ETH zürich

Master your Master: MSc Biomedical Engineering

Dr. Christian Frei
Coordinator MSc BME
05. November 2024

MSc Biomedical Engineering (BME)

- A specialized Master hosted by four departments of ETH Zurich:
  - D-ITET (leading house)
  - D-HEST
  - D-MAVT
  - D-PHYS

Christian Frei
Coordinator MSc BME

ETH zürich

BIOMEDICAL ENGINEERING

MSc Biomedical Engineering: An interdisciplinary Master program

- Our mission: Highest quality of research and education at the interfaces of engineering, biology and medicine

<u>BSc degrees that qualify for application:</u>

BSc Electrical Engineering

BSc Mechanical Engineering BSc Physics

BSc Computer Science BSc Mathematics BSc Materials Science

BSc Biology* BSc Medicine* BSc Chemistry*

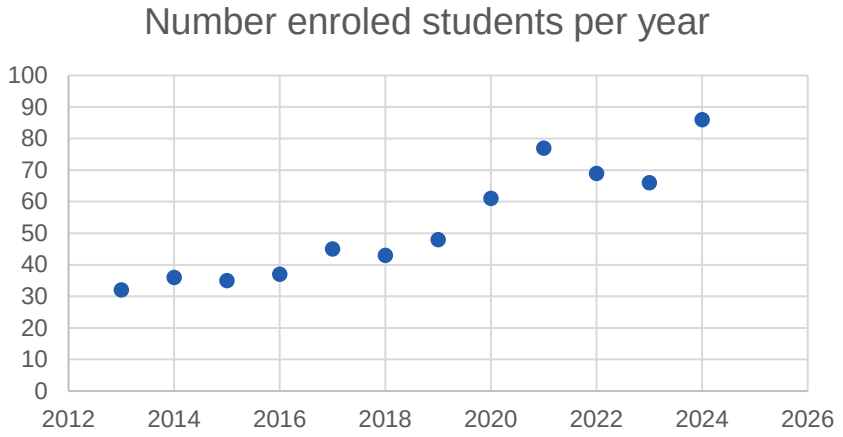
BSc Health Sciences & Technology*

*: does not qualify for all tracks (see below)

MSc Biomedical Engineering: Five tracks

- Bioelectronics
- Bioimaging
- Biomechanics
- Medical Physics
- Molecular Bioengineering

