Curriculum Vitae

Brandon M. Sie

Position:	Research Specialist	**Address**:	
	Ben Larman lab	Johns Hopkins University	
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PROFILE

I am a research specialist and data scientist with expertise in molecular biology, R programming, and liquid handling automation. I also have a background in science education, primary healthcare, and martial arts. These experiences reinforce my high regard for effective communication, the human impact of basic science, and the value of self-discipline and integrity.

EDUCATION

2011-2015 **University of California** **Berkeley, CA**
B.S., Bioengineering

- Graduated with honors.
- Selected Coursework: Biomedical Physiology, Computational Toxicology, The Developing Brain, Cell Biology Lab, Bionanotechnology, Bio-MEMS Lab, Cell and Tissue Engineering, Biological Transport Phenomena, Molecular Immunology, Biomechanics, Properties of Materials, Ethics in Science and Engineering.

WORK EXPERIENCE

2016-present **Johns Hopkins University, Pathology** **Baltimore, MD**
Research Specialist (2017-); Research Technologist (2016-2017)

- Developing and performing massively multiplexed, high-throughput assays.
  - PhIP-seq (Phage ImmunoPrecipitation Sequencing) antibody profiling and biomarker discovery using phage display. Screened 2000+ samples.
  - CLAmp-seq (Capture Ligation Annealing Sequencing) high sensitivity probe-based nucleic acid detection, e.g. for viral differential diagnosis.
  - Performed gene cloning and bacteriophage packaging and expansion to prepare PhIP-seq phage display libraries for use in experiments.
- Writing, optimizing, and implementing R software to process and communicate data from massively multiplexed experiments.
  - R Markdown report for synthesizing the millions of data points from PhIP-seq experiments into a ranked list of candidate novel biomarkers / autoantigens for subsequent validation.
  - EpitopeFinder algorithm for collapsing a set of peptides down to the minimally overlap of their BLAST alignments as a representation of likely epitopes for the antibodies used in the immunoprecipitation.
- Interacted productively with peers and collaborators.
  - Trained other lab members to proficiency in PhIP-seq benchwork.
  - Presented at department meetings and to project collaborators.
  - Developed and maintained lab inventory spreadsheet and form.

2015-2016 **Food and Drug Administration** **College Park, MD**
Research Fellow
- Evaluated and systematized scientific details from 200+ genetic toxicity studies (Ames, Chromosome Aberration, Mouse Lymphoma, Micronucleus) and performed quality control on chemical compound information to increase predictive performance of cheminformatics tools in FDA's Chemical Evaluation & Risk Estimation System.

2012-2015 **UC Berkeley Student Learning Center** **Berkeley, CA**
Chemistry Study Group Leader
- Led study group of approximately 40 students in 4+ hours per week of self-prepared lecture and worksheet based on self-designed lesson plan.
- Co-wrote, proctored, and reviewed mock exams for hundreds of students.
- Provided daily drop-in office hours for various undergrad science courses.
- Mentored new tutors and study group leaders in communication skills.

2011-2015 **Berkeley Free Clinic** **Berkeley, CA**
Volunteer Medic
- Provided limited primary care, education, and counseling to clients, from triage to diagnosis and treatment. Coordinated HIPPA-compliant release of medical records. Trained and mentored new volunteers.

2012 **UC Davis Medical Center** **Sacramento, CA**
Surgical Intern Volunteer
- Observed open and laparoscopic surgeries, surgical rounds, patient care, and resident trainings. 310 hours. In urology, neurosurgery, surgical oncology, cardiothoracic, transplant, trauma, and other services.

2012 **UC Berkeley, Optometry** **Berkeley, CA**
Undergraduate Researcher
- Wrote MATLAB software to expedite retinal imaging tests and automate subsequent image processing.

2009-2011 **UC San Francisco, Orofacial Sciences** **San Francisco, CA**
Research Assistant
- Assisted in research on effects of nicotine and smoke on human bone (osteoclasts and osteoblasts in vitro), with applications to osteoporosis.

