Nathan C. Shaner

Curriculum vitae

EDUCATION

2006 Ph.D. Biomedical Sciences, University of California, San Diego, La Jolla, CA
Advisor: Roger Y. Tsien

1999 B.A. Physics, with highest honors, Oberlin College, Oberlin, OH

POSITIONS AND EMPLOYMENT

2025 - present Manager, UC San Diego Biosensor Core, La Jolla, CA

2025 - present Associate Adj. Professor, Pharmacology, UC San Diego, La Jolla, CA

2019 - present Associate Adj. Professor, Neurosciences, UC San Diego, La Jolla, CA

2018 - 2019 Academic Program Management Officer, UC San Diego, La Jolla, CA

2016 - 2019 Associate Professor, Scintillon Institute

2012 - 2016 Assistant Professor, Scintillon Institute

2008 - 2012 Postdoc, Monterey Bay Aquarium Research Institute, Moss Landing, CA
Advisor: Steven Haddock

2006 - 2008 Postdoc, Salk Institute for Biological Studies, La Jolla, CA
Advisors: Joanne Chory and Joseph Noel

2006 - present Consultant, Director of Translational Research
Allele Biotechnology & Pharmaceuticals, Inc.

FELLOWSHIPS, AWARDS, AND HONORS

2007 - 2010 Helen Hay Whitney Postdoctoral Fellowship

2007 -2008 Salk Institute Innovation Grant
(with Joanne Chory and Joseph Noel)

2003 - 2006 Howard Hughes Medical Institute Predoctoral Fellowship

2003 National Science Foundation Graduate Research Fellowship

PUBLICATIONS

Peer-reviewed:

Lee J., Lai S., Yang S., Zhao S., Blanco F.A., Lyons A.C., Merino-Urteaga R., Ahrens J.F., Nguyen N.A., Liu H., Liu Z., Lambert G.G., **Shaner N.C.**, Chen L., Tolias K.F., Zhang J., Ha T., & St-Pierre F. Bright and photostable yellow fluorescent proteins for extended imaging. Nat Commun. 2025 Apr 4;16(1):3241.

Celinskis D., Black C.J., Murphy J., Barrios-Anderson A., Friedman N.G., **Shaner N.C.**, Saab C.Y., Gomez-Ramirez M., Borton D.A., Moore C.I. Toward a brighter constellation: multiorgan neuroimaging of neural and vascular dynamics in the spinal cord and brain. *Neurophotonics*. 2024 Apr;11(2):024209.

Slaviero A.N., Gorantla N., Simkins J., Crespo E.L., Ikefuama E.C., Tree M.O., Prakash M., Björefeldt A., Barnett L.M., Lambert G.G., Lipscombe D., Moore C.I., **Shaner N.C.**, Hochgeschwender U. Engineering luminopsins with improved coupling efficiencies. *Neurophotonics*. 2024 Apr;11(2):024208.

Björefeldt A., Murphy J., Crespo E.L., Lambert G.G., Prakash M., Ikefuama E.C., Friedman N., Brown T.M., Lipscombe D., Moore C.I., Hochgeschwender U., & **Shaner N.C.** Efficient opto- and chemogenetic control in a single molecule driven by FRET-modified bioluminescence. *Neurophotonics*. 2024 Apr;11(2):021005.

Petersen E.D., Lapan A.P., Castellanos Franco E.A., Fillion A.J., Crespo E.L., Lambert G.G., Grady C.J., Zanca A.T., Orcutt R., Hochgeschwender U., **Shaner N.C.** & Gilad A.A. (2023) Bioluminescent Genetically Encoded Glutamate Indicators for Molecular Imaging of Neuronal Activity. *ACS Synth Biol.* Jul 14.

Prakash M., Murphy J., St Laurent R., Friedman N., Crespo E.L., Bjorefeldt A., Pal A., Bhagat Y., Kauer J.A., **Shaner N.C.**, Lipscombe D., Moore C.I., Hochgeschwender U. (2022) Selective control of synaptically-connected circuit elements by all-optical synapses. *Commun Biol.* Jan 11;5(1):33.

