book Chapter]
34. **A. Ibraheem** and R.E. Campbell*, “Designs and applications of fluorescent protein-based biosensors”, *Curr. Opin. Chem. Biol.*, 2010, **14**, 30-36. [2011 IF = 9.9]
33. R.E. Campbell* and C.J. Chang*, "Molecular Imaging: Editorial Overview", *Curr. Opin. Chem. Biol.*, 2010, **14**, 1-2. [Served as co-editor (equal contributions) for this Special issue of the journal which had 15 invited reviews.] [2011 IF = 9.9]
32. M.W. Davidson and R.E. Campbell*, “Engineered fluorescent proteins: innovations and applications”, *Nat. Methods*, 2009, **6**, 713-717. *[Invited Commentary for 5th Anniversary issue.]* [2011 IF = 19.3]
31. W.B. Frommer*, M.W. Davidson, R.E. Campbell* “Genetically encoded biosensors based on engineered fluorescent proteins”, *Chem. Soc. Rev.*, 2009, **38**, 2833-2841. [2011 IF = 28.8]
30. D.E. Johnson, **H-w. Ai**, **P. Wong**, J.D. Young, R.E. Campbell*, and J.R. Casey* “Red fluorescent protein pH biosensor to detect concentrative nucleoside transport”, *J. Biol. Chem.*, 2009, **284**, 20499-20511. [2011 IF = 4.8]
29. R.E. Campbell*, “Fluorescent Protein-Based Biosensors: Modulation of Energy Transfer as a Design Principle”, *Anal. Chem.,* 2009, **81**(15), 5972–5979. *[Invited Feature article with cover art and accompanying podcast.]* [2011 IF = 5.9]
28. **Z. Cheng** and R.E. Campbell*, “An engineered tryptophan zipper-type peptide as a molecular recognition scaffold”, *J. Pept. Sci.*, 2009, **15**, 523-532. [2011 IF = 1.8]
27. **H.J. Carlson**, R.E. Campbell*, “Genetically encoded FRET-based biosensors for multiparameter fluorescence imaging”, *Curr. Opin. Biotechnol.*, 2009, **20**, 19-27. [2011 IF = 7.7]
26. R.E. Campbell*, “Fluorescent proteins”, *Scholarpedia J.*, 2008, **3**(7), 5410. [IF not tracked, page accessed 82,365 times as of December, 2013]
25. **H-w. Ai**, K.L. Hazelwood, M.W. Davidson, and R.E. Campbell*, “Fluorescent protein FRET pairs for ratiometric imaging of dual biosensors”, *Nat. Methods*, 2008, **5**, 401-403. [Cover story of October 2008 issue of Biophotonics.] [2011 IF = 19.3]
24. **H-w. Ai**, S.G. Olenych, **P. Wong**, M.W. Davidson, and R.E. Campbell*, “Hue-shifted monomeric variants of Clavularia cyan fluorescent protein: identification of the molecular determinants of color and applications in fluorescence imaging”, *BMC Biol.*, 2008, **6**, 13. [Designated Highly Accessed and Featured article.] [2011 IF = 5.8]
23. **H-w. Ai**, and R. E. Campbell*, “Teal fluorescent proteins: Characterization of a reversibly photoconvertible variant”, *Proc. SPIE*, 2008, **6868**, 68680D. [2011 IF = 1.0]
22. Q.K. Timerghazin, **H.J. Carlson**, C. Liang, R.E. Campbell,* and A. Brown*, “Computational prediction of absorbance maxima for a structurally diverse series of engineered green fluorescent protein chromophores”, *J. Phys. Chem B*, 2008, **112**, 2533-2541. [2011 IF = 3.7]
21. **Y. Li**, **A.M. Sierra**, **H.-w. Ai**, and R.E. Campbell*, “Identification of sites within a monomeric red fluorescent protein that tolerate peptide insertion and testing of corresponding circular permutations”, *Photochem. Photobiol.*, 2008, **84**, 111–119. [2011 IF = 2.4]
20. **H-w. Ai** and R.E. Campbell*, “More than just pretty colors: the growing impact of fluorescent proteins in the life sciences”, *Biotechnology Focus (Bioscienceworld)*, 2007, issue **11**, 16-18. [IF not tracked]

19. **Z. Cheng**, M. Miskolzie, and R.E. Campbell*, "In vivo screening identifies a highly folded beta-hairpin peptide with a structured extension", *ChemBioChem*, 2007, **8**, 880-883. [Featured with cover art] [2011 IF = 3.9]
18. **H.-w. Ai**, N.C. Shaner, **Z. Cheng**, R.Y. Tsien, and R.E. Campbell*, "Exploration of new chromophore structures leads to the identification of improved blue fluorescent proteins", *Biochemistry*, 2007, **46**, 5904 - 5910. [News story featured on the cover of June 2007 issue of Biophotonics and 9th most-accessed article in Biochemistry for 2007.]
17. J.N. Henderson, **H.-w. Ai**, R.E. Campbell, and S.J. Remington*, "Structural basis for reversible photobleaching of a green fluorescent protein homologue", *Proc. Natl. Acad. Sci. U.S.A.*, 2007, **14**, 6672-6677. *[News story in June 2007 issue of Biophotonics and April 2007 Science Daily online.]*
16. **Z. Cheng** and R.E. Campbell*, "Fluorescence-based characterization of genetically encoded peptides that fold in live cells: progress towards a generic hairpin scaffold", *Proc. SPIE*, 2007, **6449**, 64490S.
15. **H-w. Ai**, J.N. Henderson, S.J. Remington, and R.E. Campbell*, "Directed evolution of a monomeric, bright, and photostable version of *Clavularia* cyan fluorescent protein: structural characterization and applications in fluorescence imaging", *Biochem. J.*, 2006, **400**, 531-540.
14. **Z. Cheng** and R.E. Campbell*, "Assessing the Structural Stability of Designed β-Hairpin Peptides in the Cytoplasm of Live Cells", *ChemBioChem*, 2006, **7**, 1147-1150.
13. R.E. Campbell*, "Realization of β-lactamase as a versatile fluorogenic reporter", *Trends Biotech.*, 2004, **22**, 208-211.

- **Postdoctoral research at the University of California, San Diego**

12. M.Z. Lin, M.R. McKeown, H.-L. Ng, T.A. Aguilera, N.C. Shaner, R.E. Campbell, S.R. Adams, L.A. Gross, W. Ma, T. Alber, R.Y. Tsien*, "Autofluorescent Proteins with Excitation in the Optical Window for Intravital Imaging in Mammals", *Chem. Biol.*, 2009, **16**, 1169-1179. [2011 IF = 5.8]
11. N.C. Shaner, R.E. Campbell, P.A. Steinbach, B.N.G. Giepmans, A.E. Palmer, and R.Y. Tsien*, "Improved monomeric red, orange, and yellow fluorescent proteins derived from *Discosoma* red fluorescent protein", *Nat. Biotechnol.,* 2004, **22**, 1567-1572.
10. J. Zhang, R.E. Campbell, A.Y. Ting and R.Y. Tsien*, "Creating New Fluorescent Probes for Cell Biology", *Nat. Rev. Mol. Cell Biol.*, 2002, **3**, 906-918.
9. R.E. Campbell, O. Tour, A.E. Palmer, P.A. Steinbach, G.S. Baird, D.A. Zacharias and R.Y. Tsien*, "A Monomeric Red Fluorescent Protein", *Proc. Natl. Acad. Sci. U.S.A.*, 2002, **99**, 7877-7882.
8. S.R. Adams, R.E. Campbell, L.A. Gross, B.R. Martin, G.K. Walkup, Y. Yao, J. Llopis and R.Y. Tsien*, "New Biarsenical Ligands and Tetracysteine Motifs for Protein Labeling in Vitro and in Vivo: Synthesis and Biological Applications", *J. Am. Chem. Soc.*, 2002, **124**, 6063-6076.
7. O. Griesbeck, G.S. Baird, R.E. Campbell, D.A. Zacharias and R.Y. Tsien*, "Reducing the Environmental Sensitivity of Yellow Fluorescent Protein: Mechanism and Applications", *J. Biol. Chem.*, 2001, **276**, 29188-29194.

- **Graduate research at the University of British Columbia**

6. R.E. Campbell, S.C. Mosimann, M.E. Tanner*, and N.C.J. Strynadka*, "The Structure of UDP-*N*-Acetylglucosamine 2-Epimerase Reveals Homology to Phosphoglycosyl Transferases", *Biochemistry*, 2000, **39**, 14993-15001.

5. R.E. Campbell, S.C. Mosimann, I. van de Rijn, M. E. Tanner, and N.C.J. Strynadka*, "The First Structure of UDP-Glucose Dehydrogenase Reveals the Catalytic Residues Necessary for the Two-fold Oxidation", *Biochemistry*, 2000, **39**, 7012-7023.
4. R.E. Campbell and M.E. Tanner*, "UDP-Glucose Analogues as Inhibitors and Mechanistic Probes of UDP-Glucose Dehydrogenase", *J. Org. Chem.*, 1999, **64**, 9487-9492.
3. X. Ge, R. E. Campbell, I. van de Rijn, and M.E. Tanner*, "Covalent Adduct Formation with a Mutated Enzyme: Evidence for a Thioester Intermediate in the Reaction Catalyzed by UDP-Glucose Dehydrogenase", *J. Am. Chem. Soc.*, 1998, **120**, 6613-6614.
2. R.E. Campbell and M.E. Tanner*, "Uridine diphospho-alpha-D-gluco-hexodialdose: Synthesis and kinetic competence in the reaction catalyzed by UDP-glucose dehydrogenase", *Angew. Chem. Int. Ed. Eng.* 1997, **36**, 1520-1522.
1. R.E. Campbell, R.F. Sala, I. van de Rijn and M.E. Tanner*, "Properties and kinetic analysis of UDP-glucose dehydrogenase from group A streptococci. Irreversible inhibition by UDP-chloroacetol", *J. Biol. Chem.,* 1997, **272**, 3416-22.

SUBMITTED

- **Y. Ding**, J. Li, **S.C. Alford**, Y. Zhang, and R.E. Campbell*, "Color switch biosensors based on dimerization dependent fluorescent proteins". Under revision.
- T. Albrecht, **Y. Zhao**, **T.H. Nguyen**, R.E. Campbell, and J.D. Johnson*, "New fluorescent biosensors unveil endosomes as physiological Ca^{2+} buffers in beta-cells", Under revision.
- P. Zou (equal contribution), **Y. Zhao** (equal contribution), A.D. Douglass, D.R. Hochbaum, D. Brinks, C.A. Werley, D.J. Harrison, R.E. Campbell (*correspondance related to directed evolution), and A.E. Cohen*, "Bright and fast voltage reporters across the visible spectrum via electrochromic FRET (eFRET)", *arXiv*:1403.4636 [q-bio.BM], and Under revision.
- **Y. Shen** (equal contribution), M. Rosendale (equal contribution), R.E. Campbell (*correspondance related to new FP variants), and D. Perrais*, "pHuji, a pH sensitive red fluorescent protein for imaging of exo- and endocytosis", Under revision.
- **J. Wu**, **A.S. Abdelfattah**, L.S. Miraucourt, E. Kutsarova, A. Ruangkittisakul, **H. Zhou**, K. Ballanyi, G. Wicks, M. Drobizhev, A. Rebane, E.S. Ruthazer, and R.E. Campbell*, "A long Stokes shift red fluorescent protein Ca2+ indicator for 2-photon and ratiometric imaging", Submitted.
- Y. Wang, L. Tang, W. Liu, **Y. Zhao**, B.G. Oscar, R.E. Campbell, and C. Fang, "Excited State Structural Events of a Dual-Emission Fluorescent Protein Biosensor for Ca^{2+} Imaging Studied by Femtosecond Stimulated Raman Spectroscopy", Submitted.

