Foster Diversity in Biomedical Engineering and AI in Medicine

At the ARTORG Center for Biomedical Engineering Research multidisciplinary teams are joining in a mission to tackle healthcare challenges and unmet clinical needs. To enhance performance and expand the research footprint for medical technology innovation, the ARTORG and the Center for Artificial Intelligence in Medicine (CAIM) want to harness the high-performance capacity of diverse teams. To increase the possibility of building such diverse teams, two STEM undergraduates from the Global South will be supported through full scholarships for a two-year master's programme.

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Diverse teams in STEM as a game-changer

Background Increasing the heterogeneity of teams in STEM (Science–Technology–Engineering–Mathematics) harnesses the ability of diverse teams to outperform homogenous teams to problem solve[1]. Qualified and motivated STEM professionals are much sought after in academic research and industry globally, however the "STEM Diversity Bonus" can only be addressed if diverse teams can be built from graduate cohorts that have the means and opportunities to take up studies of STEM subjects and then remain in the STEM domain[2,3]. The Global South as an emerging source of manpower, intellectual capital and market forces should be considered furthermore as an origin for future STEM professionals[4].

Overall Goal To attract young STEM talent from diverse backgrounds in order to increase the possibility of building diverse teams from graduate cohorts and thus harness the power of heterogenous teams.

Our strategy To encourage STEM undergraduates from diverse backgrounds to embark on postgraduate education in Biomedical Engineering (BME) and Artificial Intelligence (AI), the ARTORG and CAIM wish to support two STEM graduates from the Global South through full scholarships for a two-year master's programme at ARTORG or CAIM.

Benefits Bring significant gains for enhanced performance through diverse team members and expand research-footprint for medical technology innovation at ARTORG and CAIM.

Financial Need
The costs for a full scholarship for a two-year master's programme are as follows:

Project costs/scholarship		CHF
Living expenses (room, board, etc.)		
Year 1	Living expenses (2'200 CHF*/month)	26'400
Year 2	Living expenses (2'200 CHF*/month)	26'400
Total living expenses		**52'800**
Other expenses		
Year 1	Tuition fees (950 CHF/semester)	1'900
	Study equipment (laptop etc.)	2'000
Year 2	Tuition fees (950 CHF/semester)	1'900
Total other expenses		**5'800**
Total living- & other expenses		**58'600**
Overhead costs (6%)		3'500
Total project costs/scholarship		**62'100**

Scholarship The call for applications for the scholarships will be promoted on relevant platforms. The attribution of the scholarships will be based on the official application of the candidates to the respective Master programmes at the University of Bern. A specific motivation

[1]Hong, L. & Page, S. E. Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proc Natl Acad Sci U S A* **101**, 16385–16389 (2004).

[2]Aminpour, P. et al. The diversity bonus in pooling local knowledge about complex problems. *Proc Natl Acad Sci U S A* **118**, (2021).

[3]Bailey, L. D. Diversity in science, technology, engineering and mathematics: what does a scientist look like? *Bioanalysis* **14**, 401–403 (2022).

[4]Cortés, J. D., Guix, M. & Carbonell, K. B. Innovation for sustainability in the Global South: bibliometric findings from management & business and STEM (science, technology, engineering and mathematics) fields in developing countries. *Heliyon* **7**, (2021).

letter will develop the arguments of the candidate for receiving a scholarship. A multidisciplinary committee will rank the submissions along a predetermined evaluation grid and designate the laureates.

ARTORG and CAIM

The **ARTORG Center for Biomedical Engineering Research** at the University of Bern is a multidisciplinary Center of Excellence for medical technology. Joining engineers, computer-, material- and life scientists, clinicians, and biologists its mission is to tackle healthcare challenges and unmet clinical needs in diagnosis, monitoring, treatment, and rehabilitation through innovative healthcare technology solutions that have proven itself in real-world clinical settings. The ARTORG has a strong clinical and translational focus and spans the entire process from discovery to clinical adoption. Twelve independent research groups headed by a technical and a clinical group head form this strategic center that is unique world-wide in being in a medical faculty. Projects at the intersection of life-sciences, medicine and engineering are test-bedded in applied clinical research and can benefit from rapid translation into healthcare daily practice through clinical validation and commercialisation strategies.

The **Center for Artificial Intelligence in Medicine (CAIM)** is embedded within the ARTORG and the teaching and translation platform for medical technology that exploits the healthcare potential of Artificial Intelligence (AI) technology to deliver better care to patients and facilitate the work of doctors and nurses. CAIM researchers understand healthcare digitalization as a chance, creating innovation that brings meaning to the ever-increasing flood of health data to enable clinicians to push the boundaries of what is possible in treatment, rehabilitation, and prevention. CAIM starts from a clinical perspective, putting patient benefit first and supporting personalized treatment approaches.

CAIM educates the next generation of digital medicine experts through tailored educational programs and supports research into digital and smart technologies with a strong potential to be ground-breaking for future therapeutic and clinical appro-aches with its research fund. CAIM fosters commercialisation of AI technology innovation, supports start-up incubation, and creates sustained value through best-in-class research, translation and economic growth.

Master's Programmes ARTORG/CAIM In harmony with the world-leading biomedical engineering research, the ARTORG and CAIM are at the forefront of postgraduate education and research in clinically-driven medical technology research. ARTORG and CAIM are host to two globally-leading Master programmes designed to educate and graduate BME and AI professionals with a unique combination of i) deep technical knowledge, ii) medical device development expertise, and iii) clinical translation experience. These skills and qualifications allow graduates to progress effectively into the workforce and bring innovation to the medical STEM sector that brings forward better patient care and creates value to the healthcare economy.

Master's Programme in Biomedical Engineering (BME) The Master's in Biomedical Engineering is a leading programme for technology discipline graduates from a variety of technical backgrounds including engineering, computer, physical sciences and medicine. Its applied curriculum of technical and clinical teaching is unique worldwide to let students acquire engineering skills that can solve existing and future unmet clinical needs with sustainable medical technology solutions developed together with clinicians and patients.

Master's Programme in AI in Medicine (AIM) The Master's in AI in Medicine furnishes graduates with a solid understanding of the principles of artificial intelligence and machine learning, so that they can apply this knowledge to design, develop and evaluate intelligent systems across the medical and clinical lifecycle. The program will train the next generation of the AI work force, and enable them to drive entrepreneurial, technical, and practical innovation for tomorrow's healthcare.

Prof. Dr. Raphael Sznitman

„As a researcher in Biomedical Enginee-ring, it is great to be so close to both clinicians and industry partners. Together we can create better and tailored health-care for the benefit of patients."

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UniBE Foundation

The UniBE Foundation encourages and supports the University of Bern so that a new generation of researchers can develop pioneering and globally acclaimed solutions for the economy of the future, sustainable habitats, and an ethical standard of living. The Foundation orients its funding according to the University's strategy, placing particular emphasis on excellence, innovation, and potential for the future.

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