**MIT Industrial Liaison Program Faculty Knowledgebase Report**

Precision Medicine in Oncology

October 16, 2020 11:00 am - 1:00 pm

11:00am

Single-cell mass as a clinical tool for guiding treatment decisions

Functional precision medicine aims to match each cancer patient to the most effective treatment by performing *ex vivo* drug susceptibility testing on the patient's tumor cells. However, despite promising feasibility studies, translation to the clinic has been limited by a lack of technologies and studies that directly assess whether *ex vivo* drug susceptibility testing is correlated with patient treatment outcome.

In this talk, we will highlight an ongoing collaboration between MIT and the Dana Farber Cancer Institute where we developed a simple and high-throughput assay based on measuring subtle changes in single-cell mass distributions between drug-treated and untreated cancer cells. To demonstrate its potential, we will show results from a retrospective cohort of 70 glioblastoma patient-derived neurosphere models with matched patient outcomes. Our findings suggest that cell mass measurements could be a "universal biomarker" to complement existing genomic and metabolic biomarkers to measure sensitivity or resistance to oncology drugs with a wide variety of cytostatic or cytotoxic mechanisms. To conclude, we will describe Travera's progress towards further validating the predictive power of the single-cell mass assay and for establishing it as a CLIA-approved test for oncologists.

Keith Ligon
Associate Professor of Pathology at Harvard Medical School

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Keith Ligon is a Physician-Scientist with expertise in neuropathology and oncology focused on improving the diagnosis and treatment of cancer. He attended medical school and received his PhD at the University of Texas-Houston Medical School and the M.D. Anderson Cancer Center. Currently he is an Associate Professor of Pathology at Harvard Medical School with joint appointments at the Dana-Farber Cancer Institute, the Broad Institute, and Brigham and Women's Hospital (BWH). He is the Chief of Neuropathology at BWH/DFCI and the Director of the Center for Patient Derived Models (CPDM) at DFCI. His research and clinical activities have improved the scientific understanding of brain tumors. He has also led efforts to train neuropathologists in the utilization of genomic tests in practice and led genomically informed clinical trials development at the local and national consortium levels. Dr. Ligon is a co-founder of Travera.

Scott Manalis
Andrew and Erna Viterbi Professor of Biological Engineering

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Scott Manalis is the Andrew and Erna Viterbi Professor of Biological Engineering, a member of the Koch Institute for Integrative Cancer Research and the Associate Department Head of Biological Engineering at MIT. He received a B.S. in physics from the University of California, Santa Barbara and a Ph.D. in applied physics from Stanford University. His lab develops and applies high precision approaches for measuring biophysical properties of single cells. Dr. Manalis is a co-founder of Affinity Biosensors and Travera.

Clifford Reid
CEO of Travera

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| 11:40am | Q&A |
| 11:55am | Startup pitches |

- **Celsius:** AI & single cell genomics for autoimmune & immune oncology therapy
- **Epitoire:** Small molecule correctors of RNA pathobiology for hard-to-treat cancers
- **twoXAR**: First-in-class small molecules for oncology & more using AI

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| 12:15pm | Breakout Discussion |
| 1:00pm | Adjournment |