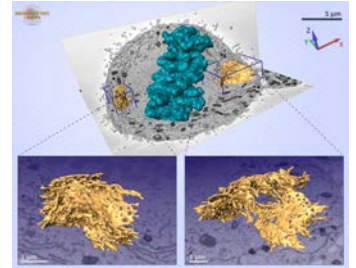


**Inštitut za biologijo celice, Medicinska fakulteta, Univerza v Ljubljani,  
vabi na predavanji:**

### **Form follows function – Correlative volumeEM studies of organelles**

**Eija Jokitalo**, Institute of Biotechnology, University of Helsinki, Finland

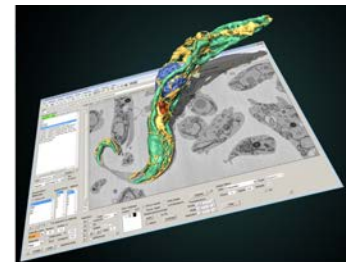


One defining feature of eukaryotic cells is the presence of diverse set of membrane bound organelles, each hosting unique set of functions. The dynamic and complex organization of organelles poses a major challenge on understanding how organelle functioning – maintenance of the characteristic structure, distribution of its functions, and communication with other organelles – is orchestrated and how the organelle size, quantity and position within cell are determined and controlled.

In this talk, I will briefly introduce various volume-EM techniques and then showcase our applications of correlative volumeEM techniques, combined with custom-developed software, to quantitatively analyse the morphology of various organelles and their membrane contact sites. I will highlight our recent findings on the dynamics and structural organization of the ER in dendritic spines and the impact of Golgi organization on stem cell function in the small intestine.

### **Microscopy Image Browser: The Swiss Army Knife of Image Processing and Analysis**

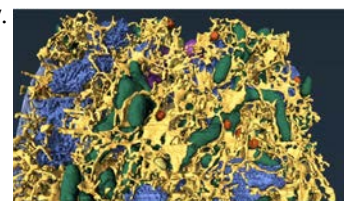
**Ilya Belevich**, Institute of Biotechnology, University of Helsinki, Finland



Since its inception in 2010, the Microscopy Image Browser (MIB) has evolved from a simple image viewer into a robust, all-encompassing tool for image processing, segmentation, and quantification. In this talk, I will present the latest advances that have significantly expanded MIB's capabilities.

A major highlight is the integration of the Segment Anything Model 2 (SAM2), which enables flexible, interactive segmentation across a wide range of biological objects. I will also present updates to DeepMIB, our deep learning segmentation module, focusing on the 2.5D Depth-to-Color technique - an approach that efficiently leverages 3D contextual information to improve model accuracy with minimal additional training time.

To demonstrate these tools in practice, I will walk through segmentation and quantification workflow applied to a human macrophage FIB-SEM dataset. This includes generating models for key cellular organelles - mitochondria, endoplasmic reticulum, Golgi apparatus, nuclear envelope, and lipid droplets - and deriving quantitative metrics that support comparative studies. Importantly, MIB stays as an open-source and free-to-use tool, making these powerful capabilities accessible to a wide scientific community.



### **Predavanja bosta v ponedeljek 13. aprila 2026 ob 13.00**

v živo v predavalnici Inštituta za biologijo celice, Vrazov trg 2, 1000 Ljubljana  
ter preko Zoom-a:

<https://eu01web.zoom.us/j/3900607312?pwd=eqEKqhSOroI4QX3iThyeDmA4hG3BHB.1>

**Vljudno vabljeni!**