PATENTS

- Adam Cohen, Daniel Hochbaum, **Yongxin Zhao,** Peng Zou, Samouil Leon Farhi, Jed Harrison, and Robert E. Campbell, "Improved Optogenetic Probes and Measuring Membrane Potential", U.S. Provisional Patent Application Serial No. 62/013,775.
- Robert E. Campbell, **Yidan Ding**, **Spencer Alford**, **Jhon Ralph Enterina**, and **Tiffany Yan Lai**, "Drug Discovery and Protein-Protein Interaction Assay using Fluorescent Protein Exchange", Filed May 9, 2014.
- Robert E. Campbell*, **Wei Zhang**, and **Hiofan Hoi**, "Genetically Encoded Photocleavable Proteins", United States Provisional Patent Application Serial No 61/938,483. Filed Feb. 11, 2014.

- Robert E. Campbell*, **Hiofan Hoi**, **Wei Zhang**, **Yongxin Zhao**, and D. Jed Harrison, "Monomeric Yellow Fluorescent Protein", United States Provisional Patent Application Serial No. 61/871,432 filed August 29, 2013.
- Jiwu Wang, Robert E. Campbell*, **Hiofan Hoi**, and Nathan C. Shaner, "Photoconvertible fluorescent proteins" University of Alberta, Edmonton and Allele Biotechnology & Pharmaceuticals, US Provisional Application Serial No. 12/960,397 (Filed December 3, 2010)
- Robert E. Campbell* and **Hui-wang Ai**, "Teal Fluorescent Proteins" United States Patent Application No. 11/419,437. Filed: May 19, 2006. Issued 7 September 2010; US Patent No: 7 790 868 (Issued September 7, 2010) and 7,935,801 (Issued May 3, 2011).
- Roger Y. Tsien*, Michael R. McKeown, Michael Z. Lin, Nathan C. Shaner, and Robert E. Campbell, "Fluorescent proteins with red-shifted excitation wavelengths and methods for making same", U.S. Provisional Application Serial No. 61/391,470. Filed October 8, 2010,
- Roger Y. Tsien* and Robert E. Campbell, "Non-oligomerizing tandem fluorescent proteins" United States Patents 6,852,849, February 8, 2005; 7,332,598, February 19, 2008.
- Roger Y. Tsien*, Robert E. Campbell, and Geoffrey S. Baird, "Fluorescent protein variants and methods for making same" United States Patent 7,329,735, February 12, 2008.
- Roger Y. Tsien* and Robert E. Campbell, "Monomeric and dimeric fluorescent protein variants and methods for making same" United States Patents 7,157,566; 7,906,636; 7,687,614. January 2, 2007.

TECHNOLOGY TRANSFER

- Allele Biotechnology (San Diego, CA) is the licensed distributor of the genes encoding mMaple, mTFP1, mWasabi, and mClavGR2.
- Anaptys Biosciences (La Jolla, CA) has licensed the right to use the gene encoding mTFP1 for private research.
- Many of the Campbell lab cDNA constructs are distributed through Addgene (http://www.addgene.org/Robert_Campbell/). As of December 2013, over 2200 samples have been distributed via Addgene. In addition, we distribute many additional samples per year directly from our lab.
- Clontech (Mountain View, CA) is the licensed distributor of the mFruit DsRed FP variants.

RESEARCH SEMINARS BY R.E.C.

1. Harvard Physical Chemistry Seminar Series, Cambridge, MA, Sept. 25, 2014
2. "Visualizing and manipulating biochemistry where and when it happens with engineered fluorescent proteins", *Protein Engineering Canada Conference*, Ottawa, ON, June 20-22, 2014.
3. "Illuminating cellular physiology with next generation optogenetic reporters", *Graduate Student Research Day*, Department of Physiology and Biophysics, Dalhousie University.
4. "Genetically encoded fluorophores and reporters to illuminate neuronal activity" *Frontiers in Neurophotonics 2014*, June 10, 2014, Laval University, Quebec city
5. "Design and evolution of genetically encoded probes to illuminate cellular activities", *Bioimaging at the Nanoscale*, Oregon Health & Science University, June 6, 2014.
6. "Engineering Next Generation Optogenetic Probes for Visualization of Neuronal Activity", Award lecture, *97th Canadian Chemistry Conference*, Vancouver, B.C., June 5, 2014.

7. "Engineering the Next Generation of Optogenetic Tools for Visualization of Neuronal Activity", Brain Research Centre, University of British Columbia, May 16, 2014.
8. "A new generation of optogenetic reporters to illuminate neuronal activity", *2nd International Symposium on Transformative Bio-Molecules*, Nagoya University, May 12, 2014
9. "Molecular engineering to build new tools to probe neuronal physiology", The Institute of Scientific and Industrial Research, Osaka University, Japan, May 9, 2014.
10. "Engineering the Next Generation of Optogenetic Tools for Neurophotonic Applications", University of Lethbridge, Department of Neuroscience, Dec. 10, 2013.
11. "Engineering the Next Generation of Optogenetic Tools for Neurophotonic Applications", Physics Colloquium, University of Alberta, Nov. 29, 2013.
12. "Optogenetic reporters for all-optical neurophysiology", Neurobiology Department, Northwestern University, Evanston, Illinois, Nov. 19, 2013
13. "Engineering the Next Generation of Optogenetic Tools for Neurophotonic Applications", University of Laval, Quebec, Nov. 15, 2013.
14. "Building tools today to enable the neuroscience of tomorrow", *CIHR 12th Annual New PI meeting*, Mont Gabriel, Quebec, Nov 1-3, 2013
15. "Engineering fluorescent protein-based biosensors for optical interrogation of cell physiology", IEEE Engineering in Medicine and Biology Society, Northern Canada Section, University of Alberta, October 16, 2013.
16. "Optogenetic reporters for all-optical neurophysiology", *Neurophotonics*, Bordeaux, France, October 1-4, 2013.
17. "Engineering genetically encoded indicators for imaging biochemistry where and when it happens", *Neurobiology of Adaptive Processes*, Université Pierre et Marie Curie, Paris, Sept. 30, 2013.
18. "Design and Evolution of Biosensors for Imaging of Ca^{2+} and Voltage in Live Cells", *Protein Society Symposium*, Nanotechnology and Biosensors, Boston, July 20-23.
19. "Engineering red fluorescent proteins for imaging of membrane potential, ion concentrations, and enzyme activities in live cells", *13th Congress of the French Society for Microscopy*, Nantes, France, July 5, 2013.
20. "Engineering genetically encoded indicators for imaging biochemistry where and when it happens", Faculty of Engineering Graduate Research Symposium, June 20, 2013.
21. "Engineering genetically encoded indicators for all-optical neurophysiology", *Frontiers in Neurophotonics*, Laval Univ., Quebec City, May 31, 2013
22. "Optogenetic reporters for imaging of ion concentrations, membrane potential, and enzyme activities in live cells", Department of Physiology, McGill University, May 30, 2013.
23. "Optogenetic reporters for all-optical neurophysiology", *Montreal All-Opto-Club*, McGill University, May 29, 2013.
24. "Glowing animals: a neuroscience toolkit at the end of the rainbow", Edmonton Nerd Nite, May 23, 2013
25. "Engineering red fluorescent proteins for imaging of membrane potential and ion concentrations in live cells", Peking University, Beijing, China, May 17, 2013
26. "Engineering red fluorescent proteins for imaging of ion concentrations, membrane potential, and enzyme activities in live cells", Chinese Academy of Sciences, Beijing, China, May 16, 2013
27. "Engineering red fluorescent proteins for imaging of ion concentrations and enzyme activities in live cells", Chinese Pharmaceutical University, Nanjing, China, May 14, 2013

28. "Engineering red fluorescent proteins for imaging of membrane potential, ion concentrations, and enzyme activities in live cells", Nanjing University, Nanjing, China, May 13, 2013
29. "Bioanalytical strategies for imaging membrane potential and ion concentrations in neurons", *4th Canada-China Conference on Analytical Chemistry,* Dalian, May 8-11, 2013.
30. "Engineering fluorescent proteins for visualizing biochemistry in live cells", *ABRF 2013*, Palm Springs California, Mar. 2-5, 2013.
31. "Engineering fluorescent probes for multicolor imaging of neuronal function", Department of Chemistry, University of California, Riverside, CA, Feb. 28, 2013.
32. "A colourful new generation of fluorescent probes for interrogating cellular physiology", Hotchkiss Brain Institute, University of Calgary, Dec. 7, 2012.
33. "The expanding toolbox of fluorescent probes for imaging of neuronal function", Department of Pharmacology, University of Alberta, Nov. 30, 2012.
34. "Genetically encoded biosensors that provide a colourful view of intracellular biochemistry", *CIHR Biotherapeutics group*, University of Toronto, Nov. 22, 2012.
35. "Fluorescent proteins remixed: New combinations of colours and tools", *FPs and Biological Sensors III*, Janelia Farm, Virginia, November 4-7, 2012.
36. "A new generation of fluorescent probes for interrogating cellular physiology", Department of Cellular and Molecular Physiology, Yale University, Oct. 25, 2012.
37. "Engineering fluorophores for bio-analytical and bio-imaging applications", *Materials and Instrument for Disease Diagnostic Devices*, Edmonton, Aug. 28-29, 2012
38. "Engineering palettes of calcium ion indicators and dimerization dependent fluorescent proteins for live cell imaging", *19th International MPSA Conference*, Ottawa, Ontario, June 26-28, 2012.
39. "Engineering of orange and red fluorescent indicators with extremely high signal changes", *2012 FASEB meeting on Calcium Signaling*, Snowmass village, Colorado, June 17-22, 2012.
40. "Engineering a colourful next generation of genetically encoded probes and sensors", *European Light Microscopy Initiative (ELMI) Meeting*, Leuven, Belgium, June 5-8, 2012.
41. "Engineering the Next Generation of Genetically Encoded Fluorescent Indicators for Neuroscience and Cell Biology", Brain Institute, University of Utah, Salt Lake City, December 8, 2011.
42. "Engineering new hues of genetically encoded indicators for live cell imaging", Dept. of Chem. and Biochem., University of Notre Dame, Indiana, November 4, 2011.
43. "Expanding the palette of genetically-encoded optical indicators for multicolour Ca2+ imaging", *ICASS / 3rd CCACC 2011 joint conference*, Toronto, August 29-31, 2011.
44. "Novel genetically-encoded optical probes: An expanded palette of Ca^{2+} indicators", Neurophotonics satellite Symposium of the *2011 Can. Neurosci. Meeting*, Quebec City, May 29, 2011.
45. "Fluorescence imaging: Enabling the visualization of biochemistry where and when it happens", *Frontiers in Neurophotonics*, Laval Univ., Quebec City, May 18-28, 2011
46. "A new strategy for the engineering of genetically encoded biosensors", BMES-SPRBM Conference on Cellular and Molecular Bioengineering, Miami, Jan. 5, 2011.
47. Microscopy Workshop, Hokkaido University, November 25, 2010.
48. Idea Seminar, Research Institute for Electronic Science, Hokkaido University, Oct. 12, 2010.
49. *Protein Design & Engineering session* at the *CSC Conference*, Toronto, June 2, 2010.
50. *Edmonton Chemistry Regional* presentation for high school teachers, May 7, 2010

