

**NRI Annual Report** 

University of California Santa Barbara

https://www.nri.ucsb.edu

## **Mission Statement**

he mission of the Neuroscience Research Institute is to foster knowledge and understanding of the nervous system by serving as a center for scientific research breakthroughs. The NRI is a group of investigators whose collective goal is to create an intellectual atmosphere conducive to exploration at the frontiers of human knowledge where disciplinary boundaries disappear. Investigators in the NRI recognize that the interests of neuroscience extend broadly from repair and prevention of human disease to the principles that underlie the earliest nervous systems, from the human mind to the single molecular building blocks of the brain.

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# Co-Director's Statement 2019-2020 Stuart Feinstein and Kenneth S. Kosik

Neuroscience is increasingly viewed as a primary scientific priority at the national level in both the public and private sectors as well as on university campuses. The Neuroscience Research Institute (NRI) is the hub of neuroscience research at UCSB. Our missions are: (i) to serve the research interests of the campus in all facets of neuroscience; (ii) to promote collaborative, inter-disciplinary neuroscience research at UCSB; (iii) to train the next generation of neuroscientists. Our work includes both basic science inquiries into the development, function, degeneration and regeneration of the nervous system as well as translational studies directed toward developing therapeutic strategies for the many neurological maladies afflicting society.

Beginning a few years ago, NRI collaborated with numerous other units on campus to increase the presence and breadth of neuroscience at UCSB. As just one measure of our success, NRI and the campus now have 13 tenure-track, neuroscience Assistant Professors among its ranks. Importantly, these new faculty hail from a wide range of departments and programs across campus, including Molecular, Cellular and Developmental Biology, Psychological and Brain Sciences, Chemistry and Biochemistry, Chemical Engineering, Mechanical Engineering, Physics, Bioengineering and Biomolecular Sciences and Bioengineering. This achievement addresses one of the most important recommendations from the NRI external review just a few years ago, that is, to increase the presence and breadth of modern neuroscience on campus. Additionally, we have reached out to quite a number of senior faculty on campus who are not necessarily "card carrying" neuroscientists but who nonetheless conduct research that is highly relevant to neuroscience. These senior faculty also come from a wide range of departments, including Chemistry and Biochemistry, Physics, Electrical and Computer Engineering, Ecology Evolution and Marine Biology, Computer Science, Math and even Communications. Taken together, all of these junior and senior investigators complement our original core of NRI scientists to produce a vibrant, inter-disciplinary neuroscience environment at UCSB.

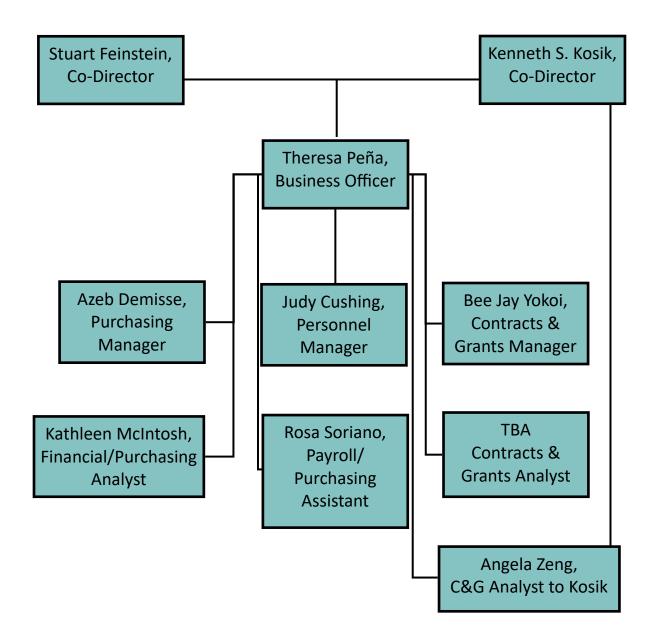
Looking to the future, we hope to continue recruiting new neuroscientists at the cutting-edge of the neuroscience to augment and complement our present research efforts. Recruitment of new faculty addressing cutting-edge questions is essential to maintain and enhance the neuroscience research excellence on campus as well as our position in the national and international neuroscience research communities. We believe that continuing the practice of having some of the future neuroscience recruitments non-aligned to particular departments during the search process increases our ability to leverage our existing collaborative strengths to create an intellectually and technically state-of-theart, interdisciplinary neuroscience program for the future.