SELECTED SKILLS

Soft Skills	Delivered presentations to lab team, university department, and at a national conference. Interacted with researchers from diverse fields for collaborative work. Instructor experience from leading chemistry study group at university level. Clinical patient interaction experience from volunteering at a free clinic for four years.
Laboratory skills	DNA cloning, viral packaging, phage display, liquid handling robotics operation, nucleic acid detection, microfluidics design and fabrication, bacterial & human cell culture, gel electrophoresis & gel extraction.
Programming languages & technical proficiencies	R, Matlab, Mathematica, Java, HTML, CSS, Markdown, LaTeX, SFTP, AutoCad, COMSOL, MS Office, Adobe CS, Linux/Unix, Windows XP - 10

PUBLICATIONS

SUBMITTED

- Eshleman SH, Laeyendecker O, Kammers K, Chen A, Sivay MV, Kottapalli S, **Sie BM**, Yuan Y, Mohan D, Wansley, D, Kula T, Morrison C, Elledge SJ, Brookmeyer R, Ruczinski I, and Larman HB. (awaiting review). "Comprehensive profiling of HIV antibody evolution." Cell Host & Microbe.

CO-FIRST AUTHORED, PEER-REVIEWED PUBLICATIONS

- Mohan D*, Wansley DL*, **Sie BM***, Noon MS, Baer AN, Laserson U*, Larman HB*. (2018). "PhIP-Seq characterization of serum antibodies using oligonucleotide-encoded peptidomes." Nature Protocols. **These authors contributed equally.*

PRESENTATIONS

- Sie BM. (2018) "High-Throughput Phage Display of a Synthetic Human Peptidome for Autoantibody Characterization in Dermatomyositis." (presented to collaborators, department.)
- Sie BM, Johnson DE. (2016) "A Correlative Relationship Between Regional Clusters of Agricultural Permethrin Exposure and Parkonson's Deaths Per Capita: An Analysis of United States Counties." (poster presented at annual meeting of the Society of Toxicology).

CO-AUTHORED POSTERS AND ABSTRACTS

- Barnes LA, **Sie BM**, Shan K, Perkins JA, Griffin G, Rozenberg AZ, Miller LS, Okoye GA, Larman HB, Byrd AS. (2018) "Identification of Autoantibodies in Patients with Hidradenitis Suppurativa Using PhIP-Seq" (World Congress of Dermatology poster.)
- Laeyendecker O, Kammers K, Chen A, Sivay MV, **Sie B**, Yuan T, Mohan D, Kottapalli S, Kula T, Morrison CS, Elledge S, Brookmeyer R, Ruczinski I, Larman HB, Eshleman SH. An Early Decline in HIV Antibody Breadth Predicts More Rapid Disease Progression. (Conference on Retroviruses and Opportunistic Infections abstract.)
- Laeyendecker O, Kammers K, Chen A, Sivay MV, **Sie B**, Yuan T, Mohan D, Wansley D, Kula T, Morrison CS, Elledge S, Brookmeyer R, Ruczinski I, Larman HB, Eshleman SH. Antibody Profiling Identifies Novel Biomarkers for Duration Of HIV Infection. (Conference on Retroviruses and Opportunistic Infections abstract.)
- Eliason J, Jue S, Tsao A, **Sie B**, Pal M, and Loomer P. (2010) "Biomolecular Effects of Nicotine on Human Bone Cells." (International Association of Dental Research poster & abstract.)

ACHIEVEMENTS

2018 Data Science Certification, Coursera, License 34QCDB3NMQ3E
2015 Honors at graduation, UC Berkeley College of Engineering
2013 Tau Beta Pi Engineering Honor Society inductee & subsequent officer
2012 Bioengineering Honor Society inductee
2011 Regent's and Chancellor's Scholarship recipient
2011 National Merit Scholarship recipient