Eric A. Klein

Associate Professor of Biology
Center for Computational and Integrative Biology
Rutgers University-Camden

CONTACT INFORMATION

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PROFESSIONAL EXPERIENCE

Rutgers University-Camden, Camden, NJ 2013-Present
Associate Professor (2020-Present)
Assistant Professor (2013-2020)
Department of Biology and Center for Computational and Integrative Biology
Member of the Rutgers Microbial Biology Graduate Group

Princeton University, Princeton, NJ 2009- 2013
Post-doctoral fellow, Department of Molecular Biology; PI: Zemer Gitai

University of Pennsylvania, Philadelphia, PA 2008-2009
Post-doctoral researcher, Department of Pharmacology; PI: Richard Assoian

EDUCATION

PhD in Pharmacology, University of Pennsylvania, Philadelphia, PA.....December 2007
Thesis: Regulation of *cyclin D1* expression by Rac, the actin cytoskeleton, and extracellular matrix compliance. Advisor: Professor Richard K. Assoian
BS in Chemical Engineering, University of Pennsylvania, Philadelphia, PA.....May 2000
BA in Biochemistry, University of Pennsylvania, Philadelphia, PA .....May 2000

HONORS AND AWARDS

Rutgers-Camden Chancellor's Research Award..... 2025
Rutgers-Camden Faculty Fellowship..... 2022
Theobald Smith Society (NJ Chapter of ASM) Young Investigator Award..... 2019
National Science Foundation CAREER Award (MCB-1553004)..... 2016
Ruth L. Kirschstein National Research Service Award (NIH F32GM090684)..... 2010-2013
Pharmacology Department John O'Brien Award..... 2006
Appointment to Cell and Molecular Biology Training Grant, U. of Pennsylvania..... 2000-2002
Class of 1939 Graduate Fellowship, University of Pennsylvania..... 2000

PROFESSIONAL AFFILIATIONS

American Society for Microbiology
American Society for Biochemistry and Molecular Biology
Biophysical Society
Rutgers Center for Lipid Research
Cancer Institute of New Jersey
Penn Center for Musculoskeletal Disorders

INVITED RESEARCH TALKS

Biology Department, Villanova University 2025
Department of Microbiology and Immunology, Drexel University 2024
Gordon Research Conference on Bacterial Cell Surfaces, Portland, ME
Cancer Metabolism and Immunology Program, Cancer Institute of New Jersey
Biological Sciences Department, University of Texas- Dallas
Gordon Research Conference on Glycolipid and Sphingolipid Biology, Galveston, TX
Microbiology Department, Michigan State University
Discover BMB, American Society of Biochemistry and Molecular Biology, Seattle, WA 2023
Session Chair, Gordon Conf. on Molecular and Cellular Biology of Lipids, Waterville Valley, NH
Rutgers University-Camden Faculty Fellow Lecture, Camden, NJ
Biology Department, University of Mississippi 2022
Sphingolipid Biology Webinar
Microbiology Graduate Program, University of Delaware 2021
CauloCon 3.0
Biology Department, Rutgers University-Camden
Microbial Systems Symposium, University of Delaware 2019
Rutgers Center for Lipid Research, New Brunswick, NJ
Biology Department, University of the Sciences, Philadelphia, PA
Biochemistry and Molecular Biology Department, University of Chicago
Biological Chemistry Department, Johns Hopkins University
Molecular Genetics and Microbiology Department, SUNY Stony Brook
ASM Microbe, Mini-symposium moderator and speaker
Bacteria Club, Stanford University
Physics Department, UC Irvine
Gordon Conference on the Molecular and Cellular Biology of Lipids
Molecular, Cellular, and Biological Sciences, U. of New Hampshire
Rutgers Microbiology Symposium 2018
Microbiology Department, University of Pennsylvania
Microbiology and Biochemistry Department, Rutgers University
Biology Department, Villanova University 2017
CCIB Retreat, Rutgers University-Camden 2016
Biology Department, Hofstra University
Session chair, Gordon Conference on Bacterial Cell Surfaces
Molecular Biology Department, Rowan School of Medicine
Microbiology Department, Pearson Lab, New York University