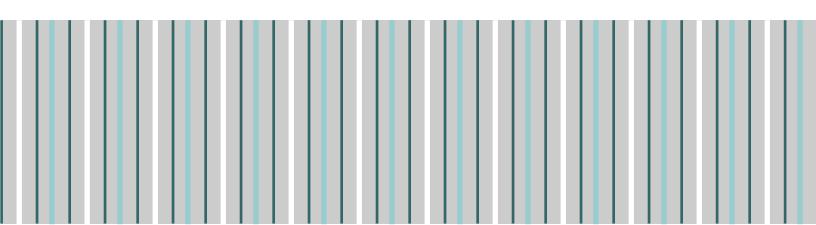
The NRI continues to promote research on campus through various facilities and activities. Our Core Facilities in (i) Light and Electron Microscopy and (ii) Stem Cells are essential for the research of numerous investigators across campus in over a dozen departments/units in the Life Sciences, Physics, Chemistry, Materials and Engineering. Two remarkable new state-of-the-art microscopes, acquired via successful NIH and NSF grant applications 3 years ago are being used extensively by UCSB investigators. We have additional applications to federal agencies in the pipeline to further enhance the Facility's (and our researchers) capabilities. NRI also promotes neuroscience research on campus by sponsoring frequent seminars (often co-sponsored with other units on campus) as well as a day-long Annual NRI Neuroscience Symposium at which graduate students and postdocs present

their work, along with an outside invited Keynote Speaker. Over the past two years, we have also sponsored workshops for our graduate students and postdocs on "How to Earn a Faculty Position After Your Postdoc" as well as "Things to do with a PhD in the Life Sciences Other than Academia". NRI has also sponsored travel grants to assist graduate students and postdocs who are presenting their research at major research meetings. With respect to laboratory space, we are currently in the midst of renovating space that will be assigned to two Assistant Professors to promote their research. Additionally, we have conducted a space audit and two senior faculty have generously agreed to modify their laboratory space assignments to promote the work of another new young Assistant Professor. Finally, in a rather intensive effort, we have completely re-built the NRI website from the ground up. The current version is both informative and aesthetic — our hope is that it will further increase the number of outstanding graduate student and postdoctoral applicants to our laboratories.

Finally, NRI also promotes neuroscience research on campus with its outstanding administrative support. Our administration and faculty work together in an environment of professionalism, excellence, cooperation and respect that greatly facilitates the many administrative components of our operations. Under the superb chairmanship of Drs. Denise and Craig Montell, the NRI advisory committee has provided sage counsel to the NRI Co-Directors.

As we move forward to the coming year, the NRI will increasingly serve as a scientific and administrative home to ongoing neuroscience research as well as for efforts to broaden, enhance and better integrate neuroscience research across the campus.







# ADVISORY COMMITTEE, ADMINISTRATIVE AND TECHNICAL STAFF

## 2018/19 NRI Advisory Committee

Mark Brzezinski, EEMB
Miguel Eckstein, PSYC
Steve Fisher, NRII
Thomas Harriman, Community Member
Emily Jacobs, PSYC
Matthieu Louis, MCDB

Craig Montell, Co-Chair, MCDB (Winter/Spring)
Denise Montell, Co-Chair, MCDB (Fall)

Bridget Queenan, NRI / Brain Initiative Megan Valentine, ME

Ex-Officio Members Stuart Feinstein, Co-Director NRI Kenneth Kosik, Co-Director, NRI Benjamin Lopez, Microscopy Director, NRI Theresa Peña, Business Officer, NRI

#### **NRI Administrative Staff**

Judy Cushing, Personnel Manager
Azeb Demisse, Purchasing Manager
Kathleen McIntosh, Financial/Personnel Analyst
Theresa Peña, Business Officer
Rosa Soriano, Personnel/Purchasing Assistant
Alysa Sweeney, Personnel/Contract & Grant Analyst
Bee Jay Yokoi, Contract and Grant Manager
Angela Zeng, Assistant to Kenneth Kosik

#### **Technical Staff**

Elmer Guzman, Sequencing Facility Assistant Director Cassidy Arnold, Stem Cell Lab, Associate Director John Craighead, Computer Support Geoffrey Lewis, Microscopy Support Benjamin Lopez, Microscopy Director



