

BE FBI 8 Novembre 2023

COMPTE RENDU REUNION DU BUREAU EXECUTIF DE FBI

8 novembre 2023, 14:00 – 15:30

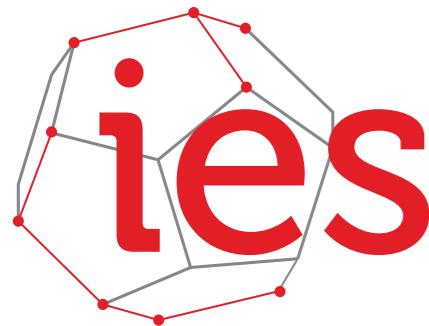
Visio-conférence

Participants : Benoit Charlot (présentation équipe R&D candidate), Yves Mely, David Perrais, Marc Tramier, Anthony Sebillot, Daniel Stockholm, Charles Kervrann, Jean-Christophe Olivo-Marin, Pierre-François Lenne, Emmanuel Margeat, René Marc Mège, Nathalie Aulner, Cécile Pouzet, Audrey Salles, Etienne Henry, Jean Salamero, Emmanuel Faure, Caroline Thiriet, Alban Belloir, Alexandre Philips, Edouard Bertrand

Excusés : Bertrand Vernay, Jacky Goetz, Fabrice Cordelières, Perrine Paul-Gilloteaux, Emmanuel Beaurepaire, Sandrine Lecart, Didier Marguet, Patrick Lemaire, Olivier Gadal, Jacques Rouquette, Aurélien Dauphin, Artemis Kosta, Cédric Matthews, Nicolas Brouilly, Christine Terryn, Lydia Danglot, Laurent Heliot, Cyril Favard, Fabrice Schmitt, Martin Belle,

BE FBI 8 Novembre 2023

14 :00-14 :20 **Présentation des équipes R&D candidates : Benoit Charlot (Nœud Montpellier)** – 15 minutes de présentation/5 minutes de question par équipe



INSTITUT
D'ÉLECTRONIQUE
ET DES SYSTÈMES



Biomicrofluidics and Biophotonics

micro and nano fabrication for experimental biophysics

**Benoit Charlot, Oramany Phouphetlinthong, Audrey Sebban, Remy Fulcrand,
Evelio Ramirez Miquet, Patricia Loren, Sébastien Méance**

IES, Institut d'Electronique et des Systèmes
CNRS / Université de Montpellier
<https://www.ies.umontpellier.fr/biomp/>

Lab Overview



CNRS / University of Montpellier
160 people (64 faculty)
3 Research depts.



Photonics and waves : IR lasers and detectors, plasmonics, THz
Energy and Reliability : Power electronics, Rad. Hard. Electronics
Sensors and Systems : Acoustics, PVs, MEMS, **Microfluidics**

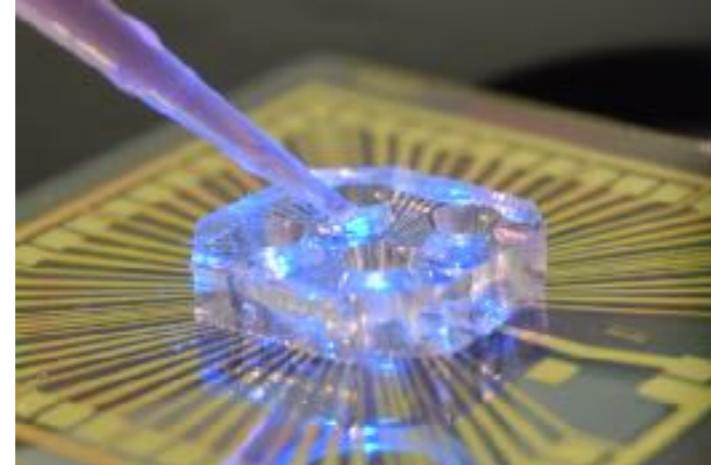
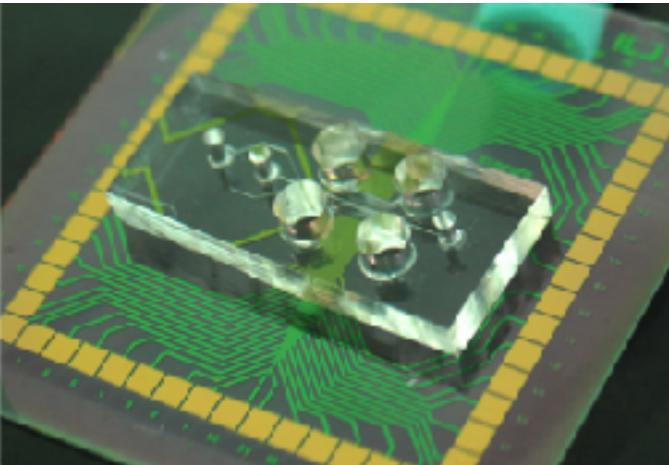
Clean Room : 400m², Lithography, Material deposition, Etching, Microscopy, SEM, AFM, EDX



