Isabelle A. Engelberg
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PROFILE

Highly motivated research scientist with experience in medicinal chemistry, biology, biochemistry, and computational chemistry. Self-driven, exceptionally organized team player with strong verbal and written communication skills.

EDUCATION

University of California, Berkeley, Berkeley, CA — Expected Jan 2023
Master of Information and Data Science (MIDS)

University of North Carolina at Chapel Hill, Chapel Hill, NC — Expected Nov 2021
Ph.D. in Pharmaceutical Sciences

Johns Hopkins University, Baltimore, MD — May 2017
B.A. in Chemistry with Minor in Mathematics. Departmental GPA: 3.98/4.00

INDEPENDENT LEARNING

Databases: Relational Databases and SQL, Stanford University on edX — Aug 2021 – Sept 2021

Introduction to Computer Science and Programming Using Python, MIT on edX — June 2021 – Aug 2021
Python 3.5

RESEARCH EXPERIENCE

University of North Carolina, Center for Integrative Chemical Biology and Drug Discovery — Chapel Hill, NC
Graduate Researcher — Fall 2017 – Present

Advisors: Dr. Stephen V. Frye & Dr. Lindsey I. James

- Initiated the development of a bifunctional degrader (PROTAC) using a novel E3 ligase-recruiting ligand
- Discovered and characterized the first synthetic ligand for plant homeodomain finger proteins 1/19 (PHF1/19) using peptidomimetic synthesis and rational design
- Developed TR-FRET assays for methyl-lysine reader proteins PHF1/19 and screened over 1K small molecules
- Currently optimizing and analyzing the effects of a small molecule chemical probe for PHF1/19 through medicinal chemistry, ligand- and structure-based modeling, biophysical screening, and cellular assays
- Collaborating on various projects with labs at and beyond UNC
- Responsible for maintenance and repair of two HPLC systems (Agilent: 1260 Infinity I, II)

Johns Hopkins University, Chemistry Department — Baltimore, MD
Undergraduate Research Assistant — Aug 2015 – May 2017

Advisor: Dr. Steven Rokita

- Synthesized novel quinone methides capable of reversibly alkylating DNA
- Used compounds to study the effect of substituent placement on the efficiency and kinetics of reversible alkylation using gel electrophoresis of radiolabeled DNA

Johns Hopkins Medical Institutions, Gastroenterology Department — Baltimore, MD
Undergraduate Research Assistant — Aug 2014 – Aug 2015

Advisor: Dr. Jay Pasricha

- Validated incorporation of target genes into Cre-Lox mice using DNA isolation and PCR techniques

LEADERSHIP/MENTORSHIP EXPERIENCE

Empowerly Berkeley, CA

College Counselor Feb 2021 – Present

- Develop individualized plans for high-achieving high school students seeking college admissions
- Edit all written essays and other application documents
- Mentor students in time management, organization, and study skills

University of North Carolina, Chemical Biology and Medicinal Chemistry Department Chapel Hill, NC

Graduate Student Mentor Jan 2019 – May 2021

- Mentored multiple 10-week 1st year graduate students on independent rotation projects

University of North Carolina, Chemical Biology and Medicinal Chemistry Department Chapel Hill, NC

Teaching Assistant in Computational Chemistry Aug 2020 – Dec 2020

- Developed and taught a laboratory course on Molecular Modeling using Schrodinger platforms KNIME and Maestro
- Adapted course to accommodate virtual learning during the COVID-19 pandemic
- Wrote and graded 13 weeks of homework assignments and 4 quizzes

Johns Hopkins University, Chemistry Department Baltimore, MD

Teaching Assistant in Intro Chem Lab Aug 2015 – May 2017

- Led and assisted 20 students in Introductory Chemistry Lab experiments weekly
- Helped to grade lab reports and exams for 100 students
- Led a small group recitation section for underperforming students

TECHNICAL SKILLS

Computational

- Data curation and analytics using KNIME and RStudio
- Machine learning model building and predictions using KNIME
- Glide docking and virtual screening using Maestro
- Introductory knowledge of Python and SQL
- Additional Software: Microsoft Office Products, GraphPad Prism, ChemDraw, Mestrenova, Origin

