

Ilya J. Finkelstein

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Education

University of California, Berkeley (1997-2001)

B.S. Chemistry

Stanford University (2001-2007)

Ph.D. Chemistry

Professional Experience

Professor (2025-present)

Department of Molecular Biosciences,

Livestrong Cancer Institute,

Institute for Cell & Molecular Biology,

Center for Systems and Synthetic Biology,

The University of Texas at Austin

Associate Professor (2019-2025)

Department of Molecular Biosciences,

Livestrong Cancer Institute,

The University of Texas at Austin

Assistant Professor (2012-2019)

Department of Molecular Biosciences,

The University of Texas at Austin

Postdoctoral Fellow (2007-2012)

Columbia University Medical Center (with Eric C. Greene)

Graduate Student (2001-2007)

Stanford University (with Michael D. Fayer)

Title of Dissertation

Ultrafast protein dynamics in aqueous and confined environments probed by 2D-IR spectroscopy.

Dissertation Advisor

Michael D. Fayer,

Professor of Chemistry, Stanford University

Postdoctoral Research Topic

As a postdoctoral fellow, I developed and applied single-molecule biophysics tools to understand how molecular motor proteins navigate on DNA.

Postdoctoral Advisor

Eric C. Greene,

Professor of Molecular Biophysics, Columbia University Medical Center

Current Research Interests

I am a molecular biologist that develops new biophysical methods to understand how molecular machines edit and repair our genomes. One critical research objective is to understand the biophysical mechanism of CRISPR-associated (Cas) adaptive immunity. These systems are broadly important for understanding host-pathogen interactions between phages and bacteria-the most numerous biological entities on earth. Understanding the molecular mechanisms of bacterial adaptive immunity will also expand the genome editing toolbox.

My second, interrelated objective is to discover the mechanisms underlying the cellular response to DNA damage, specifically the repair of double-strand breaks (DSBs). These lesions are especially dangerous because they fragment the chromosome into two pieces. DSBs also occur naturally during replication, in prophase of meiosis I, and in the diversification of vertebrate immune systems. All cells respond to DSBs through a rapid DNA repair response that requires recognition of the damage, enzymatic processing, and repair via non-homologous end joining or one of several templated homologous recombination pathways. We use biophysical tools to decipher the mechanisms of these repair pathways and how they can be manipulated for gene editing applications. Finally, we develop new microfluidic and cell biology tools for high-throughput studies at the single-cell and single-molecule levels.

Professional Societies

Biophysical Society (2009-)

American Association for the Advancement of Science (2022-)

Patents Issued

Associate Professor:

FINKELSTEIN, Ilya, Claus Wilke, Kuang Hu, James RYBARSKI, and Alexis HILL. Crispr-associated transposons and uses thereof. World Intellectual Property Organization WO2023023519A1, filed August 16, 2022, and issued February 23, 2023.

MCLELLAN, Jason, Jennifer MAYNARD, Andrea CHASSE, Ilya FINKELSTEIN, Mohammad JAVANMARDI, Jeffrey SCHAUB, Hung-Che KUO, et al. Engineered coronavirus spike (s) protein and methods of use thereof. World Intellectual Property Organization WO2021243122A8, filed May 28, 2021, and issued January 6, 2022.

Assistant Professor:

FINKELSTEIN, Ilya, Cheulhee Jung, John Hawkins, Stephen Knox JONES, James RYBARSKI, Fatema A. SAIFUD-DIN, Cagri Savran, Andrew D. Ellington, and William H. PRESS. Chip hybridized association-mapping platform and methods of use. World Intellectual Property Organization WO2018232086A1, filed June 14, 2018, and issued December 20, 2018.

