(408) 887-3335 • lohith.akshar@gmail.com/alohith@ucsc.edu

Akshar Lohith

Objective

A PhD in nanotechnology for single-cell analysis, sequencing and biosensing

Education

June 2014	B.S. Bioengineering, Minor Bioinformatics	University of California, Santa Cruz, Santa Cruz, CA

Professional Accomplishments

Skills

Laboratory Skills

- PCR, qPCR, gel electrophoresis, Western Blot, protein purification with affinity chromatography, TLC
- Plasmid transformation into *E. coli*, cell culture of mammalian cells and *E. coli* and fluorescent microscopy of cells
- Sample handling robot operation and programming, cDNA synthesis, library preparation for Illumina sequencing on HiSeq and MiSeq
- Single-cell interrogation and nano-genomics

Computer skills

- Programming languages: Python, Some C, Java, HTML, Visual Basic of Applications (VBA), Flash animation
- Experience with Microsoft Office, Windows and UNIX systems

Active Projects Involved (Pourmand Lab)

- ISPY 2 RNA-Sequencing breast cancer research in collaboration with UCSF
- SU2C RNA-Sequencing prostate cancer research in collaboration with UCSF
- Single-cell automated nanoinjections
- Sperm genetic mutation detection and sex identification with nanopipettes in collaboration with Stanford
- Intracellular ROS detection with nanopipettes

Publications

- **Compartmental Genomics in Living Cells Revealed by Single-cell Nanobiopsy**
  P. Actis, M. M. Maalouf, H.J. Kim, **A. Lohith**, B. Vilozny, R.A. Seger, N. Pourmand, ACS Nano, DOI: 10.1021/nn405097u
- **Optimized protocol for simple extraction of high quality genomic DNA from Clostridium difficile for whole genome sequencing**
  J.H.C. Sim, V. Anikst, **A. Lohith**, N. Pourmand, N. Banaei, J. Clinical Microbiology., DOI:10.1128/JCM.00956-15.
- **Single-cell intracellular nano-pH probes**
  R.E. Özel, **A. Lohith**, W.H. Mak, N. Pourmand, RCS Advances, DOI: 10.1039/C5RA06721A
- **Smartphone Operated Signal Transduction by Ion Nanogating (STING) Amplifier**
  R.E. Özel, S. Kahnemouyi, H. Fan, W.H. Mak, **A. Lohith**, R.A. Seger, M. Teodorescu, N. Pourmand, ACS Sensors, DOI: 10.1021/acssensors.5b00289
- **Single-cell Automated Imaging and Nanoinjection Tool**
  A. Lohith, S. Rad, A. Pourshafiee, R.E. Özel, R.A. Seger, J. Raskatov, M. Teodorescu, N. Pourmand, *in prep.*

(408) 887-3335 • lohith.akshar@gmail.com

Akshar Lohith

Employment History

10/2014 – 08/2016 | Junior Specialist | Genome Sequencing-Nader Pourmand Lab, Santa Cruz, CA

Perform sequencing activities including automated cDNA synthesis and Illumina sequencing library preparation of RNA samples from various projects. Processing and QC methods for sample preparation include quantification with qPCR, bead purification with AmPureXP and Caliper, and DNA size selection with Caliper LabChipXT. Operation of sample-handling robots, including programing sample-handling robots to automate Smart-Seq2 cDNA synthesis and KAPA Biosystems' Hyper-Prep Library Preparation protocols. Sample handling robot protocols include genomic DNA extraction from whole blood. Extractions are then processed for Illumina Sequencing. Maintain server file-share space, including Illumina Sequencing data sample demultiplexing and transfer of data to research collaborators. Perform research activities with single cell nanobiopsies from mammalian cells for several projects. Biopsied samples underwent cDNA synthesis for RNA sequencing in multiple projects. Optimize injection protocol and worked to automate nanoinjections of various materials into cells with BioStinger, single-cell interrogation instrument. For automating nanoinjections, TNFa::NFkB pathway inhibitory drugs are injected into a mammalian cell culture modified for GFP-expression under TNFa exposure. Other materials injected include various toxins for Reactive Oxygen Species (ROS) detection with fluorescent probe DCFDA. Performed fluorescent imaging and subsequent analysis on cells exposed to intracellular pH probe BCECF. Projects include; ISPY 2 and SU2C RNA Sequencing cancer research projects in collaboration with groups at UCSF, RNA nanobiopsy from human sperm for genetic mutation analysis and sex identification in collaboration with Stanford School of Medicine, Intracellular ROS detection by nanoinjection of toxins, and Single-cell Automated Imaging and Nanoinjection.

6/2014 – 9/2014 | Genome Sequencing Intern | Genome Sequencing-Nader Pourmand Lab, Santa Cruz, CA

Learned and operated sample-handling robots to perform automated cDNA synthesis and Illumina Library Preparation for RNA Sequencing on Illumina Sequencing platforms. Performed laboratory sample QC methods such as qPCR library quantification and Bioanalyzer High-Sensitivity DNA Assay as well as sample purifications with AmPureXP and Caliper beads.

2/2012 – 6/2014 | Undergraduate Research Assistant | Nader Pourmand Lab, Santa Cruz, CA

Fabricated nanopipettes from glass capillaries, using Sutter P2000 laser puller, to use with the modified Scanning Ion Conductance Microscope setup developed for single cell analysis. This platform is capable of single cell nanobiopsies and injections, and was used for senior thesis project: Illuminating the Mitochondria and the Mitochondrial Genome's role in Neurodegeneration with nanopipettes. Using this platform, single mammalian cells cultured in compartmentalized Death Galaxy device were nanobiopsies for RNA sequencing, a new application of the single cell nanobiopsy technique. Maintained several mammalian cell cultures and extracted genomic DNA from cell populations using Invitrogen Genomic DNA mini kit.

10/2011 – 6/2014 | Intramural Referee | Office of Physical Education, Recreation and Sports at UCSC, Santa Cruz, CA

Refereed intramural soccer, futsal and dodgeball games on campus

6/2013 – 9/2013 | Bioinformatics Intern | Boston Heart Diagnostics, Framingham, MA

Explored to expand image analysis of High Density Lipoprotein (HDL) size separation maps in order to study HDL particle formation and potential cardiovascular health benefits they may have. This was performed through analysis of over 3700 HDL maps. Microsoft Excel Macro-enabled Templates and workflows were developed for the Image Analysis Data Collection team with SOP addendums.

(408) 887-3335 • lohith.akshar@gmail.com

Akshar Lohith

6/2009 – 9/2013 QA Intern Tricipher, Inc., Los Gatos, CA

Verified expected flow of links on web-based software product, MyOneLogin, for quality and new features. Searched for errors in both production and pre-production versions.

References

References are available on request.