

Joel A. Finbloom, Ph.D.

Faculty of Pharmaceutical Sciences
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Education

University of California, Berkeley. Berkeley, CA 2013-2018

Ph.D. Chemistry.

Thesis: Supramolecular Chemical Biology for Applications in Protein Modification and Nanomedicine

Northwestern University. Evanston, IL 2009-2013

B.A. Chemistry. *Cum Laude*

Thesis: pH-Sensitive Self-Assembling Peptide Amphiphiles for the Targeted Treatment of Cancer

Research and Work Experience

Assistant Professor (Tenure-Track) 2023-present

Faculty of Pharmaceutical Sciences, University of British Columbia

- Leading a research lab within the Faculty division of Nanomedicine and Chemical Biology
- Developing bioinspired nanomaterials to study and treat microbial-related disease – treating antibiotic resistant bacterial infections and improving the oral delivery of probiotics
- Supervising student and postdoctoral trainees in laboratory techniques, experimental design, scientific writing and communication

UCSF Health Innovation Via Engineering Postdoctoral Fellow 2018-2022

Laboratory of Prof. Tejal Desai, University of California San Francisco

- Developed polymeric nanomaterials to facilitate the co-delivery of synergistic antimicrobials to treat bacterial biofilms and cystic fibrosis lung infections
- Designed and formulated the physicochemical properties of colloidal scaffolds to improve cellular interactions and activation for applications in growth factor delivery and regenerative medicine

National Defense Science and Engineering Graduate Fellow 2013-2018

Laboratory of Prof. Matthew Francis, University of California Berkeley

- Designed and synthesized supramolecular turn-on probes for disease detection by xenon NMR/MRI
- Functionalized and evaluated protein-based nanomaterials for tumor imaging and drug delivery
- Developed new chemical reactions for use in site-specific protein modification and bioconjugation

Global Scholar 2013-2015

PreScouter Consulting Inc.

- Advised companies on the development of new R&D based on academic research
- Connected industry R&D divisions with leaders in academic research for new partnerships

Undergraduate Researcher 2011-2013

Laboratory of Prof. Samuel Stupp, Northwestern University

- Developed dynamic pH-responsive peptide amphiphile nanofibers for drug delivery applications
- Synthesized spherical micelles and investigated shape effects of nanomaterials on tumor uptake

Intramural Research Training Fellow 2008-2011

Laboratory of Dr. Kathryn Zoon, National Institute of Allergy and Infectious Diseases, NIH

- Evaluated interferon-activated monocytes as a cancer immunotherapy
- Formulated interferon-polymer conjugates for enhanced half-life and biodistribution

Honors and Awards

UC President's Fellowship for the Lindau Nobel Laureate Meeting on Interdisciplinary Research	2020, 2021
Health Innovation Via Engineering Postdoctoral Fellowship. UCSF	2020-2022
Selected to Attend Postdoc-to-Faculty Workshop. American Chemical Society	2020
Finalist for the Postdoc Slam TED Talk Competition. UCSF	2019
First Place Poster Presentation. Vail Scientific Summit for Regenerative Medicine	2019
National Defense Science and Engineering Graduate Fellowship. Dept of Defense	2015-2018
Honorable Mention for the NSF Graduate Fellowship. National Science Foundation	2014
Amgen Fellowship in Organic Chemistry. UC Berkeley	2013
Chemistry Scholar Award. Northwestern University	2013
Intramural Research Training Award. NIAID, National Institutes of Health	2009

Publications

*Denotes co-first authors. #Denotes co-corresponding authors. Details available at my [Google Scholar Profile](#)

