JEN NGUYEN | j.kimthu.nguyen@gmail.com

Goal: spread an appreciation for nature and critical thinking through scientific communication and research

Education

Massachusetts Institute of Technology
PhD in Microbiology. Sept 2012 – Feb 2020.
Advisor: Roman Stocker

ETH Zürich
Academic Guest. Sept 2015 – Feb 2020.

University of California, San Diego
MS in Biology. Received June 2011.
BS in Biology with Honors. Sept 2006 – June 2010.
Advisor: Amy Kiger

Awards

1. National Science Foundation (NSF) Postdoctoral Research Fellowship in Biology (PRFB)
   $138,000 USD over 2 years: July 1st 2021 to June 30th 2023.
2. Killam Postdoctoral Research Fellowship
   $104,000 CAD over 2 years: May 1st 2021 until beginning NSF PRFB July 1st 2021.
3. Best contributed talk. Ocean Microscale Biophysics Conference: Eilat, Israel. Nov 2015.
4. ThinkSwiss Research Fellow. Travel and living expenses for 3 months in Zürich, Switzerland. Summer 2009.

Research experience

Bacterial metabolites and their role in community stability and host phenotype
Postdoctoral Fellow (Apr 2022–present) with Eric Alm. MIT, Cambridge, MA.
- Design synthetic gut bacterial communities of fixed species composition and varied metabolic function
- Create a deep and diverse collection of bacterial isolates from the vaginal microbiomes of 100+ women
- Skills: bacterial genomics, computational and experimental assessment of bacterial function, bacterial culture and ecology, cluster computing, Python

Spatial structure as a mechanism of community resilience to environmental perturbation
Postdoctoral Fellow (Jan 2021–Feb 2022) with Carolina Tropini. University of British Columbia, Vancouver, Canada.
- Developed experimental model to study role of protected spatial niches in gut community recovery after diarrhea
- Designed and tested novel FISH probes for in situ and in vitro quantification of anaerobic bacteria
- Skills: fluorescence microscopy, anaerobic bacterial culture, 16S microbiome analyses, R

Minute-scale nutrient fluctuations and their implications for bacterial growth
Doctoral thesis (Apr 2012–Feb 2020) with Roman Stocker. MIT, Cambridge, MA.
Research Assistant (Oct 2017–Mar 2020). Institute of Environmental Engineering. ETH Zürich, Switzerland.
Visiting scientist (Oct 2015–Oct 2017). Institute of Environmental Engineering. ETH Zürich, Switzerland.
- Automated microfluidics and time-lapse imaging of E. coli grown under rapid changes in nutrient media
- Developed an image processing and analysis pipeline to quantify single-cell growth responses
- Skills: microfluidics, time-lapse microscopy, image analysis, MATLAB, low Reynolds number biophysics

First year graduate rotations (Nov 2012–Apr 2013). Interdepartmental Program in Microbiology. MIT.
- Co-evolution of Lactobacillus and mammalian hosts. Eric Alm & Susan Erdman. Bioengineering.
- Mutational trajectories of two-component systems. Michael Laub. Biology.
- Bacterial chemotaxis towards crude oil with Roman Stocker. Civil & Environmental Engineering.

The role of Dynamin in muscle remodeling and maintenance
Staff Research Associate (June 2011–June 2012) with Amy Kiger. UC San Diego, La Jolla, CA.
Masters student (Sept 2010–June 2011) with Amy Kiger and Inês Ribeiro. UC San Diego, La Jolla, CA.
Undergraduate researcher (Nov 2008–June 2010) with Amy Kiger and Inês Ribeiro. UC San Diego, La Jolla, CA.
- Studied genetic interactions between membrane regulating genes in Drosophila melanogaster
- Skills: Immunofluorescence, confocal imaging, RNA interference, Western blotting, cloning, fly pushing, ImageJ

Adenovirus infection via plus-end directed kinesins
Undergraduate researcher (Jun–Aug 2009) with Urs Greber and Martin Engelke. University of Zürich, Switzerland.