- Ø 2013-2024: 53 new students/year
- Ø 2013-2024: 54.8% CH-Bachelors

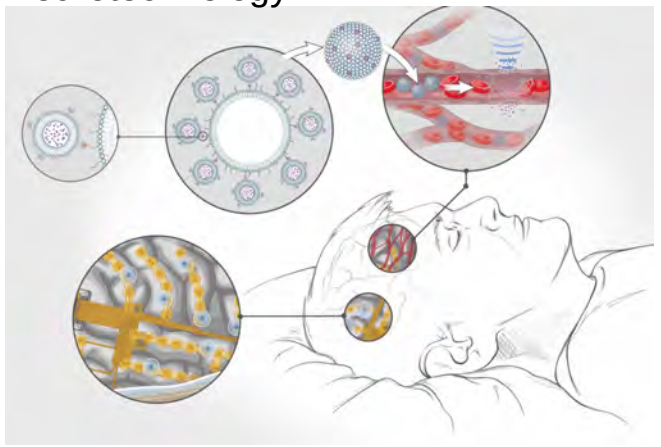


Track Bioelectronics

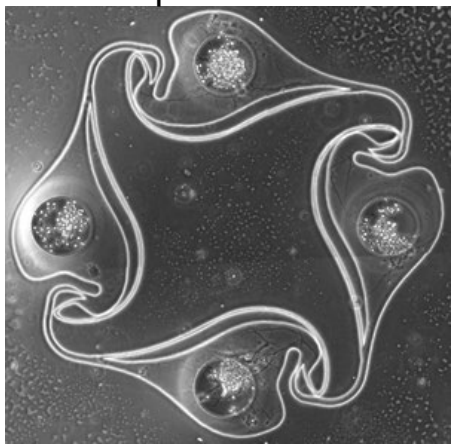
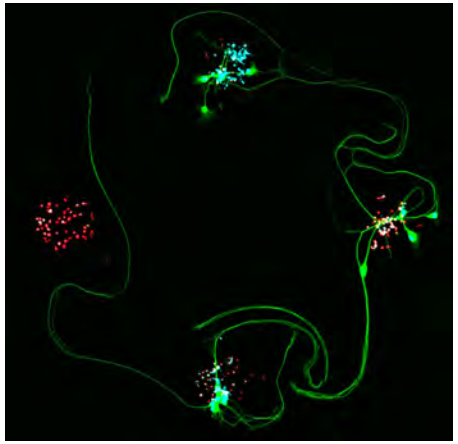
- Track advisors:
  - Taekwang Jang
  - Janos Vörös
  - Hua Wang
  - Mehmet Fatih Yanik