19. JA Finbloom, C Huynh, X Huang, TA Desai. "Bioinspired Nanotopographical Design of Drug Delivery Systems." *Nat. Rev. Bioeng.* 2023, 1, 139–152.
18. **JA Finbloom#**, P Raghavan, M Kwon, BN Kharbikar, MA Yu#, TA Desai#. "Codelivery of Synergistic Antimicrobials with Polyelectrolyte Nanocomplexes to Treat Bacterial Biofilms and Lung Infections." *Sci Advances.* 2023, 9, 8039. #Co-corresponding authors
17. WR Lykins, ME Hansen, X Sun, R Advincula, **JA Finbloom**, AK Jain, Y Zala, A Ma, TA Desai. "Impact of microdevice geometry on transit and retention in the murine gastrointestinal tract." *ACS Biomater. Sci. Eng.* 2021. <https://doi.org/10.1021/acsbiomaterials.0c01606>
16. **JA Finbloom**, Y Cao, TA Desai. "Bioinspired polymeric high aspect ratio particles with asymmetric Janus functionalities." *Adv. NanoBiomed Res.* 2021. 2000057.
15. **JA Finbloom**, B Demaree, AR Abate, TA Desai. "Networks of high aspect ratio particles to direct colloidal assembly dynamics and cellular interactions." *Adv. Funct. Mater.* 2020, 30, 2005938.
14. **JA Finbloom**, F Sousa, MM Stevens, TA Desai. "Engineering the drug carrier biointerface to overcome biological barriers to drug delivery." *Adv. Drug Deliv. Rev.* 2020, 167, 89-108.
13. S Ahadian, **JA Finbloom**, M Mofidar, SE Diltemiz, F Nasrollahi, E Davoodi, V Hosseini, I Mylonaki, S Sangabathuni, H Montazerian, K Fateh, R Nasiri, MR Dokmeci, MM Stevens#, TA Desai#, A Khademhosseini#. "Micro and nanoscale technologies in oral drug delivery." *Adv. Drug Deliv. Rev.* 2020, 157, 37-62.
12. SH Klass, AE Truxal, TA Fiala, J Kelly, D Nguyen, **JA Finbloom**, DE Wemmer, A Pines, MB Francis. "Rotaxane probes for the detection of hydrogen peroxide by ^{129}Xe hyperCEST NMR." *Angew. Chem. Int. Ed. Engl.* 2019, 58, 9948-9953.
11. **JA Finbloom***, IL Aanei*, JM Bernard*, SH Klass, SK Elledge, K Han, T Ozawa, TP Nicolaides, MS Berger, MB Francis. "Evaluation of three morphologically distinct virus-like particles as nanocarriers for convection-enhanced drug delivery to glioblastoma." *Nanomaterials.* 2018, 8; 1007-1019.
10. **JA Finbloom**, MB Francis. "Supramolecular strategies for protein immobilization and modification." *Curr. Opin. Chem. Biol.* 2018, 46; 91-98.
9. **JA Finbloom**, K Han, CC Slack, AL Furst, MB Francis. "Cucurbit[6]uril-promoted click chemistry for protein modification." *J. Am. Chem. Soc.* 2017, 139; 9691-9697.
8. CC Slack*, **JA Finbloom***, K Jeong, CJ Bruns, DE Wemmer, A Pines, MB Francis. "Rotaxane probes for protease detection by ^{129}Xe hyperCEST NMR." *Chem. Commun.* 2017, 53; 1076-1079.

7. **JA Finbloom**, K Han, IL Aanei, EC Hartman, DT Finley, MT Dedeo, M Fishman, KH Downing, MB Francis. "Stable disk assemblies of a tobacco mosaic virus mutant as nanoscale scaffolds for applications in drug delivery." *Bioconjugate Chem.* 2016. 27; 2480-85.
6. MD Gomes, P Dao, K Jeong, CC Slack, CC Vassiliou, **JA Finbloom**, MB Francis, DE Wemmer, A Pines. "¹²⁹Xe NMR relaxation-based macromolecular sensing." *J. Am. Chem. Soc.* 2016. 138; 9747-50.
5. K Jeong, C Netirojjanakul, H Munch, J Sun, **JA Finbloom**, DE Wemmer, A Pines, MB Francis. "Targeted molecular imaging of cancer cells using MS2-based ¹²⁹Xe NMR." *Bioconjugate Chem.* 2016. 27; 1796-801.
4. **JA Finbloom**, CC Slack, CJ Bruns, K Jeong, DE Wemmer, A Pines, MB Francis. "Rotaxane-mediated suppression and activation of cucurbit[6]uril for molecular detection by ¹²⁹Xe hyperCEST NMR." *Chem. Commun.* 2016. 52; 3119-22.
3. TJ Moyer*, **JA Finbloom***, C Feng, DJ Toft, VL Cryns#, SI Stupp#. "pH and amphiphilic structure direct supramolecular behavior in biofunctional assemblies." *J. Am. Chem. Soc.* 2014. 136; 14746-52.
2. H Nakashima, K Miyake, CR Clark, J Bekisz, **J Finbloom**, SR Husain, S Baron, RK Puri, KC Zoon. "Potent antitumor effects of combination therapy with IFNs and monocytes in mouse models of established human ovarian and melanoma tumors." *Cancer Immunology Immunotherapy.* 2012. 61; 1081-92.
1. S Baron, **J Finbloom**, J Horowitz, J Bekisz, A Morrow, T Zhao, S Fey, H Schmeisser, C Balinsky, K Miyake, CR Clark, KC Zoon. "Near eradication of clinically relevant concentration of human tumor cells by interferon-activated monocytes *in vitro*." *J Interferon and Cytokine Research.* 2011. 31; 569-73.

