Hes·so
Haute Ecole Spécialisée de Suisse occidentale
Fachhochschule Westschweiz

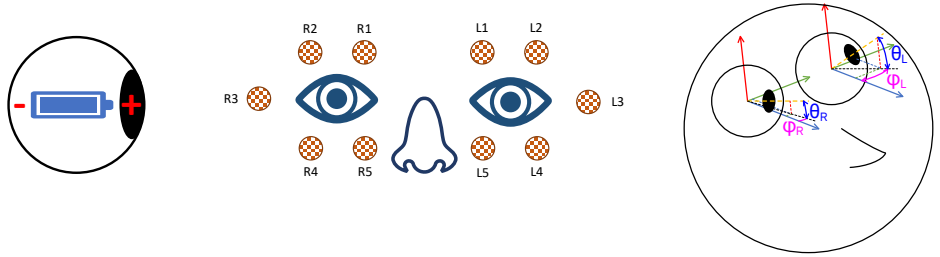
haute école neuchâtel berne jura arc ingénierie
www.he-arc.ch

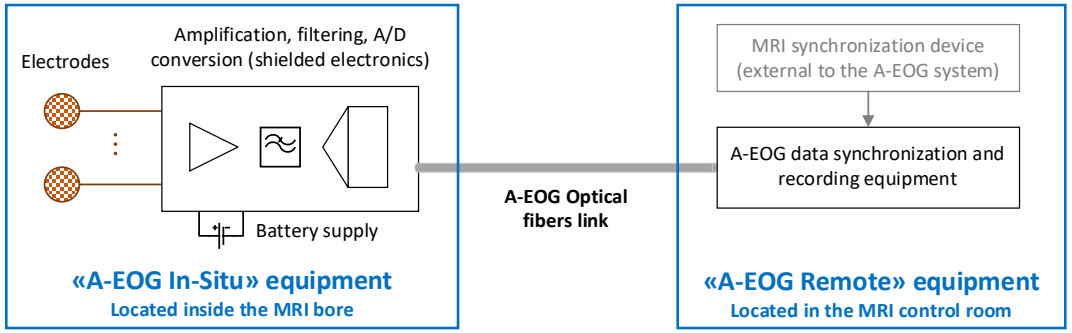
Avancées en ingénierie biomédicale

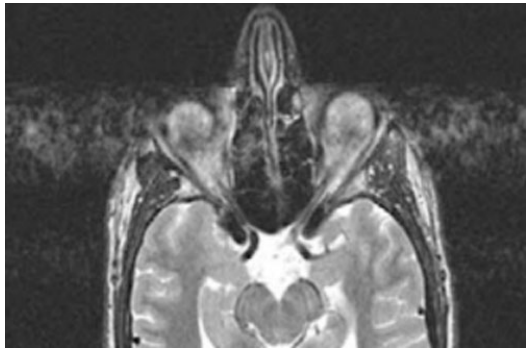
Philippe Potty ¦ 20 novembre 2024

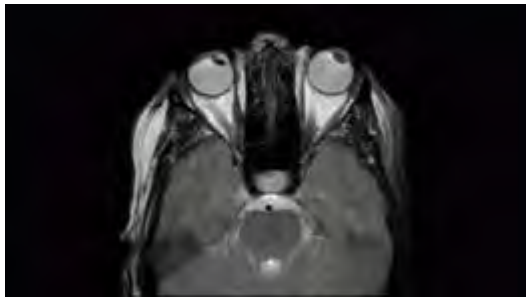
Medical devices

ADVANCED ELECTROOCULOGRAPHY FOR EYE TRACKING IN MRI









A-EOG In-Situ signals acquisition in the MRI bore:

- low noise shielded electronics running on batteries
- use of electrodes with short wiring
- optical data transmission to the remote recording equipment
- avoidance of ferromagnetic materials

A-EOG Remote recording equipment in the MRI control room:

