

Handheld bioprinter design for deposition of multilayered engineered skin grafts (*New - Fall 2018*)

Faculty advisor: Prof. Axel Guenther

At the Guenther laboratory, we have designed a handheld microfluidic cartridge-based 3D bioprinter that allows the formation of cell-embedded, multi-layered gels in a single, continuous process directly on a patient's burn wound to facilitate wound healing [1]. This project will be focused on further developing the handheld bioprinter to include functions such as temperature control to enable a wider range of compatible bioinks, printhead designs to allow printing on non-flat surfaces, and wheel designs to permit printing on fragile wound surfaces. We are seeking two highly motivated MEng candidates with experience in product design and prototyping who are interested in designing a medical device in a collaborative setting, working with molecular biologists, surgeons, and other technical staff.

Recommended prerequisites

- Previous product design and prototyping experience, with interest in engineering design
- Proficiency in design software, for example Solidworks, AutoCAD, or Labview
- Strong communication and teamwork skills

References

[1] Hakimi N, Cheng R, Leng L, Sotoudehfar M, Ba P, Bakhtyar, N, Amini-Nik S, Jeschke M, and Gunther, A. Handheld skin printer: in situ formation of planar biomaterials and tissues. Lab on a Chip. doi: 10.1039/c7lc01236e.

Contact

Please contact Richard Cheng at richard.cheng@mail.utoronto.ca

Research area: Product design, prototyping, development, and manufacturing. Biological materials, biomedical engineering, tissue engineering, regenerative medicine, medical devices