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<b>Education</b>	<b>Ph.D., Microbiology</b> University of Georgia <b>B.S., Biological Sciences &amp; Genetic Biology, Honors Research Program</b> Purdue University <b>Summer Course in Microbial Diversity</b> Marine Biological Laboratory, Woods Hole, Massachusetts	
<b>Work Experience</b>	<b>Associate Research Professor</b> 07/2014 – present      Arizona State University      Tempe, AZ Biodesign Center for Applied Structural Discovery <b>Assistant Research Scientist</b> 01/2012 – 06/2014      Arizona State University      Tempe, AZ Biodesign Center for Innovations in Medicine <b>Research Assistant Professor</b> 01/2004 – 06/2009      Medical University of South Carolina      Charleston, SC Department of Biochemistry & Molecular Biology <b>Associate Research Scientist</b> 08/2001 – 07/2003      Yale University      New Haven, CT Molecular Biophysics & Biochemistry <b>Post-doctoral Fellow</b> 06/1997 – 07/2001      Yale University      New Haven, CT Molecular Biophysics & Biochemistry	
<b>Intellectual Property</b>	<b>Hansen D</b> , Antonyrajah J, Fromme P (2025) WIPO international patent application WO 2025048289, filed September 26, 2025, Arizona Board of Regents on Behalf of Arizona State University. <b>Hansen D</b> , Antonyrajah J, Fromme P (2024) USPTO U.S. Patent Application 63/700,242, filed September 27, 2024. <b>&gt;300 unique plasmid DNAs &amp; expression vectors, and 2 unique <i>Escherichia coli</i> expression strains</b> , available through Addgene.org and DNASU.org. Since 8/2020, these materials were <b>distributed to 82 institutions across 24 countries</b> .	
<b>Publications</b>	<a href="http://www.ncbi.nlm.nih.gov/sites/myncbi/1NS_VusA66fkG/bibliography/43651356/public/?sort=date&amp;direction=descending">http://www.ncbi.nlm.nih.gov/sites/myncbi/1NS_VusA66fkG/bibliography/43651356/public/?sort=date&amp;direction=descending</a> Antonyrajah J, Aguilar J, Kiefer D, Schrag L, <b>Hansen D</b> , Fromme R, Fromme P (2026) Abstract 2339 Structural characterization of the secreted autotransporter toxin (Sat), a class I-SPATE from <i>Escherichia coli</i> , by cryogenic electron microscopy. <i>J Biol Chem</i> 302, 112696. <a href="https://doi.org/10.1016/j.jbc.2026.112696">https://doi.org/10.1016/j.jbc.2026.112696</a> Ranaweera M, Jernigan R, Boradia K, Schrag L, <b>Hansen D</b> , Fromme P (2026) Abstract 2304 Exploring the membrane architecture of <i>Francisella tularensis</i> : structural	

characterization of key virulence-associated proteins. *J Biol Chem* 302, 112687.  
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**Proposals  
Written as  
Lead PI**

**NIH NIAID R21.** Co-Investigators Petra Fromme, Po-Lin Chiu. Submitted 2/16/2026.

**NIH NINDS R03.** Co-Investigator Petra Fromme. Submitted 2/16/2026.

**NIH NIAID R21.** Co-Investigators Petra Fromme, Po-Lin Chiu. Submitted 10/13/2025.

**Arizona Department of Health Services**, Arizona Biomedical Research Centre, Investigator Grant. Collaborators Petra Fromme, Abhishek Singharoy. Pre-Proposal submitted 9/4/2025.

\* **INVITED FULL PROPOSAL** \* **Department of Defense**, Congressionally Directed Medical Research Programs, Tick-Borne Disease Research Program, Idea Award. Co-PIs Petra Fromme, Abhishek Singharoy. Pre-Proposal submitted 6/26/2024; full proposal submitted 10/3/2024.

**Department of Defense**, Congressionally Directed Medical Research Programs, Tick-Borne Disease Research Program, Idea Award. Co-PIs Petra Fromme, Abhishek Singharoy. Pre-Proposal submitted 5/25/2023.

\* **INVITED FULL PROPOSAL** \* **Department of Defense**, Congressionally Directed Medical Research Programs, Tick-Borne Disease Research Program, Therapeutic/Diagnostic Research Award. Co-PIs Petra Fromme, Abhishek Singharoy. Pre-Proposal

submitted 5/23/2022; full proposal submitted 8/25/2022.

**Bay Area Lyme Foundation.** Co-PI Petra Fromme. Submitted 6/30/2022.

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**\* SCORED \* NIH NIAID R21.** Co-PI Petra Fromme. Submitted 2/14/2022.

