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## Letter of Support for 2019 ChEM-H Seed Grant Proposal

Date: June 10<sup>th</sup>, 2019

Dear Committee members,

I would like to provide my strongest support for the Stanford ChEM-H 2019 Seed Grant Competition proposal by Georgi Marinov, Zohar Shipony and Zhengu Zuo titled “Single-molecule methods for direct base-pair mapping of in vitro and in vivo protein-DNA interactions”.

Georgi is a postdoctoral researcher in my lab and is co-advised by Prof. William Greenleaf. He has extensive experience developing and applying high-throughput functional genomics technology. He is also equally adept at statistical and computational analyses. Georgi has been a key player in the ENCODE consortium for many years. He has a strong publication record with extensive collaborations. My lab collaborates extensively with the Greenleaf and Fordyce labs and we already have several collaborative publications with each other. This would be our first joint project across all 3 labs. I have no doubt that this innovative project proposed by Georgi and his postdoc colleagues will lead to exciting collaborative science.

My lab has a long history and extensive expertise in developing analytical approaches and standard procedures for working with ChIP-seq data, going back to the early years of the high-throughput sequencing revolution. In recent years, our efforts have been centered on using machine learning techniques, in particular deep neural network, to understand the relationship between DNA sequence and regulatory function, based on ChIP-seq and chromatin accessibility datasets. Given this background, I am excited for our lab to participate in the development of new experimental methods that can provide more finely grained and direct measurements of protein-DNA interactions.

To this end, I will be happy to provide my laboratory resources for the purposes of this project. These include access to the Sherlock high-performance computing cluster at Stanford, where we have over 24 compute nodes dedicated to our lab, including multiple GPU ones. We will also provide our lab’s own computing cluster containing over 100 CPU cores and 24 GPU nodes. I am also happy to provide additional financial funding where required to supplement the seed grant.

I will also be happy to assist with our extensive deep learning experience, which will be invaluable for developing novel base calling algorithms tailored to the need of this proposal.

Sincerely,

Anshul Kundaje, Ph.D.  
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