Parashar S., Chidambaram R., Chen S., Liem C.R., Griffis E., Lambert G.G., **Shaner N.C.**, Wortham M., Hay J.C. & Ferro-Novick S. (2021) Endoplasmic reticulum tubules limit the size of misfolded protein condensates. *Elife.* Sep 1;10:e71642.

Crespo E.L., Prakash M., Bjorefeldt A., Medendorp W.E., **Shaner N.C.**, Lipscombe D., Moore C.I. & Hochgeschwender U. (2021) Bioluminescent optogenetic (BL-OG) activation of neurons during mouse postnatal brain development. *STAR Protoc*. Jul 7;2(3):100667.

Drobizhev M., Molina R.S., Callis P.R., Scott J.N., Lambert G.G., Salih A., **Shaner N.C.**,& Hughes T.E. (2021) Local Electric Field Controls Fluorescence Quantum Yield of Red and Far-Red Fluorescent Proteins. *Front. Mol. Biosci.* Feb 3;8:633217.

Lambert G.G., Depernet H., Gotthard G., Schultz D.T., Navizet I., Lambert T., Adams S.R., Torreblanca-Zanca A., Chu M., Bindels D.S., Levesque V., Nero Moffatt J., Salih A., Royant A. & **Shaner N.C.** (2020) Aequorea's secrets revealed: New fluorescent proteins with unique properties for bioimaging and biosensing.. *PLoS Biol.* Nov 2;18(11):e3000936.

Celinskis D., Friedman N., Koksharov M., Murphy J., Gomez-Ramirez M., Borton D. & **Shaner N.C.**, Hochgeschwender U., Lipscombe D., Moore C.I. (2020) Miniaturized Devices for Bioluminescence Imaging in Freely Behaving Animals. *Annu Int Conf IEEE Eng Med Biol Soc. 2020* Jul;4385-4389.

de Heuvel E., Singh A.K., Boronat P., Kooistra A.J., van der Meer T., Sadek P., Blaazer A.R., **Shaner N.C.**, Bindels D.S., Caljon G., Maes L., Sterk G.J., Siderius M., Oberholzer M., de Esch I.J.P., Brown D.G. & Leurs R. (2019) Alkynamide phthalazinones as a new class of TbrPDEB1 inhibitors (Part 2). *Bioorg Med Chem.* Sep 15;27(18):4013-4029.

Tewson P., Martinka S., **Shaner N.C.**, Berlot C., Quinn A.M. & Hughes T. (2018) Assay for Detecting Gαi-Mediated Decreases in cAMP in Living Cells. *SLAS Discov.* Jul 1: 2472555218786238.

Hong S.R., Wang C.L., Huang Y.S., Chang Y.C., Chang Y.C., Pusapati G.V., Lin C.Y., Hsu N., Cheng H.C., Chiang Y.C., Huang W.E., **Shaner N.C.**, Rohatgi R., Inoue T. & Lin Y.C. (2018) Spatiotemporal manipulation of ciliary glutamylation reveals its roles in intraciliary trafficking and Hedgehog signaling. *Nat Commun*.Apr 30;9(1):1732.

Mastop M., Bindels D.S., **Shaner N.C.**, Postma M., Gadella T.W.J. Jr. & Goedhart J. (2017) Characterization of a spectrally diverse set of fluorescent proteins as FRET acceptors for mTurquoise2. *Sci Rep.* Sep 20;7(1):11999.

Molina R.S., Tran T.M., Campbell R.E., Lambert G.G., Salih A., **Shaner N.C.**, Hughes T.E. & Drobizhev M. (2017) Blue-Shifted Green Fluorescent Protein Homologues Are Brighter than Enhanced Green Fluorescent Protein under Two-Photon Excitation. *J Phys Chem Lett*. Jun 15;8(12):2548-2554.