**Bay Area Lyme Foundation.** Co-PI Petra Fromme. Submitted 9/30/2021.

**Bay Area Lyme Foundation.** Co-PI Petra Fromme. Submitted 1/31/2021.

**Infectious Diseases Society of America.** Co-PI Petra Fromme. Submitted 9/21/2021.

**Bay Area Lyme Foundation.** Co-PI Petra Fromme. Submitted 6/30/2020.

**Department of Defense,** Congressionally Directed Medical Research Programs, Tick-Borne Disease Research Program, Idea Development Award. Co-PI Petra Fromme. Pre-Proposal submitted 5/26/2020.

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**NIH NIAID R21.** Co-Investigator Petra Fromme. Submitted 10/14/2019.

**Steven & Alexandra Cohen Foundation.** Co-PI Petra Fromme. Submitted 8/15/2019.

**Global Lyme Alliance.** Co-PI Petra Fromme. Submitted 7/22/2019.

**Department of Defense,** Congressionally Directed Medical Research Programs, Tick-Borne Disease Research Program, Investigator-Initiated Research Award. Co-PI Petra Fromme. Pre-Proposal submitted 5/22/2019.

**\* SCORED \* NIH NIAID R21.** Co-Investigator Petra Fromme. Submitted 3/15/2019.

**Bay Area Lyme Foundation, Emerging Leader Award.** Co-PI Petra Fromme. Submitted 3/1/2019.

**NIH NIAID R21.** Co-Investigator Petra Fromme. Submitted 6/16/2018.

**Global Lyme Alliance.** Co-PIs Petra Fromme, Ying Zhang (Johns Hopkins University). Submitted 9/15/2017.

**\* FUNDED \* ASU Biodesign Institute Seed Grant.** Co-PIs Stephen A. Johnston, Petra Fromme. 07/01/2015-06/30/2016.

**\* FUNDED \* Postdoctoral Fellowship.** NIH National Institute of General Medical Sciences, F32GM019278. Mentor, Dieter Söll (Yale University). 12/1997-01/2000.

**Manuscript  
Reviewer**

*Protein Science*

*PLoS ONE*

*Molecular Biology Reports*

*Applied Microbiology and Biotechnology*

*Virulence*

*Archives of Microbiology*

*Future Microbiology*

*Microbial Cell Factories*

**Teaching**

MBB 493 – Honors Thesis

MBB 492 – Honors Directed Study

MBB 495, BIO 495 – Undergraduate Research

**Service,  
Mentorship,  
& Outreach**

**Proposal Reviewer,** Arizona Department of Health Services, 12/2025-.

**Proposal Reviewer,** ASU Limited Submissions panels, 04/2020-.

**Mentor**, ASU Barrett Honors undergraduate theses, 01/2014-05/2021; 05/2025-.

**Member**, Academic Professional Personnel Committee, ASU Office of Knowledge Enterprise Development, 01/2019-.

**Lead**, Lyme Disease table, ASU Open Door public outreach events, 2024, 2023, 2020.

**Member**, ASU Biodesign Faculty Chalk Talk committee, 08/2020-07/2023 (3 year term).

**Proposal Reviewer**, ASU Biodesign internal submissions, 2023.

**Conference Chair**, International SMALP Conference, 12/2022.

**Mentor**, ASU/NASA Space Grant, 07/2020-08/2021.

**Conference Chair**, Cambridge Healthtech Institute's Discovery on Target symposium, Antibodies Against Membrane Protein Targets, Boston, Massachusetts, 2016.

## Scientific Meetings

Targeting the bacterial outer surface of tick-borne pathogens. Talk & poster.

**Outstanding Poster Award**. 18<sup>th</sup> International Conference on the Crystallization of Biological Macromolecules, Tempe, Arizona, 2024.

Membrane translocation reveals that oligomerization is a recurring theme in the structures of outer membrane (lipo)proteins from pathogenic bacteria. Poster. Symposium: Aspects of Imaging, Diffraction, and Crystallography: Where John Spence's Legacy Takes Us, Tempe, Arizona, 2022.

Advances in the structural biology of the outer surface proteins from the Lyme disease pathogen support the structure-based design of needed therapeutics. Poster. 9<sup>th</sup> Annual BioXFEL International Conference, Tempe, Arizona, 2022.

The first images of a membrane-translocated virulence determinant from the Lyme disease pathogen. Invited seminar. ASU Biodesign Faculty Chalk Talks, Tempe, Arizona, 2020.

In vivo presentation to generate antibody-based structural ligands against membrane proteins. Talk & Poster. *Nature* Conference: Functional dynamics – visualizing molecules in action, Tempe, Arizona, 2019.

Generation of high specificity antibodies against membrane proteins using DNA-gold micronanoplexes for gene gun immunization. Poster. Cambridge Healthtech Institute's Discovery on Target symposium Antibodies Against Membrane Protein Targets, Boston, Massachusetts, 2017.