Awards and Honors

Associate Professor:

2025

Edith and Peter O'Donnell Award in Biology, Texas Academy of Medicine, Engineering, Science and Technology (TAMEST)

2025

Provost's Aspiring and Research Leader Academy, UT-Austin

2024

WelchX Collaborative Award, UT-Austin

2021

Provost's Mentored Faculty Scholar, UT-Austin

2021

Lorene Morrow Kelley Research Fellowship, UT-Austin

2021

Norman Hackerman Award in Chemical Sciences, Welch Foundation

Assistant Professor:

2018

William H. Tonn Professorial Fund Fellow, UT-Austin

2015

CAREER Award, National Science Foundation

2014

Junior Fellow, American Federation of Aging Research

2013

Emerging Investigator, Molecular BioSystems

2013

Protege, The Academy of Medicine, Engineering and Science of Texas

2012

Fellow in Cancer Research, CPRIT

Before UT-Austin:

2011

Pathway to Independence Award (K99/R00), NIH

2007

NRSA Postdoctoral Fellow, NIH

2005

Veatch Graduate Fellowship, Stanford University

2003

McBain and Stauffer Graduate Fellowship, Stanford University

Service

Department

2022□23	ILS Graduate Admissions Committee , College of Natural Sciences
2021	Junior Faculty Search Committee , Molecular Biosciences
2021	Infrastructure Committee (building representative) , Molecular Biosciences
2016	Standing Hiring Committee , Chemistry
2013□18	Seminar Series Committee , Molecular Biosciences
2012□13	Graduate Admissions Committee, Biochemistry , Molecular Biosciences

College

2025	Undergraduate Research Fellowship Review Committee
2025	Kleberg Foundation Limited Submission Review Committee
2024	Welch Catalyst Grant Review Committee
2020-	Biochemistry GSC Executive Committee (<i>standing member</i>) , College of Natural Sciences
2015, 2021□	Catalyst Grant Evaluation Committee (<i>standing member</i>) , College of Natural Sciences
2019□20	ICMB Graduate Curriculum Committee , College of Natural Sciences
2016	21st Century Research Working Group , College of Natural Sciences
2016	Center for Nano□ and Molecular Science (CNM) Steering Committee , College of Natural Sciences
2016	Welch Hall Renovation Architectural Committee , College of Natural Sciences
2012□13	Biochemistry Undergraduate Curriculum Reform Committee , College of Natural Sciences

University

2025	Kleberg Foundation limited submission Review Committee
2024	MD Anderson Cancer Center Pilot Awards Review Committee
2021□	Limited submissions Proposal Review Committee , UT□Austin
2020□22	External Member, Biomedical Engineering Graduate Committee , UT□Austin

State, National and International

2025	Macromolecular Structure and Function (MSFC) Study Section (ad hoc), NIH
2025	Cell and Molecular Technologies (CMT) Study Section (ad hoc), NIH
2024	NCI Pathway to Independence Award Study Section (ad hoc), NIH
2021	Faculty Research and Education Development Mentor, NSF □ ASCB
2021	Genes, Genomes and Genetics Study Section (ad hoc), NIH
2021	Genetic Mechanisms Study Section, NSF
2021	PCMB Study Section, NIH
2019	External PhD Thesis Committee (<i>on □ site</i>), TU Delft
2019	Reviewer (<i>ad hoc</i>), Army Research Office
2019	Organizer: Molecular Biophysics Focus Group, Biophysical Society
2017	Reviewer, French National Cancer Institute
2016	Reviewer, Dutch Foundation for Fundamental Research on Matter
2016	International Fellow Grant Reviewer, HHMI
2016	CAREER grant reviewer (<i>ad hoc</i>), NSF
2015	Early Career Reviewer (MSFB Study Section, <i>ad hoc</i>), NIH
2014	Research Portfolio Review Committee, Department of Homeland Security
2013	Judge, Siemens Science & Math Competition, Semi □ Finals

Seminars/Lectures

Invited Conference Presentations

2025	Texas Academy of Math Engineering Science and Technology, Dallas, TX
2024	Structural Biology of DNA Repair Symposium, via Zoom
2024	FASEB Dynamic DNA Structures, Florida
2024	WelchX Interactive Conference, Austin TX
2023	Bill & Melinda Gates Foundation Global Challenges Meeting, Dakar, Senegal
2023	Structural Biology of DNA Repair Symposium, Berkeley, CA
2023	Advancing Mass Spectrometry for Biophysics & Structural Biology, Austin, TX
2023	67th annual meeting of the Biophysical Society, San Diego, CA
2022	Cystic Fibrosis Foundation Workshop on CFTR Gene Insertion, Lexington, MA
2022	EMBO DNA damage response meeting, Greece; declined