Shen Y., Chen Y., Wu J., **Shaner N.C.** & Campbell R.E. (2017) Engineering of mCherry variants with long Stokes shift, red-shifted fluorescence, and low cytotoxicity. *PLoS One*. 2017 Feb 27;12(2):e0171257.

Clavel D., Gotthard G., von Stetten D., de Sanctis D., Pasquier H., Lambert G.G., **Shaner N.C.** & Royant A. (2016) Structural analysis of the bright monomeric yellow-green fluorescent protein mNeonGreen obtained by directed evolution. *Acta Crystallographica D Struct Biol*, 72(12):1298-1307.

Tewson P.H., Martinka S., **Shaner N.C.**, Hughes T.E. & Quinn A.M. (2016) New DAG and cAMP Sensors Optimized for Live-Cell Assays in Automated Laboratories. *J Biomol Screen*, 21(3):298-305.

Francis W.R., **Shaner N.C.**, Christianson L.M., Powers M.L. & Haddock S.H. (2015) Occurrence of Isopenicillin-N-Synthase Homologs in Bioluminescent Ctenophores and Implications for Coelenterazine Biosynthesis. *PLoS One*, 10(6):e0128742.

Shaner, N.C., Lambert, G.G., Chammas, A., Ni, Y., Cranfill, P.J., Baird, M.A., Sell, B.R., Allen, J.R., Day, R.N., Davidson, M.W.,& Wang, J. (2013) A bright monomeric green fluorescent protein derived from Branchiostoma lanceolatum. *Nature Methods*, 10(5), 407-9.

Francis, W.R., Christianson, L.M., Kiko, R., Powers, M.L., **Shaner, N.C.** & Haddock, S.H. (2013) A comparison across non-model animals suggests an optimal sequencing depth for de novo transcriptome assembly. *BMC Genomics*, 14(1):167.

Powers, M.L., McDermott, A.G., **Shaner, N.C.** & Haddock, S.H. (2012) Expression and characterization of the calcium-activated photoprotein from the ctenophore Bathocyroe fosteri: Insights into light-sensitive photoproteins. *Biochemical and Biophysical Research Communications*, 431(2):360-6.

Li, H., Foss, S.M., Dobryy, Y., Park, C.K., Hires, S.A., **Shaner, N.C.**, Tsien, R.Y., Osborne, L.C. & Voglmaier, S.M. (2011) Concurrent imaging of synaptic vesicle recycling and calcium dynamics. *Frontiers in Molecular Neuroscience*, 4:34.

Siebert, S., Robinson, M.D., Tintori, S., Goetz, F., Helm, R. Smith, S.A., **Shaner, N.C.**, Haddock, S.H.D. & Dunn, C.W. (2011) Differential gene expression in the siphonophore *Nanomia bijuga* (Cnidaria) assessed with multiple next-generation sequencing workflows. *PLoS One*, 6(7):e22853.

Ewen-Campen, B., **Shaner, N.C.**, Panfilio, K.A., Suzuki, Y., Roth, S. & Extavour, C.G. (2011) The maternal and early embryonic transcriptome of the milkweed bug *Oncopeltus fasciatus*. *BMC Genomics*, 12:61.

Hoi, H., **Shaner, N.C.**, Davidson, M.W., Cairo, C.W., Wang, J. & Campbell, R.E. (2010) A monomeric photoconvertible fluorescent protein for imaging of dynamic protein localization. *Journal of Molecular Biology*, 401(5), 776-91.

Ouyang, M., Huang, H., **Shaner, N.C.**, Remacle, A.G., Shiryaev, S.A., Strongin, A.Y., Tsien, R.Y. & Wang. Y. (2010) Simultaneous visualization of pro-tumorigenic Src and MT1-MMP activities with fluorescence resonance energy transfer. *Cancer Research*, 70(6), 2204-12.

