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
Department of Biology and Center for Computational and Integrative Biology
Member of the Rutgers Microbial Biology Graduate Group
Associate Professor 2020-Present
Assistant Professor 2013-2020

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 Annual Faculty Fellow 2022-2023
Theobald Smith Society Young Investigator Award 2019
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
Rutgers Center for Lipid Research
Cancer Institute of New Jersey
Penn Center for Musculoskeletal Disorders

PEER-REVIEWED PUBLICATIONS (*= co-first author, #=undergraduate, ^=graduate student, $=high school student, &=corresponding author) (h-index 18; i10-index 19)

1. Dhakephalkar T.^, Stukey, G.J.^, Guan, Z., Carman, G.M., **Klein, E.A.&** Characterization of an evolutionarily distinct bacterial ceramide kinase from *Caulobacter crescentus*. *J. Biological Chemistry* (2023), 299(7): 104894.
2. Zik, J.J., Yoon, S.S., Guan, Z., Stankeviciute, G.^, Gudoor, R.R., Davies, K.M., Deutschbauer, A.M., Goodlett, D.R., **Klein, E.A.**, Ryan, K.R. *Caulobacter* requires anionic sphingolipids and deactivation of fur to lose lipid A. *Cell Reports*, (2022), 39(9): 110888.
3. Stankeviciute, G.^, Tang, P., Ashley, B., Chamberlain, J.D.^, 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. Stankeviciute, G.^, **Klein, E.A.&** Purification and HPLC analysis of cell wall muropeptides from *Caulobacter crescentus*. *Bio-protocol* (2019), 9(21): e3421.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. Moorthy, S.%, Keklak, J.^, and **Klein, E.A. &** Perspective: Adhesion mediated signal transduction in bacterial pathogens. *Pathogens* (2016), 5(1):23.
16. 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.
17. **Klein, E.A.** and Gitai, Z. Draft genome sequence of uropathogenic *Escherichia coli* strain J96. *Genome Announc.* (2013),1(1):e00245-12.
18. **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.

19. 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.
20. 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.
21. 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.
22. **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.
23. Assoian, R.K. and **Klein E.A.** Growth control by intracellular tension and extracellular stiffness. *Trends Cell Biol* (2008), 18(7):347-52.
24. **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.
25. 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.
26. **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.
27. **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.
28. **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.
29. 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.

CURRENT FUNDING

NSF MCB-2224195 (7/22-6/25) 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

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

Rutgers University Core Utilization Grant (2021) Role: PI

Transcriptional profiling of the nitric oxide response in uropathogenic E. coli

Provost's Research Grant (1/18-12/19) Role: PI
Bacterial adhesion: A novel regulator of prokaryotic signal-transduction

NSF CMMI-1531783 (8/15-8/17) 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 (8/15-7/17) Role: PI
Laser ablation synthesis of nanoparticles: innovations for antibiotic development

INVITED RESEARCH TALKS

Discover BMB, American Society of Biochemistry and Molecular Biology, Seattle, WA 2023
Session Chair, Gordon Conference 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
Microbiology Symposium, University of Delaware 2019
Rutgers Center for Lipid Research, New Brunswick, NJ
Biology Department, University of the Sciences, Philadelphia, PA
Biophysics Department, University of Chicago
Microbiology Department, Johns Hopkins University
Molecular Genetics and Microbiology, SUNY Stony Brook
ASM Microbe 2019, Symposium Moderator
Bacteria Club, Stanford University
Physics Department, University of California- Irvine
Gordon Conference on Molecular and Cellular Biology of Lipids, Waterville Valley, NH
Molecular, Cellular, and Biomedical Sciences Department, University 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, Mt. Snow, VT
Molecular Biology Department, Rowan SOM
Microbiology Department, Pearson Lab Meeting, New York University
Gordon Conference on Microbial Adhesion and Signal Transduction, Newport, RI 2015
Bacteria Club Seminar, Stanford University
Microbiology Department Seminar, University of Pennsylvania
SEBS/CCIB Retreat, Rutgers University-Camden
Rutgers Microbiology Symposium, New Brunswick, NJ
Molecular UTI Conference, Malmo, Sweden 2014
Biology Department Seminar, Rutgers University-Camden
Glenn Minisymposium on Aging, Princeton University.....2013
Biology Department Seminar, Rutgers University-Camden