2022	FASEB Dynamic DNA Structures , Nova Scotia, Canada
2022	15th Asia Pacific Physics Conference , via Zoom
2022	Texas Conference on Genome Repair , San Antonio, TX
2022	ASMBM Experimental Biology Conference , Philadelphia, PA
2021	Austin Forum on Technology and Society , Austin, TX
2021	AIChE 4th International Conference on CRISPR Technologies , via Zoom
2021	Structural Biology of DNA Repair , via Zoom
2020	2nd Annual Cellular and Molecular Biophysics Conference , Houston, TX
2020	UT COVID-19 Conference: Virus, Variants, and Antivirals , Austin, TX
2020	American Chemical Society , postdoc attended in my place
2020	EMBO Conference on Chromatin Organization , Cape Sounio, Greece, <i>declined</i>
2020	Structural Biology of DNA Repair , via Zoom
2020	Genome Repair: Basic Mechanisms and Clinical Implications , San Antonio, TX
2020	DNA Damage, Mutation and Cancer Gordon Research Conference , Ventura, CA
2020	2nd DNA & Interacting Proteins as Single Molecules Meeting , Nassau, Bahamas
2020	64th Annual Biophysical Society Meeting , San Diego, CA
2020	Engineering the Genome, Keystone Conferences , Alberta, Canada
2019	CRISPR 2019 annual meeting , Quebec, Canada
2019	EMBO Workshop on Fission Yeast , Barcelona, Spain; <i>declined</i>
2019	NSF CAREER Conference , Alexandria, VA
2019	Structural Biology of DNA Repair Symposium , Berkeley, CA; <i>declined</i>
2019	Biophysical Society of Canada (BSC) annual meeting , Ontario, CA
2018	Austin Forum on Technology and Society , Austin, TX
2018	CRISPR 2018 meeting , Vilnius, Lithuania
2018	Quantitative biology (q-bio) conference , Houston TX; <i>declined</i>
2018	Structural Biology of DNA Repair Symposium , Berkeley, CA; <i>declined</i>
2018	Biophysical Society Annual Meeting , San Francisco, CA
2018	SXSW Panel on Genome Editing , Austin, TX
2018	DNA Replication and Repair Structures & Cancer Conference , Cancun, MX
2017	Protein-DNA Interactions Workshop , Houston, TX
2017	DNA23 Conference on DNA Computing and Programming , Austin, TX

2017	FASEB Conference on Genetic Recombination , Steamboat Springs, CO
2017	Quantitative Biology Conference , Beijing, China
2017	Gordon Conference on Mammalian DNA Repair , Ventura, CA
2017	Structural Biology of DNA Repair Symposium , Berkeley, CA
2017	CRISPR 2017 Meeting , Big Sky, MO
2016	Lithography Workshop 2016 , Kamuela, HI, <i>declined</i>
2016	Gordon Conference on Single Molecule Biology , Hong Kong, <i>declined</i>
2016	CSH Asia 2016 Conference on Genomic Stability , Suzhou; China
2016	Stone Symposium , Baylor University, Waco TX
2016	Structural Biology of DNA Repair Symposium , Berkeley, CA
2016	Dynamic DNA and RNA Structures in Cancer , Cancun; Mexico
2015	American Federation of Aging Research , Santa Barbara, CA
2015	Structural Biology of DNA Repair , Berkeley, CA
2015	Foundations of Nanoscience (F²NANO) Conference , Snowbird UT
2015	Zing Conference on Nucleic Acids , Cancun; Mexico
2014	Gordon Conference on Single Molecule Approaches to Biology , Lucca, Italy
2013	Gordon Conference on Nucleic Acids , Biddeford, ME
2013	Keystone Symposium on DNA Repair and Replication , Banff, Canada
2012	Lost Pines Conference on Genome Integrity , Smithsville, TX
2012	Biophysical Society 56th Annual Meeting , San Diego, CA