## STATISTICAL SUMMARY FOR: (Neuroscience Research Institute)

1. Academ	nic personnel engaged in research:				
a.	a. Faculty				
b.	Professional Researchers (including Visiting)	5			
C.	Project Scientists	16			
d.	Specialists	9			
е	Postdoctoral Scholars	24			
f	Postgraduate Researchers				
	TOTAL	78			
2. Gradua	2. Graduate Students:				
a	Employed on contracts and grants	40			
b.	Employed on other sources of funds				
C.	Participating through assistantships				
d.	Participating through traineeships				
е	Other (Fellowship)	1			
	TOTAL	41			
3. Undergi	raduate Students:				
a.	Employed on contracts and grants	21			
b.	Employed on other funds	7			
C.	Number of volunteers, & unpaid interns	45			
	TOTAL	73			
4. Particip	4. Participation from outside UCSB: (optional)				
a.	Academics (without Salary Academic Visitors)				
b.	Other (CSUCI - CIRM Internship)	1			
5. Staff (U	niv. & Non-Univ. Funds):				
a.	Technical	3			
b.	Administrative/Clerical	8			
6. Semina	ars, symposia, workshops sponsored	5			
7. Propos	als submitted	72			
8. Numbe	r of different awarding agencies dealt with*	33			
9. Numbe	er of extramural awards administered	62			
10. Dollar	value of extramural awards administered during year**	\$32,701,324			
	er of Principal Investigators***	40			
12. Dollar value of other project awards **** \$7,017,8					
13. Numbe	13. Number of other projects administered 142				
14. Total base budget for the year (as of June 30, 2018) \$372,699					
15. Dollar value of intramural support \$82,124					
16. Total assigned square footage in ORU 24794					
	17. Dollar value of awards for year (08 Total) \$10,288,0				
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<sup>\*</sup> Count each agency only once (include agencies to which proposals have been submitted).

<sup>\*\*</sup> If the award was open during the year, even if for only one month, please include in total.

<sup>\*\*\*</sup> Number of PIs, Co-PIs and Proposed PIs (count each person only once.)

<sup>\*\*\*\*</sup> Other projects - such as donation, presidential awards, fellowships, anything that isn't core budget, extramural, or intramural.

Bianca		Acevedo	Visiting Researcher	NRII
Longhini		Andrew	Postdoctoral Fellow	NRII
Dennis		Clegg	Professor	NRII
Peter		Coffey	Researcher	NRI
Stuart		Feinstein	Professor	NRII
Steven		Fisher	Professor	NRII
Luis		Franco Mendez	Postdoctoral Fellow	NRII
Michael J	J.	Goard	Asst. Professor	Psychological and Brain Sciences/MCDB
Songi		Han	Professor	Chemisrty & Biochemi
Jacob		Israelachvili	Professor	Chemical Engineering
Emily		Jacobs	Assistant Professor	Psychological and Brain Sciences
Kenneth		Kosik	Professor	NRII
Nicole		Leung	Graduate Student	MCDB
John		Lew	Professor	NRII
Geoff		Lewis	Researcher	NRII
Benjamin		Lopez	Microscopy Director	NRII
Matthieu		Louis	Assistant Professor	MCDB
Michael		Mahan	Professor	MCDB
В		Manjunath	Professor	Electrical & Computer
Craig		Montell	Professor	MCDB
Denise		Montell	Professor	MCDB
Stanley		Parsons	Professor	Chemistry
Monte		Radeke	Project Scientist	NRII
Jennifer		Rauch	Postdoctoral Fellow	NRII
Benjamin		Reese	Professor	NRII
Tal		Sharf	Postdoctoral Fellow	NRII
Joan-Emma		Shea	Professor	Chemisrty & Biochemistry
Julie		Simpson	Professor	MCDB
William		Smith	Professor	MCDB
Izel		Tekin	Postdoctoral Scholar	MCDB
Dhananjay		Thakur	Postdoctoral Scholar	MCDB
Luke		Theogarajan	Professor	Electrical & Compute
James		Thomson	Professor	MCDB
J	T.	Valentine	Asst. Professor	MECE
Thomas		Weimbs	Professor	NRII
Leslie		Wilson	Professor	NRII
Max		Wilson	Assistant Professor	MCDB