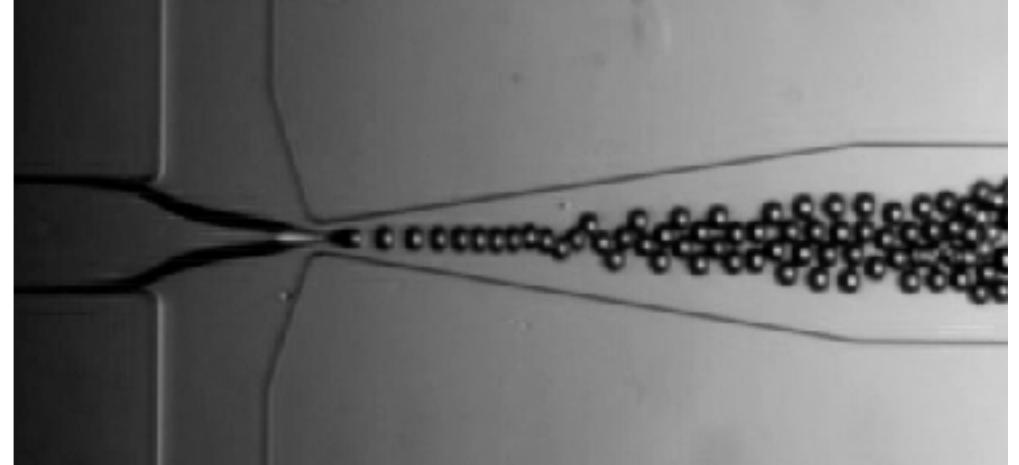
Biomicrofluidics and Biophotonics

Overview

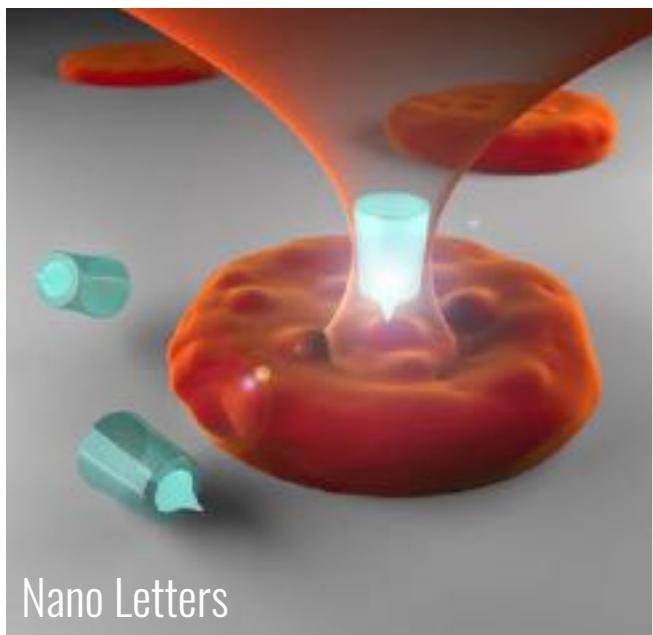
Neurofluidics, Organs On Chip



Droplet microfluidics