Invited Seminars

2025	UT San Antonio Health Science Center , San Antonio, TX
2025	UC Irvine , Irvine, CA, (Guest Lecture on Large DNA insertions)
2025	UC Irvine , Irvine, CA, (Department Seminar)
2024	Austin Forum on Technology & Society , Austin, TX
2023	UC San Francisco , San Francisco, CA
2023	Rice University , Houston, TX
2023	Saint Louis University , St. Louis, MO
2022	Keynote: St. Edwards University , Austin, TX
2022	UT²Austin TOWER Fellows Seminar , Austin, TX
2022	Johns Hopkins University , Baltimore, MD
2021	Livestrong Cancer Institute , via Zoom
2021	UT Southwestern , via Zoom
2021	UT El Paso , via Zoom
2021	New England Biolabs , via Zoom

2025	UT San Antonio Health Science Center , San Antonio, TX
2021	Structural Biology of DNA Repair Webinar , via Zoom
2019	TU Delft University , Delft, Netherlands
2019	UT Southwestern , Dallas, TX
2018	Austin Forum on Science and Technology , Austin, TX
2018	Rice University , Houston TX; <i>declined</i>
2017	Dell Med School, Livestrong Cancer Institute , Austin, TX
2017	Rockefeller University , New York, NY
2017	University of Iowa Carver College of Medicine , Iowa City, IA
2017	Cornell University , Ithaca, NY
2016	University of Pittsburgh School of Medicine , Pittsburgh, PA
2016	Baylor College of Medicine , Houston, TX
2016	Weizmann Institute of Science , Rehovot, Israel
2016	Department of Molecular Biosciences Third Year Seminar , Austin, TX
2016	Institute for Cellular and Molecular Biology, Annual Retreat , Austin, TX
2015	Institute for Cellular and Molecular Biology, Annual Retreat , Austin, TX
2015	MD Anderson Cancer Center , Houston, TX
2014	Department of Biomedical Engineering , Austin, TX
2014	Institute for Cellular and Molecular Biology, Annual Retreat , Austin, TX
2014	Cornell University , Ithaca, NY
2014	Department of Chemistry , Austin, TX
2014	University of Michigan at Ann Arbor , Ann Arbor, MI
2014	Department of Physics , Austin, TX
2014	Georgia State University , Atlanta, GA
2013	Institute for Cellular and Molecular Biology , Austin, TX
2013	J.J. Pickle Research Campus , Austin, TX
2013	Department of Physics , Austin, TX

Professional Services

Peer Reviewing

Nature, Science, Cell, Molecular Cell, Cell Reports, eLife, Proceedings of the National Academies of Science, Nature Communications, Nature Chemical Biology, Nature Structural and Molecular Biology, Nucleic Acids Research, Journal of the American Chemical Society, Scientific Reports, Journal of Biological Chemistry, Journal of Molecular Biology, Biochemistry, J Phys Chem B, PLOS Bio, PLOS ONE, Analytical Chemistry, Analytical Biochemistry, BioEssays, Methods

Grant Proposal Reviewing

- National Institutes of Health
- National Science Foundation
- French National Cancer Institute

- Dutch Foundation for Fundamental Research on Matter
- HHMI International Scholars Program

Mentoring

([L] = LinkedIn site; [W] = professional website)

Visiting Faculty

2014–15 **Prof. Çağrı A. Savran**, Professor of Mechanical Engineering, Purdue University. Founder & CEO, Savran Technologies Inc. [L][W]

Postdoctoral Fellows

2022–23 **Dr. Andrea Quezada**, Marie Curie fellow, Max Delbrück Center [L]

2020–21 **Dr. Parastoo Maleki**, Research Scientist, UT–Austin. [L]

2029–21 **Dr. Carlos Calcines–Cruz**, Research Scientist, Mascoma LLC. [L]

2018–19 **Dr. Shane McDevitt**, Senior Medical Science Liaison – Oncology at Bayer. [L]

2016–22 **Prof. Michael Soniat**, Assistant Professor at Jefferson University. [L][W]

2016–21 **Prof. Stephen Jones Jr.**, Assistant Professor at Vilnius University. [L][W]

2015–17 **Prof. Cheulhee Jung**, Associate Professor at Korea University. [L][W]

2013–16 **Prof. Eric Spivey**, Assistant Professor at Vanderbilt University. [L][W]

2013–15 **Prof. Aaron Robison**, Assistant Professor, Christian University. [L][W]

2012–16 **Dr. Ignacio Gallardo**, Environmental Scientist at AECOM. [L]

Graduate Students (with last known location, [LinkedIn][Website])

2024– **Paola Carneiro**, Graduate Student, UT–Austin. PGEF Fellow [L]

2022– **You–Chiun Chang**, Graduate student, UT–Austin.