Gordon Conference on Microbial Adhesion and Signal Transduction..... 2015
Bacteria Club, Stanford University
Microbiology Department, University of Pennsylvania
SEBS/CCIB Retreat, Rutgers University-Camden
Rutgers Microbiology Symposium, New Brunswick, NJ
Molecular UTI Conference, Malmo, Sweden..... 2014
Biology Department, Rutgers University-Camden
Glenn Minisymposium on Aging, Princeton University 2013
Biology Department, Rutgers University-Camden
Center for Computational and Integrative Biology, Rutgers University-Camden
Biology Department, Georgetown University
American Society for Cell Biology..... 2010
Zing Bacterial Cell Biology Conference
EMBO Workshop on System Dynamics of Intracellular Communication 2007

PEER-REVIEWED PUBLICATIONS (*= equal contributions, #= RU undergraduate, ^=RU graduate student, %=RU postdoc, $= high school student, &=corresponding author)

1. Dhakephalkar, T.^, Guan, Z., **Klein, E.A.&** CpgD is a phosphoglycerate cytidylyltransferase required for ceramide diphosphoglycerate synthesis. *bioRxiv* (2025).
2. Dunkley, T.^, Shain, D.H., **Klein, E.A.&** A histidine-rich extension of the mitochondrial F0 subunit ATP6 from the ice worm *Mesenchytraeus solifugus* increases ATP synthase activity in bacteria. *FEBS Letters* (2025), 599(8):1113-1121.
3. DiGianivittorio, P., Hinkel, L.A.%, Mackinder, J.R., Schutz, K., **Klein, E.A.**, Wargo, M.J. The *Pseudomonas aeruginosa sphBC* genes are important for growth in the presence of sphingosine by promoting sphingosine metabolism. *Microbiology* (2025), 171(1): 001520.
4. Uchendu, C.G.^, Guan, Z., **Klein, E.A.&** Spatial organization of bacterial sphingolipid synthesis enzymes. *Journal of Biological Chemistry* (2024), 300(5): 170276.
5. Shain, D.H. and **Klein, E.A.&** Genome assembly of *Pseudomonas* sp. strain SED1^{T}, a psychrotolerant bacterium isolated from Deception Glacier (Washington, USA). *Microbiology Resource Announcements* (2024), 0:e00125-24.
6. Dhakephalkar, T.^, Stukey, G.J.^, Guan, Z., Carman, G.M., **Klein, E.A.&** Characterization of an evolutionarily distinct bacterial ceramide kinase from *Caulobacter crescentus*. *Journal of Biological Chemistry* (2023), 299(7): 104894.
7. Zik, J.J., Yoon, S.H., Guan, Z., Skidmore, G.S.^, Gudoor, R.R., Davies, K.M., Deutschabuer, A.M., Goodlett, D.R., **Klein, E.A.**, Ryan, K.R. *Caulobacter* lipid A is conditionally dispensable in the absence of *fur* and in the presence of anionic sphingolipids. *Cell Reports* (2022), 39(9): 110888.
8. Stankeviciute, G.^, Tang, P., Ashley, B., Chamberlain, J.C.^, Hansen, M.E.B., Coleman, A.$, D'Emilia, R.#, Fu, L.$, Mohan, E.C., Nguyen, H.$, Guan, Z., Campopiano, D.C., **Klein, E.A.&** Convergent evolution of bacterial ceramide synthesis. *Nature Chemical Biology* (2022), 18(3): 305.
9. Revaitis, N.T.^, Niepielko, M.G., Marmion, R.A., **Klein, E.A.**, Piccoli, B., Yakoby, N. Quantitative analyses of EGFR localization and trafficking dynamics in the follicular epithelium. *Development* (2020), 147(15): dev183210.

