

# Adjusted 2-day BioVoxxel Workshop

## "Image Processing and Analysis"

### Focus on Intensity Analysis

#### Basics in Microscopy and Imaging

- Correct Illumination
- Signal-to-noise and background
- Pixels and voxels
- Resolution and its limit
- Imaging artifacts
- Correct image sampling

#### Digital Images

- Image formats
- Image compression and artifacts
- Metadata handling
- Bit-depth
- Human vision and digital images

#### Introduction into the ImageJ/Fiji software

#### Scientifically Correct Image Adjustment

- The image histogram
- Correct contrast adjustments
- Background subtraction methods
- Basic image filters

#### Image Segmentation

- Basic image pre-processing
- Feature extraction (grayscale)
  - e.g. from fluorescent images
- Post-processing to improve analyses

#### Higher Dimensional Images in Fiji

- Introduction in stack handling

#### Image Annotation/Labelling

- Image scaling (setting units like  $\mu\text{m}$ )
- Scale bars
- Calibration bars

#### Publication Figures

- Documentation and ethics
- Image data integrity preservation
- Do's and Dont's during figure preparation

#### Automatic Counting and Measuring

- Automatic counting of objects applying different methods
- Quantification by distinction of size and shape
- Area and area fraction measurements

#### Quantitative Intensity Analysis

- Prerequisites for intensity quantification
- Image intensity calibration
- Correct intensity measurements

Specific Analyses Techniques according to participants needs, such as...

- **Statistical co-localiation analysis**
- **Image Stitching**

2.5-day adjusted to 2 days (~16 hours)