2022– **Jesse Buffington**, Graduate student, UT–Austin. NIH F31 Fellow [L]

2021–25 **Ankur Annappareddy**, Graduate student, UT–Austin. [L]

2020–25 **Chia–Wei (Alvin) Chou**, Graduate student, UT Austin. [L]

2019–23 **Kuang Hu**, Graduate student, UT–Austin.

2018–22 **Dr. Kamyab Javanmardi**, Senior Bioarchitect at Stealth Biotech Startup. [L]

2018–23 **Hung–Che (Jami) Kuo**, Graduate student, UT–Austin. [L]

2017–24 **John Cooper**, Graduate student, UT Austin. [L]

2016–21 **Dr. Jeffrey Schaub**, Senior Scientist at Abbott. [L]

2014–20 **Dr. John Hawkins**, Postdoctoral research fellow at EMBL, Heidelberg

2014–21 **Dr. Kaylee Dillard**, Senior Scientist at Merck. [L]

2013–23 **Dr. James (Jim) Rybarski**, Scientist of Quantitative Biology at Moderna. [L]

2013–18 **Prof. Yoori Kim**, Assistant Professor at DGIST, Daegu, South Korea. [L][W]

2013-18 **Dr. Logan Myler**, Assistant Professor at the University of Pittsburgh. [L][W]

2012-18 **Dr. Maxwell (Max) Brown**, Senior process engineer at ICU medical. [L]

Staff Scientists

2023- **Dr. Selma Sinan**, Staff Scientist, UT Austin. [L]

2022-23 **Henry Garcia**, Graduate student, UT Austin.

2022-23 **Mary Arnold**, Staff Scientist, UT Austin. [L]

2021-23 **Lianne Dubbs**, Lab Manager and research scientist, UT Austin. [L]

2018- **Dr. Hongshan Zhang**, Research Scientist, UT Austin. [L]

2017-19 **Nicole Johnson**, Graduate student at UT Austin. [L]

2016-21 **Giaochau Nguyen**, Graduate student at UT Southwestern. [L]

2013-16 **Armando de la Torre**, Budget Analyst, UT Austin

Undergraduate Students

2025- **Anna Le**, Undergraduate Researcher, UT Austin.

2025- **Jimin Han**, Undergraduate Researcher, UT Austin.

2025- **Shreya Arvind**, Undergraduate Researcher, UT Austin. [L]

2024- **Zowie Gaylor**, Undergraduate Researcher, UT Austin.

2022-25 **Daphne Sahaya**, Undergraduate Researcher, UT Austin. [L]

2022-23 **Carlos Arguello**, Undergraduate Researcher, UT Austin. [L]

2022-23 **Caitlin Kuriakose**, Undergraduate Researcher, UT Austin. [L]

2021-22 **Tyler Washburn**, Neuroscience major, UT Austin. [L]

2020-21 **Hayley Zorkic**, Data Scientist at Thermo Fisher Scientific. [L]

2019-21 **Henry Trentham**, Associate Scientist at Thermo Fisher Scientific [L]

2018-21 **Cynthia Terrace**, Graduate Student at the UC Berkeley. [L]

2018-20 **Jake Kula**, MD Candidate, McGovern Medical School. [L]

2015-17 **Brianna Gonzales**, 2nd Lieutenant Medical Student. [L]

2014-15 **Andrew Leal**, PhD Candidate at Boston University School of Medicine. [L]

2014-18 **Fatema Saifuddin**, Graduate Student at UCSF. [L]

2014-16 **Jesus De La O**, Staff Software Engineer at Indeed.com. [L]

2013-14 **Jacob Bobb**, Software engineer at Lost Boys Interactive. [L]

2012-14 **Kameron Azarm**, Associate Medical Director at BGB group [L]