Center for Computational and Integrative Biology, Rutgers University-Camden
Biology Department Seminar, Georgetown University
American Society for Cell Biology, Philadelphia, PA.....2010
Zing Bacterial Cell Biology Conference, Playa del Carmen, Mexico
EMBO Workshop on Sys. Dynamics of Intracellular Comm., Maale Hachamisha, Israel.....2007

SERVICE

Doctoral Fellows Committee..... 2023-present
Busch Biomedical Advisory Committee 2023-present
Graduate Program Director, Computational and Integrative Biology..... 2022-present
Biology Graduate Program Director 2018-2022
PennPORT Advisory Committee..... 2016-present
Rutgers-Camden Title IX Team..... 2015-2017
Rutgers-Camden Faculty Senate..... 2014-2016
Executive Committee, Center for Computational and Integrative Biology..... 2014-2022
Rutgers University Institutional Biosafety Committee..... 2014-present
Health Sciences Major Advisory Committee..... 2013-present
Biology Undergraduate Committee..... 2013-2021
Biology Graduate Committee..... 2013-2021

TEACHING AND ADVISING

BIO596 How to Win a Nobel Prize?..... 2021-present
BIO103 Biology of Cancer 2018
CIB565 Essentials of Biophysics..... 2017-present
BIO495/499 Biology Honors Thesis..... 2016-present
BIO399 Current Topics in Biology.....2014, 2021
BIO341 General Physiology..... 2014-present
BIO342 General Physiology Laboratory..... 2014-present
BIO530 Molecular Carcinogenesis..... 2013-Present
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

Undergraduate (15 total):

1. 2023: Lombeh Tengbeh
2. 2021: Kabiru Babalola
3. 2019: Rachel D'Emilia
4. 2018-2019: William Myers
5. 2018-2019: Veronica Rosselli (Honors thesis)
6. 2016-2017: Ali Siddiqui
7. 2016-2017: Ariel Hartman
8. 2016: Preet Raval- REU summer research program
9. 2015-2017: Kevin de Young (Honors thesis)
10. 2015-2016: Ryan Snow
11. 2014-2016: Michael Bamimore

12. 2014: Christopher Cherfane
13. 2014: Abdullah Abdelaziz
14. 2013-2016: Joseph Naddeo
15. 2013-2017: Matthew Ratti

Graduate: (8) Master's and (5) Ph.D. students

1. 2023-PRESENT: (Computational and Integrative Biology MS) Labenyimoh Patrick
2. 2023-PRESENT: (Computational and Integrative Biology MS) Anupam Dalmia
3. 2022-PRESENT: (Computational and Integrative Biology PhD) Tanisha Dhakephalkar
4. 2022-PRESENT: (Computational and Integrative Biology PhD) Chioma Uchendu
5. 2021-PRESENT: (Computational and Integrative Biology PhD) Joshua Chamberlain
6. 2021-PRESENT: (Computational and Integrative Biology PhD) Truman Dunkley
7. 2022: (Biology MS) Sarah Mulla
8. 2021: (Computational and Integrative Biology MS) Anushriya Subedy
9. 2021: (Biology MS) Antonella Abou Samra
10. 2020: (Computational and Integrative Biology PhD) Gabriele Stankeviciute
11. 2019: (Biology MS) Kevin de Young
12. 2017: (Computational and Integrative Biology MS) Sreelekha Revur
13. 2016: (Biology MS) Julia Keklak

Postdoctoral Scientists

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

Thesis Committee Membership (2013-2023)

1. PhD thesis committees- 16 total
2. MS thesis committees- 44 total