Workshop

Title: High-resolution Scanning electron microscopy

Date, duration: On demand, 2 days

Location: Division of Veterinary Anatomy, Länggass-Strasse 120, 3012 Bern

Lecturer(s): Prof. Dr. med. vet. Michael Stoffel (Vet. Anatomy)

Number of participants: 1 – 2 students

Target audience Master and PhD students of the University of Bern. Lecture Series on Advanced Microscopy plus exam (KSL 9256)

Registration: Send request to Prof. Michael H. Stoffel (michael.stoffel@vetsuisse.unibe.ch) cc: Helga Mogel (helga.mogel@vetsuisse.unibe.ch)

KSL: 470966

Reward: 1.0 ECTS

Costs: Usage fees for Scanning electron microscope DSM982
- PhD students enrolled in the Graduate School for Cellular and Biomedical Sciences (GCB) can apply for refund at the PhD program Cutting Edge Microscopy (limited until 31st December 2022)
- Amount accounts for students of the University of Bern. Other participants, please request quote.

Learning goals: Transfer of knowledge from theory to practice.
Development of basic lab skills.
Enabling participants to process and examine samples by scanning electron microscopy.

Description: Sample preparation under guidance. Hands-on training on the scanning electron microscope and independent examination of the samples.
Working with own samples is expressly encouraged. Otherwise, suitable and instructive samples will be provided.

Course structure: Refreshing the theoretical basics. Practical laboratory work and sample examination under the microscope.
Content:

Sample preparation

- Sample collection and handling
  - tissue blocks
  - single cells
  - particles
  - material may be supplied by participants or will be provided by the Division of Veterinary Anatomy

- Fixation
  - Chemical fixation with different fixatives
  - plunge freezing (optional)

- Labeling
  - Use of colloidal gold-labeled antibodies or lectins

- Dehydration
  - Critical point drying
  - Chemical drying

- Mounting of samples

- Metal coating
  - sputter coating
  - electron beam evaporation

- Artifacts
  - promoting the awareness of artifacts resulting from inadequate sample preparation

Handling of a high resolution field emission scanning electron microscope (Zeiss DSM982)

- Select adequate detector and working distance

- Optimize microscope settings as required for best imaging results
  - Select proper high voltage
  - Select appropriate detector
  - Adjust focus properly
  - Perform proper correction of astigmatism
  - Select adequate brightness and contrast settings
  - Avoid imaging artifacts

- Perform image acquisition and data transfer

Assessment: Pass/fail