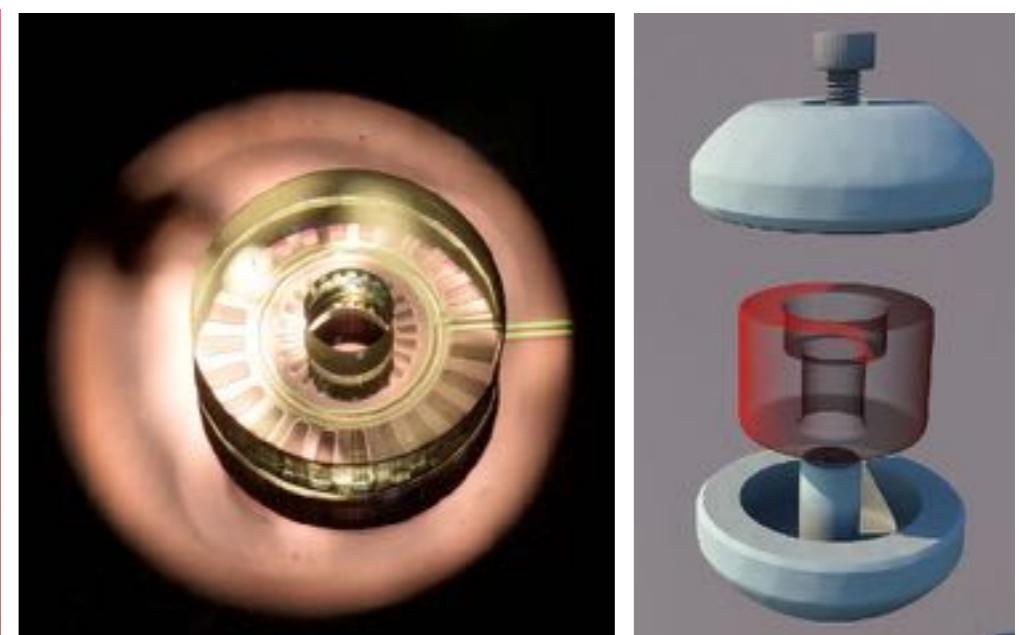
Photonic force Microscopy



Blood, hemophysics



Cancerology



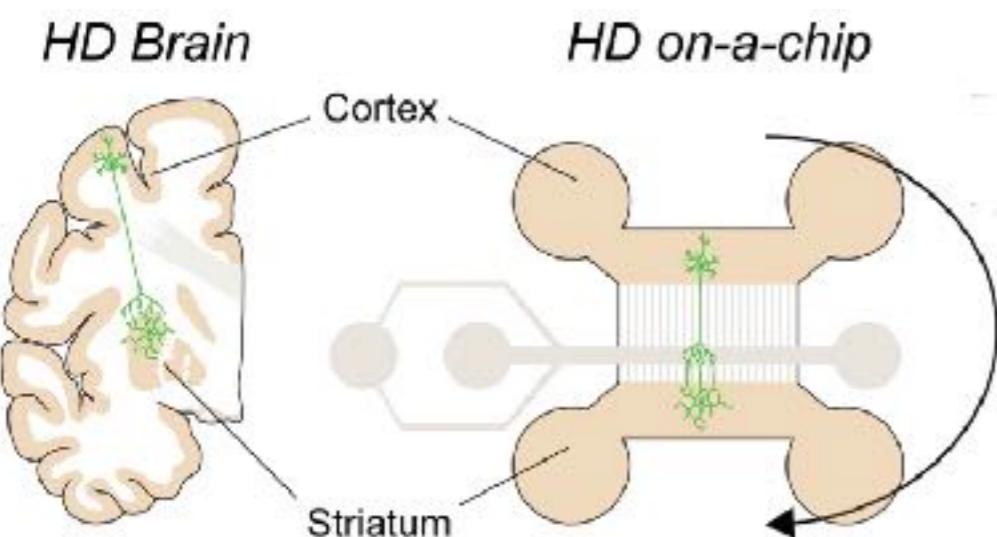
Part 1. Neurofluidics

Compartmentalized Microfluidics