- optical data reception, and recording in synchronization with MRI

Hes·so VALAIS WALLIS

Fonds national suisse

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CHUV

NEW GENERATION OF ATRAUMATIC CURETTE

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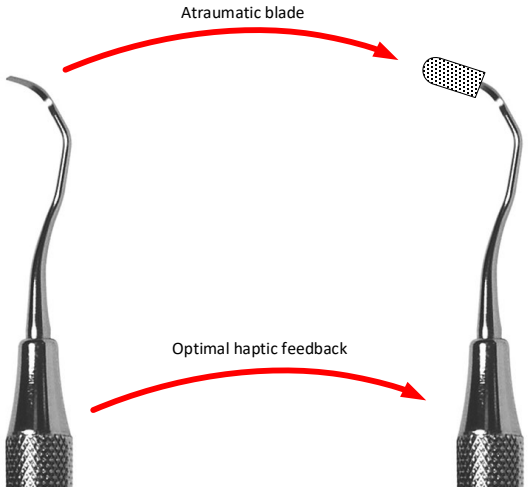
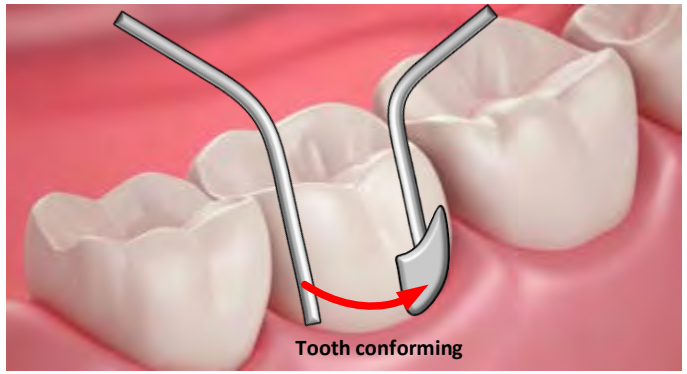
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Innosuisse – Agence suisse pour l'encouragement de l'innovation

- Cleaning of periodontal/periimplant pockets
- Trauma rehabilitation
- Atraumatic blade
- Optimal haptic feedback