51. University of Toronto, Department of Chemistry, April 13, 2010.
52. *Light in Life Sciences Conference*, Melbourne, Australia, November 24-27, 2009.
53. Department of Chemistry, School of Science, University of Tokyo, Japan, Nov. 9, 2009.
54. *Molecular Imaging and Systems Biology* Symposium, Aichi, Japan, Nov. 6, 2009.
55. *Fluorescent Proteins and Biological Sensors II*, Janelia Farm, Ashburn, VA, Nov. 1-4, 2009.
56. Department of Chemistry, University of Washington, Seattle, Washington, Oct. 27, 2009.
57. *2nd Canada-China Symp. on Analytical Chem. for Life Sciences*, Beijing, Oct. 14-16, 2009.
58. Department of Chemistry and Biochemistry, Concordia University, Sept. 18, 2009.
36. Department of Biochemistry, McGill University, Sept. 17, 2009.
37. *SNM's 56th Annual Meeting*, Toronto, Canada. June 13 - 17, 2009,
38. *Frontiers in Neurophotonics* Summer School, Laval University, Quebec City, June 2, 2009
39. *PROTEO annual symposium*, Laval University, Quebec City, May 21, 2009.
40. *CMBiG lecture series* at University of Northern British Columbia, March 20, 2009.
41. *Symposium in honor of the 2008 Nobel Prize in Chemistry*, San Diego, CA, Feb. 17th, 2009.
42. *Edmonton Section of the CSC*, Edmonton, AB, January 29, 2009.
43. *Northern lights Seminar Series*, Dept. of Biochemistry, University of Alberta, Jan. 16th, 2009
44. *Integrating the Physical and Applied Sciences into Biomed. Res. III*, Ottawa, Oct. 2-4, 2008.
45. Inst. of Biotechnol., National Autonomous University of Mexico (UNAM), Aug. 25, 2008.
46. Dept. of Pharmacology, Wayne State University, June 13th, 2008, Detroit, Michigan.
47. *Altered Proteins* at the *91st CSC conference*, May 24–28, 2008, Edmonton, Alberta.
48. *9th Organic Workshop for Leading, Young Canadian Chemists*, May 21-24, 2008, Hinton.
49. *Biomolecules, Cells and Microbes group*, University of Calgary, May 9th, 2008.
50. *Omics and Systems Biology conference*, Can. Proteome Soc., Feb. 21-22, 2008, Edmonton.
51. *Fluorescent Proteins & Biological Sensors I*, Oct. 28-31, 2007, Janelia Farm, Ashburn, VA
52. Department of Chemistry, University of Washington, Oct. 22, 2007, Seattle, Washington.
53. Département de chimie, Université de Montréal, Oct. 10, 2007, Montreal, Quebec.
54. *Imaging in 2020*, Sept. 23-27, 2007, Teton Lodge near Jackson Hole, Wyoming.
55. 1st *Canada-China Symposium on Anal. Chem. for the Life Sci.*, Aug. 20-22 2007, Edmonton.
56. *Bioluminescence Podcast*. See: 'http://video.conncoll.edu/f/mzim/podcast.xml'. March 2007.
57. *SPIE Photonics West 2007*, Jan. 20-25 2007, San Jose, CA.
58. American Society for Photobiology meeting, July 8-13, 2006, Puerto Rico.
59. *Peptide Science* at *89th CSC conference*, May 27–31, 2006, Halifax.
60. *Advances in Protein Engineering* at *89th CSC conference*, May 27–31, 2006, Halifax.
61. *Department of Medical Microbiology and Immunology*, University of Alberta, Dec. 8, 2005.
62. Submitted oral presentation at the *88th CSC*, Saskatoon, Saskatchewan, May 29, 2005.
63. Department of Biochemistry, Queen's University, Kingston, ON, May 25, 2005.
64. The 48th *CSBMCB Annual Meeting*, Banff, Alberta, March 17, 2005.
65. WUSEP Speaker Department of Chemistry, University of Victoria, Feb. 21, 2005.
66. *Department of Pharmacology Departmental Seminar*, University of Alberta, Nov. 15, 2004.
67. *Whither Structural Biology symposium*, University of Alberta, May 07, 2004.
68. **Postdoctoral research at the University of California, San Diego**
69. *Department of Physiology,* University of Alberta, March 05, 2004.
70. *Department of Biological Sciences,* University of Alberta, Feb. 06, 2004.
71. *Department of Oncology Departmental Seminar series*, University of Alberta, Dec. 04, 2003.

72. *WUSEP speaker*, Dept. of Chem. and Biochem., University of Lethbridge, Nov. 17, 2003.
73. *Northern Lights protein structure/function series*, University of Alberta, Nov. 14, 2003.
74. *Environmental Health Sciences Program*, University of Alberta, Oct. 17, 2003.
75. *Cell Biology Research in Progress Seminar Series*, University of Alberta, Oct. 03, 2003.
76. Twelve seminar and research proposal talks during job interviews.
77. Award lecture at the *85th CSC Conference*, University of British Columbia, Vancouver, 2002.
78. *Center for Molecular Medicine Seminar*, University of California, San Diego, 2002.
79. *Pharmacology Research Discussions Seminar*, University of California, San Diego, 2002. **Graduate research at the University of British Columbia**
80. Submitted oral presentation at the *Annual Volcano Bioorganic Chemistry Conference*, Pack Forest, Washington, 2000.
81. Submitted oral presentation at the *Annual Volcano Bioorganic Chemistry Conference*, Pack Forest, Washington 1997.

STUDENT ORAL PRESENTATIONS

(trainees in **bold**, presenter underlined)

1. **Yi Shen** and Robert E. Campbell, "Engineering of genetically encoded pH sensors based on red fluorescent proteins", *Protein Engineering Canada Conference*, Ottawa, ON, June 20-22, 2014.
2. **Jiahui Wu** and Robert E. Campbell, "An expanded Ca^{2+} indicator toolbox with various hues and affinities", Submitted poster and oral presentation at *2014 FASEB SRC on Calcium and Cell Function* in Nassau Bahamas, June 1-6, 2014.
3. **Wei Zhang** and Robert E. Campbell. Oral presentation at *Volcano Conference* March 1, 2014, Pack Forest, Washington.
4. **Ahmed Abdelfattah** and Robert E. Campbell. Oral presentation at the *Biophysical Society 58th Annual meeting* in the platform session: *Neurons: Modeling, Synaptic Transmission, and Optogenetics*. Feb 19, 2014.
5. **Ahmed Abdelfattah** and Robert E. Campbell. Invited oral "All optical electrophysiology with voltage indicators based on a red fluorescent protein" and poster "Development of red fluorescent protein-based voltage indicators and their application in cultured neurons" presentation at at *Campus Alberta Neuroscience Symposium* Sep. 2013.
6. **Yidan Ding** and Robert E. Campbell. Oral presentation at *Volcano Conference* Feb. 2013, Pack Forest, Washington.
7. **Yi Shen** and Robert E. Campbell. Oral presentation at *Volcano Conference* Feb. 2013, Pack Forest, Washington.
8. **Yongxin Zhao,** D. Jed Harrison and Robert E. Campbell, "A directed evolution strategy for improving genetically encoded fluorescent indicators of membrane potential". Two Oral and poster presentations *FPs and Biological Sensors III*, Janelia Farm, Virginia, November 4-7, 2012.
9. **Hiofan Hoi** and Robert E. Campbell. "Genetically-encoded photoconvertible Ca^{2+} sensors for live cell imaging". Oral presentation at the *19th MPSA Conference*, Ottawa, Ontario, June 26-28, 2012.
10. **Haley Carlson** and Robert E. Campbell. "A RFP-based Ca^{2+} indicator based on quantum yield and extinction coefficient modulation". Oral presentation at the *2012 CSC Conference*, Calgary, May 26-30, 2012.

11. **Ahmed Abdelfattah** and Robert E. Campbell. "Computationally Guided Engineering of Conformationally Flexible Green Fluorescent Protein". Oral presentation at *2012 CSC Conference*, Calgary, May 26-30, 2012.
12. **Ahmed Belal** and Robert E. Campbell. "A bacteria colony based screening methodology for optimal fluorescent protein FRET biosensor for protein kinase B(PkB) and cyclin-dependent kinase-1 (CDK-1)". Oral presentation at *2012 CSC Conference*, Calgary, May 26-30, 2012.
13. **Spencer Alford** and Robert E. Campbell. "Fluorogenic red fluorescent protein heterodimers: A new template for live cell biosensor design". Oral presentation at the *2012 ACS Conference*, March 25, San Diego, CA.
14. **Haley Carlson** and Robert E. Campbell. "Red fluorescent protein Ca^{2+} indicator based on quantum yield and extinction coefficient modulation". Oral presentation at the *2012 ACS Conference*, March 25, San Diego, CA.
15. **Haley Carlson** and Robert E. Campbell. "Engineering circularly permuted red fluorescent proteins as calcium biosensors". Oral presentation at the 2011 *CSC Conference,* Montreal, QC.
16. **Spencer Alford** and Robert E. Campbell. "Development of heterodimeric red fluorescent proteins". Oral presentation at the *2011 CSC Conference,* Montreal, QC.
17. **Yongxin Zhao** and Robert E. Campbell. "A live cell library screening strategy for the discovery of improved single fluorescent protein-based Ca^{2+} biosensors". Oral and poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
18. **Spencer Alford** and Robert E. Campbell. Oral presentation at the *2011 Volcano Conference,* Pack Forest Washington, Feb. 25-27, 2011.
19. **Spencer Alford** and Robert E. Campbell. Invited oral presentation for The 56th Annual International Conference on Analytical Sciences and Spectroscopy (ICASS), Edmonton, August 15–18, 2010.
20. **Hiofan Hoi** and Robert E. Campbell, "Development and application of a new monomeric photoconvertible fluorescent protein". Oral presentation at the *2010 Volcano Conference,* Pack Forest Washington, March 7, 2010.
21. **Andreas Ibraheem** and Robert E. Campbell. Oral presentation at the *ACB Histone Methyltransferase group project retreat*, Cross Cancer Institute, Zane Feldman auditorium, April 24, 2009.
22. **Zihao Cheng** and Robert E. Campbell, "Engineered peptides for phage display". Oral presentation for a symposium on *Bioorganic Chemistry* at the *91st CSC conference*, May 24–28, 2008, Edmonton, Alberta, Canada.
23. **Zihao Cheng** and Robert E. Campbell, "Engineered peptides for phage display". Oral presentation at the *2008 Volcano Bioorganic Conference*, Pack Forest Washington, Feb. 29-Mar. 2, 2008.
24. **Hui-wang Ai** and Robert E. Campbell. Oral presentation at the *Small Animal Whole-Body Optical Imaging Based on Genetically Engineered Probes* at *SPIE Photonics West 2008*, Jan. 19-24, 2008, San Jose.
25. **Haley Carlson** and Robert E. Campbell, "Engineering fluorescent proteins with novel chromophore structures". Oral presentation at the Western Canadian Undergraduate Chemistry Conference, Saskatoon, Saskatchewan, May 4-6, 2007
26. **Zihao Cheng** and Robert E. Campbell, "Versatile fluorescence-based characterization and selection of genetically encoded peptides that fold efficiently in live cells". Submitted oral presentation at the 2006 Chemistry Graduate Student Conference, Aug. 31, 2006, Edmonton,

Alberta.

27. **Hui-wang Ai** and Robert E. Campbell, "Improved Blue and Cyan Fluorescent Proteins with tyrosine-derived chromophores". Oral presentation at the *2006 Volcano Bioorganic Conference*, Pack Forest Washington, Feb. 25-26, 2006.

