OBJECTIVES/GOALS: Rapid and accurate identification of primary malaria vector species from collected specimens is the most critical aspect of effective vector surveillance and control. This interdisciplinary team of engineers aims to automate identification using a deep learning computer vision algorithm. METHODS/STUDY POPULATION: The team spent August of 2019 observing and participating in control and surveillance activities in Zambia and Uganda. They conducted >65 interviews with key stakeholders across 9 malaria control and surveillance sites, ranging from field and community health workers, to malaria researchers and Ministry of Health employees. Stakeholder feedback validated the need for a more accurate and efficient method of vector identification in order to more effectively deploy targeted malaria interventions. The team set forth in designing and prototyping a portable, automated field tool that could speciate mosquito vectors to the complex level using artificial intelligence. RESULTS/ANTICIPATED RESULTS: The team’s research demonstrated that accuracy, cost effectiveness, and ease of use would be critical to the successful adoption of the tool. Results of initial prototyping, usability studies, and stakeholder surveys were used to determine the tool’s minimal user specifications: 1) the ability to distinguish between *Anopheles Gambiae* and *Anopheles Funestus*, the two principal malaria vectors in the countries visited, 2) achieving an identification accuracy of ≥90% to the complex level, and 3) accessibility to the speciation data 3-7 days following vector collection. Next steps include optimizing the tool to deploy a minimal viable product for testing in Kenya by the summer of 2020. DISCUSSION/SIGNIFICANCE OF IMPACT: The accurate, high-quality surveillance enabled by this device would allow malaria control programs to scale surveillance to remote regions where an entomologist may not be available, allowing malaria programs to deploy effective interventions, monitor results, and prevent disease.
Translational Fellows as a mechanism to improve throughput of university technology commercialization

Everett Gordon Hall1, Tom Krenning2, Michael Seper2, and Michael Kinch1

1Washington University in Saint Louis; 2Skandalaris Center, Washington University in Saint Louis

OBJECTIVES/GOALS: The development of early university technologies for commercialization is largely inefficient and exhibits a high rate of failure, often due to a lack of researcher time and commercialization experience. We have created the Translational Fellow role to address these needs and increase the throughput of university technology transfer. METHODS/STUDY POPULATION: Translational Fellows will first build their initial competencies to identify, evaluate, and develop new technologies through internships with intake organizations within the university ecosystem, including the Office of Technology Management, the LEAP gap-funding mechanism, and local venture capital firms. Following this training, Fellows will provide tailored support to validated projects by establishing development milestones, liaising with industry experts, navigating regulatory requirements, and drafting marketing materials such as executive summaries and financial projections. Lastly, Fellows will partner with a highly developed project to facilitate the commercialization of the technology, whether through a SBIR/STTR grant, direct licensing event, or startup creation. RESULTS/ANTICIPATED RESULTS: We anticipate that implementation of this mechanism will increase the proportion of university-generated inventions that undergo successful commercialization events, as well as increase the rate at which these projects develop after initial validation. Furthermore, we expect that the skills acquired through this program will allow Fellows to successfully transition to a variety of roles in the biotech space. We also expect that Fellows will be capable of training other scientific teams in the preparation of SBIR/STTR grants, further expanding opportunities for commercialization in the research space. DISCUSSION/SIGNIFICANCE OF IMPACT: Translational Fellows fill a unique interdisciplinary niche, allowing them to address common barriers faced by academic inventors. Improving commercialization throughput further capitalizes on the wealth of ideas generated in universities, thereby driving innovation in the biomedical space and directly contributing to improved human health. CONFLICT OF INTEREST DESCRIPTION: The authors have no conflicts of interest.

Data Science/Biostatistics/Informatics

Big data analysis of adolescent obesity, pregnancy and kidney function

Dana Bielopolski1, Neha Singh1, Caroline Jiang1, Robert Bruce MacArthur, PharmD, MS, BCSCP1, Kimberly Vasquez, MPH1, Dena Moftah2, Rhonda G Kost, MD1, and Jonathan N. Tobin, PhD1

1Rockefeller University; 2Clinical Directors Network, Inc. (CDN)

OBJECTIVES/GOALS: 1. Examine the associations among BMI and markers of cardiometabolic risk, including blood pressure, lipids and blood glucose.
2. Assess prevalence of kidney function deterioration, identified as hyperfiltration and moderately increased albuminuria (MIA), in obese compared to normal weight adolescents.

METHODS/STUDY POPULATION: De-identified electronic health records (EHR) data were extracted for female adolescents, aged 12-21 years, and their offspring through 24 months, who received health care services (Jan 2012 to Dec 2016) in NYC from 12 academic health centers and community health centers that are part of PCORnet NYC Clinical Data Research Network (NYC-CDRN). Data were analyzed using SAS (version 3.2.5). Patient characteristics overall and for study subgroups were examined using standard summary statistics. Trends in cardio-renal variables were examined by BMI groups coded according to NHANES as underweight, normal weight, overweight or obese. Multiple linear regression analyses will control for covariates. RESULTS/ANTICIPATED RESULTS: Data from 651,066 adolescent females aged 12-21 were retrieved. Analysis was performed on a subset of 202,214 unique patients (26% white, 15% black, 12.9% Latina) for whom there was complete data for BMI and blood pressure. Distribution of BMI was 6% underweight, 59% normal weight, 19% overweight, and 17% obese. There were significant differences in mean systolic (SBP, mean ± SD mmHg: 102 ± 12, 108 ± 11, 112 ± 12, 116 ± 12) and diastolic blood pressure (DBP, mean ± SD mmHg: 62 ± 10, 66 ± 8, 68 ± 8.9, 70 ± 9) across the four BMI groups with an increasing trend (p-values < 0.0001). We will examine renal function trends, and whether these cardio-renal differences persist when controlling for age, race and ethnicity. DISCUSSION/SIGNIFICANCE OF IMPACT: Although SBP/DBP means were within normal limits across BMI groups, significant increasing trends suggest that women in higher BMI groups may be at increased risk for hypertension and potentially for renal dysfunction. We will examine contributions of race/ethnicity and age to these associations.