

BRUCE E. KIRKPATRICK

MD-PhD Student, University of Colorado

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Education

University of Colorado Anschutz Medical Campus

2018–26 MD-PhD Student, Medical Scientist Training Program

University of Colorado Boulder

2020–24 PhD Student, Biological Engineering
Mentor: Dr. Kristi Anseth

2013–17 Bachelor of Science, *with honors*, Chemical & Biological Engineering
Minor in Business Analytics, Leeds School of Business

Experience

2019 PhD Rotation, Bowman Research Group, CU Boulder
Synthesized novel photocrosslinkable monomers for self-immolative gels.

2018 PhD Rotation, Anseth Research Group, CU Boulder
Developed high-throughput microfluidic devices for microgel synthesis.

2017–18 Research Assistant, iC42 Clinical Research and Development
Investigated aging and metabolism biomarkers using multi-omics.

2016–17 Research Assistant, Jeerage Laboratory, NIST
Developed spectroscopic assays for quantifying cellular AuNR uptake.

2014–16 Research Assistant, Goodwin Research Group, CU Boulder
Synthesized novel monomers for mechanoresponsive CuAAC hydrogels.

2015 Research Assistant, Weiser-Evans Research Group, CU Anschutz
Investigated the role of PTEN in α -SMA regulation in human atheromas.

2014–15 Research Assistant, Moulton Research Group, CU Anschutz
Investigated Nrp2-targeting of AuNRs to atherosclerotic vessels.

Honors and Awards

2021 Best Presentation, Rocky Mountain Biomaterials Day

2019 First Prize, CU Anschutz Ethics Case Competition

2018 First Prize, CU Anschutz Ethics Case Competition

2013–17 Joseph A. Sewall Award, CU Boulder

2017	Finalist, CESR Business Ethics Case Competition
2016	Undergraduate Research Fellowship, NIST Mackison Writing Award, CU Boulder Outstanding Delegate, National Model United Nations
2015	Undergraduate Research Fellowship, American Heart Association
2014	Clinical Undergraduate Research Experience Fellowship, CU Boulder

Writing

Academic

2021	“Photoclick Chemistry: A Bright Idea,” <i>Chemical Reviews</i> . BD Fairbanks, LJ Macdougall, S Mavila, J Sinha, BE Kirkpatrick , KS Anseth, CN Bowman. doi:10.1021/acs.chemrev.0c01212
2020	“Toward Stimuli-Responsive Dynamic Thermosets through Continuous Development and Improvements in CANs,” <i>Advanced Materials</i> . M Podgorski, BD Fairbanks, BE Kirkpatrick , MK McBride, A Martinez, A Dobson, NJ Bongiardina, CN Bowman. doi:10.1002/adma.201906876
2019	“CyP-D Knockout Protects the Mouse Kidney Against CsA-Induced Oxidative Stress and DNA Hypomethylation,” <i>AJP Renal</i> . Je Klawitter, Jo Klawitter, A Pennington, B Kirkpatrick , GF Roda, NC Kotecha, JM Thurman, U Christans. doi:10.1152/ajprenal.00417.2018
2018	“PTEN deficiency promotes pathological vascular remodeling of human coronary arteries,” <i>JCI Insight</i> . KS Moulton, M Li, K Strand, S Burgett, P McClatchey, R Tucker, SB Furgeson, S Lu, B Kirkpatrick , JC Cleveland, RA Nemenoff, AV Ambardekar, MCM Weiser-Evans. doi:10.1172/jci.insight.97228

Graduate Reports

2020	“On Macromolecular Crowding and its Effect on Cell Cycle” BE Kirkpatrick , review of dependence of biochemical equilibria on crowding.
2019	“Surviving Human Body Block and Graduate Core” BE Kirkpatrick , overview of study strategies and resources for MSTP trainees.

Undergraduate Reports

2017	“Coker Gas Plant Design” E Magnuson, A Burns, BE Kirkpatrick , GF Roda, CE Miksch
2016	“Vinyl Chloride Production” L Karasek, BE Kirkpatrick , A Lipsey, K Siahpush “Terpene and Terpenoid Biosynthesis” BE Kirkpatrick , GF Roda, C Sterling
2015	“Honeybee Flight: An Inquiry” BE Kirkpatrick , S Payne, C Ritz, P Doan, J McDaniel

Proposals

- 2019 “Carbon Monoxide Mediates Preeclamptic Phenotypes in Human Placental Tissues.”
BE Kirkpatrick, MD-PhD preliminary exam.

Figure Contributions

- 2020 “ETV6 germline mutations cause HDAC3/NCOR2 mislocalization and upregulation of interferon response genes”
M Fisher, GD Kirkpatrick *et al.*, *JCI Insight*. **Contributed graphical abstract.**
- 2018 “Genomics and transcriptomics of megakaryocytes and platelets: Implications for health and disease”
M Fisher, J Di Paola, *Res Pract Thromb Haemost*. **Contributed Figure 1.**
- 2015 “ETV6 mutations define a new cancer predisposition syndrome”
GD Kirkpatrick *et al.*, *Oncotarget*. **Contributed Figure 1.**

Non-Academic

- 2019 “70 years ago, physicians used a heart defect to fix blue babies”
BE Kirkpatrick, *Massive Science*.
- 2017 “Frequent Flyer: Why Isn’t Dad Dead Yet?”
BE Kirkpatrick, *Journal* 2020, 5 31–38.

