

# PhD in Quantitative Biology of Development and Aging

Two PhD positions in **Quantitative Biology** are available in the group of Prof. Benjamin Towbin at the Institute of Cell Biology (ICB), **University of Bern** (<http://www.towbinlab.org>). The PhD students will be part of an interdisciplinary project combining live imaging, genetics, and computational approaches using *C. elegans*.

## Project 1: Growth and Aging

Nearly all animals live longer when dietarily restricted. The mechanism causing this slow-down of aging is not understood but is thought to stem from an optimal adjustment of metabolism and growth to nutritional conditions. This project will test this hypothesis and ask how animals compute an optimal response to dietary conditions. The project will use imaging of hundreds of individual animals in highly parallelized microscopy farms from birth to death, advanced computational image analysis, quantitative genetic manipulations, and modelling of optimal control.

see also: Stojanovski et al., 2022 & 2023, *Nature Communications*

## Project 2: Growth and Development

Tissue overgrowth causes many prevalent diseases, and the correct size of organs is crucial for their function. To ensure the faithful development of correct size proportions, different body parts must coordinate their growth with each other in space and time. This project will define the molecular mechanisms and regulatory networks responsible for this coordination. The project will combine high throughput live microscopy, AI-driven analysis of images and large datasets, advanced genetic manipulation, and single cell transcriptomics.

## Your profile

You should own a MSc degree, or equivalent, in biology, bioengineering, bioinformatics, or related fields. The projects will combine experimental and computational approaches. Previous experience in programming is not required and can be acquired during the project through courses, self-study, and individual mentoring. Conversely, students with a background in quantitative sciences (e.g. physics or computer science) with a strong interest in learning wet lab biology will also be considered. Foremost, you will require enthusiasm for cross-disciplinary research and pro-activity in learning new skills.

## We offer

We are a young and international team that collaborates tightly across disciplines. You will work with researchers from diverse fields: from molecular and evolution biology to computer science and mathematics. You will have access to state-of-the-art equipment, including advanced fluorescence microscopes and a GPU cluster for data and image analysis by AI. Our PhD students are embedded in a graduate school (GCB) and the EMBO young investigator program, granting access to extensive training opportunities, including international workshops and conferences, individual mentoring, and ample networking opportunities for career development. Bern is located in the heart of Switzerland one hour from major alpine resorts.

## Application

Please, send a single PDF named LastName\_FirstName\_PhD.pdf with the following documents by email to Prof. Benjamin Towbin ([benjamin.towbin@unibe.ch](mailto:benjamin.towbin@unibe.ch)):

1. Motivation letter explaining why you want to join our lab, what you know, and what you want to learn.
2. Detailed CV

3. A short summary (half a page) of your MSc research
4. Contact information for 2-3 academic references
5. Copies of University transcripts

Applications will be evaluated starting 1.6.2024 on a rolling basis until both positions are filled. We will announce on our webpage (<http://www.towbinlab.org>) once the positions have been filled. The start date is flexible within a year of the appointment.

Contact and further information: [benjamin.towbin@unibe.ch](mailto:benjamin.towbin@unibe.ch)  
<http://www.towbinlab.org>, <http://www.izb.unibe.ch>