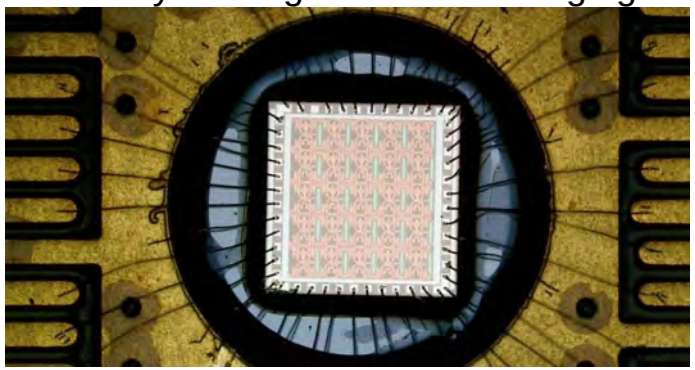

Neurotechnology



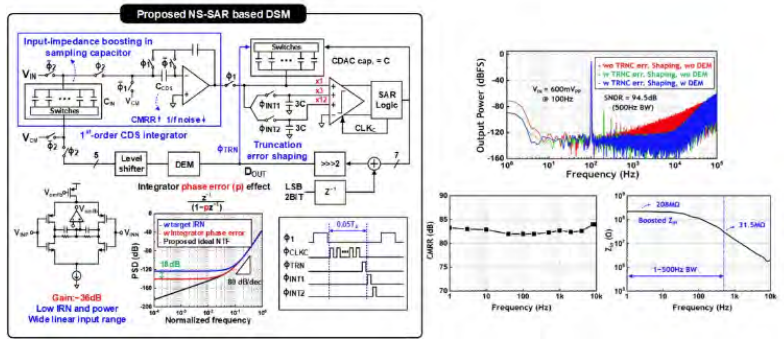
Bottom-up neurosciences

THz Arrays for high resolution imaging/sensing



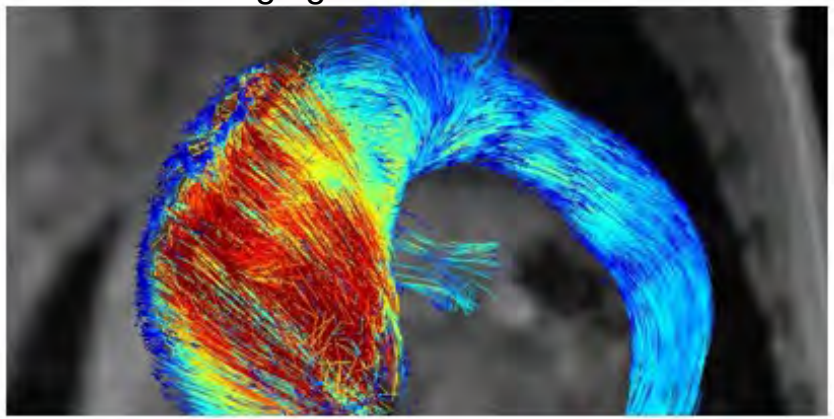
Analog and mixed-signal interfaces



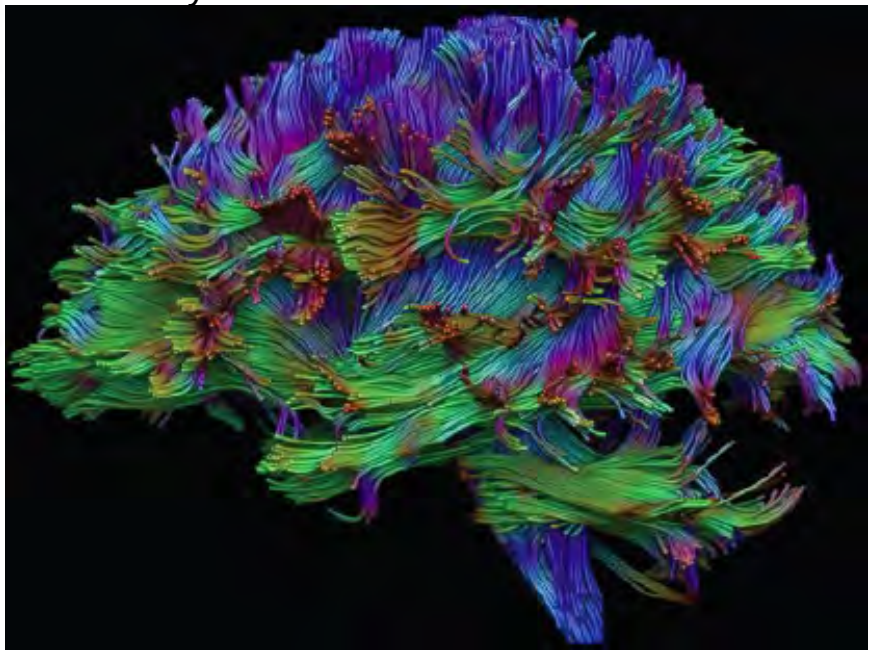
Track Bioimaging

- Track advisor:
  - Klaas Prüssmann

Biomedical imaging



Connectivity in the brain

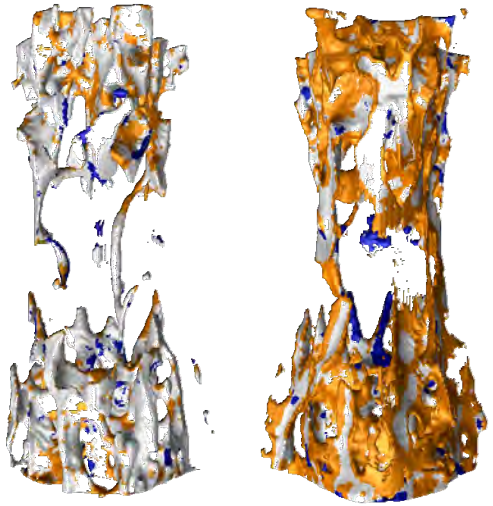


MRI technology

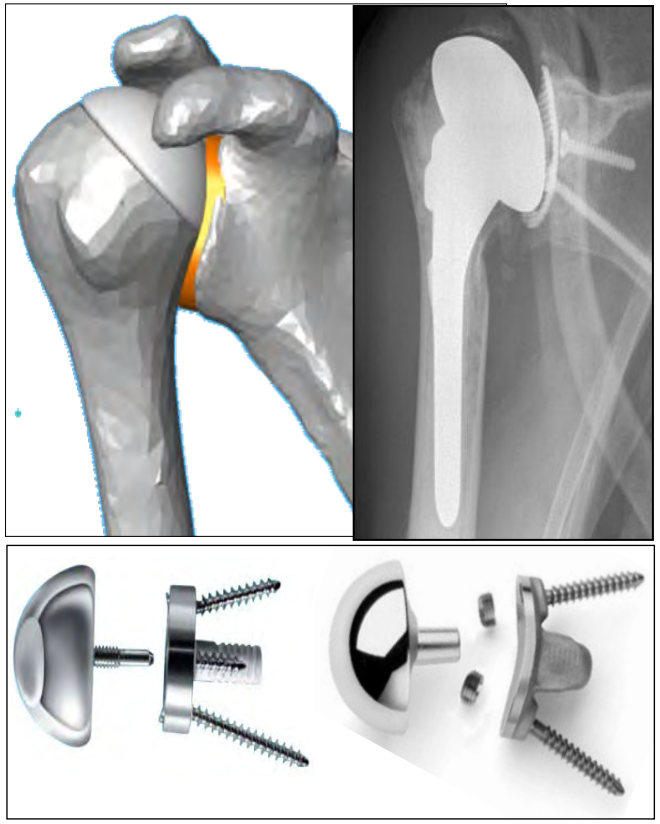
Track Biomechanics

- Track advisor:
  - Ralph Müller

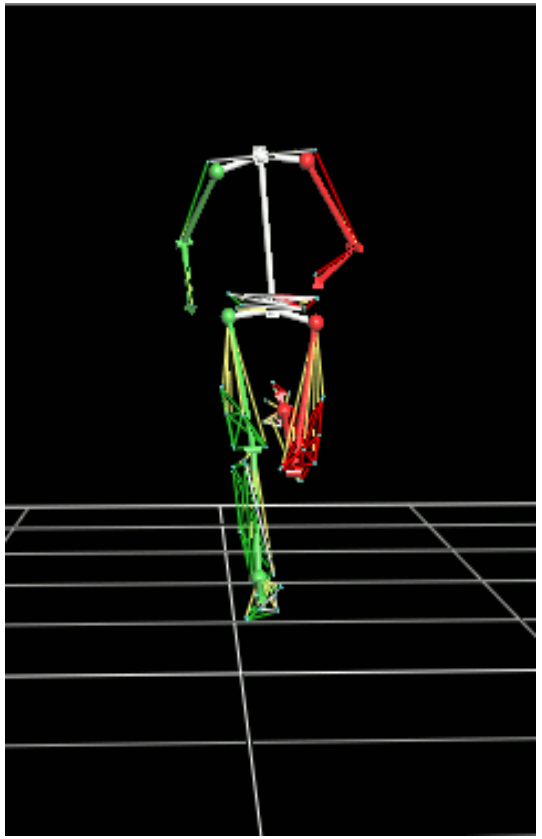
Bone biomechanics



Orthopaedic biomechanics



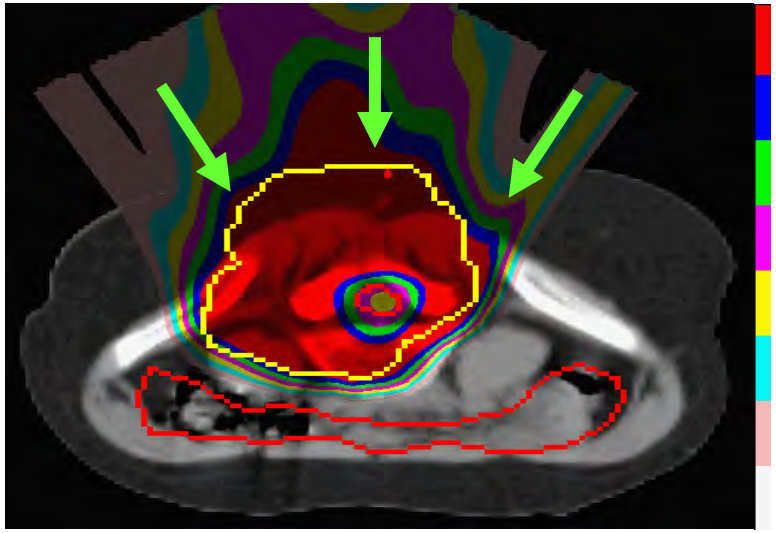
Movement biomechanics



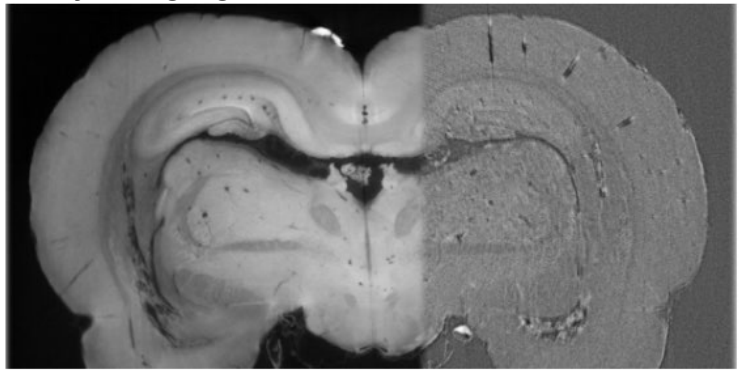