rincipal Investigators



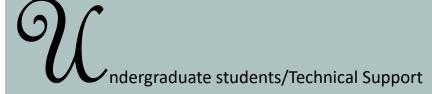


## ostdoctoral Researchers

**BAILEY JEFFREY** Clegg Lab **CHANDEL AVINASH** Montell Lab CHEN Montell Lab JIEYAN DE SOUSA ABREU **RAQUEL** Goard Lab **FICHOU** YANN Han Lab **FOLTZ** LEAH Clegg Lab FRANCO MENDEZ LUIS Goard Lab **GANGULY ANINDYA** Montell Lab **GLASAUER STELLA** Kosik Lab HAN Kosik Lab DASOL LI QIAORAN Montell Lab LIU **GUOJING** Kosik Lab LIU Montell Lab JIANGQU LONGHINI ANDREW Kosik Lab **MCCARTY** Han Lab **JAMES PENNINGTON BRITNEY** Clegg Lab **RAUCH JENNIFER** Kosik Lab **SHARF** Kosik Lab TAL **STRUBL SEBASTIAN** Weimbs lab **TEKIN** IZEL Craig Montell Lab **THAKUR** DHANANJAY C Montell Lab **TORRES** JACOB Weimbs Lab WARRINGTON RACHAEL Radeke Lab ZHAN YINPENG Montell Lab



**BERGMAN GUSTAV** Clegg Lab **BERNALES AUSTIN** Kosik **BUSTILLOS AUSTIN** C. Montell Lab Deak D. Montell Lab SIERRA D. Montell Lab **DONALDSON TIFFANY DOWNEY** JULIA C. Montell Lab **FIERROS TIFFANY** Weimbs Lab D. Montell Lab **HAMILTON** LUKE HARRISON-GLEASON JAKOB Mahan Lab **JONES** Weimbs Lab TIA KRISTEL C. Montell Lab KERRIGAN **KHOUVILAY SHERLYN** Weimbs Lab **MENDONCA RAINA** Rothman Lab **RICHARD MURPHY** Reese Lab **NGUYEN** AMY Rothman Lab **POLES NOUR** Weimbs Lab C. Montell Lab **ROSEMAN VICTORIA SANDOVAL CITLALLI** D. Montell Lab SUL JULIAN Reese Lab **TUCKER BRIGHAM** Clegg Lab **VARVARO ARIANNA** Smith Lab



MCCARDLE JAMES
MEJIA OJEDA LUIS
NEKOOMANESH KAVEH
PADILLA ORTIZ DANIEL
REZHKO ANNA
TSEGAYE JONATHAN

WOO ERIN



**AGRAWAL SHAGUN** Weimbs Lab Weimbs Lab **ASPLUND DAVID** Beserra NICOLAI Goard Lab **BESS** NIGEL Goard Lab CHENG Kosik LAb **LADIA** CHIH YU CHENG Feinstein Lab **CHIN TIFFANY** Weimbs Lab **CLASSON SOFIA** Weimbs Lab DECKER **MORGAN** Weimbs Lab **DUONG KAITHLYN** Goard lab **GELFER SERENA** Goard Lab GLICK **NICOLE** Goard Lab Goldstein JULIA Weimbs Lab **GONZALES MAYLIE** Thomson Lab HAM7A AZIZ Weimbs Lab HILDEBRAND RACHEL Weimbs Lab KASABY AN ARMINE Weimbs Lab KIM **CLARA** Kosik Lab **LABIB** SARAH Kosik Lab Weimbs lab LACH **RYAN** LAVOY NATE Kosik Lab LEVI **CHELSEA** Kosik Lab LI YIJING D. Montell Lab **JASON** Weimbs Lab LITVINCHUK MCBRIDE **FIONA** Goard Lab PATHANIA ANOUSH (SHANE) Goard Lab **PERKOVICH KYLE** Weimbs Lab **PRIESTLEY ASHLEE** Weimbs Lab RAPOPORT MAYA Kosik Lab RODRIGUEZ **AMANI** Goard Lab ROMMELFANGER **EMMA** Kosik Lab SADJADI RYAN Thomson Lab **SALWAN** SHIV VIR Weimbs Lab SCIAMANNA **JASON** Goard Lab **SHAHREZA** DONNA Goard Lab **CHANCE** SINE Weimbs Lab Smith **MORGAN** Weimbs Lab Stegman ROBERT Doyle Lab **SULLIVAN KIERA** Weimbs Lab **THELEN MAXIMILIAN** Kosik Lab TONUM KANLAYANEE Weimbs Lab **TSHIMANGA EREN-AJANI** Weimbs lab WU LAURA (JINXUAN) Weimbs Lab ZHANG JIAYING C. Montell Lab **ZHENG ERIC** Weimbs Lab