Patents

MB Francis, **JA Finbloom**, K Han, MT Dedeo, DT Finley. Viral disk assemblies and methods of use thereof. US Patent Application No. 62 / 404,531

Grants and Funding

NIH R01 Research Project Grant "Regulation of Epithelial Function Using Targeted Nanowires" (PI: Michael Koval. Co-PI: Tejal Desai.)	2022-2027
Orthopaedic Trauma Association Research Award "Injectable bioinspired nanowires to accelerate fracture healing through therapeutic delivery of painless NGF" (PI: Chelsea Bahney. Co-PI: Tejal Desai)	2022-2023
NIH R01 Research Project Grant (NIAMS) "Nanowire Delivery of Painless Nerve Growth Factor to Accelerate Fracture Repair" (PI: Chelsea Bahney. Co-PI: Tejal Desai)	2022-2027
Cystic Fibrosis Foundation Research Award "Bacteriomimetic Polymeric Particles for the Treatment of Cystic Fibrosis Lung Infections" (awarded \$200,000 over 2 years, PI: Tejal Desai)	2021-2023
Health Innovation Via Engineering Postdoctoral Fellowship "Improving Cystic Fibrosis Drug Delivery with Bacteriomimetic Polymeric Particles" (awarded \$75,000 over 2 years, PI: Joel Finbloom)	2020-2022
National Defense Science and Engineering Graduate Fellowship (awarded graduate stipend for 3 years at UC Berkeley, PI: Joel Finbloom)	2015-2018
UC Berkeley Travel Grant (awarded \$3,000 to attend two international conferences)	2016, 2018

Selected Presentations

JA Finbloom, MA Yu, TA Desai. "Engineering material biointerfaces to advance the treatment of cystic fibrosis lung infections." Virtual oral presentation at the BMES National Meeting. Oct 2021.

JA Finbloom, S Ranucci, MA Yu, TA Desai. "Treating cystic fibrosis lung infections with bacteria-inspired nanoscale drug delivery systems." Virtual oral presentation at the AIChE National Meeting. Nov 2020.

JA Finbloom, S Ranucci, MA Yu, TA Desai. "Treating cystic fibrosis lung infections with bacteria-inspired nanoscale drug delivery systems." Virtual oral presentation at the ACS National Meeting. Aug 2020.

JA Finbloom. "Storming bacterial biofilm fortresses with nanotechnology." Oral presentation at the UCSF Postdoc Slam TED Talk Competition. San Francisco, CA. Sep 2019.

JA Finbloom, KO Rivera, T Miclau, CS Bahney, TA Desai. "Injectable nanowire scaffolds for the treatment and repair of infected open fractures." Poster presentation at the Vail Scientific Summit on Advances in Regenerative Medicine. Vail, CO. Aug 2019. *Awarded First Prize*

JA Finbloom, TA Desai. "Tunable nanowire scaffolds for regenerative engineering." Invited oral presentation at the Molecular Foundry Annual User Meeting. Berkeley, CA. Aug 2019.

JA Finbloom, TA Desai. "Tunable nanowire scaffolds for regenerative engineering." Poster presentation at the Biomaterials and Tissue Engineering Gordon Research Conference. Barcelona, Spain. Jul 2019.

JA Finbloom, IL Aanei, JM Bernard, K Han, T Ozawa, TP Nicolaidis, MS Berger, MB Francis. "Morphological effects of protein-based nanomaterials for drug delivery." Poster presentation at the Bioinspired Materials Gordon Research Conference. Les Diablerets, Switzerland. Jun 2018.

JA Finbloom, CC Slack, K Han, DE Wemmer, A Pines, MB Francis. "Rotaxane probes for applications in molecular detection with Xe hyperCEST NMR." Oral presentation at the ACS National Meeting. San Francisco, CA. Apr 2017.