10. Werner, J.N.*, Shi, H.*, Hsin, J., Huang, K.C., Gitai, Z., **Klein, E.A.&** AimB is a small protein regulator of cell size and MreB assembly. *Biophysical Journal* (2020), 119(3): 593.
11. Moorthy, S.%, Byfield, F.J., Janmey, P.A., **Klein, E.A.&** Matrix stiffness regulates endosomal escape of uropathogenic *E. coli*. *Cellular Microbiology* (2020), 22(5): e13196.
12. de Young, K.D.^, Stankeviciute, G.^, **Klein, E.A.&** Sugar-phosphate metabolism regulates stalk elongation in *Caulobacter crescentus*. *Journal of Bacteriology* (2020), 202(4): e00468.
13. Stankeviciute, G.^, **Klein, E.A.&** Purification and HPLC analysis of cell wall muropeptides from *Caulobacter crescentus*. *Bio-protocol* (2019), 9(21): e3421.
14. Mandal, K., Pogoda, K., Nandi, S., Mathieu, S., Kasri, A., **Klein, E.A.**, Radvanyi, F., Goud, B., Janmey, P.A., Manneville, J.B. Role of a kinesin motor in cancer cell mechanics. *Nano Letters* (2019), 19(11): 7691.
15. Moffett, S.X.^, **Klein, E.A.**, Brannigan, G., Martin, J.V. L-3,3',5-triiodothyronine and pregnenolone sulfate inhibit Torpedo nicotinic acetylcholine receptors. *PLoS One* (2019), 14(10): e0223272.
16. Stankeviciute, G.^, Guan, Z., Goldfine, H., **Klein, E.A.&** *Caulobacter crescentus* adapts to phosphate-starvation by synthesizing anionic glycoglycerolipids and a novel glycosphingolipid. *mBio* (2019), 10(2): e00107.
17. Stankeviciute, G.^, Miguel, A.V., Radkov, A., Chou, S., Huang, K.C., **Klein, E.A.&** Differential modes of crosslinking establish spatially distinct regions of peptidoglycan in *Caulobacter crescentus*. *Molecular Microbiology* (2019), 111(4): 995-1008.
18. Ratti. M.#, Naddeo, J.J.#, Griepenburg, J.C., O'Malley, S.M., Bubb, D.M., **Klein, E.A.&** Production of metal nanoparticles by pulsed laser-ablation in liquids: a tool for studying the antibacterial properties of nanoparticles. *Journal of Visualized Experiments*, (2017), 124: e55416.
19. Ratti, M.#, Naddeo, J.J.#, Tan, Y.#, Griepenburg, J.C., Tomko, J.#, Trout, C.#, O'Malley, S.M., Bubb, D.M., and **Klein, E.A.&** Irradiation with visible light enhances the antibacterial toxicity of silver nanoparticles produced by laser ablation. *Applied Physics A*, (2016), 122:346.
20. Moorthy, S.%, Keklak, J.^, and **Klein, E.A.&** Perspective: Adhesion mediated signal transduction in bacterial pathogens. *Pathogens* (2016), 5(1):23.
21. Naddeo, J.J.#, Ratti, M.#, O'Malley, S.M., Griepenburg, J.C., Bubb, D.M., **Klein, E.A.&** Antibacterial properties of nanoparticles: a comparative review of chemically synthesized and laser-generated particles. *Advanced Science, Engineering, and Medicine* (2015), 7(12):1044-1057.
22. **Klein, E.A.** and Gitai, Z. Draft genome sequence of uropathogenic *Escherichia coli* strain J96. *Genome Announc.* (2013),1(1):e00245-12.
23. **Klein, E.A.***, Schlimpert, S.*, Hughes, V., Brun, Y.V., Thanbichler, M., and Gitai, Z. Physiological role of stalk lengthening in *Caulobacter crescentus. Commun Integr Biol* (2013), 6:e24561.
24. Schlimpert, S.*, **Klein, E.A.***, Briegel, A., Hughes, V., Kahnt, J., Bolte, K., Maier, U.G., Brun, Y., Jensen, G.J., Gitai, Z., and Thanbichler, M. General Protein Diffusion Barriers Create Compartments within Bacterial Cells. *Cell* (2012), 151(6):1270-82.
25. Levental, I., Levental, K.R., **Klein, E.A.**, Assoian, R.K., Miller, R.T., Wells, R.G., and Janmey, P.A. A simple indentation device for measuring micrometer-scale tissue stiffness. *J. Physics: Condensed Matter* (2010), 22(19): 194120.
26. Cerezo, A., Guadamillas, M.C., Goetz, J.G., Sanchez-Perales, S., **Klein, E.A.**, Assoian, R.K., and del Pozo, M.A. Absence of caveolin-1 increases proliferation and anchorage independent growth by a Rac-dependent, Erk-independent mechanism. *Molecular and Cellular Biology* (2009), 29(18):5046-59.

