WRF/ITHS Summer Commercialization Fellows Projects 2021

Stroke Screening - Smartphone-based Risk Assessment Tool for Stroke
(Ricky Wang, Department of Bioengineering)
Carotid "vulnerable plaques" are a major cause of atheroembolic stroke in people aged over 50. We are developing a low cost, easy-to-use smartphone-based screening tool that will use facial PPGs (photo plethysmographies) as metrics to predict stroke at high risk. Using this tool, clinicians can screen patients for stroke risk as easily as measuring body weight and easier than taking blood pressure. This method will identify more people who can benefit from carotid endarterectomy, stenting, or medical therapy, which could prevent up to 100,000 strokes per year in the US and potential save over $3 Billion in healthcare costs. A summer fellow will explore go-to-market strategies for this technology within the current healthcare system as well as other potential applications.

Rapid Diagnostic Sensor – Immunoresistive Sensor for Point-of-care COVID-19 Screening
(Jae-Hyun Chung, Department of Mechanical Engineering)
The implementation of rapid testing has been a key factor in fighting the COVID-19 pandemic. To aid in this endeavor, we are developing a point-of-care, rapid screening sensor based on a novel immunoresistive platform technology that detects the virus from nasal swab samples. The test has been validated to detect SARS-CoV-2 (the causative agent for COVID-19) at an analytical limit equivalent to the sensitivity of current PCR-based assays in only 15 minutes. With clinical evaluation, we will soon apply for emergency use authorization (EUA) followed by FDA approval for the COVID-19 application. However, several fundamental questions remain regarding the device's long-term commercialization potential. A student will explore other major target markets for this technology and work to identify a sustainable path for commercialization for after the COVID-19 pandemic.

EpiCell Therapeutics– An Epigenetic Platform for Controlling Stem Cell Differentiation
(Shiri Levy, Department of Biochemistry and Institute for Protein Design)
Novel cell-based curative therapies need to ensure safe and accurate activation of target genes during cell differentiation. Our *de novo* computational designed protein inhibitor remodels the epigenome at a precise locus to activate targeted gene expression. This solves the problem of excessive gene expression that can lead to inaccurate cell differentiation and allows the activation of target genes in a more natural, organic manner. There are no competing technologies that use computer designed novel proteins for epigenetic changes, so this platform offers a wide range of discovery and service opportunities for commercialization. A summer fellow will explore which of these possible applications is likely to be the most attractive to the market and what strategy is the most likely to succeed in bringing such a product to fruition.

TB Medication Adherence – Remote Monitoring to Measure Adherence to TB Therapy
(Sarah Iribarren, Department of Biobehavioral Nursing/Health Informatics and Barry Lutz, Department of Bioengineering)
Tuberculosis (TB) continues to be the biggest infectious disease killer worldwide, claiming 1.5 million people each year despite it being largely curable and preventable. However, the current antibiotic regimen for treating TB lasts for 6-9 months with the potential for multiple challenges. Effective tools are needed for both patients and healthcare teams, particularly in low- and middle-income countries, to fight this global pandemic by ensuring treatments are completed. Our team has developed digital adherence tools to promote timely support and empower teams with accurate adherence data using an interactive app and a new at home drug metabolite test. A summer fellow will evaluate potential go-to-market and commercialization strategies for this technology both in the US and abroad.