- Constructed motor domain mutants of kinesin isoforms and assayed effects of mutants on adenovirus infection
- Skills: human cell culture, transfection, cloning, fluorescence microscopy

Scientific articles

1. Jiménez-Martínez J*, Nguyen J*, Or D. Controlling pore-scale processes to tame subsurface biomineralization. 2022. Reviews in Environmental Science and Bio/Technology. *Equal contribution. Illustrated graphical abstract and Figure 2A.
2. Nguyen J, Pepin DM, Tropini C. Cause of effect? Spatial organization of pathogens and the gut microbiota in disease. 2021. Microbes and Infection. Illustrated Figures 1-4.
3. Nguyen J, Fernandez V, Pontrelli S, Sauer U, Ackermann M, Stocker R. A distinct growth physiology enhances bacterial growth under rapid nutrient fluctuations. 2021. Nature Communications.
4. Nguyen J, Lara Gutiérrez J, Stocker R. 2021. Environmental fluctuations and their effects on microbial communities, populations, and individuals. FEMS Microbiology Reviews. Illustrated graphical abstract.
5. Nguyen J, Tropini C. 2020. Shedding light on microbial biogeography. Nature. (News and Views)
6. Sekar K, Linker S, Nguyen J, Grünhagen A, Stocker R, Sauer U. 2020. Bacterial glycogen provides short-term benefits in changing environments. Applied and Environmental Microbiology. PMID: 32111592. Contributed image was selected for the issue's cover.
7. Behrendt L, Trampe E, Nord N, Nguyen J, Kühl M, Lonco D, Nyarko A, Dhinojwala A, Hershey O, Barton H. 2019. Life in the dark: Far-red absorbing cyanobacteria extend photic zones deep into terrestrial caves. Environmental Microbiology. PMID: 31390129.
8. Lee KS, Palatinsky M, Pereira F, Nguyen J, Fernandez V, Mueller A, Menolascina F, Daims H, Berry D, Wagner M, Stocker R. 2019. An automated Raman-based platform for sorting of live cells by functional properties. Nature Microbiology. PMID: 30886359.
9. Sekar K, Rusconi R, Sauls JT, Fuhrer T, Noor E, Nguyen J, Fernandez V, Buffing M, Berney M, Jun S, Stocker R, Sauer U. 2018. Synthesis and degradation of FtsZ quantitatively predict the first cell division in starved bacteria. Molecular Systems Biology. PMID: 30397005.
10. Fujita N, Huang W, Lin T, Groulx J, Jean S, Nguyen J, Kuchitsu Y, Koyama-Honda I, Mizushima N, Fukuda M, Kiger A. 2017. Genetic screen in Drosophila muscle identifies autophagy-mediated T-tubule remodeling and a Rab2 role in autophagy. eLIFE. 6:e23367. PMID: 28063257.
11. Yawata Y, Nguyen J, Stocker R, Rusconi R. 2016. Microfluidic studies of biofilm formation in dynamic environments. Journal of Bacteriology. PMID: 27274032. Illustrated Figure 1.
12. Nelson MB, Chase AB, Martiny JBH, Stocker R, Nguyen J, Lloyd K, Oshiro RT, Kearns DB, Schneider JP, Ringel PD, Basler M, Olson CA, Vuong HE, Hsiao EY, Roller BRK, Ackermann M, Smillie C, Chien D, Alm E, Jermy AJ. 2016. The Microbial Olympics 2016. Nature Microbiology. PMID: 27573121. Illustrated Figure 1.

Published science illustrations (in addition to those noted above)

1. Alcolombri U, Lei L, Meltzer D, Vardi A, Tawfik DS. 2017. Assigning the algal source of dimethylsulfide using a selective lyase inhibitor. ACS Chemical Biology. PMID: 28103686. Illustrated graphical abstract.
2. Fernandez V and Stocker R. 2016. Modus vivendi. Nature Physics 13, 326-327. Illustrated Figure 1.
3. Stocker R. 2015. The 100 µm length scale in the microbial ocean. Aquatic Microbial Ecology 76, 189-194. Illustrated Figure 1.
4. Nguyen J. 2015. What is One? https://www.youtube.com/watch?v=OMCMyWYmN8A *3rd place and People's Choice Award in departmental (MIT CEE) video competition.

