# Engineer/Tinkerer for open microscopy project

A pre- or postdoc position is available for 6 to 9 months in the group of Prof. Benjamin Towbin for **designing and building open-source microscopes**.

Our interdisciplinary group in Organismal Systems Biology uses quantitative long-term live imaging to investigate, growth, survival, and aging of the nematode *C. elegans* (www.towbinlab.org). To enable live imaging experiments taking weeks to months, we have recently built low-cost microscopes based on open source hard- and software. We now seek to optimize the software implementation, develop new applications, and implement new hardware.

## Project description

Quantitative time-lapse microscopy is of increasing importance in modern cell and developmental biology for the precise measurements of dynamic processes. This trend is supported by rapid advances in automated image analysis by artificial intelligence. However, the high cost of commercial microscopes creates a bottleneck for their application at scale, especially when long instrument time for continuous observation over many days is required.

Recent developments in open hardware microscopy can overcome equipment bottlenecks of traditional live microscopy, thanks to the declining cost of mass-produced consumer electronics. The project will implement ongoing open hardware initiatives (https://openuc2.com/, https://squid-imaging.org/) for applications in fundamental research, teaching, and outreach and provides a unique opportunity for creative exploration.

Specific tasks include: (i) optimizing the hardware functionality (e.g. TTL triggering) and software user interface of an existing microscope based on https://squid-imaging.org/, together with our wet lab researchers. (ii) build and implement software control of microscopes based on https://openuc2.com/ for transmitted light and fluorescence. The latter will be used for teaching and outreach, and possibly research.

## Your profile

We look for enthusiastic candidate with proven expertise in computational instrument control, a good understanding of microscopy, and a passion for tinkering. The successful candidate will interact closely with experimentalists in biology, must have excellent communication skills across disciplines, and willingness to document applications in ways accessible to non-specialists. Pre- or postdoctoral candidates in experimental physics, software engineering, or bioengineering are most likely to have the required skills, but we are open to anybody with the relevant expertise and passion for the task.

## We offer

The successful candidate will join a young, collaborative, and international research team in Organismal Systems Biology and will have freedom to put innovative ideas to practice. Our institute provides state-of-the-art infrastructure for advanced live microscopy and computational infrastructure for image processing. As the capital of Switzerland, Bern provides a high standard

of living and is located one hour from major alpine resorts. A competitive pre- or postdoctoral salary is offered, depending on the level of education of the candidate.

**Application**

Please, send a <u>single PDF</u> named LastName_FirstName_MIC.pdf with the following documents by email to Prof. Benjamin Towbin:

1. Detailed CV and motivation letter explaining why you are excited to join this project, and how your expertise contributes to it.
2. A short summary (half a page) of the most relevant previous project(s).
3. contact information for 2-3 references
4. copies of University transcripts

Applications will be evaluated on a rolling basis, starting 1.1.2024, until the position is filled. We will announce on our webpage (http://www.towbinlab.org) once the position is filled. The anticipated start date is in Spring 2024.

Contact and further information: benjamin.towbin@unibe.ch
http://www.towbinlab.org, http://www.izb.unibe.ch