Track Medical Physics

- Track advisors:
  - Tony Lomax
  - Marco Stampanoni

Radiation therapy



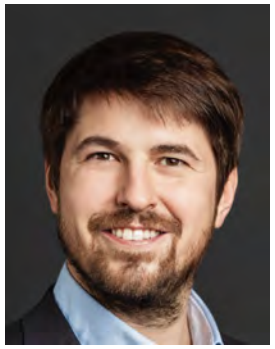
X-ray imaging

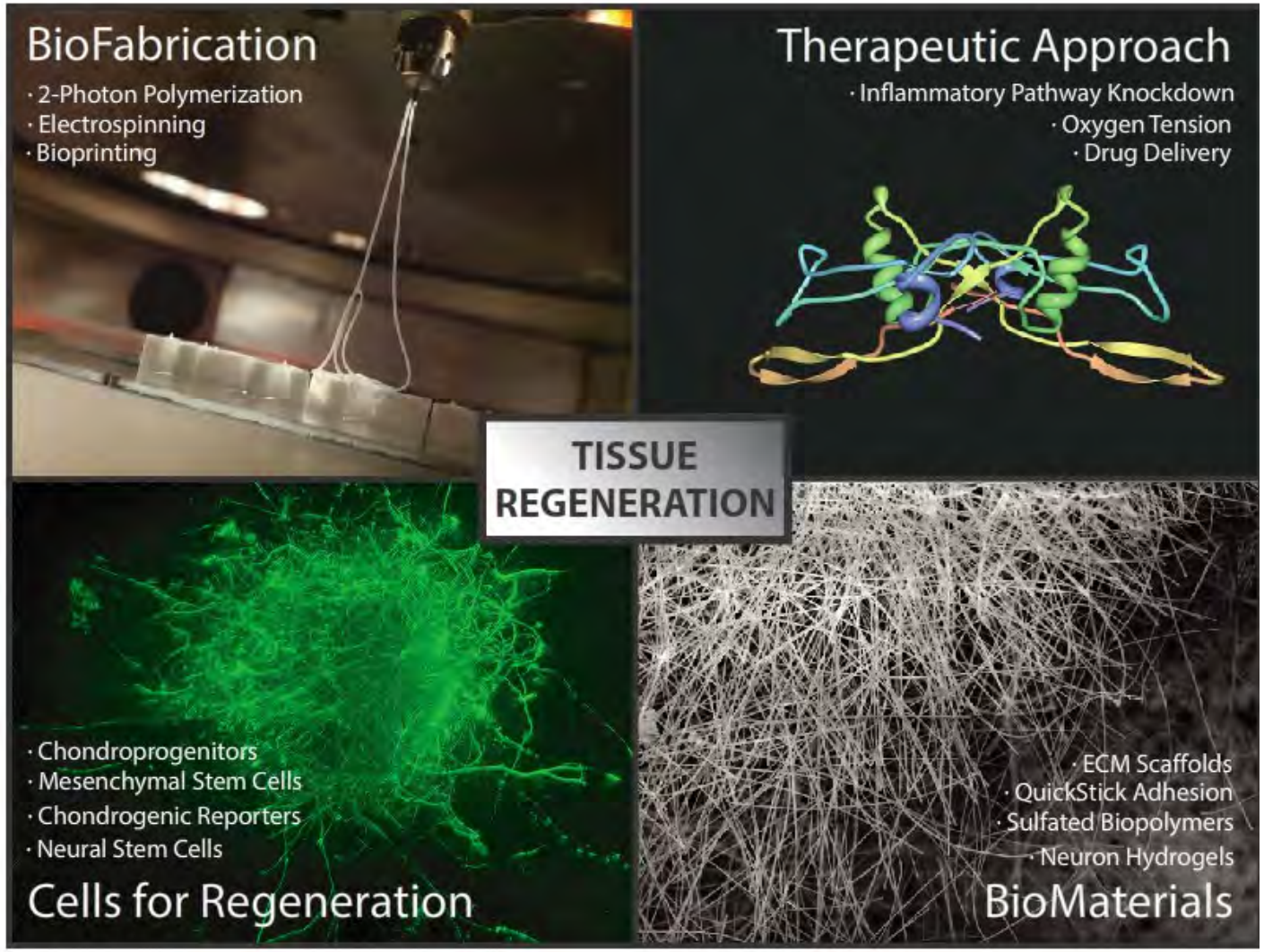


Paul Scherrer Institute, Villigen

Track Molecular Bioengineering

- Track advisors:
  - Mark Tibbitt
  - Marcy Zenobi





How to enter our program

- Application through the Rectorate (Admission's office)
- Application for one particular track
- Application windows:
  - November 1 - November 30 (all students, including Excellence Fellowship)
  - April 1 - April 30 (Bachelor from Swiss universities only)
- Start of the MSc: Autumn semester 2025

- Documents required (ETH/EPFL students):
  - Bachelor degree (the same rules apply as in your consecutive BSc)