STUDENT POSTER PRESENTATIONS

(trainees in **bold**, presenter underlined)

1. **Landon Zarowny** and Robert E. Campbell, "Towards Integrating Calcium Sensors for In vivo Neuronal Activity Imaging", *Protein Engineering Canada Conference*, Ottawa, ON, June 20-22, 2014.
2. **Matthew Wiens** and Robert Campbell, "Tandem dimer fluorescent proteins", *Protein Engineering Canada Conference*, Ottawa, ON, June 20-22, 2014.
3. **Jhon Ralph Enterina** and Robert E. Campbell, "Screening of affinity engineered protein-protein interactions and its peptide inhibitors". 97th Canadian Chemistry Conference & Exhibition, Vancouver, B.C., June 5, 2014.
4. **Nazanin Assempour, Yongxin Zhao,** Toshiyuki Kowada, Kazuya Kikuchi, and Robert E. Campbell "Fluorescent Modulation Of Optical Based-biosensors By Chromophore Analogue Replacement". 97th Canadian Chemistry Conference & Exhibition, Vancouver, B.C., June 5, 2014.
5. **Tiffany Lai**, **Spencer C. Alford**, **Yidan Ding**, and Robert E. Campbell, "Engineering Dimerization Dependent Fluorescent Proteins for Multicolour Biosensing". 97th Canadian Chemistry Conference & Exhibition, Vancouver, B.C., June 5, 2014.
6. **Yan Li** and Robert E. Campbell. and Robert E. Campbell. Poster presentation at *Volcano Conference* March 1, 2014, Pack Forest, Washington.
7. **Yongxin Zhao** and Robert E. Campbell. Poster presentation at the *Biophysical Society 58th Annual meeting*. Feb 19, 2014.
8. **Yongxin Zhao** and Robert E. Campbell. Poster presentation at at *Campus Alberta Neuroscience Symposium* Sep. 2013.
9. **Yidan Ding** and Robert E. Campbell, "Color switch biosensors based on dimerization dependent fluorescent proteins". Poster presentation at at *Campus Alberta Neuroscience Symposium* Sep. 2013.
10. **Matthew Wiens** and Robert E. Campbell, "Development of a generalized genetically encoded method for RNA detection". Poster presentation at at *Campus Alberta Neuroscience Symposium* Sep. 2013.
11. **Jiahui Wu**, **Hang Zhou**, and Robert E. Campbell, "Development of a Red Fluorescent Probe for Glutamate Detection". Poster presentation at at *Campus Alberta Neuroscience Symposium* Sep. 2013.
12. **Jiahui Wu** and Robert E. Campbell. Poster presentation at the *Protein Society Meeting*, Boston, July 20-23.
13. **Ahmed Abdelfattah** and Robert E. Campbell. Poster presentation at the *Protein Society Meeting*, Boston, July 20-23.
14. Yongxin Zhao and **Robert E. Campbell**. Poster presentation at the *Protein Society Meeting*, Boston, July 20-23.
15. **Yongxin Zhao, Hiofan Hoi**, Robert E. Campbell and D. Jed Harrison, "Microfluidic cell sorter aided live cell screening for improved fluorescent proteins". Poster at *MicroTAS*, Okinawa, Japan, October 28 to November 1, 2012.

16. **Jiahui Wu** and Robert E. Campbell. "Development of a series of genetically encoded Ca^{2+} indicators for imaging of Ca^{2+} dynamics in vivo". Poster presentation at the *19th MPSA Conference*, Ottawa, Ontario, June 26-28, 2012.
17. **Yongxin Zhao**, **Hiofan Hoi,** D. Jed Harrison, and Robert E. Campbell. "A directed evolution strategy for improving genetically encoded fluorescent indicators of membrane potential". Poster presentation at the *19th MPSA Conference*, Ottawa, Ontario, June 26-28, 2012.
18. **Ritesh Saini** and Robert E. Campbell. "Development of single FP based biosensors based on repeated beta strand strategy". Poster presentation at the *2012 CSC Conference*, Calgary, May 26-30, 2012.
19. **Yidan Ding** and Robert E. Campbell. "Concurrent monitoring of multiple cell processes with fluorescent protein biosensors". Poster presentation at *2012 CSC Conference*, Calgary, May 26-30, 2012.
20. **Yi Shen** and Robert E. Campbell. "Filter paper blot screening method for fluorescent protein-based biosensor development". Poster presentation at *2012 CSC Conference*, Calgary, May 26-30, 2012.
21. **Yi Shen** and Robert E. Campbell. "Development of orange fluorescent protein-based pH sensors". Poster presentation at *ICASS/CCACC joint conference*, Toronto, Aug. 29-31, 2011.
22. **Hiofan Hoi** and Robert E. Campbell. "A photoconvertible fluorescent protein with multiple applications". Poster presentation at the *2011 CSC Conference,* Montreal, QC.
23. **Ritesh Saini** and Robert E. Campbell. "Development of single FP-based biosensors based on a repeated beta-strand strategy". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
24. **Yi Shen** and Robert E. Campbell. "Development of single orange fluorescent protein-based pH sensors". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
25. **Jiahui Wu** and Robert E. Campbell. "Development of a series of genetically encoded Ca^{2+} indicators for imaging of Ca^{2+} dynamics in vivo". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
26. **Spencer Alford** and Robert E. Campbell. "Development of a fluorogenic heterodimeric red fluorescent protein". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
27. **Ahmed Belal** and Robert E. Campbell. "Development and optimization of fluorescent protein FRET-based biosensors". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
28. 32. **Yidan Ding** and Robert E. Campbell. "Fluorescent protein based biosensors for multiparameter imaging". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
29. **Hiofan Hoi** and Robert E. Campbell. "Efforts to generate a monomeric yellow fluorescent protein with an unique chromophore structure". Poster presentation at *7th National Carbohydrate Symposium*, Banff, AB, May 5-7, 2011.
30. **Yongxin Zhao**, S. Araki, **Jiahui Wu**, D. J. Harrison, T. Nagai, R. E. Campbell. Poster presentation at *2011 Volcano Conference,* Pack Forest Washington, Feb. 25-27, 2011.
31. **Yongxin Zhao**, S. Araki, **Jiahui Wu**, D. J. Harrison, T. Nagai, R. E. Campbell. Poster presentation at *BMES-SPRBM Conference on Cellular and Molecular Bioengineering*, Miami, Jan. 5, 2011.
32. **Yidan Ding** and Robert E. Campbell. Poster presentation at the *CSC Conference*, Toronto,

May 29 - June 2, 2010.

33. 25. **Andreas Ibraheem** and Robert E. Campbell. Poster presentation at the *2010 Volcano Conference,* Pack Forest Washington, March 7, 2010.
34. **Hiofan Hoi**, Nathan C. Shaner, Rory Cochran, Jiwu Wang, Michael W. Davidson, and Robert E. Campbell, "Monomeric photoconvertible fluorescent protein variants produced by directed evolution with screening for brightness and efficient photoconversion". Poster presentation at the *American Society for Cell Biology meeting*, San Diego, Dec. 5-9, 2009.
35. **Haley Carlson**, **Sean Liew**, **Darrel Cotton** and Robert E. Campbell, "Circularly permuted variants of mCherry for use in single RFP biosensors". Poster presentation at the *Light in Life Sciences Conference*, Melbourne, Australia, Nov. 24-27, 2009.
36. **Andreas Ibraheem** and Robert E. Campbell, "A high-throughput screen for optimal linker combinations and domain arrangement in genetically encoded biosensors for posttranslational modifications". Poster presentation at *Fluorescent Proteins and Biological Sensors II*, Janelia Farm, Nov. 1-4, 2009.
37. **Haley Carlson** and Robert E. Campbell, "Progress towards novel biosensors based on circularly permuted fluorescent proteins". Poster presentation at the *2009 Volcano Bioorganic Conference*, Pack Forest Washington, Feb 27-Mar 1, 2009.
38. **Zhihua Yang** and Robert E. Campbell. Poster presentation at the *2008 Volcano Bioorganic Conference*, Pack Forest Washington, Feb. 29-Mar. 2, 2008.
39. **Hui-wang Ai** and Robert E. Campbell. Poster presentation at the Janelia Farm Research Campus conference on *Fluorescent Proteins & Biological Sensors*, Oct. 28-31, 2007, Howard Hughes Medical Institute, Ashburn, VA.
40. **Zihao Cheng** and Robert E. Campbell, "Assessing the structural stability of β-hairpin peptides in the cytoplasm of live cells". Poster presentation at the Canada-China Symposium on Analytical Chemistry for the Life Science, Edmonton, AB, Aug. 20-22, 2007.
41. **Hui-wang Ai** and Robert E. Campbell, "Filling the fluorescent protein toolbox: new colors for construction of orthogonal biosensors". Poster presentation at the *2007 Bioorganic Gordon Conference* held at Proctor Academy, Andover, New Hampshire, June 10-15, 2007.
42. **Hui-wang Ai** and Robert E. Campbell, "New genetically encoded fluorophores for multicolor live cell imaging". Submitted poster presentation by for the American Chemical Society, 233rd National Meeting & Exposition, March 25-29, 2007, Chicago, IL USA.
43. **Zihao Cheng** and Robert E. Campbell, "Assessing the structural stability of β-hairpin peptides in the cytoplasm of live cells". Poster presentation at the *2006 Bioorganic Gordon Conference* held at Magdalen College, Oxford, UK, July 30 - August 4, 2006.
44. **Zihao Cheng** and Robert E. Campbell, "Versatile fluorescence-based characterization of genetically encoded peptides that fold in live cells: progress towards a generic hairpin scaffold". Poster presentation at the *6th International Conference of the Canadian Proteomics Initiative*, Edmonton, Alberta, May 10-12, 2006.
45. **Monika Johar**, **Carine Lafaille** and Robert E. Campbell, "Design of a quenched fluorogenic substrate for a mutant beta-lactamase". Poster presentations at the *2006 Volcano Bioorganic Conference*, Pack Forest Washington, Feb. 25-26, 2006 and the *6th International Conference of the Canadian Proteomics Initiative*, Edmonton, Alberta, May 10-12, 2006.
46. **Yankun Li** and Robert E. Campbell, "Circular permutation of a monomeric red fluorescent protein". Poster presentations at the *2006 Volcano Bioorganic Conference*, Pack Forest Washington, Feb. 25-26, 2006 and the *6th International Conference of the Canadian Proteomics Initiative*, Edmonton, Alberta, May 10-12, 2006.

47. **Hui-wang Ai** and Robert E. Campbell, "Improved blue and cyan fluroscent proteins with tyrosine-derived chromophores". *Poster presentation at the 4th annual CIHR Institute of Genetics New Principal Investigators meeting*, Jackson's Point, Ontario, Nov 4-6, 2005. Also presented by **Hui-wang Ai** at the *6th International Conference of the Canadian Proteomics Initiative*, Edmonton, Alberta, May 10-12, 2006.
48. **Zihao Cheng** and Robert E. Campbell, "A minimal generic protein scaffold with a defined structure". Poster presentation at the *88th Canadian Society for Chemistry Conference*, Saskatoon, Saskatchewan, May 28 - June 1, 2005
49. **Hui-wang Ai** and Robert E. Campbell, "An improved cyan fluorescent protein with a tyrosine-derived chromophore". Poster presentation at the Banff Conference on Cellular Dynamics, the *48th CSBMCB Annual Meeting*, Banff, Alberta, March 16-20, 2005.