utside the University—
California State Channel Islands
CIRM/Bridge Internship

Olga Kuzenna, Doyle lab

The NRI-MCDB Microscopy Facility, founded in 1990, is jointly maintained by the Neuroscience Research Institute and the Department of Molecular, Cellular and Developmental Biology at the University of California, Santa Barbara. The Facility's mission is to promote and facilitate microscopy-based research. To achieve this mission the Facility houses state-of the art instruments, supports expert full-time support staff, hosts outreach events and provides both individual and workshop-based training in microscopy.

The Facility is the primary light microscopy core on campus supporting researchers in more than 13 department/units including the Life Sciences, Physics, Chemistry, Materials, and Engineering. The Facility has over 100 registered Principal Investigators with use by 56 Pls this year. In the last 12 months, the Facility supported 155 users and 2167 reservations. Those reservations count for approximately 5,100 hours of use for \$77,000 of recharge income. This is a 40% increase in hours of use and 14% increase in recharge income compared to the previous year. The Facility users are asked to acknowledge the Facility in their publications and report new publications supported by the Facility. A list of the research publications that have been reported to the Facility in 2018-2019 conclude this report.

This centrally located Facility is based within the Neuroscience Research Institute, in the Biological Sciences II building. Presently, the Facility maintains multiple sophisticated instruments including a JEOL JEM-1230 transmission electron microscope, a Leica SP8 resonant fast scanning confocal with white-light laser, an Olympus Fluoview 1000 Spectral Confocal Laser Scanning Microscope, an Olympus Fluoview 1000 Multiphoton Laser Scanning Microscope, an Olympus Spinning Disk Confocal, and a Zeiss Z.1 lightsheet. The Facility also hosts five Olympus compound microscopes configured with transmitted and fluorescent light-paths as well as a stereomicroscope configured with transmitted and reflected light. These microscopes are further equipped with research grade digital cameras and computer workstations for image acquisition, processing, and analysis. The confocal, multiphoton, and lightsheet microscopes are equipped with time-lapse software controls for automated long-term imaging and are equipped with a motorized XY stages for automated sampling of multiple locations. The facility also provides two high-end workstations for 3D image processing and analysis with software licenses for Imaris, Leica LASX, and Zeiss Zen.

There were three major improvements to the Facility's capabilities this year. In February the Leica SP8 confocal had an upgrade to its electronics and scanners, resulting in: a linear scan for more quantitative imaging, doubled possible pixel count to 2048 in resonant scanning mode, and FLIM capabilities. FLIM is fluorescent lifetime imaging microscopy which is especially useful for quantitative FRET measurements. The upgrade of the Leica SP8 confocal was funded from the original NSF MRI grant (1625770) that enabled the purchase of the instrument. The second major improvement was the purchase of the Nanolive 3D Cell Explorer. This novel new instrument uses holographic tomography to generate a three-dimensional image of the sample with contrast determined by refractive index. It works primarily with adherent cell cultures where the instrument makes many subcellular structures immediately visible label-free. The cell membrane, nuclear material, nuclear envelope, condensed chromsomes, mitochondria, and lipid droplets are all clearly identifiable. A 30 micrometer stack of images can be collected

every 2 seconds. It uses a low powered green laser that does essentially no photodamage; that combined with the included environmental chamber can keep cells alive in a healthy state for days at a time allowing incredibly long timelapses. The purchase of the Nanolive microscope was funded primarily through the depreciation funds from the purchase of the Olympus DSU. A depreciation fund has been set up to recoup the Nanolive purchase over a period of seven years. Lastly, the IX70 inverted fluorescence scope was replaced by a Zeiss Axiovert thanks to a donation from Dr. Vandenburg. The Axiovert improves upon the IX70 by being fully motorized and having a far-red filterset.

In May an NIH HEI (High End Instrumentation) grant proposal was submitted for an Aberrior Instruments STED super resolution microscope. Ben Lopez was the head PI with Denise Montell, Ken Kosik, Max Wilson, and Skirmantus Janusonis as Major Users. Thomas Weimbs and Anthony DeTomaso were also included as a minor users. The grant review will happen in November and we will hopefully hear good results soon after.