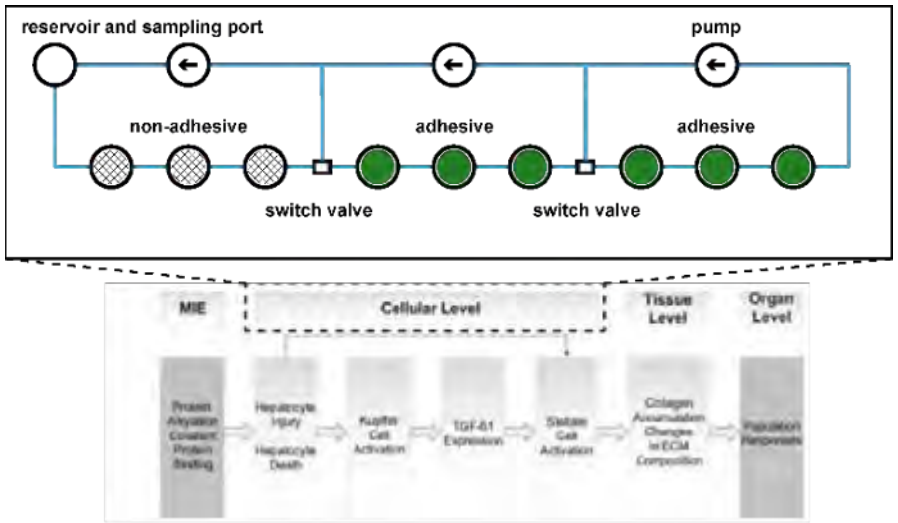


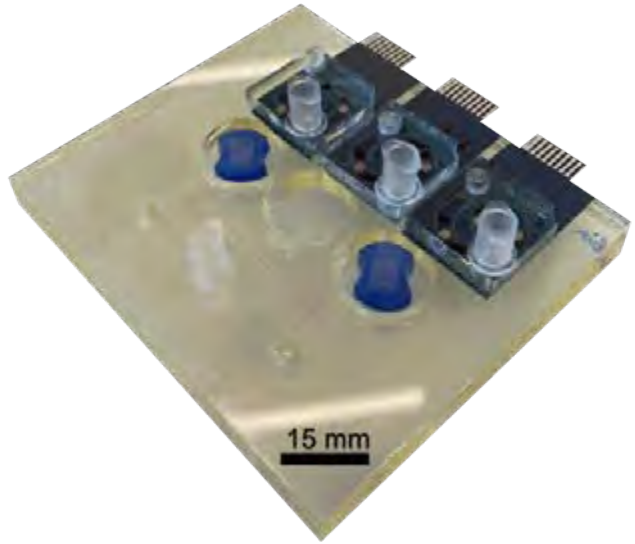
Project in elaboration, discussion with industrial partner

In-Vitro Diagnostic

AOP plug'n'play

Provide a model for generating quantitative, human-relevant data on the mechanisms of liver fibrosis, which can be used for safety assessment (quantification of AOP) and disease modelling.



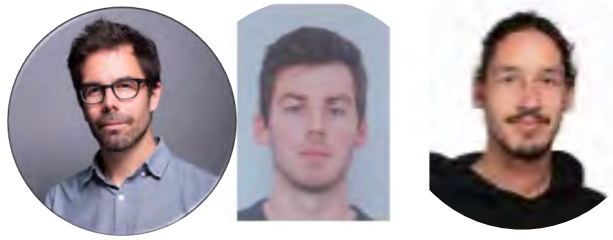


Design of a smart microfluidic multiwell plate for AOP assessment with integrated sensors

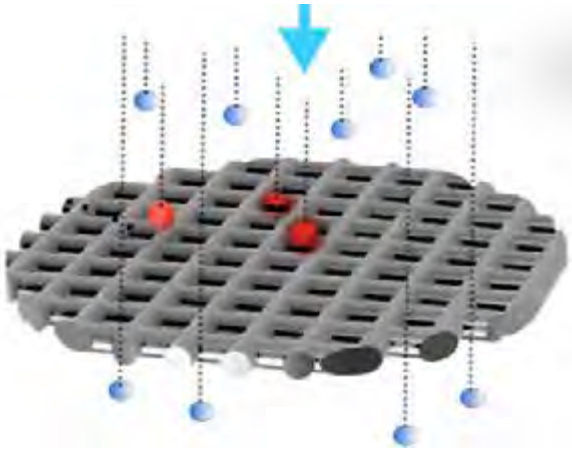
Funding: FNS Bridge Discovery

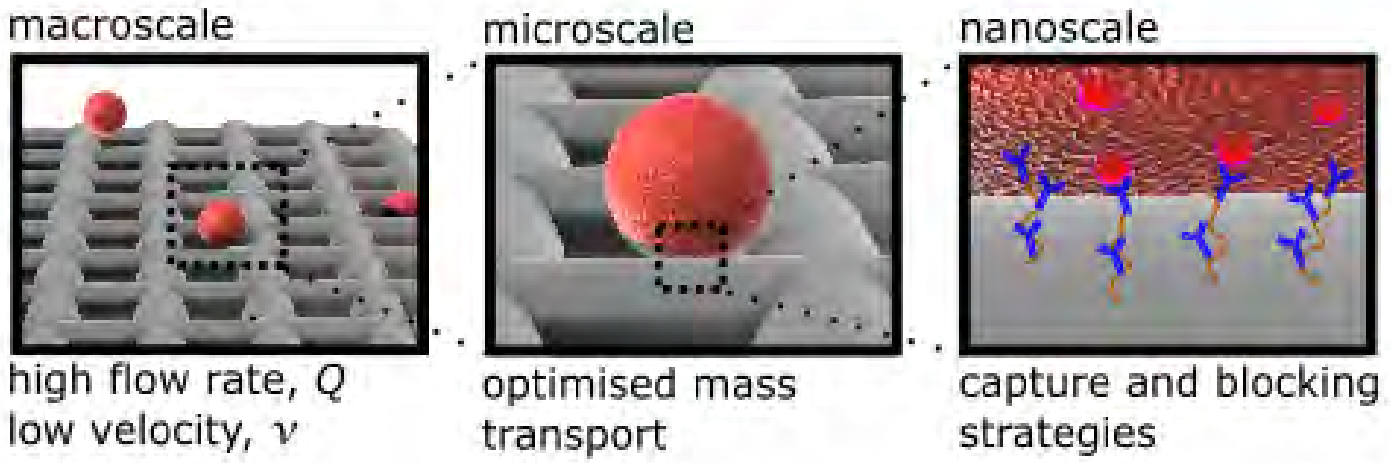
S. Wenger, et al., µTAS 2023, Katowice, Poland