- **Postdoctoral research at the University of California, San Diego**
  Robert E. Campbell, Nathan C. Shaner, and Roger Y. Tsien, "Brighter and Wavelength Shifted Variants of the Monomeric Red Fluorescent Protein". Poster presentation at the *3rd Annual Alliance for Cellular Signaling Meeting* in Pasadena, California, May 18-21, 2003.
- **Graduate research at the University of British Columbia**
  Robert E. Campbell and Martin E. Tanner, "UDP-glucose Analogues as Mechanistic Probes of the Reaction Catalyzed by UDP-glucose Dehydrogenase". Poster presentation at the *81st Canadian Society for Chemistry Conference*, Whistler, British Columbia, 1998.
  Robert E. Campbell and Martin E. Tanner, "UDP-glucose Analogues as Mechanistic Probes of the Reaction Catalyzed by UDP-glucose Dehydrogenase". Poster presentation at the *7th International Conference on New Aspects of Organic Chemistry*, Kyoto, Japan, 1997.

RESEARCH GRANTS AND FELLOWSHIPS

- In progress: CFI grant with PI Jaideep Bains; CREATE grant with PI Yves De Koninck; Killam Research Fellowship.
- 09/2014-08/2017 NIH BRAIN initiative RFA-NS-14-008 (3 years, $171,720 total): "Development of Protein-based Voltage Probes". PI Vincent Pieribone, Yale. **Applied for**.
- 09/2014-08/2017 NIH BRAIN initiative RFA-NS-14-008 (3 years, $262,440 total): "Northern Lights collaboration for better 2-photon probes". PI Aleksander Rebane, Montana State University. **Applied for**.
- 07/2014-06/2017 Brain Canada Platform support grant (3 years, $1,500,000 total): "The Canadian Neurophotonics Platform: Molecular and photonics tools to unlock the mysteries of the normal and diseased brain". PI Yves De Koninck. **Applied for.**
- 02/2014-10/2014 "Pre-Commercialization Validation of a Patentable Technology for Assaying Protein-Protein Interactions in Live Cells", Alberta Glycomics Centre pre-commercialization development grant (8 months, $38,800).
- 07/2013-06/2015 Canadian Cancer Society Innovation Grant (2 years, $100,000/year; 30% to R.E.C. in year 1; 50% to Campbell in year 2): "Development and application of genetically-encoded photoacoustic biosensors for imaging of tumour biology". Principle Investigator Roger Zemp (Engineering).
- 09/2012-08/2017 CIHR Operating Grant (5 years, $712,000 total, $142,400/year, $442,590 to R.E.C., $88,518/year to R.E.C.): "Engineering biosensors for fluorescence imaging of neuronal signalling in whole animals". Co-applicants Alan Fine (Dalhousie) and Ed Ruthazer (McGill). Ranked 6th of 61 in Molecular & Cellular Neurosciences - B (NSB).
- 2012 NSERC Research Tools and Instruments ($52,330): "A second generation screening

system for fluorescence-guided protein engineering"

- 2010 Japan Society for the Promotion of Science Long Term Fellowship (~$30,000) to support a 6 month Sabbatical in the lab of Prof. Takeharu Nagai, Hokkaido University, Sapporo, Japan. Notified Jan. 2010; held from July through Dec. 2010.
- 04/2010-03/2015 NSERC Discovery grant (5 years, $375,000 total, $75,000/year): "Moulding fluorescent proteins into biotools: engineering topology, surfaces, and chromophores".
- 07/2009-06/2014 CRC Tier II Chair research supplement (5 years, $75,000 total, $15,000/ year) "Expanding the fluorescent protein toolkit: New colors and FRET pairs for functional imaging of live cells".
- 2008-2013 CIHR Catalyst Grant NHG-94487/99085 ($304,525 total, $208,923 to R.E.C): "New tools for real-time imaging of multiple signaling events in single cells: design, construction, and biological applications of genetically encoded biosensors". Co-applicants Jim Johnson (UBC) and Thomas Simmen (Cell Biology). Ranked 5th of 81.
- 2008 Petro-Canada Young Innovator Award ($20,000 for 1 year): "Protein Engineering applied to the development of an improved yellow fluorescent protein".
- 2008-2010 ACRI High Risk for High Return Grants ($478,700 total, $35,000/year to R.E.C.): "In Silico and In Vitro Screening for Small Molecule Inhibitors of Histone Lysine Methyltransferase Inhibitors". Dr. J. Tuszynski project leader.
- 2007-2010 NSERC Discovery Grant ($55,000/year): "New Agents for the Visualization of Biochemistry in Live Cells".
- 2007 NSERC Research Tools and Instruments Category 1 ($41,988): "A constant cell disuption system for the extraction of mammalian, bacterial and fungal proteins for structure-function relationship studies". Principal applicant Todd Lowary. Co-applicants Vederas, Bundle, and Cairo.
- 2006-2008 Alberta Ingenuity New Faculty Award Extension ($100,000/year for 1.5 years): "Synthesis and application of small-molecule probes for the study of protein localization and post-translational modification in live cells".
- 2006-2008 Alberta Cancer Board (ACB) Alberta Breast Cancer Research initiative (ABCRI) High Risk Innovation grant (53% of $453,500 to REC) with co-applicants Dr. M. Hendzel and Dr. G. Chan: "Development of versatile reagents for the diagnosis, prognosis and chemotherapy of breast cancer: molecular recognition modules that bind to trimethylated lysine 27 of histone H3 in living cells".
- 2006-2011 Canadian Foundation for Innovation Infrastructure Operating Fund ($33110 to support operation of equipment purchased with New Opportunities Fund): "Chemical Biology and protein engineering applied to the development of versatile fluorescence-based molecular tools for live cell imaging applications"
- 2004 Canadian Foundation for Innovation Canada Research Chairs Infrastructure Fund ($53,297 to cover 40% of the total project cost): "Basic Instrumentation for Biophotonic research: Upgrading a shared use fluorometer for time-resolved anisotropy and energy transfer measurement capabilities".
- 2004-2005 Alberta Ingenuity New Faculty Award ($55,000/year for 1.5 years): "Molecular Biophotonics: Fluorescent Labels and Biosensors for Visualizing Dynamic Biochemical Events in Living Cells".

- 2004-2007 NSERC Discovery Grant ($43,000/year for 3 years): "Molecular Biophotonics: Fluorescent Labels and Biosensors for Visualizing Dynamic Biochemical Events in Living Cells".
- 2004 NSERC Research Tools & Instruments - Category 1 ($70,636): "Basic instrumentation for chemical biology research: a liquid chromatography system for purification of proteins, peptides, and organic dyes".
- 2003 Canadian Foundation for Innovation New Opportunities Fund ($132,440 to cover 40% of the total project cost, $331099): “Chemical Biology and protein engineering applied to the development of versatile fluorescence-based molecular tools for live cell imaging applications”. Partner funds generously provided by the University of Alberta.
- Robert E. Campbell and Roger Y. Tsien “New Fluorescent Probes for Cell Biology”. A *CIHR Postdoctoral Fellowship* held from 2000-2003 at the University of California, San Diego.
- Robert E. Campbell and Roger Y. Tsien “New Fluorescent Probes for Cell Biology”. A *NSERC Postdoctoral Fellowship* that was awarded in 2000 but declined.
- Robert E. Campbell and Martin E. Tanner “Structure and Mechanism of UDP-glucose Dehydrogenase”. A *Walter C. Koerner Postgraduate Scholarship* held from 1998-1999 at the University of British Columbia (University Award).
- Robert E. Campbell and Martin E. Tanner “Structure and Mechanism of UDP-glucose Dehydrogenase”. A *NSERC Postgraduate Scholarship* held from 1996-1998 at the University of British Columbia.
- Robert E. Campbell and Martin E. Tanner “Structure and Mechanism of UDP-glucose Dehydrogenase”. A *Gladys Estella Laird Research Fellowship* held from 1996-1999 at the University of British Columbia (University Award).
- Robert E. Campbell and Martin E. Tanner “Structure and Mechanism of UDP-glucose Dehydrogenase”. A *University Graduate Fellowship* that was awarded in 1996 at the University of British Columbia but declined (University Award).

CONTRIBUTIONS TO THE TRAINING OF HIGHLY QUALIFIED PERSONNEL (HQP)

Current Graduate Students [6 Ph.D., 4 M.Sc.]

- **Landon Zarowny**, Ph.D. candidate in Chemical Biology
    - May 2013 - present
    - Supervisory committee: Vederas, Gibbs-Davis
- **Tiffany Yan Lai**, M.Sc. candidate in Chemical Biology
    - September 2012 - present
    - Supervisory committee: Buriak, Petersen
- **Jhon Ralph Enterina**, M.Sc. candidate in Chemical Biology
    - January 2012 (July 2012)-present
    - Supervisory committee: Cairo, Rivard
- **Matthew Wiens**, Ph.D. candidate in Chemical Biology
    - September 2011-present
    - 2014: 1st place poster prize at Protein Engineering Canada Conference
    - Queen Elizabeth II scholarship 2013
    - Queen Elizabeth II scholarship 2012
    - Supervisory committee: Gibbs-Davis, Serpe
- **Wei Zhang**, Ph.D. candidate in Chemical Biology

- September 2011-present
- Alberta Innovates Technology Futures (AITF) Scholarship 2012
- GSA Professional Development Award ($500) to attend the 2014 Volcano Conference in Chemical Biology
- Supervisory committee: Derda, McDermott

- **Nazanin Assempour**, M.Sc. candidate in Chemical Biology
  - September 2011-present
  - Feb.-Mar. 2014: 2 month research exchange visit with Prof. Kazuya Kikuchi at Osaka University through FrontierLab Mini program.
  - Supervisory committee: Cairo, Brown
- **Yan Li**, M.Sc. candidate in Chemical Biology
  - September 2011-present
  - GSA Professional Development Award ($500) to attend the 2014 Volcano Conference in Chemical Biology
  - Supervisory committee: Petersen, Le
- **Ahmed Abdelfattah**, Ph.D. candidate in Chemical Biology
  - January 2011-present
  - 2014 Education Travel Award from The Biophysical Society
  - "Best discussion" award at Campus Alberta Neuroscience Symposium Sep. 2013
  - Chemical Biology 502 Presentation award 2012/2013
  - President's Doctoral Prize of Distinction
  - Vanier Canada Graduate Scholarship (Vanier CGS) 2012-2015
  - Alberta Innovates Health Solutions (AIHS) Studentship
  - President's International Doctoral Award
  - Protein Science Young Investigator Travel Grant / Protein Society Finn Wold Travel Award (2013)
  - Supervisory committee: Lowary, Brown
- **Jiahui Wu**, Ph.D. candidate in Chemical Biology
  - September 2009-present
  - Best poster award at the 2014 *FASEB SRC on Calcium and Cell Function*
  - Supervisory committee: Li, Vederas
- **Yi Shen**, Ph.D. candidate in Chemical Biology
  - September 2009 to present
  - Honourable Mention Analytical Graduate Poster competition at 2012 CSC
  - Alberta Ingenuity Nanotechnology Scholarship 2009-2014
  - Supervisory committee: Klassen, Harynuk

Co-supervised Graduate Students [1 M.Sc.]

- **Negar Mokhtarihaj**, M.Sc. candidate in Chemical Biology
  - co-supervised with Prof. Dennis Hall,
  - September 2012 (July 2012)-present
  - Supervisory committee: West, Lowary

Former Graduate Students [8 Ph.D., 4 M.Sc.]