The facility director since March 2016 is Dr. Benjamin Lopez. Ben has experience in doctoral and postdoctoral research involving microscope instrument design, imaging, and image analysis. Ben is assisted by Dr. Geoff Lewis who oversees transmission electron microscopy. Both Ben and Geoff have published numerous papers employing conventional, TIRF, optical trapping, transmission electron microscopy and confocal microscopy. Drs. Lopez and Lewis provide training on a daily basis and regularly meet with individuals to provide advice and to address additional microscopy needs.

#### Other University contributions

# MCDB103L: Cellular Biology Lab

Introduction to fluorescence microscopy lecture.

#### MCDB126BL: Basic Pharmacology

The main microscopy facility room 5173 and widefield epifluorescence microscopes were used in the basic pharmacology lab for 2 weeks.

#### MCDB133L: Immunobiology

The main microscopy facility room 5173 and widefield epifluorescence microscopes were used for one day.

#### MCDB290MR: Introduction to Microscopy

Room 5173 used for three lectures and labs. Hands-on use of brightfield, fluorescence, confocal, and lightsheet microscopy.

### **ENGR 220B: Graduate Microscopy Lab**

One three hour lab in the main microscopy facility room 5173 using the widefield epifluorescence microscopes.

## ME225-MC: MEMS Characterization

One two-hour lab session and one student project using a confocal microscope for 3 hours.

#### Santa Barbara Advanced School of Quantitative Biology

Leica SP8 confocal was used half the day each day for three weeks.

#### Public Service and K-12 Outreach

The NRI-MCDB Microscopy Facility participates in campus-wide events as well as undergraduate and graduate student tours and orientations. In the last year the Facility participated in Parent and Family Weekend and also gave a tour to Ventura College students.

#### Facility Supported Publications 2018-2019

#### 2019

- Engel L, Gaietta G, Dow LP, Swift MF, Pardon G, Volkmann N, Weis WI, Hanein D, Pruitt BL. 2019. Extracellular matrix micropatterning technology for whole cell cryogenic electron microscopy studies. bioRxiv.
- Seppälä S, Yoo JI, Yur D, O'Malley MA. 2019. Heterologous transporters from anaerobic fungi bolster fluoride tolerance in Saccharomyces cerevisiae. Metabolic Engineering Communications. 9:e00091.
- Zhou Y, Su JM, Samuel CE, Ma D. 2019. Measles Virus Forms Inclusion Bodies with Properties of Liquid Organelles. Journal of Virology.
- Brown TD, Nowak M, Bayles AV, Prabhakarpandian B, Karande P, Lahann J, Helgeson ME, Mitragotri S. 2019. A microfluidic model of human brain (μHuB) for assessment of blood brain barrier. Bioengineering & Translational Medicine. 4:e10126.
- Lin Y, McCarty J, Rauch JN, Delaney KT, Kosik KS, Fredrickson GH, Shea J-E, Han S. 2019. Narrow equilibrium window for complex coacervation of tau and RNA under cellular conditions. Elife. 8
- Kourakis M, Borba C, Zhang A, Newman-Smith E, Salas P, Manjunath B, Smith W. 2019. Parallel Visual Circuitry in a Basal Chordate. bioRxiv.
- Kennard RM, Dahlman CJ, Nakayama H, DeCrescent RA, Schuller JA, Seshadri R, Mukherjee K, Chabinyc ML. 2019. Phase Stability and Diffusion in Lateral Heterostructures of Methyl Ammonium Lead Halide Perovskites. ACS Appl Mater Interfaces. 11(28):25313-25321.
- Peniston JH, Ellis EA, Churchill CKC, M Ramirez D, Oakley TH. 2019. Phylogenetic position of Alternochelata lizardensis Kornicker, 1982 within Rutidermatidae (Ostracoda: Myodocopida), with an investigation into its green coloration. Journal of Crustacean Biology.
- Kassmer SH, Langenbacher A, De Tomaso AW. 2019. Primordial Blasts, a population of blood borne stem cells responsible for whole body regeneration in a basal chordate. bioRxiv.
- Best RL, LaPointe NE, Liang J, Ruan K, Shade MF, Wilson L, Feinstein SC. 2019. Tau isoform—specific stabilization of intermediate states during microtubule assembly and disassembly. Journal of Biological Chemistry. 294:12265-12280.