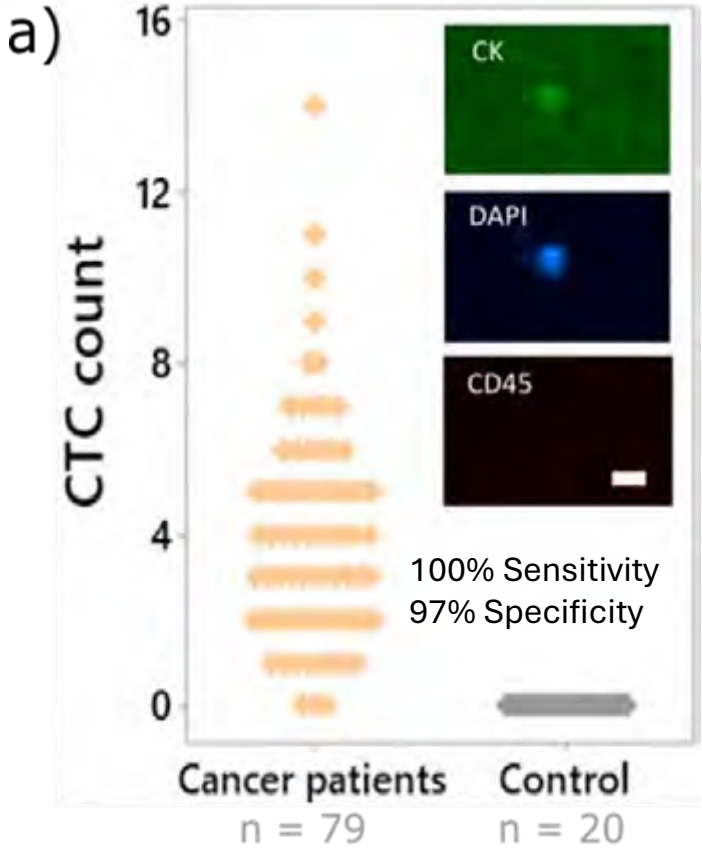
HYPERCELL



Evaluation of autologous adoptive T-cell therapy directly from patient blood





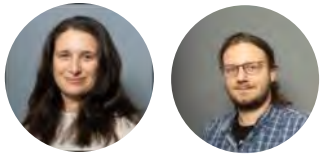


FNS project 31HW-0_220646

Building on ACS Sens. 2023, 8, 3, 1200 - 3 patent families

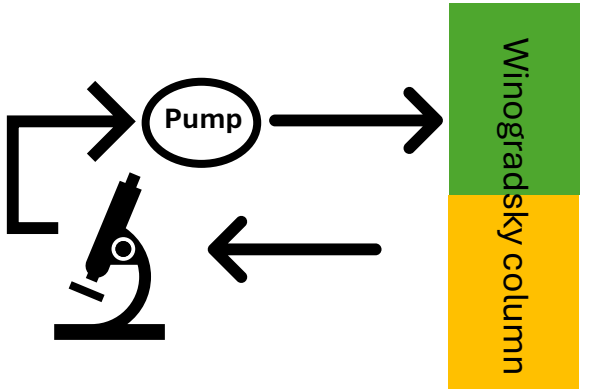
Life Sciences

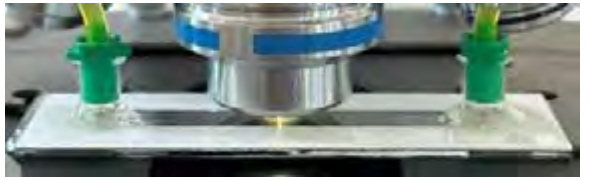
Bacterioscope



Temporary exhibit in 2023

This installation was co-created by the UniNe Laboratory of Microbiology, HE-Arc Ingénierie and the Neuchâtel Botanical Garden.



