



Dr. Yannick Schwab

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EMBL Australia and the Cell Motility & Mechanobiology group are proud to host Dr. Yannick Schwab for a special seminar at 1:30-2:30pm, Thursday 20th July 2017.

Cellular-, 3D- and Correlative Electron Microscopy

Abstract Correlative light and electron microscopy (CLEM) is a set of techniques that allow data acquisition with both imaging modalities on a single object. One common challenge when trying to combine imaging modalities on the same sample is to identify space cues (external or internal) to track single objects when switching from light microscopy (LM) to electron microscopy (EM). On adherent cultured cells, we have previously developed specific substrates with coordinates to precisely record the position of cells (Spiegelhalter et al., 2009).

On more complex specimens, such as multicellular organisms, this targeting is even more critical, as systematic EM acquisition of their entire volume is close to impossible. For this reason, we are developing new methods to map the region of interest (ROI) within large living specimens, taking advantage of structural hallmarks in the sample that are visible with both LM and EM. The position of the ROI is mapped in 3D by confocal or multiphoton microscopy and then tracked at the EM level by targeted ultramicrotomy (Kolotuev et al. 2009; 2012; Goetz et al. 2014). Relying on structural features of the sample as anchor points, the cell or structure of interest can then be retrieved with sub-micrometric precision (Durdu et al. 2014, Goginashvili et al. 2015, Hampoelz et al 2016).

References

- Spiegelhalter C et al. (2010), *PLoS ONE* **5(2):e9014**. doi: 10.1371/journal.pone.0009014
- Kolotuev I, Schwab Y, Labouesse M. (2010), *Biol. Cell* **102(2):121-132**. doi: 10.1042/bc20090096
- Kolotuev I... Schwab Y. (2012), *Methods Cell Biol.* **111:203-222**. doi: 10.1016/b978-0-12-416026-2.00011-x
- Goetz JG, et al. (2014), *Cell Rep* **6(5):799-808**. doi: 10.1016/j.celrep.2014.01.032
- Durdu S, et al. (2014), *Nature* **515(7525):120-124**. doi: 10.1038/nature13852
- Goginashvili A, et al. (2015), *Science* **347(6224):878-882**. doi: 10.1126/science.aaa2628
- Hampoelz B et al. (2016), *Cell* **166(3):664-678**. doi: 10.1016/j.cell.2016.06.015

For information or to arrange a meeting with the speaker contact Maté Biro: m.biro@unsw.edu.au