27. **Klein, E.A.**, Castagnino P., Yin, L., Byfield, F.J., Kothapalli, D., Xu, T., Levental, I., Hawthorne, E., Janmey, P.A., and Assoian, R.K. Cell cycle control by physiological matrix elasticity and *in vivo* tissue stiffening. *Current Biology* (2009), 19(18):1511-8.
28. Assoian, R.K. and **Klein E.A.** Growth control by intracellular tension and extracellular stiffness. *Trends Cell Biol* (2008), 18(7):347-52.
29. **Klein, E.A.** and Assoian, R.K. Transcriptional regulation of the cyclin D1 gene at a glance. *J Cell Sci*. (2008), 121(23):3853-7.
30. Yang, C., **Klein, E.A**., Assoian, R.K., Kazanietz, M.G. Heregulin beta1 Promotes Breast Cancer Cell Proliferation through Rac/Erk-dependent Induction of Cyclin D1 and p21 Cip1. *Biochem J* (2008), 410(1):167-75.
31. **Klein, E.A.**, Campbell, L.E., Kothapalli, D., Fournier, A.K., Assoian, R.K. Joint requirement for Rac and ERK activities underlies the mid-G1 phase induction of cyclin D1 and S phase entry in both epithelial and mesenchymal cells. *J Biol Chem* (2008), 83(45):30911-8.
32. **Klein, E.A.**, Yung, Y., Castagnino, P., Kothapalli, D., Assoian, R.K. Cell adhesion, cellular tension, and cell cycle control. *Methods Enzymol* (2007), 426:155-75.
    [Provided 50% of the writing and edited manuscript.]
33. **Klein, E.A.**, Yang, C., Kazanietz, M.G., Assoian, R.K. NFkappaB-independent signaling to the cyclin D1 gene by Rac. *Cell Cycle* (2007), 6(9):1115-21.
34. Zhao, L., Cuff, C.A., Moss, E., Wille, U., Cyrus, T., **Klein, E.A.**, Praticò, D., Rader, D.J., Hunter, C.A., Puré, E., Funk, C.D. Selective interleukin-12 synthesis defect in 12/15-lipoxygenase deficient macrophages associated with reduced atherosclerosis in a mouse model of familial hypercholesterolemia. *J Biol Chem* (2002), 277(38):35350-6.

SERVICE

Camden Workgroup- Academic and Workplace Behaviors and Environment Survey 2025
Editorial Board, *Journal of Biological Chemistry* 2024-present
Faculty Leadership Program, Rutgers-Camden 2024-2025
Conference Organizer: Sphingolipids - key communicators from the microbial world 2023
Computational and Integrative Biology Graduate Program Director 2022-present
President, Theobald Smith Society (NJ Chapter of ASM) 2020
National Science Foundation Grant Review Panelist 2019-present
Biology Graduate Program Director 2018-2022
Rutgers-Camden Community Leadership Center, Faculty fellow 2018-present
Provost's Research Fund, grant reviewer 2018-present
Faculty Search Committee (4 searches) 2017-2018
PennPORT Advisory Committee 2016-2020
Rutgers-Camden Title IX Team 2015-2017
Rutgers-Camden Faculty Senate 2014-2016
Executive Committee, Center for Computational and Integrative Biology 2014-present
Rutgers University Institutional Biosafety Committee 2014-present
Health Sciences Major Advisory Committee 2013-present
Biology Undergraduate Committee 2013-present
Biology Graduate Committee 2013-present