- **Yongxin Zhao**, Ph.D. candidate in Analytical Chemistry
  - co-supervised by Jed Harrison

- September 2009-April 25, 2014
- Title: Directed Evolution Approaches for Improved Genetically Encoded Fluorescent Calcium Ion and Voltage Indicators
- 2014 Faculty of Science Doctoral Dissertation Award
- 2014 Chinese Government Award for Outstanding Self-Financed Students Abroad
- 2014 Education Travel Award from The Biophysical Society
- 2013 Dissertation Fellowship
- 2013 Andrew Stewart Prize
- 2011 Lap-Chee Tsui publication award
- 2011 Robert Swindlehurst Graduate Book Prize in Chemistry
- 2009-2014 Alberta Ingenuity Nanotechnology Scholarship
- Best Poster Prize at Biomedical Engineering Society - Society for Physical Regulation in Biology, January 2010, Miami Beach
- Analytical 502 Presentation award for 2010/11
- GSA Professional Development Grant for travel to Janelia Farm conference
- Protein Science Young Investigator Travel Grant / Protein Society Finn Wold Travel Award (2013)
- Committee: Harrison (co-supervisor), Li, Petersen, Michael Lin

- **Yidan Ding**, Ph.D. in Chemical Biology
  - September 2008 to November 8, 2013
  - Title: Design and applications of fluorescent protein-based biosensors for live cell imaging
  - "Most amazing story/science" poster award at Campus Alberta Neuroscience Symposium Sep. 26-27, 2013
  - GSA Professional Development Grant
  - Committee: Loppnow, Lowary, Petersen, Jin Zhang
  - Current position: Gilead (Edmonton)
- **Ahmed Belal**, Ph.D. in Chemical Biology
  - January 2008 to August 16, 2013
  - Title: Development of new fluorescent protein biosensors
  - Committee: Klassen, Vederas, McDermott, D. Zechel
- **Haley Carlson,** Ph.D. in Chemical Biology
  - September 2007 to March 13, 2013
  - Title: Development of cpRFPs for use as Ca^{2+} biosensors
  - NSERC PGSM
  - Alberta Ingenuity Scholarship
  - Norman Jones Travel Award, LILS2009
  - Student Organizing Committee of ICASS 2010
  - Graduate Student Teaching Award 2009
  - Committee: Lucy, Lowary, Le, Lutz
  - Current position: Teaching at Grant MacEwan
- **Hiofan Hoi**, Ph.D. in Chemical Biology
  - January 2008 to December 19, 2012

- Title: Development of monomeric fluorescent proteins and fluorescent protein-based biosensors
- Committee: Li, Loppnow, Cairo, Simmonds, and Prescott
- Current position: Postdoc with Dr. Carlo Montemagno in ECERF/NINT

- **Ritesh Saini**, M.Sc. in Chemical Biology
  - September 2009 to September 21, 2012
  - Title: Generation of a fluorescent protein-derived biosensor based on alternate frame folding
  - Committee: Gibbs-Davis, Loppnow
  - Current position: Gilead (Edmonton)
- **Spencer Alford**, Ph.D. in Chemical Biology
  - September 2007 to August 17, 2012
  - Title: Development of fluorogenic fluorescent protein heterodimers
  - Committee: Harrison, Lowary, Gibbs-Davis, Glover, Pelletier
  - Faculty of Science Dissertation Award
  - NSERC CGSD3
  - Alberta Ingenuity Ph.D. Scholarship
  - CGS - Michael Smith Foreign Study Supplements (MSFSS) to support 3 months (Jan-Mar, 2010) of research in the lab of Wolf Frommer, Stanford University.
  - Queen Elizabeth II scholarship
  - Chemical Biology 502 Presentation award for 2008/09
  - Current position: Postdoc with Jennifer R. Cochran, Stanford
- **Andreas Ibraheem**, M.Sc. in Chemical Biology
  - January 2006 to Feb. 16, 2012
  - Title: Development and optimization of a high through-put screening methodology for rapid dynamic range improvement of FRET-based biosensors
  - Committee: Cairo, Hendzel
  - Graduate Student Teaching Award 2011.
  - Current position: Assistant Lecturer, Faculty of Pharmacy, Cairo University
- **Zihao Cheng**, Ph.D. in Chemical Biology
  - September 2003 to August 7, 2008
  - Title: Engineering of a minimal β-hairpin scaffold for molecular recognition applications
  - Committee: Scott, Li, Reha-Krantz, Klobukowski, Klassen
  - Awards: Best Oral presentation in Biological/Medicinal Division, CSC 2008; Graduate Student Teaching Award 2006.
  - Current position: Gilead (Edmonton)
- **Hui-wang Ai**, Ph.D. in Chemical Biology
  - September 2003 to April 30, 2008.
  - Title: New Fluorescent Proteins and Genetically Encoded Biosensors
  - Committee: Daugherty, Goping, Tykwinski, Vederas, Le
  - Awards: Andrew Stewart Memorial Prize for 2008; Norman Jones Travel Award, Bios2008
  - Postdoc with Professor Peter G. Schultz, Scripps
  - Current position: Assistant Professor at University of California, Riverside.

- **Carine Lafaille**, M.Sc. in Chemical Biology
    - September 2004 to August 23, 2007
    - Title: Design of New Live Cell Fluorescent Reporters
    - Committee: MacMillan, Hall, McDermott
    - Current position: K'(Prime) Technologies Inc.
- **Yankun Li**, M.Sc. in Analytical Chemistry
    - January 2004 to May 16, 2007.
    - Title: Making Ca^{2+} Sensors Based on cpmCherry
    - Committee: Li, Chan
    - Current position: Synta Pharmaceuticals, Lexington, MA

Postdoctoral fellows

- **Dr. Yongxin Zhao**
    - June 2014 -
- **Dr. Yidan Ding**
    - February 2014 - March 2014
    - Funded by the Alberta Glycomics Centre
- **Dr. Hiofan Hoi**
    - February 2013- April 2013
- **Dr. Cory Beshara**
    - August 2009 to August 2010, May-July 2011.
    - Current position: Assistant Professor at University of the Fraser Valley.
- **Dr. Hongkin Yap**
    - July 2006 to September 2007.
    - Current position: Research Associate in Hong Kong
- **Dr. Monika Johar**
    - Mar. 2005 to July 2006.
    - Current position: Radient Technologies

Undergraduates

- **Lance Wu**, Summer 2014
- **Andy Le,** NSERC USRA and AIHS studentship, Summer 2014
- **Fahim Rahman**, NSERC USRA and AIHS studentship, Summer 2014
- **Lidong Chen**, Chem 401 Winter 2014
- **Landon Zarowny**, Chem 401 Fall 2012, Chem 403 Winter 2013
    - Currently Ph.D. student in Campbell group
- **Joshua Rojas**, Chem 401 Fall 2012
- **Hang (Joho) Zhou,** undergraduate summer student, summer 2012, Chem 401 Winter 2013, Chem 402 Summer 2013, Fall 2013, Winter 2014, Summer 2014.
- **Trang Nguyen,** 4th year honors Fall 2011
    - Currently with Labs-Mart
- **Yang Liu,** 4th year honors Fall 2011
- **Max Buchko**, 4th year honors Fall/Winter 2009/2010 (Biochem 499)
    - Currently in medical school at the University of Alberta
- **Laura Johnston**, 2009/2010 Summer student, 4th year honors Fall 2009, Winter 2010
- **Sean Liew**, 2009 NSERC USRA

- Currently Ph.D. student in Chemistry (University of Toronto)

- **Rachael Da Cunha**, 2008 NSERC USRA
  - Currently MD resident at Calgary
- **Hernan Martinez**, 4th year honors project Fall 2007.
- **Darrel W. Cotton**, 4th year honors project Fall 2007, Winter 2008, 2008 NSERC USRA.
  - Award for best talk in area of Biochemistry at the 2008 WCUCC
  - Internal Medicine resident at University of Calgary
- **Haley Carlson**, 4th year honors project 2006/2007 and NSERC USRA Summer 2007.
  - Continued on for Ph.D. in Campbell group
- **Karen Ridgway**, 4th year honors project Fall 2006.
  - Family doctor in Peace River
- **Peter Wong**, NSERC USRA recipient Summer 2006, 2007.
  - Residency in internal medicine (Toronto)
- **Anu Parhar**, NSERC Undergraduate Student Research Award recipient, Summer 2004.
  - Currently resident in respirology at University of Alberta Hospital
- **Wallis Rudnick**, NSERC USRA recipient, Summer 2004 and 2005.
  - Currently Ph.D. student with Allison McGeer at Mount Sinai (Microbiology).

Research assistants

- **Aillette Sierra Mulet**, research technician, July 2006 to September 2007.

Other contributions to training of HQP

- Supported **Ahmed Abdelfattah** to attend Neurophotonics summer course, Laval, 2013
- Supervised visiting graduate student **Benjamien Moeyaert**, University of Leuven, Belgium, September 2011.
- I was a mentor and research supervisor for a team of **3 high-school students** who participated in the 2006 Sanofi-Aventis Biotech Challenge. The participation of these students is mentioned in the Acknowledgement our 2007 *Biochemistry* paper.
- I supported **Hui-wang Ai** to attend the *11th International 3D Microscopy of Living Cells course*, June 9-26 2006, Vancouver, British Columbia, and **Andreas Ibraheem** and **Hiofan Hoi** to attend the 14th annual course, June 13-29 2009.
- I supported **Zihao Cheng** to attend *the 2006 Cold Spring Harbor course on Phage Display of Proteins & Peptides*, November 7–20. Cold Spring Harbor, NY.
- **Peter Wong** and **Wallis Rudnick** attended the 2006 WCUCC, May 4-6, Edmonton. **Haley Carlson** attended the 2007 WCUCC, May 4-6, Saskatoon. **Darrel Cotton** attended the 2008 WCUCC, May 1-3, Winnipeg.

SUPERVISORY COMMITTEES

Brown: Mohammad Salem
Buriak: Christopher Fetterly
Cairo: Neha Khanna; Daniel Hernandez
Derda: Reza Jafari
Fenniri: Kumakshi Sharma; Liang Shuai
Gibbs-Davis: Abu Kausar; Safeenaz Alladin Mustan
Harrison: Hamid Ramezani; Yufeng Zhao
Klassen: Ling Han; Sanaz Nikjah; Yuyu Yao
Klobukowski: Ahmed Ayoub

Le: Rebecca Paliwoda
Li: Zhendong Li; Lara Ebert
Lowary: Parnian Lak; Ryan Snitynsky; Amira Khalil
Lucy: Mahmoud Bahnasy
McDermott: Ahmed Yousef Mahmoud, Sunil Rajput
Roy: Yalina Tritzant
Serpe: Xue Li
Stryker: Dominique Hebert
Vederas: Amy Norquay; Christopher Lohans; Rachel Cochrane; Jeella Acedo
West: Shorena Gelozia
Total: 31

EXAMINATION COMMITTEES

Ph.D. Thesis defense (external)

1. C.B. Don Paul, supervisor Dr. Mark Prescott (Department of Biochemistry and Molecular Biology, Monash University, Victoria, Australia), July, 2014.
2. X. Chen, supervisor Dr. K. Truong (Department of Electrical and Computer Engineering, University of Toronto), September 23, 2013
3. A. Ménard, supervisor Dr. Karine Auclair (Chemistry, McGill University), Fall 2012
4. H. Shahravan, supervisor Dr. J. Shin (Chemistry, University of Toronto), December 3, 2010.
5. S. A. Morgan, supervisor Dr. A. Wooley (Chemistry, University of Toronto), April 13, 2010.
6. S. Nagaraj, supervisor Dr. K. Truong (Department of Electrical and Computer Engineering, University of Toronto), January 28, 2010.