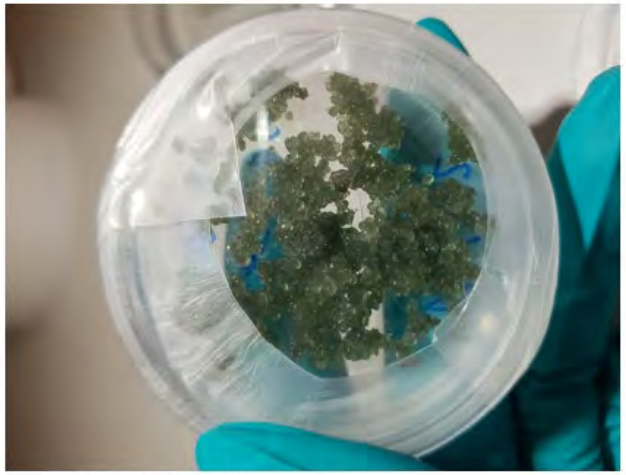


Thanks to a flow of liquid from the Winogradsky column, the microbes pass under a microscope slide linked to a camera that allows to observe, on screen, the bacteria living in the column's ecosystem.

Funding: HE-Arc, canton de Neuchâtel

Biopesticide encapsulation

Video: Alginate droplets in colza oil. PDMS microchannel. Microchannel dimensions: 1.5 mm (width and height)



Beads after coating – Mockup 2

Former project:

Microcapsules: Past innosuisse projet with UniNE + Agroscope (2020-21)

- Heal plant root with a fungus-bacteria consortium
- High throughput microfluidic encapsulation

Future projects:

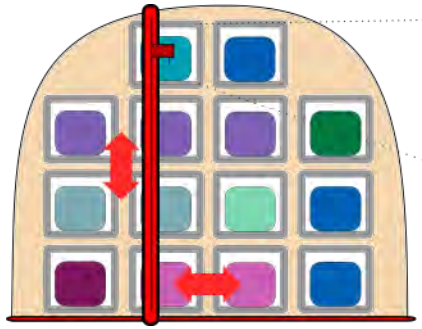
- **Enhance**: collaboration with UniNE + FiBL (2025-28): continue innosuisse projet, improve volume production of microcapsules, automatisation of encapsulation process, intensive validation in real cuture conditions
- **BioCapVine**: collaboration with Changins (2025-26): encapsulate essential oils to treat wine leaves, produce smaller microcapsules (20-200µm), study release of EO + UV resistance + adhesion

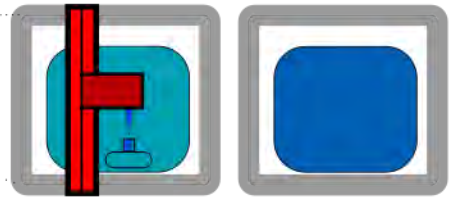
Funding: Microcapsules (Innosuisse), Enhance (FNS syngergia), BioCapVine (HES-SO)

A. Homsy, et al., µTAS 2022, Hangzhou, China

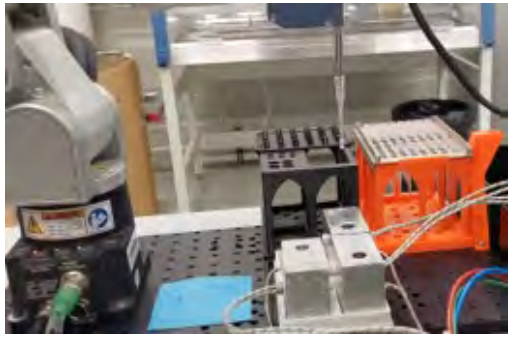
Manufacturing & Industrialization

DNAMIC: microfactory for DNA data storage





Synthesis, Mixing, Amplification,
Sequencing, ... Future technology



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ktu kaunas university of technology 1922