  - Transcripts, motivation letter, CV, GRE (Graduate Record Examinations; suggested)
  - 2 letters of reference (ETH/EPFL-Bachelors are exempt)

    Note: Holders of a Swiss matriculation certificate (Matura) and/or an ETH/EPFL Bachelor:
    No English language certificate required

BSc degrees that qualify for application

- BSc degrees for all tracks
  - Electrical Engineering
  - Mechanical Engineering
  - Physics
  - Material Science
  - Computer Science
  - Mathematics
  - Chemical Engineering
  - Biotechnology
  - Computational Science and Engineering
  - Biomedical Engineering

- Note:
  - These lists are not restrictive
  - Minimal requirements if mathematics/physics

- Additional BSc degrees for Biomechanics
  - Health Sciences and Technology
  - Human Movement Sciences
  - Life Sciences and Technology

- Additional BSc degrees for Medical Physics
  - Biology
  - Chemistry
  - Health Sciences and Technology
  - Life Sciences and Technology
  - Medicine

- Additional BSc degrees for Mol. Bioengineering
  - Biology
  - Chemistry
  - Health Sciences and Technology
  - Human Movement Sciences
  - Life Sciences and Technology
  - Medicine

How to enter our program

- Selection committee (about 5 members): Evaluation of all applications

- Positive evaluation: Admission to one particular track

MSc Biomedical Engineering is a 120 CP Master

- a. Specialization Courses — min. 52 credits
  - Core courses of specialization (min. 12 cp)
  - Elective courses of specialization (-- cp)
  - Biology courses (-- cp)