Ph.D. Thesis defense (Alberta)

1. M. Bahnasy, supervisor Dr. C. Lucy (Chemistry), April 22, 2014.
2. R. Zhou, supervisor Dr. L. Li (Chemistry), Jan. 27, 2014.
3. K. Pandya, supervisor Dr. J. Vederas (Chemistry), December 2, 2013.
4. S. Wong, supervisors Drs. A. Brown and P.N. Roy (Chemistry), September 23, 2013.
5. M.F. Wahab, supervisor Dr. C. Lucy (Chemistry), September 18, 2013
6. A. Alsbaiee, supervisor Dr. H. Fenniri (Chemistry), September 13, 2013
7. Z. Gao, supervisor Dr. J. Vederas (Chemistry), August 12, 2013.
8. J. Diaz, supervisor Dr. J. Gibbs-Davis (Chemistry), May 22, 2013.
9. J. Bailey, supervisor Dr. D. Bundle (Chemistry), March 27, 2013.
10. A. El-Yazbi, supervisor Dr. G. Loppnow (Chemistry), March 8, 2013.
11. Y.-K. Wu, supervisor Dr. F. West (Chemistry), Feb. 4, 2013
12. F. Li, supervisor Dr. X.C. Le (Chemistry), Feb. 1, 2013
13. R. Soudy, supervisor Dr. K. Kaur (Pharmacy), Dec. 3, 2012.
14. M. Poulin, supervisor Dr. T. Lowary (Chemistry), Sept. 10, 2012
15. M. Xu, supervisor Dr. L. Li (Chemistry), July 31, 2012.
16. C. Fan, supervisor Dr. J.C. Vederas (Chemistry), May 22, 2012
17. H. El-Saidi, supervisor Dr. T. Lowary (Chemistry), January 16, 2012.
18. C. Sit, supervisor Dr. J.C. Vederas (Chemistry), August 8, 2011.
19. L. Liu, supervisor Dr. J. Klassen (Chemistry), July 19, 2011.

20. L. Voss, supervisor Dr. G. Chan (Experimental Oncology), April 8, 2011.
21. A. Goulko, supervisor Dr. X.C. Le (Chemistry), March 29, 2011.
22. M. Ross, sup. Dr. C. Wong (Chemistry) and Dr. J. Martin (Lab. Med. Path.), March 3, 2011.
23. J. Li, supervisor Dr. J. Vederas (Chemistry), January 17, 2011.
24. A. McKnight-Whitford, supervisor Dr. X.C. Le (Chemistry), April 12, 2010.
25. V. Incani (Pharmacy and Pharmaceutical Sciences), supervisor Dr Hasan Uludag (Department of Chemical and Materials Engineering), October 28, 2010.
26. D. Gulcev, supervisor Dr. C. Lucy (Chemistry), March 26, 2010.
27. V. Miyyapuram, supervisor Dr. J Vederas (Chemistry), September 14, 2009.
28. T. Tam, supervisor Dr. T. Lowary (Chemistry), September 8, 2009.
29. C. Grant, supervisor Dr. M. McDermott (Chemistry), April 23, 2009.
30. M. Pham, supervisor Dr. D. Clive (Chemistry), March 2, 2009.
31. D. Hou, supervisor Dr. T. Lowary (Chemistry), February 2, 2009.
32. R. Johnson, supervisor Dr. H. Fenniri (Chemistry), November 18, 2008.
33. S. Jacques, supervisor Dr. D. Bundle (Chemistry), September 30, 2008.
34. N. Wang, supervisor Dr. L. Li (Chemistry), September 2, 2008.
35. N. Warner, supervisor Dr. C. Wong (Chemistry), Jan. 8, 2008
36. G. Shoemaker, supervisor Dr. J. Klassen and Dr. M. Palcic (Chemistry), February 20, 2007.
37. X. Wan, supervisor Dr. G. Lin (Computing Science), July 17, 2006.
38. M. Dowlut, supervisor Dr. D. Hall (Chemistry), May 24, 2006.
39. D. Burr, supervisor Dr. J. Vederas (Chemistry), April 28, 2006.
40. M. Lu, supervisor Dr. X. C. Le (Public Health Science/Chemistry), Nov. 29, 2005.
41. C. Ji, supervisor Dr. L. Li (Chemistry), Oct. 24, 2005.
42. M. Yu, supervisor Dr. D. Clive (Chemistry), Oct. 14, 2005.
43. X. Gao, supervisor Dr. D. Hall (Chemistry), Oct. 06, 2005.
44. T. Moraes, supervisor Dr. Mark Ellison (Biochemistry), Sept. 23, 2004.
45. N. Zhang, supervisor Dr. L. Li (Chemistry), Sep. 22, 2003.

M.Sc. Thesis defense

1. R. Snitynsky, supervisor Dr. T. Lowary (Chemistry), April 1, 2014
2. U. Ho, supervisor Dr. H. Fenniri (Chemistry), September 16, 2013
3. I. Heppner, supervisor Dr. M. Serpe (Chemistry), May 24, 2013
4. I. Hosamani, supervisors Dr. G. Chan and Dr. J. Tuszynski (Oncology), April 16, 2013
5. X. Li, supervisor Dr. X.C. Le (Chemistry), Jan. 29, 2013
6. J. Toman, supervisor Dr. M. McDermott (Chemistry), Jan. 22, 2013
7. Z. Shire, supervisor Dr. G. Loppnow (Chemistry), March 15, 2012.
8. N.G. Ebesoh, supervisor Dr. C. Cairo (Chemistry), March 31, 2011.
9. R. Heit, supervisor Dr. M. Hendzel (Oncology), August 5, 2008.
10. A. Smith, supervisor Dr. M. McDermott (Chemistry), August 29, 2008.
11. L. Silkin, supervisor Dr. J. Vederas (Chemistry), September 1, 2006.
12. L. Lau, supervisors Dr. L. Li and Dr. M. Palcic (Chemistry), August 10, 2006.
13. K. Lynch, supervisor Dr. A. MacMillan (Biochemistry), April 12, 2006.
14. M.J. Lewis, supervisor Dr. L. Spyracopoulos (Biochemistry), Mar. 9, 2006.
15. M. Gebre, supervisor Dr. L. Li (Chemistry), Sept. 27th, 2005.

Ph.D. Candidacy exams

1. M. Salem, supervisor Dr. A. Brown (Chemistry), May 29, 2014.
2. N. Shaabani, supervisor Dr. D. J. Harrison (Chemistry), April 14, 2014.
3. A. Darlington, supervisor Dr. J. Gibbs-Davis (Chemistry), Mar. 25, 2014.
4. L. Hadidi, supervisor Dr. J. Veinot (Chemistry), Mar. 12, 2014
5. A. Forbrich, supervisor Dr. R. Zemp (Electrical and Computer Engineering), Jan. 29, 2014
6. Z. Li, supervisor Dr. L. Li (Chemistry), November 27, 2013.
7. J. Thuss, supervisor Dr. J.C. Vederas (Chemistry), November 21, 2013.
8. J. Bau, supervisor Dr. J. Buriak (Chemistry), November 5, 2013.
9. L. Han, supervisor Dr. J. Klassen (Chemistry), September 3, 2013.
10. R. Cochrane, supervisor Dr. J. Vederas (Chemistry), August 9, 2013.
11. D. Wu, supervisor Dr. C. Lucy (Chemistry), July 25, 2013
12. A.T. Ayoub, supervisors Dr. M. Klobukowski (Chemistry) and Dr. J. Tuszynski (Oncology), June 27, 2013.
13. L. Shuai, supervisor Dr. H. Fenniri (Chemistry), June 3, 2013.
14. C. D. Hodge, supervisor Dr. M. Glover (Biochemistry), April 3, 2013.
15. R. Jafari, supervisor Dr. R. Derda (Chemistry), March 25, 2013.
16. M. Wang, supervisor Dr. N. Petersen (Chemistry), January 29, 2013
17. Y. Wu, supervisor Dr. L. Li (Chemistry), November 16, 2012.
18. C. Lohans, supervisor Dr. J.C. Vederas (Chemistry), October 10, 2012.
19. P. Lak, supervisor Dr. T. Lowary (Chemistry), October 9, 2012
20. R. Zhou, supervisor Dr. L. Li (Chemistry), June 1, 2012.
21. A. Kausar, supervisor Dr. J. Gibbs-Davis (Chemistry), May 1, 2012.
22. H. Sheng, supervisor Dr. D.J. Harrison (Chemistry), April 10, 2012.
23. H. Ramezani, supervisor Dr. D.J. Harrison (Chemistry), February 29, 2012.
24. A. Alsbaiee, supervisor Dr. H. Fenniri (Chemistry), February 28, 2012.
25. M. Bahnasy, supervisor Dr. C. Lucy (Chemistry), December 5, 2011.
26. S. Elbayomy, supervisor Dr. M. McDermott (Chemistry), December 2, 2011.
27. J. Diaz, supervisor Dr. J. Gibbs-Davis (Chemistry), October 12, 2011.
28. Z. Gao, supervisor Dr. J.C. Vederas (Chemistry), October 11, 2011.
29. A. El-Yazbi, supervisor Dr. G. Loppnow (Chemistry), July 5, 2011.
30. R. Soudy, supervisor Dr. K. Kaur (Pharmacy), June 17, 2011.
31. A. Khalil, supervisor Dr. T. Lowary (Chemistry), May 19, 2011.
32. M. Farooq Wahab, supervisor Dr. C. Lucy (Chemistry), May 10, 2011.
33. D. Hebert, supervisor Dr. J. Stryker (Chemistry), Feb. 28, 2011.
34. B.J. Medos, co-supervised by Dr. R. Tykwinski and Dr. T. Lowary (Chemistry), April 8, 2010.
35. M. Poulin, supervisor Dr. T. Lowary (Chemistry), February 2, 2010.
36. C. Sadek, supervisor Dr. C. Cairo (Chemistry), January 28, 2010.
37. L. Liu, supervisor Dr. J. Klassen (Chemistry), November 18, 2009.
38. C. Sit, supervisor Dr. J. Vederas (Chemistry), October 7, 2009.
39. M. Xu, supervisor Dr. L. Li (Chemistry), July 8, 2009.
40. V. Incani, supervisor Dr. H. Uludag (Chem. and Mat. Eng. and Pharmacy), June 30, 2009.
41. J. Bailey, supervisor Dr. D. Bundle (Chemistry), May 5, 2009.

