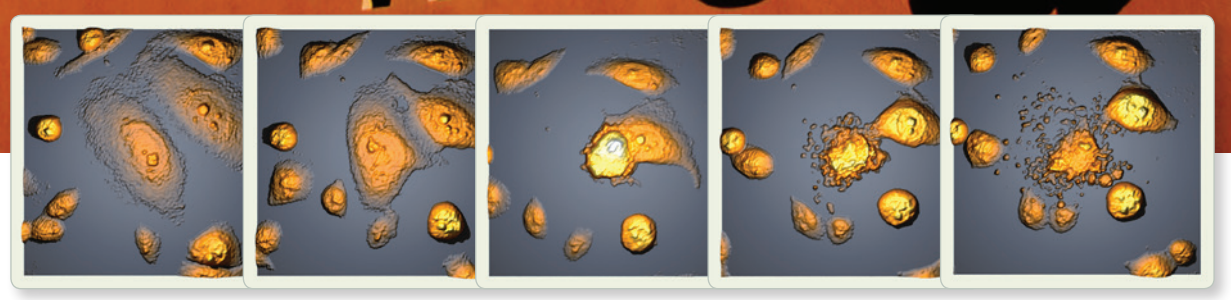
HOLOGRAPHIC TIME-LAPSE IMAGING CYTOMETRY SEMINAR

Thursday, February 18th, 2:00 - 5:00pm
UCSF Mission Bay Campus, Genentech Hall N114
600 16th St, San Francisco, CA

Please RSVP to holometrics@gmail.com by February 16



2:00 - 2:15pm ***Opening and welcome***
Dr. Robert Judson

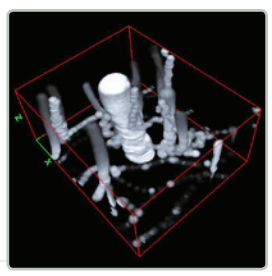
2:15 - 2:45pm ***HoloMonitor M4 – holographic imaging cytometer for real-time kinetic label-free live-cell analysis of adherent cells***
Mikael Sebesta, Head of R&D, Phase Holographic Imaging AB

Phase Holographic Imaging (PHI) has developed a time-lapse label-free imaging cytometer HoloMonitor® M4. Cellular events can be monitored and quantified continuously over long periods with unprecedented ease of use and affordability. The underlying technology, digital holography creates quantitative phase images of unlabeled cells. These images are amenable to segmentation and tracking while measuring various parameters such as optical cell volume and thickness amongst others. This presentation will explain the difference between traditional phase contrast imaging and quantitative phase imaging (QPI), define phase imaging parameters associated with specific biology (mitosis, cell growth and various cell phenotypes) and provide an overview of diverse applications.

Mikael is a co-founder of PHI (Lund, Sweden). He is spearheading all technical developments in his capacity as the Head of R&D. He has over 15 years of experience in digital holographic microscopy (DHM) and advanced microscopy developments, managing both academic and industrial projects.

2.45 – 3:15pm ***HoloMonitor M4 – a versatile, significant and welcomed tool in pharmaceutical compound development***
Ed Luther, Core Imaging and Cytometry Facility, Northeastern University

Our Department is concentrating on the development of nano-scale combinatorial formulations to precisely target tumor cells without destroying non-tumor bystanders. Using the HoloMonitor M4 we developed an array of applications to monitor the effects of pharmaceutical compounds on tumor cells in 2D and 3D in vitro models. We will present monitoring non-motile HeLa cell progeny, mitotic aberrations and various modes of cell death, followed by the analysis of the phenotype-specific responses of HT-1080 cells to multifunctional nanoparticle compounds.



Ed Luther's professional career began at UC Berkeley, in Professor Donald A. Glaser's Facility for Automated Experiments in Cell Biology. Ed was one of the early developers of flow cytometry, contributing to new hardware and data analysis concepts of high throughput flow cytometry. He joined Lou Kamentsky's company CompuCyte to translate the tenets of quantitative flow cytometry to the solid phase – tissue sections and in situ adherent cells – contributing greatly to the development of quantitative imaging laser scanning cytometers. In his current position as the Core Imaging Cytometry Facility supervisor at Northeastern University and the leader of the Holographic Imaging Cytometry Program of Excellence, Ed is developing novel HoloMonitorM4 applications supporting research interests of the NU faculty and students.

3.15 – 4:00pm ***Simultaneous label-free detection of proliferative, migratory, apoptotic & senescent cell phenotypes in human melanomas***
Dr. Robert Judson, UCSF Sandler Faculty Fellow and NIH Early Independence Award Fellow

Holographic microscopy offers label-free high-resolution non-toxic three dimensional live imaging of mammalian cells. The images are beautiful but how reliable, quantitative and ultimately useful are these data? We will present the use of holographic imaging coupled with machine learning algorithms to accurately detect changes in oncogenic phenotypes of both patient-derived and engineered human melanoma lines with single cell resolution.

Dr. Judson earned his Ph.D. in Biomedical Sciences from UCSF in the laboratory of Dr. Robert Blelloch developing techniques of high-throughput high-content imaging to study microRNA target genetic interactions during somatic cell reprogramming. After further post-doctoral training with Dr. Boris Bastian, Dr. Judson was awarded the NIH Early Independence Award and now heads a research group in the Helen Diller Comprehensive Cancer Center as a UCSF Sandler Faculty Fellow, where his group is establishing novel models of melanoma subtypes and using a variety of techniques to study the genetic interactions that govern disease progression.

4:00 – 4.20pm ***HoloMonitor M4 – A Core's Perspective***
Dr. Felix Bestvater, Head of the Light Microscopy Facility, German Cancer Research Center (DKFZ), Heidelberg, Germany

In a typical light microscopy core facility classical widefield and confocal microscopes are now complemented by pricey instruments which enable fast high- and ultra-resolution imaging with high sensitivity, deep tissue penetration and limited phototoxicity. Is holographic microscopy about to blaze a trail into facilities and stir up the range of applications? We will present a new user perspective highlighting practical benefits of medium resolution label-free cell-based kinetic imaging in the core facility settings.

Dr. Felix Bestvater obtained his degree (Diploma) in Technical Biology from the University of Stuttgart and earned his PhD degree from the German Cancer Research Center in Heidelberg. He worked as a software and optical process developer of technological platforms for the identification and characterization of genetic biomarkers followed by several years as a senior scientist at the Institute Pasteur Korea in Seoul, South Korea. In 2008 Dr. Bestvater returned to Heidelberg, where he is heading the light microscopy facility unit of the DKFZ since 2010.

4:20 – 5:00pm *HoloMonitor M4 demonstration and discussions over refreshments and hors-d'oeuvres sponsored by Phase Holographic Imaging*

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