

MSCBMP 2860 Multiparametric Microscopic Imaging

Summer 2016

Tuesdays and Thursdays 10-11:30 May 10- July 31 in the Cell Biology Conference Room
BST South 373. 20 lectures/workshops, Occasional Quizzes, 10 page paper.

May 10 Tuesday: **Simon Watkins** Intro to Microscopy I (Lab Kohler Illumination)

May 12 Thursday: **Simon Watkins** Intro to Microscopy II

May 17 Tuesday: **Claudette St Croix** Confocal Theory

May 19 Thursday: **Donna Stolz** Labeling Cells/Tissues for Imaging I

May 24 Tuesday: **Donna Stolz** Labeling Cells/Tissues for imaging II

May 26 Thursday: **Donna Stolz** TEM and SEM Theory (Lab)

May 31 Tuesday: **Donna Stolz** Processing for TEM and SEM (Lab)

June 2 Thursday: **Donna Stolz** Specialized EM techniques

June 7 Tuesday: **James Conway** Cryo Electron Microscopy*

June 9 Thursday: **Claudette St. Croix** Live Cell Imaging

June 14 Tuesday: **Simon Watkins**: MPE + Lab

June 16 Thursday: **Simon Watkins** TIRF + Lab

June 21 Tuesday: **Ben Van Houten** Atomic Force Microscopy*

June 23 Thursday: **Claudette St Croix**: Additional Advanced Techniques (FRET, FRAP, Ratioing, etc)

June 28 Tuesday: **Simon Watkins** Super Resolution + Lab

June 30 Thursday: **Michael Tsang** Live Imaging: Examples using Zebrafish model systems*

July 5 Tuesday: **Marcel Bruchez** Novel Probes and probe development

July 7 Thursday: **Stephen Thorne** Whole animal Imaging*

July 12 Tuesday: **Donna Stolz** Photoshop and ethical image processing, Open lab, questions, etc.

July 14 Thursday: **Simon Watkins** Image processing

To be scheduled: ThermoFisher lecture and workshops. Details to follow. (**Nick Dolman, from ThermoFisher, presentations and labs during those days**)

quest lecturers

Papers due Friday August 26, 2016 at 5 pm

Expectations: Attendance is mandatory and counts for 20% of the grade. Quizzes will be 20% of the grade and will be given several times during the course of the lectures. The remaining 60% of

the grade will be based upon the quality of a 10 page paper (written in the style of a journal article including abstract, introduction, methods, results, discussion and references, details of assignment to be handed out in class) using one or more modes of imaging to answer a research question. It can be part of your current research. This paper will be due on or before Friday, August 26 at 5:00 pm. Documents submitted after 5 pm on that date will be graded as 0. The extra open time in July and August is allowed to give students the opportunity to explore and use a variety of imaging technologies to answer their research questions. Students are highly encouraged to employ more than one type of imaging technology and are required to use quantitative image analysis (using MetaMorph, Imaris, Elements or another program) on some aspect of the research. The facilities of the CBI and all the techniques available are completely open to all students of this course. Techniques and equipment employed by outside speakers may be available to students, but students will have to make arrangements specifically with those speakers. It is highly advised that students don't wait until August to start their projects.

Faculty:

Course Directors/lecturers:

Donna Stolz, Ph.D. dstolz@pitt.edu

Claudette St. Croix, Ph.D. cls13@pitt.edu

Additional Lecturers:

Simon Watkins, Ph.D., swatkins@pitt.edu

Bennett Van Houten, Ph.D. vanhoutenb@upmc.edu

James Conway, Ph.D., jxc100@pitt.edu

Michael Tsang, Ph.D., tsang@pitt.edu

Stephen Thorne, Ph.D., thornesh@upmc.edu

Marcel Bruchez, Ph.D., bruchez@cmu.edu

Potential: Nick Dolman, Ph.D. ThermoFisher Nicholas.Dolman@thermofisher.com, **LifeTechnology: Workshop**