42. H. Liu, supervisor Dr. J. Vederas (Chemistry), April 15, 2009.
43. S. Wong, supervisor Dr. A. Brown (Chemistry), April 1, 2009.
44. Y. Tritzant-Martinez, supervisor Dr. A. Brown (Chemistry), March 31, 2009.
45. C. Markin, supervisor Dr. L. Spyracopoulos (Biochemistry), February 25, 2009.
46. R. Al-Zoubi, supervisor Dr. D. Hall (Chemistry), May 16, 2008.
47. M. Ross, supervisor Dr. C. Wong (Chemistry), Mar. 14, 2008.
48. L. Vos, supervisor Dr. G. Chan (Oncology and Cross Cancer Institute), March 04, 2004.
49. M. Pham, supervisor Dr. D. Clive (Chemistry), Jan. 16, 2008.
50. H. Yan, supervisor Dr. X. C. Le (Chemistry), Jan. 15, 2008.
51. V. Miyyapuram, supervisor Dr. J. Vederas (Chemistry), Nov. 26, 2007.
52. A. McKnight-Whitford, supervisor Dr. X. C. Le (Chemistry), Nov. 8, 2007.
53. D. Gulcev, supervisor Dr. C. Lucy (Chemistry), Aug. 10, 2007.
54. D. Johnson, supervisor Dr. J. Casey (Physiology), June 22, 2007.
55. P.H. Tam, supervisor Dr. T. Lowary (Chemistry), April 2, 2007.
56. J. Wasylycia, supervisor Dr. J. Harrison (Chemistry), Mar. 22, 2006.
57. G. Completo, supervisor Dr. T. Lowary (Chemistry), Mar. 20, 2006.
58. S. Jacques, supervisor Dr. D. Bundle (Chemistry), November 29, 2006.
59. D. Hou, supervisor Dr. T. Lowary (Chemistry), August 30, 2006.
60. M. Lee, supervisor Dr. M. Glover (Biochemistry), May 19, 2006.
61. J. Hu, supervisor Dr. M. J. Ellison (Biochemistry), Dec. 14, 2005.
62. A. Goulko, supervisor Dr. X. C. Le (Public Health Science/Chemistry), Oct. 7, 2005.
63. C. Grant, supervisor Dr. M. McDermott (Chemistry), Aug. 18, 2005.
64. N. Warner, supervisor Dr. C. Wong (Chemistry), July 4, 2005.
65. X. Wan, supervisor Dr. G. Lin (Computing Science), June 9, 2005.
66. C. Ji, supervisor Dr. L. Li (Chemistry), Dec. 15th, 2004.
67. M. Lu, supervisor Dr. X.C. Le (Chemistry), July 08, 2004.
68. J. Cote, supervisor Dr. J. Vederas (Chemistry), Jan. 23, 2004.
69. J. P. Butt, supervisor Dr. M. Glover (Biochemistry), Jan. 14, 2004.
70. G. Shoemaker, supervisor Dr. M. Palcic (Chemistry), Nov. 27, 2003.
71. C. McDonald, supervisor Dr. L. Li (Chemistry), Nov. 26, 2003.
72. M. Dowlut, co-supervised by Dr. D. Hall and Dr. O. Hindsgaul (Chemistry), Oct. 07, 2003.

TEACHING AND PUBLIC PRESENTATIONS

University of Alberta Teaching

- 2004-2014: Chem 419/511/519, Bioanalytical Chemistry. Instituted an independent proposal writing and peer review assignment since 2010.
- 2007-2010, 2012-2014: Chem 298, Introduction to Spectroscopy ('Organic' half). Responsible for course and lab development.
- 2011-2014: Guest lectures on fluorescence imaging for *Microscopy for Cell & Developmental Biology workshop,* University of Alberta, July 5, 2011; June 12, 2012; July 12, 2013, July 7, 2014.
- 2008-2009: Biochem 481 (with Ridgeway, Ellison, and Deyholas), Fall 2008, 2009
- 2009: Guest lecture for Chem 489, Feb. 26, 2009.
- 2007: Guest lectures for Chem 299, January 29, 2007.

- 2004, 2006: Chem 161/261, Organic Chemistry I.

External University-level Teaching

- 2009, 2011, 2013, 2014: Invited lectures for *Frontiers in Neurophotonics* Summer School, Laval, June.
- 2003: Two invited lectures presented at the *8th Annual Course on 3D Microscopy of Living Cells*, University of British Columbia, Vancouver, June 14-26.
- 2002: Four guest lectures for the course *BIBC103 Biochemistry Techniques* at the University of California, San Diego.

High School and other Public Presentations

- 2013: Presentation to the public for Edmonton Nerd Nite, "Glowing animals: a neuroscience toolkit at the end of the rainbow", Haven Social Club, May 23, 2013
- 2008: Contributed reagents and consultation for University of Alberta Heritage Science Teachers' Workshop, August 5-7, 2008
- 2005: Research presentation for I.B. students from Harry Ainlay high school, May 3.

CONFERENCE AND EVENT ORGANIZATION

- 2015: Co-organizer (with Takanari Inoue, Jin-Der Wen and Chiafu Chou) of a 2015 *Biophysical Society Thematic Meeting* entitled New Biological Frontiers Illuminated by Molecular Sensors and Actuators, in Taiwan, June 28-July 1, 2015
- 2014: Co-organizer (with Andrew Woolley) of a symposium for the 97th Canadian Chemistry Conference and Exhibition, Vancouver, BC, June 1-5.
- 2014: Plenary symposium chair (Optogenetic tools) at the *Canadian Association for Neuroscience* (CAN) meeting, Montreal May 25-28.
- 2013: Member of the organizing committee for the *Campus Alberta Neuroscience Symposium*, University of Calgary, September 26-27,
- 2011: Co-organizer (with Gonzalo Cosa) of a symposium for the 94th Canadian Society for Chemistry Conference, Montreal: *Advances in Spectroscopy and Imaging for Biological Systems* (4 sessions), June 5-9.
- 2009: Co-chair for Bios 2009 (BO210) "Fluorescence in vivo imaging based on genetically engineered probes: from living cells up to small animal whole body imaging", San Jose, CA, January 24-29.
- 2008: Co-representative (with Todd Lowary) of the Medicinal/Biological Division for the 91st Canadian Society for Chemistry Conference, Shaw Convention Center, May 24-28.
- 2008: Conference Chair (together with Chair A. P. Savitsky, Co-chair J. Zhang, and Co-chair R. M. Hoffman) for Bios 2008 (BO133) "Small Animal Whole-Body Optical Imaging Based on Genetically Engineered Probes" (part of SPIE Photonics West) San Jose Convention Center, San Jose, CA, Jan. 19-24.
- 2006: Faculty organizer for the 2006 Western Canadian Undergraduate Chemistry Conference (WCUCC), Edmonton, Alberta, May 4-6.
- 2005: Co-organizer (with David Cramb, Kathleen M. Gough, and Tanya Dahms) of a symposium at the 88th Canadian Chemistry Conference: *Frontiers in Biophysical and Bioanalytical Chemistry*, Saskatoon, SK, May 28-June 1.

REVIEWING AND EDITORIAL ACTIVITIES

Editorial

- 2011-present: Associate Editor for BMC Biotechnology
- 2010: Guest Editor (with Chris Chang) for *Current Opinion in Chemical Biology* special section on Molecular Imaging, 2010, volume 14, issue 1, February 2010.

External Reviewing

- 2013-2014: Member of the Canadian Institutes of Health Research (CIHR) "Fellowships - Post-PhD" review committee.
- 2011: Invited judge for the Olympus BioScapes Digital Imaging Competition, October 5, Tallahassee, Florida.
- 2011: Book proposal review for John Wiley and Sons.
- Reviewer for many journals including but not limited to: *ACS Chemical Biology, Analytical Biochemistry, Analytical Chemistry, Biochemistry, BMC Biology, BMC Biotechnology, CFI, ChemBioChem, Chemistry & Biology, Journal of Biological Chemistry, Journal of the American Chemical Society, Journal of Molecular Biology, Journal of Visual Experiments, Nature Biotechnology, Nature Communications, Nature Methods, NSERC, NSF, Organic Letters, Photochemistry and Photobiology.*

Internal Reviewing

- 2013: Faculty of Science Martha Cook Piper Prize Committee, May 2013.
- 2012: Invited judge for Pharmacology Graduate Student Research Day, June 14, 2012.

MEMBERSHIPS

External Committees

- 2014-present: Faculty of Science Awards Committee
- 2011-present: Lemieux Biotechnology Lecture Selection Committee (Faculty of Science).
- 2008-2009: Co-chair (with Todd Lowary) of the Biological and Medicinal Division of the Canadian Society for Chemistry.

Departmental Committees

- 2014-present: Chair of Chemical Biology division
- 2013-present: Chair of Graduate Admissions committee,
- 2007-present: Chemical Biology Representative on the 502 student seminar committee
- 2006-present: Member of the Spectral Services committee.
- 2011-2013: Member of TA Assignment committee.
- 2007-2013: Member of Graduate Admissions committee.
- 2007-2010: Member of Graduate Advisory committee.
- 2009: Chair of Chemical Biology Faculty hiring committee.
- 2006-2007: Member of the Graduate Student Curriculum committee.
- 2003-2005: Cameron library book selection advisor in the area of Biochemistry.
- 2003-2008: Organic Division Secretary.
- 2003-2006: Faculty Liaison for the Undergraduate Chemistry Student Association. Coordinated the Departmental contingent that attended the 2004 (Winnipeg), 2005 (Victoria), and 2006 (Edmonton) Western Canada Undergraduate Chemistry Conference (WCUCC). In 2005 I accompanied undergraduates to Victoria and participated in recruitment fair.

Professional Societies

- Canadian Society for Chemistry (since 1997)
- The American Chemical Society (since 2002)

IN THE MEDIA

Broadcast Interviews and Podcasts

- 2012: Featured participant in a discussion for *Nature Methods* Webinar "Fluorescent Proteins and Sensors Webinar – Questions & Answers" (http://blogs.nature.com/methagora/2012/12/fluorescent_proteins_and_sensors.html), December 17.
- 2012: Interviewed for December *ACS Synthetic Biology* Podcast (http://pubs.acs.org/page/asbcd6/audio/index.html)
- 2009: Feature interview for the August *Analytical Chemistry* podcast.

Text Interviews, Quotes, and Highlights

- 2013: Interviewed for a *Nature News* article (http://www.nature.com/news/first-fluorescent-protein-identified-in-a-vertebrate-1.13190), June 13.
- 2013: New GECOs highlighted on the *openoptogenetics wiki* (http://openoptogeneticsblog.org/?p=600), May 11, 2013.
- 2013: Highlightable GECO highlighted on the *openoptogenetics wiki* (http://openoptogeneticsblog.org/?p=429), January 10, 2013.
- 2011: Development of GECO series featured in the November 2011 issue of *Biophotonics* (http://photonics.com/Article.aspx?AID=49151), C&EN Science Concentrates (C&EN, 89 (37), Sept. 12, 2011), and numerous other venues.
- 2011: Interviewed for a *Nature* Technology feature on Microscopy (http://www.nature.com/nature/journal/v478/n7367/full/478137a.html?WT.ec_id=NATURE-20111006), October 6, 2011.
- 2008: News story on dual FRET pair development featured on cover of October issue of *Biophotonics* (http://photonics.com/Article.aspx?AID=35356).
- 2008: Research highlighted on the Alberta Cancer Board website.
- 2007: Research highlighted in TEC Edmonton Annual Report 2007, p. 20.
- 2007: News story on EBFP2 development featured on the cover of June issue of *Biophotonics* (http://photonics.com/Article.aspx?AID=38771).
- 2007: News stories on mTFP0.7 structure featured in June issue of Biophotonics (http://photonics.com/Article.aspx?AID=38748) and April 2007 Science Daily online.

CONSULTING

- 2013-present: Scientific consultant for Tempo Bioscience.

OTHER WORKSHOPS, MEETINGS, AND COURSES

- 2007: Participant in 2007 W.E. Harris Teaching Workshop: Teaching of Organic Chemistry, Edmonton, May 17-18.
- 2004: University of Alberta Biohazard Training and Certification, June 21-25.
- 2003: 86th Annual Canadian Society of Chemistry (CSC) Conference in Ottawa, Ontario, Aug. 10-15.
- 2001: Rapid Data Collection and Structure Solving at the NSLS: A Practical Course in Macromolecular X-Ray Diffraction Measurement. Brookhaven National Laboratory, April 22-27.
- 1996: Instructional Skills Workshop (3 days) provided by the Centre for Teaching and Academic Growth, University of British Columbia.