Dimitri Athan Bikos, Ph.D.

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I am a broadly experienced postdoctoral researcher currently developing isothermal nucleic acid amplification assays for detection of SARS-CoV-2 and performing single-cell, high-throughput drop microfluidics in the group of Connie B. Chang at the MSU Center for Biofilm Engineering. I have nearly nine years of research experience with experimental colloidal soft matter at UCLA under Thomas G. Mason where I taught extensively and was recognized by the Hanson-Dow Teaching Assistant Award in 2015. Expertise in size separations and sorting. Developed novel applications in hydrogels published in *Nature Communications* and leading field-specific journals.

Research Experience

Montana State University - Center for Biofilm Engineering July 2018 - Present
PI: Connie B. Chang, Ph.D.

- Designing nucleic acid amplification detection methods for SARS-CoV-2
- Customizing nanosphere-stabilized drops for use in microfluidic applications.
- Developing high-throughput microfluidic drop detection methods using Raman and fluorescent spectroscopy.
- Investigating influenza virus dynamics using drop-based microfluidics as part of DARPA-funded project.

UCLA Department of Chemistry and Biochemistry 2012 - 2018
Advisor: Thomas G. Mason, Ph.D.

- First publication of 3D printed tools for shear rheometry. Boosted torque response for small sample volumes. Made-to-order tool surface roughness. 100x decrease in production costs.
- Developed novel technique of band-collision gel electrophoresis published in *Nature Communications*. Created and characterized devices for gel electrophoretic separations of colloidal particles and nanoemulsions. Enhanced separation efficiency per unit area of porous hydrogel media.

Education

University of California, Los Angeles Los Angeles, CA
Ph.D. Department of Chemistry and Biochemistry, June 2018

University of California, Los Angeles Los Angeles, CA
M.S. Department of Chemistry and Biochemistry, 2016

University of Virginia – College at Wise Wise, VA
B.S. Chemistry, cum laude, 2007
Minor in Physics
Minor in Literature

Publications

"Measuring colloid-surface interaction forces in parallel using fluorescence centrifuge force microscopy." Thomas B. LeFevre, **Dimitri A. Bikos**, Connie B. Chang, James N. Wilking, *Soft Matter*, 2021, 17, 6326.

"SLAMP: A rapid fluorometric RT-LAMP assay for sensitive and specific detection of SARS-CoV-2 from human saliva." **Dimitri A. Bikos**, et al. *bioRxiv*, 2021 https://doi.org/10.1101/2021.03.31.21254634

"Screening of additive formulations enables off-chip drop reverse transcription quantitative polymerase chain reaction of single influenza A virus genomes." Emma Kate Loveday, Geoffrey K. Zath, **Dimitri A. Bikos**, Zackary J. Jay, Connie B. Chang, *Anal. Chem*., 2021, 93, 10, 4365.

"Band-collision gel electrophoresis." **Dimitri A. Bikos**, Thomas G. Mason, *Nat. Commun.*, 2019, 10, 3631.

Publications (continued)

"Influence of ionic constituents and electrical conductivity on the propagation of charged nanoscale objects in passivated gel electrophoresis." **Dimitri A. Bikos**, Thomas G. Mason, *Electrophoresis*, 2018, 39, 394.

"Propagation and separation of charged colloids by cylindrical passivated gel electrophoresis." **Dimitri A. Bikos**, Thomas G. Mason, *J. Phys. Chem. B*, 2016, 120, 6160.

"The physical origins of transit time measurements for rapid, single cell mechanotyping." Kendra D. Nyberg, Michael B. Scott, Samuel L. Bruce, Ajay B. Gopinath, **Dimitri A. Bikos**, Thomas G. Mason, Jin Woong Kim, Hong Sung Choi, and Amy C. Rowat, *Lab Chip*, 2016, 16, 3330.

"Customizable tool geometries by additive manufacturing for mechanical rheometry of soft matter." **Dimitri A. Bikos**, Thomas G. Mason, *J. Rheol*., 2016, 60, 1257.

Awards

Walker and Upjohn Fellowship (Spring 2018).
UCLA ACS Research Showcase Fellowship (Apr. 2-6, 2017).
UCLA Graduate Division Fellowship Award (2012 – 2018).
Hanson-Dow Teaching Assistant Award (2015).
ACS Northeast Tennessee Section Outstanding Chemistry Senior (2007).

Patents

Mason, Thomas G., **Bikos, Dimitri A.** Reacting molecules and colloids electrophoretically. U.S. Patent Application no. 63050466, filed July 2020.

Mason, Thomas G., **Bikos, Dimitri A.** Customized rheometer tools by three dimensional printing. International and U. S. Patent Application PCT/US2017/013027, filed January 2017.

Presentations

ACS Fall 2020 Virtual Meeting & Expo Aug. 17 - 20, 2020
Dimitri A. Bikos* et al, Interfacial additives increase the thermal and mechanical stability of aqueous emulsion droplets for high-throughput microfluidic single-cell influenza studies. *Oral presentation.

APS March Meeting 2020 – Denver, CO Mar. 2 - 6, 2020
Dimitri A. Bikos* and Thomas G. Mason, Band-collision gel electrophoresis (BCGE) for visualizing molecular and colloidal interactions. *Oral presentation.

Materials Science Under the Big Sky – Bozeman, MT Sept. 27, 2019
Dimitri A. Bikos* and Thomas G. Mason, Band-collision gel electrophoresis.
*Oral presentation.

APS March Meeting 2018 – Los Angeles, CA Mar. 5 - 9, 2018
Dimitri A. Bikos* and Thomas G. Mason, Effect of ionic constituents on the propagation of charged nanospheres in passivated gel electrophoresis. *Oral presentation.

Frontiers in Soft Matter and Macromolecular Networks – San Diego, CA Sept. 21, 2017
Dimitri A. Bikos* and Thomas G. Mason, Customized 3D tool geometries for rheometry of soft matter. *Oral presentation.

253rd ACS National Meeting & Exposition – San Francisco, CA Apr. 2 - 6, 2017
Dimitri A. Bikos* and Thomas G. Mason, Propagation and separation of charged colloids by cylindrical gel electrophoresis.
*Oral and poster presentation.

88th Annual Meeting of the Society of Rheology – Tampa, FL Feb. 14 - 16, 2017
Dimitri A. Bikos* and Thomas G. Mason, Customized 3D tool geometries for rheometry of soft matter. *Oral presentation.

Teaching Experience	**UCLA Department of Chemistry and Biochemistry**	Los Angeles, CA
	Teaching Fellow averaging five courses per year	Sept. 2012 - Dec. 2017

- Composed dozens of original exams and taught hundreds of discussion sections and reviews, frequently speaking in front of hundreds of students.
- Led undergraduate laboratory sections of 20-30 students.

Professional Affiliations	Society of Rheology (SoR) American Chemical Society (ACS) American Physical Society (APS)

Service	**UCLA Dept. of Chemistry and Biochemistry Recruitment Events**	Los Angeles, CA
	Gave presentations for and co-hosted dinners with grad student admits.	2014 - 2017
	Office of Surface Mining (OSM)/AmeriCorps VISTA	Big Stone Gap, VA
	Performed water quality testing and served as community liaison.	Feb. 2007 - Feb. 2008