- Valois E, Hoffman C, DeMartini DG, J Waite H. 2019. The Thiol-Rich Interlayer in the Shell/Core Architecture of Mussel Byssal Threads. Langmuir.
- Toh H, Smolentsev A, Bozadjian RV, Keeley PW, Lockwood MD, Sadjadi R, Clegg DO, Blodi BA, Coffey PJ, Reese BE et al.. 2019. Vascular changes in diabetic retinopathy-a longitudinal study in the Nile rat. Lab Invest.

#### 2018

- Rodriguez D, Nourizadeh S, De Tomaso AW. 2018. The biology of the extracorporeal vasculature of Botryllus schlosseri. Developmental Biology.
- Wang B, Fronk SL, Rengert ZD, Limwongyut J, Bazan GC. 2018. Conjugated Oligoelectrolytes: Materials for Acceleration of Whole Cell Biocatalysis. Chemistry of Materials. 30:5836-5840.
- McNair HM, Brzezinski MA, Krause JW. 2018. Diatom populations in an upwelling environment decrease silica content to avoid growth limitation. Environmental Microbiology. 20:4184-4193.
- Cook B.M, Wozniak K.M, Proctor D.A, Bromberg R.B, Wu Y., Slusher B.S, Littlefield B.A, Jordan M.A, Wilson L., Feinstein SC. 2018. Differential Morphological and Biochemical Recovery from Chemotherapy-Induced Peripheral Neuropathy Following Paclitaxel, Ixabepilone, or Eribulin Treatment in Mouse Sciatic Nerves. Neurotoxicity Research. 34:677–692.
- Simon AJ, Walls-Smith LT, Plaxco KW. 2018. Exploiting the conformational-selection mechanism to control the response kinetics of a smart DNA hydrogel. Analyst. 143:2531-2538.
- Limwongyut J, Liu Y, Chilambi GShankar, Seviour T, Hinks J, Mu Y, Bazan GC. 2018. Interactions of a paracyclophane-based conjugated oligoelectrolyte with biological membranes. RSC Adv. 8:39849-39853.
- Evans MA, Huang P-J, Iwamoto Y, Ibsen K[space]N., Chan EM, Hitomi Y, Ford PC, Mitragotri S. 2018. Macrophage-mediated delivery of light activated nitric oxide prodrugs with spatial, temporal and concentration control. Chem. Sci.
- Brown TD, Nowak M, Bayles AV, Prabhakarpandian B, Karande P, Lahann J, Helgeson ME, Mitragotri S. 2018. A microfluidic model of human brain (μHuB) for assessment of blood brain barrier. Bioengineering & Translational Medicine.
- Wozniak KM, Vornov JJ, Wu Y, Liu Y, Carozzi VA, Rodriguez-Menendez V, Ballarini E, Alberti P, Pozzi E, Semperboni S et al.. 2018. Peripheral Neuropathy Induced by Microtubule-Targeted Chemotherapies: Insights into Acute Injury and Long-term Recovery. Cancer Research. 78:817–829.
- Jeon B-J, Nguyen DT, Abraham GR, Conrad N, Fygenson DK, Saleh OA. 2018. Salt-dependent

- properties of a coacervate-like, self-assembled DNA liquid. Soft Matter. 14(34):7009-7015.
- Mailyan AK, Chen JL, Li W, Keller AA, Sternisha SM, Miller BG, Zakarian A. 2018. Short Total Synthesis of [15N5]-Cylindrospermopsins from 15NH4Cl Enables Precise Quantification of Freshwater Cyanobacterial Contamination. Journal of the American Chemical Society.
- Rauch JN, Chen JJ, Sorum AW, Miller GM, Sharf T, See SK, Hsieh-Wilson LC, Kampmann M, Kosik KS. 2018. Tau Internalization is Regulated by 6-O Sulfation on Heparan Sulfate Proteoglycans (HSPGs). Sci Rep. 8(1):6382.
- McNair HM, Brzezinski MA, Till CP, Krause JW. 2018. Taxon-specific contributions to silica production in natural diatom assemblages. Limnology and Oceanography. 63:1056-1075.
- Yoo JI, O'Malley MA. 2018. Tuning Vector Stability and Integration Frequency Elevates Functional GPCR Production and Homogeneity in Saccharomyces cerevisiae. ACS Synthetic Biology. 7:1763-1772.