Canary Foundation Brief Report
October 2021

Canary Center at Stanford

Canary Center is a world class facility acting as a hub for innovative research, collaborations, cross-disciplined studies, and international partnerships. Canary Foundation and the Center have helped grow the field of early detection by attracting talent to the discipline of cancer early detection, mentoring young and new researchers, and providing educational opportunities via conferences and other forums. Recent news includes:

- Utkan Demirci, PhD, is Acting Director and Ryan Spitler, PhD has been named Deputy Director. Dr. Edwin Chang has been appointed PreClinical Imaging Facility Director.
- 27 undergraduate students attended the CREST 2020 summer program, held remotely.
- Alliance for Cancer Early Detection (ACED) is an international partnership between Stanford University (Canary Center), Cambridge University, Cancer Research United Kingdom (CRUK), University of Manchester, University College of London, and Knight Cancer Institute at Oregon Health & Science University (OHSU). ACED joins top global talent and extends resources and demographic reach.
- EDx20, an early detection conference hosted by the partners in the alliance, was held successfully virtually. Topics included matching screening intensity to an individual's risk and ultrasound guided molecular imaging for detecting ovarian cancer.
- EDx21 is virtual October 2021, in person in 2022. Edx21 subjects will cover new technologies, informing research via real world systems, what follows early detection.

Ovarian

The most prevalent form of ovarian cancer (high grade serous carcinoma) originates in the fallopian tubes, a theory held by the Canary Ovarian Team more than a decade ago that has found to be true. In 2019, Canary Foundation recharged its vision by launching the Canary Ovarian Initiative, aimed at understanding the microenvironment of the fallopian tubes to look for detectable changes that signal cancer. Highlights of recent work include:

- Using bioinformatics and methylated DNA to determine origins of ovarian cancer.
- Looking for changes in fallopian tubes decades before cancer can be diagnosed, especially for high risk women (i.e. BRCA mutations). Single cell sequencing – looking for changes in cells that can signal cancer early.
- Remaining patient-focused for compassion and team-focused for efficiency.

Prostate

In 2006, Canary Foundation assembled a cross-disciplined, multi-institutional group of researchers, top in their field, to look for solutions to accurately diagnose and treat men with prostate cancer. More than a decade later, the Prostate Cancer Team and the Prostate Active Surveillance Study (PASS) reflect a model team which the National Cancer Institute (NCI) has both funded and adopted some PASS protocols in their requirements. The team has attracted multi-millions of dollars in grants. PASS helps patients in the study and is now informing the medical profession on ways to understand which men are at greatest risk, requiring aggressive treatment versus those who have slow growing cancer. Recent PASS accomplishments include:

- Advanced imaging with MRI (Liss et al, Journal of Urology 2020).
- MRI imaging allows for less impact for men with low risk prostate cancer.
- Confirmed African Americans do not have worse outcomes in active surveillance.
- Created models to predict non-progression (Cooperberg et al, JAMA Oncology 2020).
- Impact: fewer painful prostate biopsies, lower anxiety, see canarypass.org.
- PASS Trial data helps to calculate and personalize frequency of active surveillance.
- PASS risk calculator to aid patients and physicians in making decisions.
- Personalized screening for high risk patients (i.e. men with BRCA mutation).

Dr. Joseph DeSimone

We are pleased to introduce Dr. Joseph DeSimone, appointed as the inaugural Sanjiv Sam Gambhir Professor in Translational Medicine. President Obama awarded him with the 2016 National Medal of Technology and Innovation. His work as a chemist and expert in polymeric materials merges life, physical, and engineering to find out how things work to improve the human condition. Dr. DeSimone's lab work includes:

- Creating cutting edge materials to improve medicine – when you find cancer early and small the next step is to treat the tumor locally instead of the entire system.
- Vaccine delivery using microneedles on the dermis, the inner layer of the skin, is a more direct way of working with the immune system – induces a greater response.
- Multiple microneedles replaces the syringe and enters fluid in the dermis, not the bloodstream.
- True for cancer vaccines, eliminates fear in the patient and is cost effective.