TEACHING AND ADVISING

CIB620 Lab Practices (Responsible Conduct in Research) 2022-present
BIO596 How to Win a Nobel Prize 2021-present
BIO103 Biology of Cancer 2018
MATLAB Image analysis workshop 2018
CIB565 Essentials of Biophysics 2017-present
BIO495/499 Biology Honors Thesis 2016-present
BIO399 Current Topics in Biology ..... 2014 and 2021
BIO341 General Physiology (Biochemistry and Cell Biology) 2014-present
BIO342 General Physiology Laboratory 2014-present
BIO530 Molecular Carcinogenesis 2013-2017
Summer Academy in Applied Science and Technology, U. of Pennsylvania 2006
BIO045 Critical Reading of Scientific Literature, U. of Pennsylvania 2002-2003
BIO202 Cell Biology and Biochemistry, Teaching Assistant, U. of Pennsylvania 2001
MEAM333 Heat and Mass Transport, Teaching Asst, Mech. Engineering, U. of Pennsylvania 2000
CHE353 Advanced Chemical Engineering Science, Teaching Assistant, U. of Pennsylvania 1999

STUDENT MENTORSHIP

Undergraduates (16 total):

1. Flynn Semenuk (2024-present) ***Awards:*** U-RISE Undergraduate Research Fellowship
2. Lombeh Tengbeh (2023)
3. Kabiru Babalola (2021)
4. Rachel D'Emilia (2019)
5. William Myers (2018-2019) ***Awards:*** MARC Undergraduate Research Fellowship
6. Veronica Rosselli (2018-2019) ***Awards:*** Sandy Stewart Undergraduate Research Scholarship
7. Ali Siddiqui (2016-2017)
8. Ariel Hartman (2016-2017)
9. Preet Raval (2016)
10. Ryan Snow (2015-2016)
11. Kevin de Young (2015-2017)- ***Awards:*** Sandy Stewart Undergraduate Research Scholarship
12. Michael Bamimore- ***Grants:*** Arts and Sciences Dean's Research Grant; American Society for Microbiology Undergraduate Research Fellowship; Arts and Sciences Dean's Research Grant
13. Christopher Cherfane (2014)
14. Abdullah Abdelaziz (2014)
15. Matthew Ratti (2013-2017)- ***Grants*****:** NASA New Jersey Space Grant Consortium Academic Year Fellowship; Dean's Undergraduate Travel Award; Dean's Undergraduate Research Grant. ***Awards*****:** Dean's Undergraduate Research Prize.
16. Joseph Naddeo (2013-2016)- ***Grants:*** NASA New Jersey Space Grant Consortium Academic Year Fellowship. ***Awards:*** Dean's Undergraduate Research Prize.

Masters students (8 total):

1. Labenyimoh Patrick, Computational and Integrative Biology MS (2023-2025)
2. Anupam Dalmia, Computational and Integrative Biology MS (2023-2025)
3. Sarah Mulla, Biology MS (2020-2022)
4. Anushriya Subedy, Computational and Integrative Biology MS (2019-2021)
5. Antonella Abou Samra, Biology MS (2019-2021)
6. Kevin de Young, Biology MS (2017-2019)
7. Sreelekha Revur, Computational and Integrative Biology MS (2015-2017)
8. Julia Keklak, Biology MS (2014-2016)- ***Grants:*** Carl Storm Underrepresented Minority (CSURM) Travel Fellowship- Microbial Adhesion & Signal Transduction Gordon Research Conference; Dean's Graduate Conference Travel Grant

Ph.D. students (5 total):

