ASHG Contest Sample Entry

Written Sample

My name is Dr. Abella and I am a post-doc in an AIDS Research Institute. I propose using the HIVE for single-cell analysis to study HIV Infection.

HIV infection occurs through four stages:

1. Initial Infection
2. Asymptomatic
3. Advanced HIV disease
4. AIDS

Each stage exhibits different characteristics including a progressively lower CD4+ cell count. I am studying the changes in expression profiles over time of both T-cells and B-cells as HIV goes through these stages of infection.

I have been using cryopreserved samples since it has been difficult to collect fresh samples remotely that will then yield great data from my institute's droplet-based device. I would love to collect fresh HIV-infected blood and bone marrow samples from my home country of Brazil for single cell sequencing. I propose using the HIVE to capture fresh T-cell and B-cell samples over time and then ship them to be processed in my lab all at once and then sequenced in our core facility.

As a secondary line of investigation, I am also interested in understanding why Eosinophil cell numbers increase as infection progresses and the CD4+ T-cell population decreases. How do the expression profiles change in Eosinophils as they start to be infected? I can also use the HIVE to capture and store fresh samples of this cell type.