Presentations

Academic Talks

- 2021 “Macromolecular Crowding by Bio-Orthogonal Hydrogelation and its Effect on Intracellular Diffusion and Cellular Function”
Rocky Mountain Biomaterials Day, Society for Biomaterials, awarded first prize.
“On Macromolecular Crowding and its Effect on Cell Cycle”
MSTP Annual Retreat, CU Anschutz
- 2020 “Developing Synthetic Networks for Biological Preservation”
MSTP Special Topics, CU Anschutz
“Implementing Covalent Adaptable Networks for Biomedical Applications”
MSTP Annual Retreat, CU Anschutz
- 2019 “Synthesizing Novel Monomers Towards Self-Immolative Gels”
MSTP Special Topics, CU Anschutz
“Surviving Human Body Block and Graduate Core”
MSTP Special Topics, CU Anschutz
- 2018 “Bioprinting Modular Granular Hydrogels”
MSTP Special Topics, CU Anschutz
- 2016 “Non-Destructive Quantitation of AuNP Uptake by Microplate Reader Absorbance Analysis”
Summer Undergraduate Colloquium, NIST

Outreach Talks

- 2021 “Dual-Degree Training Programs: Becoming a Physician Scientist”
Introduction to Chemical Engineering, CU Boulder
- “How to Read (and Review) a Paper”
Undergraduate Mentorship Program for Physician Scientists, CU Anschutz
- “Deciding between MD, PhD, and MD-PhD programs” (panelist)
Undergraduate Mentorship Program for Physician Scientists, CU Anschutz
- “The Science of Sutures”
Biotechnology and Medical Research STEM Academy, CU Boulder.
- 2020 “Anatomy of the Larynx and Pharynx”
Knowledge Base for First-Year Medical Students, CU Anschutz

Video Essays

- 2017 “Re-Recording the Record: Pseudotranslation and Pseudotranscription in Media and Reality”
BE Kirkpatrick, [script/references] (link).
- 2015 “Don’t Trust Your Ears: Physical and Digital Sound Manipulation”
BE Kirkpatrick, [script/references] (link), awarded 2016 Mackison Writing Prize.

Posters

- 2021 “Redshifted tetrazole-ene PEG networks for self-reporting fluorogenic hydrogelation”
BE Kirkpatrick, JT Kamps, GK Hach, LJ Macdougall, KS Anseth, *ACS Fall 2021*
- 2019 “Bioprinting Modular Granular Hydrogels”
BE Kirkpatrick, CE Miksch, KS Anseth, *MSTP Annual Retreat*, CU Anschutz
- 2018 “CyP-D Knockout Protects the Mouse Kidney Against CsA-Induced Oxidative Stress and DNA Hypomethylation”
BE Kirkpatrick, Jo Klawitter, A Pennington, JM Thurman, NC Kotecha, U Christians, Je Klawitter, *Annual Anesthesiology Research Conference*, CU Anschutz
- 2017 “Effect of 1,8-dihydroxyanthraquinone on *Drosophila melanogaster* development”
BE Kirkpatrick, J Moon, *Clinical Undergraduate Research Symposium*, CU Boulder
- 2016 “Neuropilin 2-Targeted Nanoparticles Bind Selectively to Plaque Neovascularization in Atherosclerotic Arteries”
Kirkpatrick, Li, Tian, Wang, Ranville, Tudor, Boyes, Moulton, *International Vascular Biology Meeting*
- 2014 “Molecular Zipcodes of Vasa Vasorum Neovascularization in Atherosclerosis and Diabetes”
Li, Jones, **Kirkpatrick**, Chaudhary, Demos-Davies, Tudor, Taylor, Boyes Moulton, *Colorado Clinical and Translational Sciences Institute Summit*

Selected Activities

2021	Program director Anseth Research Group Undergraduate Symposiums Organized and hosted a semester-long virtual journal club and lecture series. Mentor Anschutz Medical Campus Undergraduate Mentorship Program Program for one-on-one mentorship of URM undergraduate students. Conference planner National MD-PhD Student Conference Coordinated talks by Robert Langer, Jean-luc Doumont; organized and facilitated an 'evidence-based wellness' session featuring a panel of physician-scientists.
2020–present	Webmaster Anseth Research Group & University of Colorado MSTP Regular maintenance of webpages for accurate personnel and publication records, news updates, conference advertising, and social media and archival management.
2019–present	Mentor Bryant-Webster Dual Language School STEM Scholars Program Program for one-on-one mentorship of underprivileged youth by MSTP students.
2019–21	Project lead University of Colorado MSTP Logo Redesign Sold ~ \$10k of jackets with new logo to fundraise for CU MSTP Student Council.
2019	Mentor VistaPEAK High School Senior Design Class Created an evidence-based project-help website and advised design teams. Mentor Think Like A Scientist After-school program for underprivileged third-grade students interested in science.
2018–20	1st trumpet, viola Anschutz Medical Campus Orchestra
2018	Teacher Bricks for Kids LEGO-themed science education program for elementary school students.
2017	Volunteer Denver Health Emergency Department and Adult Urgent Care
2014–17	Tutor transport phenomenon, engineering, math, humanities, sociology Mentored 10+ University of Colorado students over 12+ courses.
2013–15	1st/4th trumpet CU Boulder Thompson Jazz Studies Program Big Bands

Professional Affiliations

American Association for the Advancement of Science
American Chemical Society
American Institute of Chemical Engineers
American Medical Association
Biomedical Engineering Society
Colorado Medical Society
Materials Research Society
Regenerative Engineering Society
Society for Biological Engineering
Society for Biomaterials