Learning agreement with track advisor

Note: Track advisor can approve courses from other tracks/other programs

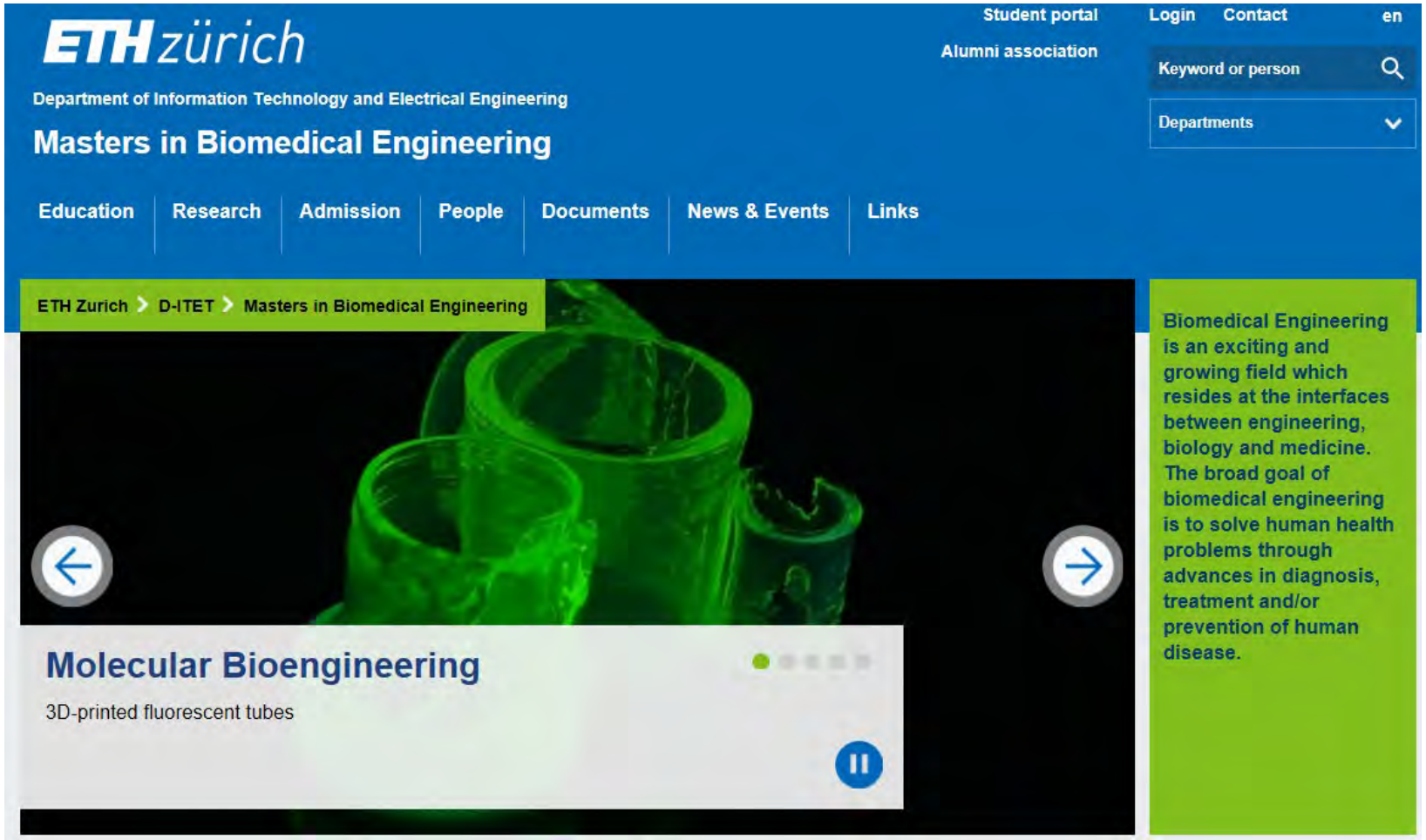
- b. Projects and Practicals — min. 12 credits
  - Semester project (min. 12 cp)
  - Group- and research projects (6, 12, 18 or 24 cp)
  - Internship in industry (12 cp)

- c. Science in Perspective (D-GESS) — min. 2 credits

- d. Master Thesis — 30 credits

- Sum of a./b./c./d: 96 credits. The remaining 24 cp can be obtained from categories a. and/or b.

www.master-biomed.ethz.ch



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