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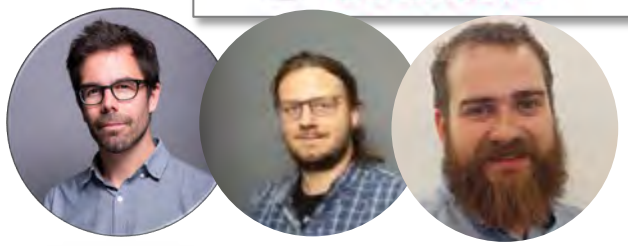
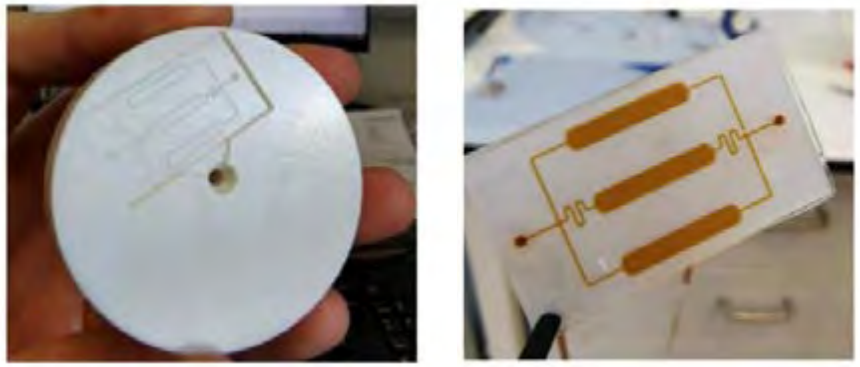
Grant Agreement 101115389.
SERI Contract 23.00300

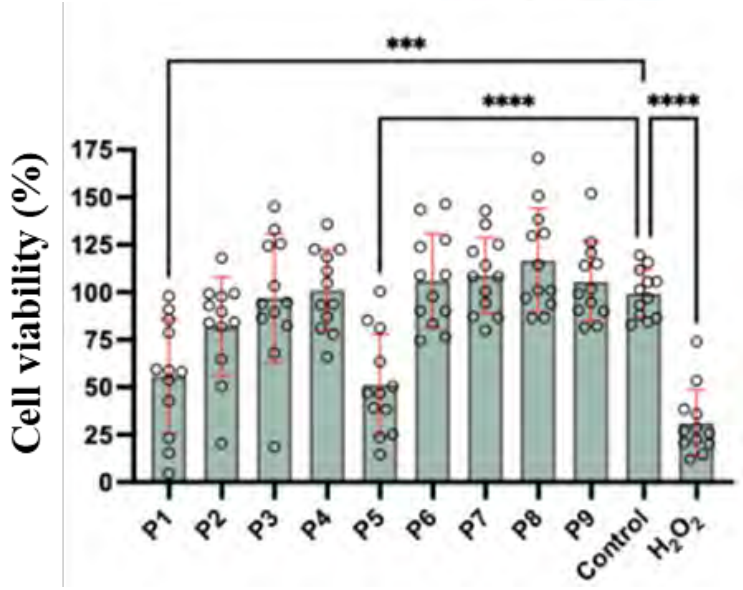


EIC Pathfinder project

www.dnamic.org

Rapid Prototyping Injection Moulding





Gülcür, *et al.,* Rapid Prototyp. J., **2024**, 30, 1322
Gülcür, *et al.,* Materials & Design, **2023**, 227, 111741
Gülcür, *et al.,* Rapid Prototyp. J., **2023**, 29, 1420,

Projects: SoftEco (HE-Arc), 3DPMold (NPR), AOP Plug and Play (FNS Bridge)