Lin, M.Z., McKeown, M.R., Ng, H.L., Aguilera, T.A., **Shaner, N.C.**, Campbell, R.E., Adams, S.R., Gross, L.A., Ma, W., Alber, T. & Tsien, R.Y. (2009) Autofluoresent proteins with excitation in the optical window for intravital imaging in mammals. *Chemistry & Biology,* 16(11), 1169-79.

Shaner, N.C., Lin, M.Z., McKeown, M.R., Steinbach, P.A., Hazelwood, K.L., Davidson, M.W. & Tsien, R.Y. (2008) Improving the photostability of bright monomeric orange and red fluorescent proteins. *Nature Methods*, 5(6), 545-51.

Shaner, N.C., Patterson, G.H. & Davidson, M.W. (2007) Advances in fluorescent protein technology. *Journal of Cell Science*, 120(Pt 24) 4247-60.

Shu, X., **Shaner, N.C.**, Yarbrough, C.A., Tsien, R.Y. & Remington, S.J. (2006) Novel chromophores and buried charges control color in mFruits. *Biochemistry*, 45(32), 9639-47.

Ai, H.W., **Shaner, N.C.**, Cheng, Z., Tsien, R.Y. & Campbell, R.E. (2007) Exploration of new chromophore structures leads to the identification of improved blue fluorescent proteins. *Biochemistry*, 46(20), 5904-10.

Shaner, N.C., Steinbach, P.A. & Tsien, R.Y. (2005) A guide to choosing fluorescent proteins. *Nature Methods*, 2(12), 905-9.

Wang, J., **Shaner, N.C.**, Mittal, B., Zhou, Q., Chen, J., Sanger, J.M. & Sanger, J.W. (2005) Dynamics of Z-band based proteins in developing skeletal muscle cells. *Cell Motility and the Cytoskeleton*, 61(1), 34-48.

Shaner, N.C., Sanger, J.W. & Sanger, J.M. (2005) Actin and alpha-actinin dynamics in the adhesion and motility of EPEC and EHEC on host cells. *Cell Motility and the Cytoskeleton*, 60(2), 104-20.

Shaner, N.C., Campbell, R.E., Steinbach, P.A., Giepmans, B.N., Palmer, A.E. & Tsien R.Y. (2004) Improved monomeric red, orange and yellow fluorescent proteins derived from *Discosoma* sp. red fluorescent protein. *Nature Biotechnology*, 22(12), 1567-72.

Sanger, J.W., Chowrashi, P., **Shaner, N.C.**, Spalthoff, S., Wang, J., Freeman, N.L. & Sanger, J.M. (2002) Myofibrillogenesis in skeletal muscle cells. *Clinical Orthopaedics and Related Research*, 403 Suppl, S153-62.

Ayoob, J.C., **Shaner, N.C.**, Sanger, J.W. & Sanger, J.M. (2001) Expression of green or red fluorescent protein (GFP or DsRed) linked proteins in nonmuscle and muscle cells. *Molecular Biotechnology*, 17(1), 65-71.

Book chapters and editorial contributions:

Fujita K., Nagai T., **Shaner N.C.** & Egner A. (2016) Special Section Guest Editorial: Protein Photonics for Imaging, Sensing, and Manipulation: Honoring Prof. Osamu Shimomura, a Pioneer of Photonics for Biomedical Research. *J Biomed Opt*, 20(10): 101201.

Shaner, N.C. (2014) “Development of new colors from coral fluorescent proteins” in *The Fluorescent Protein Revolution* (Taylor & Francis Group)

Shaner, N.C. (2014) “Fluorescent Proteins for Quantitative Microscopy: Important Properties and Practical Evaluation” in *Methods in Cell Biology: Quantitative Imaging in Cell Biology* (Elsevier)

Shaner, N.C. (2014) “Green Fluorescent Protein (GFP)” in *eLS* (John Wiley & Sons Ltd)

Shaner, N.C. (2013) The mFruit collection of monomeric fluorescent proteins. *Clin Chem*, 2013 59(2):440-1.