JA Finbloom, CC Slack, DE Wemmer, A Pines, MB Francis. "Rotaxane probes for applications in molecular detection with Xe hyperCEST NMR." Oral presentation at the Bioinspired Materials Gordon Research Seminar. Les Diablerets, Switzerland. Jun 2016.

JA Finbloom, TJ Moyer, SI Stupp. "pH-Sensitive self-assembling peptide amphiphiles for the targeted treatment of cancer." Poster presentation at Northwestern Undergraduate Research Symposium. Chicago, IL. May 2013.

JA Finbloom, S Baron, KC Zoon. "Antiproliferative activity of interferon activated monocytes against high concentrations of human tumor cells." Oral presentation at the joint meeting of the International Cytokine Society and International Society for Interferon and Cytokine Research. Chicago, IL. Oct 2010.

Teaching Experience

Guest Lecturer

- UBC, Pharmaceutical Sciences 307. "NMR Spectroscopy for Chemical and Biochemical Analysis." Four guest lectures and module development. Mar 2023
- UBC, Pharmaceutical Sciences 303/515. "Nanomedicine for Infectious Disease". In-person guest lecture. Mar 2023
- UC Berkeley, *Bioengineering 98/198*. "Micro and nanoscale approaches to therapeutic delivery and immunoengineering." Virtual lecture with Q&A. Nov 2020.
- Santa Clara University, *Bioengineering 100/200*. "Using micro and nanoscale materials to treat bacterial infections." Virtual lecture with Q&A. May 2020.
- UCSF, *STEM Career Day*. "Nanotechnology in medicine." Lecture and interactive demo. Mar 2019.
- UC Berkeley, *Bioinorganic Chemistry 103*. "Metals in medicine." Classroom lecture. Nov 2015.

Graduate Student Instructor

College of Chemistry. UC Berkeley

2013-2015

- Instructor for organic chemistry (2 semesters) and bioinorganic chemistry (1 semester)
- Supervised weekly organic chemistry lab sections with 25 students and held weekly office hours
- Organized and facilitated bioinorganic chemistry discussion sections and review sessions

Mentorship Experience

Preethi Raghavan, Bioengineering Ph.D. Student, UCSF	03/2021-present
Nafisa Elghazali, Bioengineering Ph.D. Student, UCSF	09/2021-12/2022
Eva Hansen, Bioengineering Ph.D. Student, UCSF	04/2021-06/2022
Luis Quijano, Biotechnology Ph.D. Student, Queensland University of Technology	12/2020-05/2022
Gauree Chendke, Bioengineering Ph.D. Student, UCSF	01/2020-08/2021
Charlene Pan, Bioengineering Ph.D. Student, UCSF	03/2021-05/2021
Sarah Klass, Chemistry Ph.D. Student, UC Berkeley. Currently Postdoc at UC Berkeley	05/2016-08/2018
Joshua Turnbull, Chemistry Ph.D. Student, UC Berkeley. Currently Industry Scientist	09/2017-11/2017
Kenneth Han, Chemistry B.S. Student, UC Berkeley. Currently Ph.D. Student at UCSD	06/2015-08/2017

Leadership and Service

Ad Hoc Reviewer 2019-present

Soft Matter, Materials Today Communication, Drug Delivery and Translational Research, Advanced NanoBiomed Research, Journal of Biomedical Materials Research B, Journal of Tissue Engineering and Regenerative Medicine, ACS Applied Materials and Interfaces

Co-organizer of Health Innovation Via Engineering Seminar Series 2020-2022

UC San Francisco

- Developed seminar topics and speaker list, and invited speakers for seminars
- Facilitated and moderated virtual seminar sessions

Co-chair of the Bioinspired Materials Gordon Research Seminar 2018

Gordon Research Conferences

- Developed seminar topics and speaker list, and facilitated seminar discussion panels
- Secured funding for seminar and speaker scholarships

Outreach Scientist 2014-2018

Bay Area Scientists in Schools. Berkeley, CA.

- Volunteered monthly at local elementary schools and taught interactive science lessons to 5th graders
- Created a lesson on glow-in-the-dark chemistry that complements 5th grade science curriculum

President 2009-2013

Cancer Outreach Prevention and Education at Northwestern University. Evanston, IL.

- Volunteered with American Cancer Society chapters and participated in Relay for Life
- Organized and implemented cancer education programs for Northwestern students