Conferences and summer schools

1. Cold Spring Harbor Microbiome. Virtual: Oct 20-23, 2020. Poster: "Bacterial spatial organization provides a microscale mechanism of community dynamics"
2. Swiss Microbial Meeting. Lausanne, Switzerland: Jan 31-Feb 2, 2019. Contributed talk: "Nutrient fluctuations characteristic of microscale heterogeneity reduce bacterial growth rates"

3. Physical Approaches to Understanding Microbial Life (summer school). Paris, France: Aug 28-Sept 6, 2018. Contributed talk: "Nutrient fluctuations characteristic of microscale heterogeneity reduce bacterial growth rates"
4. Microbial Stress Responses Gordon Research Seminar & Conference. Mount Holyoke College, MA: Jul 14-20, 2018. Poster: "Rapid nutrient fluctuations reduce bacterial growth"
5. Microscale Ocean Biophysics. Eilat, Israel. Oct 31-Nov 4, 2016. Contributed talk: "The consequences of nutrient fluctuations on bacterial growth"
6. International Society of Microbial Ecology. Montreal, Canada: Aug 21-26, 2016. Contributed talk: "The consequences of fluctuating nutrient environments on bacterial growth"
7. Swiss Microbial Meeting. Ascona, Switzerland: Sep 10-12, 2015. Poster: "Bacterial growth and ecology in fluctuating environments"
8. Microscale Ocean Biophysics. Aspen, CO: Jan 11-16, 2015. Poster: "Bacterial growth in fluctuating environments"
9. International Society of Microbial Ecology. Seoul, South Korea: Aug 24-29, 2014. Poster: "Growth in fluctuating environments: microfluidic-based insights into natural variability"

Invited seminars

University of British Columbia. Life Sciences Institute Seminar Series. March 19, 2021.
University of British Columbia. Department of Microbiology and Immunology. June 3, 2019.
Newcastle University. NUFEB: Frontiers in Engineering Biology. October 25, 2018.
Massachusetts Institute of Technology. Microbial Sciences Seminar. May 11, 2016.

Mentoring (academic research)

Juanita Lara Gutiérrez (PhD student, ETH Zürich). July 2018–present.
Daniel Sellers (rotating PhD student, MIT). Dec 2022–Jan 2023.
Rashi Jeeda (rotating PhD student, MIT). Nov–Dec 2022.
Victoria Chen (rotating PhD student, MIT). Nov–Dec 2022.
Kisa Naqvi (Undergraduate, University of British Columbia). May–Dec 2021.
Ernie Hwaun (Undergraduate, UC San Diego). Spring 2011–Spring 2012.
Grace Grogman (Undergraduate, UC San Diego). Winter & Spring 2011.

Teaching, science outreach and community service

Instructor, MICB 430, University of British Columbia (Sept–Dec 2021)
Volunteer reviewer, Undergraduate Journal of Experimental Microbiology & Immunology, UBC (Jun 2021)
Volunteer tutor, Step Up Tutoring in partnership with LAUSD (Nov 2020–Nov 2021)
Instructor, ARTLAB at the University of Zürich (April 23-27, 2019)
Communication Lab Fellow, MIT Department of Biological Engineering (2013–2015)
Team Mentor, Boston Museum of Science, Eurekafest (June 2015)
Teaching Assistant, 9 courses total at UC San Diego and MIT (2008–2013)

- UC San Diego: Multicellular Life (3x), Structural Biochemistry, Cell Biology (2x), Mammalian Physiology (2x)
- MIT: Introductory Biology (7.015)

Instructor, MIT Educational Studies Program, SPLASH and SPARK (Spring and Fall 2013)
Workshop Leader, UCSD Literature & Writing, non-fiction writing course LTWR 8C: (Fall 2010 and 2011)
Summer Camp Teaching Assistant, San Diego Natural History Museum (Summer 2011)

References

Roman Stocker. Graduate advisor. romanstocker@ethz.ch
Martin Ackermann. PhD thesis committee member. martin.ackermann@env.ethz.ch
Eric Alm. Postdoctoral advisor. ejalm@mit.edu