Selected Preprints (non-peer reviewed):

Lambert G.G., Crespo E.L., Murphy J., K. Turner, E.Gershowitz, M.Cunningham, D. Boassa, S. Luong, D.Celinskis, J.J. Allen, S. Venn, Y. Zhu, M. Karadas, J. Chen, R. Marisca, H. Gelnaw, D.K. Nguyen, J. Hu, B.N. Sprecher, M.O. Tree, R. Orcutt, D. Heydari, A.B. Bell, A. Torreblanca-Zanca, A. Hakimi, T. Czopka, S. Shoham, K.I. Nagel, D. Schoppik, A. Andrade, Lipscombe D., Moore C.I., Hochgeschwender U. & **Shaner N.C.** (2023) CaBLAM! A high-contrast bioluminescent Ca^{2+} indicator derived from an engineered *Oplophorus gracilirostris* luciferase. *bioRxiv* 2023.06.25.546478.

Crespo E.L., Pal A., Prakash M., Silvagnoli A.D., Zaidi Z., Gomez-Ramirez M., Tree M.O., **Shaner N.C.**, Lipscombe D., Moore C.I. & Hochgeschwender U. (2023) A Bioluminescent Activity Dependent (BLADe) Platform for Converting Neuronal Activity to Photoreceptor Activation. *bioRxiv* 2023.06.25.546469.

Yemane D., Lu I., Tiahjono W., Rubidoux L., Hussain A., Cancilla J.C., Duggan E., **Shaner N.C.**, Nakanishi N. & Wang J. (2021) Single-Domain SARS-CoV-2 S1 and RBD Antibodies Isolated from Immunized Llama Effectively Bind Targets of the Wuhan, UK, and South African Strains in vitro. *bioRxiv* 2021.02.15.431198.

Celinskis D., Friedman N., Koksharov M., Murphy J., Gomez-Ramirez M., Borton D., **Shaner N.C.**, Hochgeschwender U., Lipscombe D. & Moore C. (2020) Miniaturized Devices for Bioluminescence Imaging in Freely Behaving Animals. *bioRxiv* 152546.

Raghuram A., Ye F., Adams J.K., **Shaner N.C.**, Robinson J. & Veeraraghavan A. (2020) Determining the Depth Limit of Bioluminescent Sources in Scattering Media. *bioRxiv* 044892.

RESEARCH GRANTS

Active Funding

2022 - 2026
“Engineering photostable fluorescent proteins and biosensors using transcriptomic mining and massive-throughput single-cell screening”
R01 EB032854, National Institute of Biomedical Imaging and Bioengineering (NIBIB)
St-Pierre, F (PI)
Role: Co-PI

2024 - 2028
“New tools for quantitative non-invasive recording of biochemical signals”
R01 CA279813, National Cancer Institute (NCI)
Shaner, NC (PI)

2024 - 2026
“Transformative optical imaging of brain & behavior in navigating genetic species”
R34 DA059500-01, National Institute of Drug Abuse (NIDA)
Schoppik, D (PI)
Role: MPI

2024 - 2027
“An orthogonal bioluminescent platform for multiplexed imaging and control”
R21 EY036659, National Eye Institute (NEI) (BRAIN Initiative)
Shaner, NC (PI)

2024 - 2028
Allen Discovery Center for Neurobiology in Changing Environments
The Paul G. Allen Frontiers Group
Tresguerres, M (PI)
Role: Co-I

Completed Funding

2021 - 2025
"Selective control of synaptically-connected circuit elements by interluminescence"
R01 NS120832, National Institute of Neurological Disorders and Stroke (NINDS) (BRAIN Initiative)
Hochgeschwender, U. (PI)
Role: MPI

2020 - 2023
"From seaside to bedside: evolution of bioluminescent genetically encoded Neurotransmitter Indicators and activators for neuromodulation"
2027113, National Science Foundation (BRAIN Initiative)
Gilad, A. (PI)
Role: Co-PI

