

## RBC Lab Newsletter June 2024



The Red Blood Cell (RBC) lab continues to develop new assays or improve existing technologies to better support studies in hemoglobinopathy research. In this newsletter we present the RoxyScan as an example of a new assay and our current study with Akira Bio to illustrate our support of new clinical studies aimed to improve the quality of life of hemoglobinopathy patients.

The RBC Lab is located in a historic building on Martin Luther King Jr Way in Oakland, CA.



To comply with the UCSF plans to remodel this building, our laboratory was required to relocate. Our new lab space can be found just down the hall from our old lab suite.



Please contact us for additional information.

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The RBC Lab has been pivotal in the development of new compounds as candidates for treatment of hemoglobinopathy patients. We have collaborated with:



As an example we highlight our current study in partnership with Akira Bio.



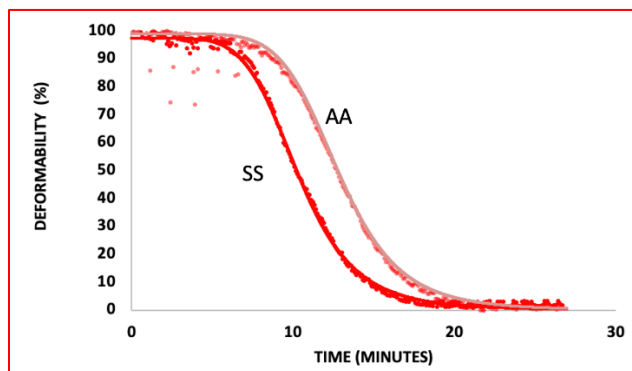
The study with [Akira Bio](#) aims to evaluate the clinical use of [ABI](#), a compound which will modify the production of fetal hemoglobin (HbF).

An increase in HbF will alter the rate of sickling in sickle cell disease (SCD) patients and hopefully improve their quality of life. The RBC lab measures the levels of HbF, the oxygen affinity, sickling, and the RBC deformation in blood samples from subjects enrolled in this study. For details of the unique assays used by the RBC Lab to evaluate these samples, please visit [RBC Lab](#).

The RBC Lab provides a large assortment of unique assays and develops new assays to provide important biomarker details of blood biology. In the spring of 2024 we published a novel measurement of red blood cell deformability under oxidative and shear stress developed in our lab ([RoxyScan paper](#)).



Transport of oxygen comes at a cost. The RBC is exposed to oxygen radical species (ROS) during its life in the circulation. To deal with ROS, the RBC uses an elaborate system of antioxidants and enzymes to neutralize attack and repair damage to proteins and lipids. The lack de novo generation of proteins and lipids, combined the damage to the antioxidant and repair systems, will decrease the ability to deform and reduces the lifespan of the RBC.



Measuring the decrease in EI under shear and oxidant stress in time reports on the overall ability of the cell to deal with ROS. The decline in EI depends on the cell, type and concentration of the oxidant.

The figure shows an example of blood from a sickle cell patient (SS) and normal control (AA) exposed to tBOOH under a 30Pa shear stress. The ability to deal with oxidant stress under shear is reduced and the goal of any clinical intervention is a move towards normal.