Heterologous expression of bacterial inner and outer membrane proteins in *E. coli* for structural studies. Invited seminar. GTCbio's 4<sup>th</sup> Protein Expression, Purification & Characterization Conference, Boston, Massachusetts, 2016.

Efficiency of genetic immunization for the generation of antibodies against membrane proteins. Invited seminar. Cambridge Healthtech Institute's Discovery on Target symposium Antibodies Against Membrane Protein Targets, Boston, Massachusetts, 2016.

Expression strategies towards the structural determination of membrane proteins from *Francisella tularensis* SCHU S4. Poster. Cambridge Healthtech Institute's PepTalk: Membrane Proteins, A Valuable Resource and Target, San Diego, California, 2015.

Production and characterization of high-specificity polyclonal antibodies against membrane proteins from highly infectious agents in the absence of purified membrane protein. Poster. Cambridge Healthtech Institute's Discovery on Target symposium, Antibodies Against Membrane Protein Targets Parts 1 & 2, Boston, Massachusetts, 2014.

Reagents for membrane proteins from highly infectious agents: generation of target-

specific mouse polyclonal antibodies in the absence of membrane protein. Poster. NIGMS Structural Biology Horizons Workshop, Bethesda, Maryland, 2013.

Production and characterization of polyclonal antibodies against membrane proteins from infectious microbes in the absence of soluble protein. Poster. PSI:Biotechnology Workshop, Bethesda, Maryland, 2012.

hTR and hTERT assemble into active human telomerase in the absence of all other eukaryotic factors. Poster. Cold Spring Harbor Meeting on Telomeres and Telomerase, Cold Spring Harbor, New York, 2009.

Expression and assembly of active human telomerase in bacteria. Poster. Hollings Cancer Center Scientific Research Retreat, Charleston, South Carolina, 2008.

Large scale purification and crystallography of tipin, a cell cycle checkpoint protein. Poster. Symposium for Structural Biology, Medical University of South Carolina Center for Structural Biology, Charleston, South Carolina, 2008.

Structural studies of the assembly and function of human telomerase. Poster. Hollings Cancer Center Scientific Research Retreat, Charleston, South Carolina, 2005.

Naturally-occurring mischarging aminoacyl-tRNA synthetases. Poster. Gordon Research Conference, Nucleic Acids, Bristol, Rhode Island, 2002.

Indirect aminoacyl-tRNA synthesis in *Methanothermobacter thermautotrophicus*. Poster. Gordon Research Conference on Archaea, Andover, New Hampshire, 2001.

An archaeal-specific glutamyl-tRNA<sup>Gln</sup> amidotransferase. Invited seminar. 18<sup>th</sup> tRNA Workshop, Cambridge, United Kingdom, 2000.

A genetics system for *Methanococcus maripaludis*. Invited seminar. Gordon Conference on Archaea: Ecology, Metabolism & Molecular Biology, Plymouth, New Hampshire, 1996.

## Skills

Project design, management, and budgets.

Scientific proposals, manuscripts, peer reviews, technical reports, standard operating procedures (SOPs), data analysis, and oral presentations.

U.S. and international patent applications, intellectual property, technology development, and interdisciplinary collaborations.

Supervision, training, and mentoring of laboratory technicians and students (graduate, medical, undergraduate, and high school).

Management of the laboratory equipment, supplies, bacterial and archaeal strain collections, nucleic acid collections, chemicals, radiochemicals, biosafety (BSL1 and BSL2), chemical safety, and general laboratory safety.

Advanced recombinant DNA technology and plasmid design; PCR, DNA sequencing and transformation, transduction, and bioinformatics.

Membrane proteins, bacterial lipoproteins, RNA biochemistry, protein expression, protein purification, gel electrophoresis, and enzymatic assays.

Immunological methods: ELISAs, western immunoblots, and B cell isolation.

Antibody generation by DNA and protein immunization.

Mouse handling.

Development and management of IACUC animal protocols.

In vitro transcription and in vitro translation.

Peptide microarrays, protein microarrays, and array analyses.

Vaccine development against pathogens and cancer.

Identification and characterization of novel genes, enzymes, and biochemical pathways.

Genetics and gene knockouts in bacteria and archaea.

Chromatography (FPLC, HPLC, TLC, GC) and spectrophotometry.

Radiolabel and stable isotope methods ( $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^3\text{H}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$ ).

Sterile microbiological technique.

Microbial growth in fermentors and on gaseous substrates.

Growth and culturing of diverse microbes, including strict anaerobes, thermophiles, photosynthetic bacteria, radioresistant microbes, and archaea.

Compressed gas handling systems and gas measurements (methane,  $\text{CO}_2$ ,  $\text{H}_2$ ,  $\text{N}_2$ , Ar).

Characterization of natural microbial populations and isolates.