2017 - 2023
"Neurotechnology Hub: Bioluminescence for Optimal Brain Control and Imaging"
1707352, National Science Foundation (BRAIN Initiative)
Moore, CI (PI)
Role: Co-PI

2019 - 2022
"Highly specific control of neurons with photoswitchable bioluminescent optogenetics"
R21 EY030716, National Eye Institute (NEI) (BRAIN Initiative)
Shaner, NC (PI); Hochgeschwender, U (Co-PI); Moore, CI (Co-PI)
Role: PI

2019 - 2022
"Designing novel indicators for multiphoton voltage imaging"
U01 NS113294, National Institute of Neurological Disorders and Stroke (NINDS) (BRAIN Initiative)
Tolias, AS (PI); St-Pierre, F (PI)
Role: Co-PI

2017 - 2022
"Probes for Luminescence-based Superresolution Microscopy"
R01 GM121944, National Institute of General Medical Sciences (NIGMS)
Shaner, NC (PI)
Role: PI

2014 - 2021
"Fluorescent proteins for superresolution imaging"
R01 GM109984, National Institute of General Medical Sciences (NIGMS)
Shaner, NC (PI)
Role: PI

2016 - 2020
“BioLuminescent OptoGenetics (BL-OG): A Novel and Versatile Strategy for Neuromodulation”
U01 NS099709, National Institute of Neurological Disorders and Stroke (NINDS) (BRAIN Initiative)
Hochgeschwender, U (PI); Moore, CI (MPI); **Shaner, NC** (MPI)
Role: MPI

2017 - 2018
“IBIS: Implantable bioluminescence interface system for an all-optical neuroprosthesis to the visual cortex”
DARPA-16-09-NESD-FP-014
Pieribone, VA (PI)
Role: Co-PI

2014 - 2017
“BRAIN EAGER: Genetically Encoded Light Sources for Non-Invasive Optogenetics”
1464686, National Science Foundation
Hochgeschwender, Ute H. (PI)
Role: Co-PI

2014 - 2015
“Nano-Antibodies for Studying RNA Modifications”
1R43DA038978-01, NIH (NIDA)
Wang, Jiwu (PI)
Role: Co-I

2014 - 2014
“RNA-Guided Gene Targeting in Human Cells”
1R43GM106537-01A1, NIH (NIGMS)
Wang, Jiwu (PI)
Role: Co-I

SELECTION OF INVITED TALKS

2025 Gordon Research Conference for Protein Engineering, Smithfield, RI
2025 Imaging the Future: New Probes & Microscopic Techniques, Symposium at ACS Spring 2025, San Diego, CA
2025 Pfizer (research campus), La Jolla, CA
2024 Western Association of Core Directors (Annual Meeting), La Jolla, CA
2024 Scripps Institution of Oceanography, La Jolla, CA
2024 Groton School Biology Club, Groton, MA
2024 Salk Institute, La Jolla, CA
2024 Fluorescence Markers for Advanced Microscopy: from Photophysics to Biology, École de Physique des Houches, Les Houches, France
2023 HHMI/Janelia Fluorescent Proteins and Biological Sensors VII
2023 Imagining the Future of Imaging, Symposium at ACS Fall 2023, San Francisco, CA
2023 Sensing, Controlling and Integrating Brain Processes with Biological Light, Symposium at BRAIN Initiative Investigators Meeting, Bethesda, MD
2023 Quantitative Imaging: From Acquisition to Analysis Cold Spring Harbor Laboratory, NY
2023 University of Southern California, Department of Bioengineering, Los Angeles, CA
2022 Quantitative Imaging: From Acquisition to Analysis Cold Spring Harbor Laboratory, NY
2021 MiFoBio 2021 Course on Biological Imaging, Presqu'île de Giens, France
2019 US-Japan Workshop on Bioengineering & Information Science, UC San Diego
2019 Johns Hopkins University, Department of Biological Chemistry, Baltimore, MD
2019 Quantitative Imaging: From Acquisition to Analysis Cold Spring Harbor Laboratory, NY
2018 HHMI/Janelia Fluorescent Proteins and Biological Sensors VI
2018 Quantitative Imaging: From Acquisition to Analysis Cold Spring Harbor Laboratory, NY
2017 Quantitative Imaging: From Cells to Molecules Cold Spring Harbor Laboratory, NY
2016 HHMI/Janelia Farm Fluorescent Proteins and Biological Sensors V
2016 Brown University Department of Neuroscience. Providence, RI
2016 Northwestern University Department of Biochemistry and Molecular Genetics, Chicago, IL
2016 Quantitative Imaging: From Cells to Molecules Cold Spring Harbor Laboratory, NY
2015 Western Sydney University, Sydney, NSW Australia
2015 Quantitative Imaging: From Cells to Molecules Cold Spring Harbor Laboratory, NY
2014 HHMI/Janelia Farm Fluorescent Proteins and Biological Sensors IV
2009 SPIE Biomedical Optics Symposium
2006 American Society for Photobiology 33rd Meeting