1. Tanisha Dhakephalkar, Computational and Integrative Biology (2023-present). ***Grants:*** Chancellor's Grant for Independent Student Research ($5,000); Dean's Graduate Conference Travel Grant, Meeting for Molecular Genetics of Bacteria and Phages, August 7-11, 2023 ($500)
2. Chioma Uchendu, Computational and Integrative Biology (2022-present). ***Awards:*** American Society for Microbiology Future Leaders Mentorship Fellowship ***Grants:*** Chancellor's Grant for Independent Student Research ($4,500); Dean's Graduate Conference Travel Grant, Meeting for Molecular Genetics of Bacteria and Phages, August 7-11, 2023 ($500)
3. Joshua Chamberlain, Computational and Integrative Biology (2021-present). ***Grants:*** Chancellor's Grant for Independent Student Research ($5,000); Dean's Graduate Conference Travel Grant, Meeting for Molecular Genetics of Bacteria and Phages, August 1-5, 2022 ($500); Dean's Graduate Conference Travel Grant, Gordon Conference on the Molecular Biology of Lipids, July 22-28, 2023 ($500)
4. Truman Dunkley, Computational and Integrative Biology (2021-2025). ***Grants:*** Chancellor's Dissertation Completion Grant ($20,000); Chancellor's Grant for Independent Student Research ($5,000); Dean's Graduate Conference Travel Grant, Gordon Conference on Microbial Adhesion and Signal Transduction, July 16-21, 2023 ($500)
5. Gabriele Stankeviciute, Computational and Integrative Biology (2016-2020). ***Grants:*** Dean's Graduate Conference Travel Grant, Great Wall Symposium; Dean's Graduate Research Grant.

Postdoctoral scientists (2 total):

1. Lauren Hinkel (2021-2022)
2. Sudha Moorthy (2015-2020)

High school students (8 total):

1. Alexander Ortiz Pantoja (2024)
2. Marissa Grapine (2023-2024)
3. Raven McKinnon (2022)
4. Chirag Choudary (2019)- ***Awards:*** 1st place in Unionville-Chadds Ford district science fair, 2nd place in the Delaware Valley Science Fair, Special Award from the Institute of Food Technologists

5. Hung Nguyen (2019)
6. Larina Fu (2018)
7. Aimiyah Coleman (2018)
8. Daniel Shao (2016)

CURRENT FUNDING

NSF MCB-2224195 (7/22-6/25, NCE to 6/26) Role: PI
RUI: Mechanisms and physiological functions of bacterial sphingolipids

NSF MCB-2031948 (7/20-6/25, NCE) Role: PI
SynBioSphinx: building designer lipid membranes for adaptive resilience to environmental challenges

Rutgers University TechXpress (12/24-5/25) Role: PI
Engineering ATP6 for increased ATP production

Chancellor's Grant for Faculty Research (9/24-8/25) Role: Co-PI
Collaborative development of a Rutgers-Camden Microbiome Research Program

PENDING FUNDING

NIH R21 Role: PI
Percentile: 10.0
"Delivery of a genetically engineered MT-ATP6 to treat mitochondrial disease"

NSF Role: PI
"Collaborative Research: RUI: Life without lipopolysaccharide- Synthesis of ceramide phosphoglycerate"

NSF Role: Co-PI
"Energy Anabolism as a Modulator of Adaptation in Glacier Ice Worms"

Rutgers-Camden Role: PI
Mid-Career Faculty Grant
Bacterial sphingolipids: elucidating their regulation and function within the host

Rutgers-Camden Role: PI
Graduate Program Enhancement Grant
Software Carpentry

COMPLETED FUNDING

NSF CBET-2215917 Role: Co-PI
MRI: Acquisition of a MALDI-TOF mass spectrometer for accurate mass determination of biomolecules

NSF MCB-1553004 Role: PI
CAREER: Composition, mechanical properties, and synthesis of the *Caulobacter crescentus* stalk

Rutgers-Camden Conference and Symposium Grant Role: PI
Sphingolipids - key communicators from the microbial world

Rutgers- Camden Annual Faculty Fellow Role: PI
Another mystery of the Sphinx: New insights into the biology of sphingolipids

Rutgers-Camden JHSC Seed Funding Initiative Role: Co-PI
Effects of bacterial infection on mitochondrial physiology

Rutgers University Core Utilization Grant Role: PI
Transcriptional profiling of the nitric oxide response in uropathogenic E. coli

Provost's Research Grant Role: PI
Bacterial adhesion: A novel regulator of prokaryotic signal-transduction

NSF CMMI-1531783 Role: Co-PI
MRI: Acquisition of a femtosecond laser system to enable multiphoton polymerization, photoporation, and laser ablation in liquids research

Busch Biomedical Research Grant Role: PI
Laser ablation synthesis of nanoparticles: innovations for antibiotic development