Chemistry

- Solid-phase and solution-phase peptide synthesis
- Design and synthesis of small molecule SAR using medicinal chemistry reactions (amidation, SnAr/SN2 displacement, Suzuki/Buchwald coupling, reductive amination, hydrogenation)
- Compound purification through automated column chromatography (Teledyne ISCO CombiFlash) and preparatory HPLC (Agilent 1200/1260 Infinity I/II)
- Compound characterization by 1D/2D NMR, LC-MS, and MALDI-TOF/TOF

Biophysical/Biochemical

- Time-resolved fluorescence resonance energy transfer (TR-FRET) assay development and execution
- Isothermal titration calorimetry (ITC) and analysis on Origin software
- Chemiprecipitation and immunoprecipitation, western blot analysis on LI-COR system
- Primer design using ENCODE/NCBI
- Reverse transcription (RT)-qPCR

Tissue Culture

- Standard culturing of numerous adherent and suspension cancer cell lines (HEK-293, U-2 OS, L-363)
- Total RNA isolation and purification from intact cells for RT-qPCR analysis
- Fluorescence microscopy of intact cells

FELLOWSHIPS, AWARDS, AND HONORS

Johns Hopkins University, Chemistry Department — Baltimore, MD
Martin & Mary Kilpatrick Award — June 2017
Departmental honor for outstanding undergraduate research

University of Maryland Baltimore County, Undergraduate Research Symposium — Baltimore, MD
Poster Award: 1st Place in Chemical Sciences, Group U — October 2016
Abstract: "Effect of Substituent Placement on Quinone Methide DNA Alkylation"

Johns Hopkins University, Chemistry Department — Baltimore, MD
Greer Undergraduate Research Award — May 2016
Received funding for research proposal on substituent effect on quinone methide stability

ORGANIZATIONS

American Association of Pharmaceutical Sciences
Member — November 2020 – Present

University of North Carolina, Eshelman School of Pharmacy
Graduate Student Organization Department Representative — August 2019 – June 2020

VOLUNTEERING

SPCA of the Triad — Greensboro, NC
Volunteer Dog Walker — June 2020 – Present

University of North Carolina, Training Initiatives in Biomedical & Biological Sciences — Chapel Hill, NC
DNA Day Ambassador — April 2019

- Taught an Epigenetics module to 5 classes of high school Biology students
- Held a discussion around the path to a Ph.D. and potential career paths

POSTER PRESENTATIONS

Engelberg, I. A., Rectenwald, J.M., Norris, J. L., Cholensky, S. H., Pearce, K. H., Frye, S. V., James, L. I. "Development of a chemical probe for the PRC2 accessory protein PHF1." Summer Symposium in Molecular Biology, Pennsylvania State University, University Park, PA, July 2019.

Engelberg, I. A., Deeyaa, B., Byrne, S., Rokita, S. E. "Effect of Substituent Placement on Quinone Methide DNA Alkylation." Undergraduate Research Symposium, University of Maryland Baltimore County, Baltimore, MD, October 2016.

PUBLICATIONS

Engelberg, I. A.; Liu, J.; Norris-Drouin, J. L.; Cholensky, S. H.; Ottavi, S. A.; Frye, S. V.; Kutateladze, T. G.; James, L. I. Discovery of an H3K36me3-Derived Peptidomimetic Ligand with Enhanced Affinity for Plant Homeodomain Finger Protein 1 (PHF1). *J. Med. Chem.*, **2021**. https://doi.org/10.1021/acs.jmedchem.1c00430.

Engelberg, I. A.; Foley, C. A.; James, L. I.; Frye, S. V. Improved Methods for Targeting Epigenetic Reader Domains of Acetylated and Methylated Lysine. *Current Opinion in Chemical Biology*. Elsevier Ltd August 1, 2021, pp 132–144. https://doi.org/10.1016/j.cbpa.2021.03.002.

Suh, J. L.; Barnash, K. D.; Abramyan, T. M.; Li, F.; The, J.; Engelberg, I. A.; Vedadi, M.; Brown, P. J.; Kireev, D. B; Arrowsmith, C. H. et al. Discovery of Selective Activators of PRC2 Mutant EED-I363M. *Sci. Rep.*, **2019**, *9* (1), 6524. https://doi.org/10.1038/s41598-019-43005-z.