PROFESSIONAL MEMBERSHIPS AND OTHER ACTIVITIES

2024	Course Instructor, “Exploring Optical Probes in Neuroscience Research” (NEUG221 Advanced Topics in Neuroscience), UC San Diego
2024	Research Host, ENLACE summer exchange program, UC San Diego
2024 - present	Member, Biomedical Sciences Graduate Program, UC San Diego
2020 - present	Member, Cell Signaling San Diego Leadership Team
2019 - present	Member, Neurosciences Graduate Program, UC San Diego
2019	Research host and mentor to University College London Bogue Scholarship awardee Dr. Thomas Blacker
2018	Symposium Organizer, “Next Generation Technologies for Neuroscience,” Brown University, Providence, RI
2018 - 2022	Course Instructor, “NeuroNex Practicum on Bioluminescence,” Marine Biological Laboratory, Woods Hole, MA (and online)
2016 - present	Member, Society for Neuroscience
2016 - present	Member, American Chemical Society
2016 - present	Member, Biophysical Society
2015 - present	Member, American Society for Cell Biology
2015	Guest Editor, Journal of Biomedical Optics
2015	Symposium Organizer, “Cells, Sensors, & Systems,” Scintillon Institute, San Diego, CA
2008 - 2009	Program committee member, Biomedical Optics Symposium “Fluorescent in vivo imaging based on genetically engineered probes: from living cells up to small animal whole body imaging IV” SPIE 2009 Conference, San Jose, CA
2005 - 2008	Co-founder, BioBridge educational outreach program University of California, San Diego (now known as ScienceBridge; URL: sciencebridge.ucsd.edu)
2014 - present	Undergraduate and high school student research mentor

PATENTS

Campbell, R.E., **Shaner, N.C.**, & Tsien, R.Y. Monomeric and dimeric fluorescent protein variants and methods for making same. University of California, San Diego (issued US Patent 7,687,614B2)

Tsien, R.Y., Campbell, R.E., & **Shaner, N.C.** Monomeric and dimeric fluorescent protein variants and methods for making same. University of California, San Diego (issued US Patent 7,906,636B2)

Wang, J., Campbell, R.E., Hoi, H., & **Shaner, N.C.** Photoconvertible fluorescent proteins. University of Alberta, Edmonton and Allele Biotechnology & Pharmaceuticals (issued US Patent 9,145,447B2)

Shaner, N.C., Lambert G., & Wang, J. Monomeric yellow-green fluorescent protein from cephalochordate. Allele Biotechnology & Pharmaceuticals Inc. (issued US Patent 10,221,221B2)

Shaner, N.C., Lin, M.Z., McKeown, M., & Tsien, R.Y. Fluorescent proteins with increased photostability. University of California, San Diego (US Patent Application No. 20090203035)

Wang, J., Lambert, G.G., & **Shaner, N.C.** Methods of selecting antibodies and antibody fragments. Allele Biotechnology & Pharmaceuticals Inc. (US Patent Application No. 20170044608A1)