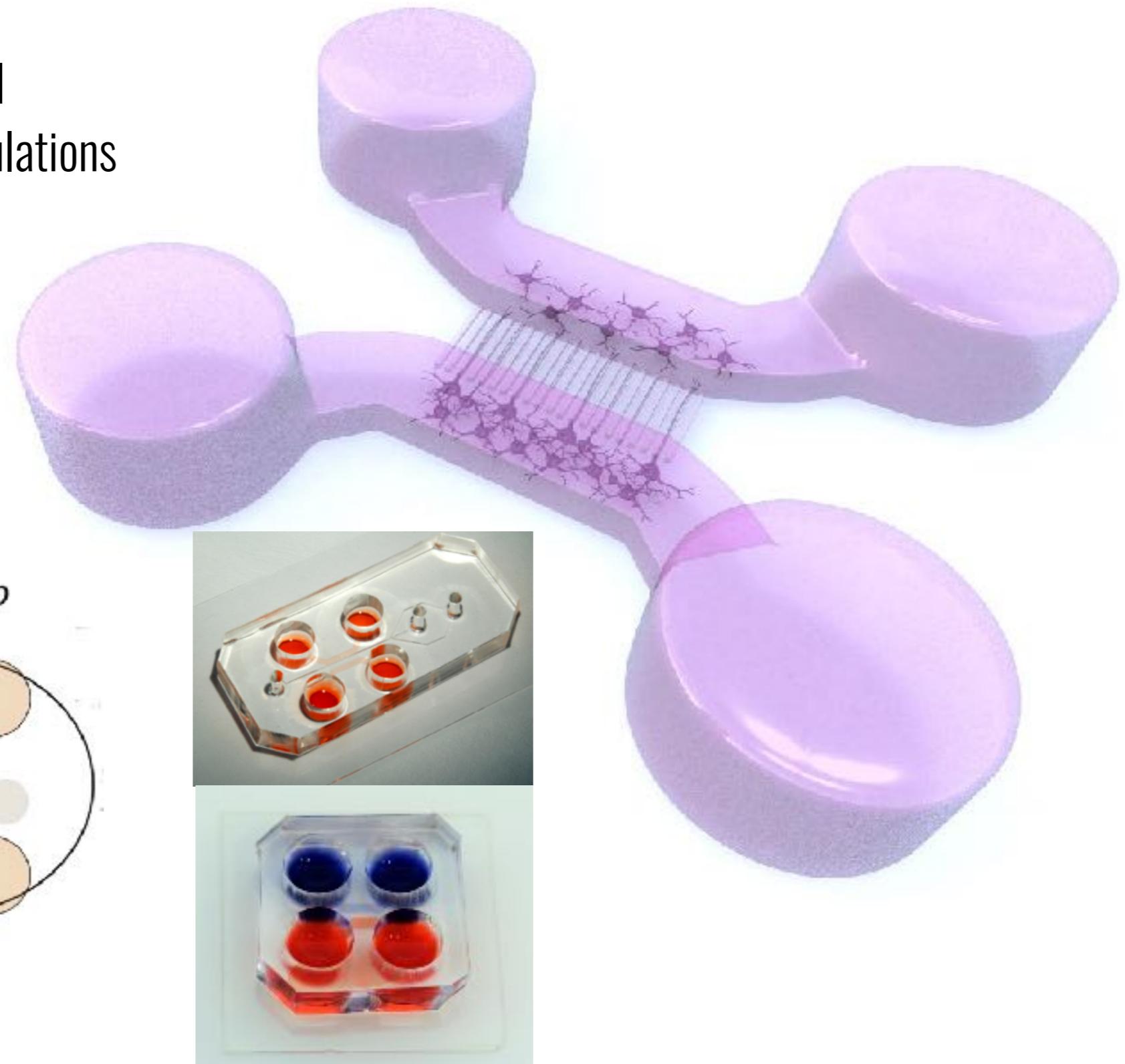
in-vitro reconstitution of functional
connections between two cell populations

cortico-cortical
cortico-Striatal
cortico-hippocampal,
hippocampo-hippocampal,
motoneuron-Muscle

...

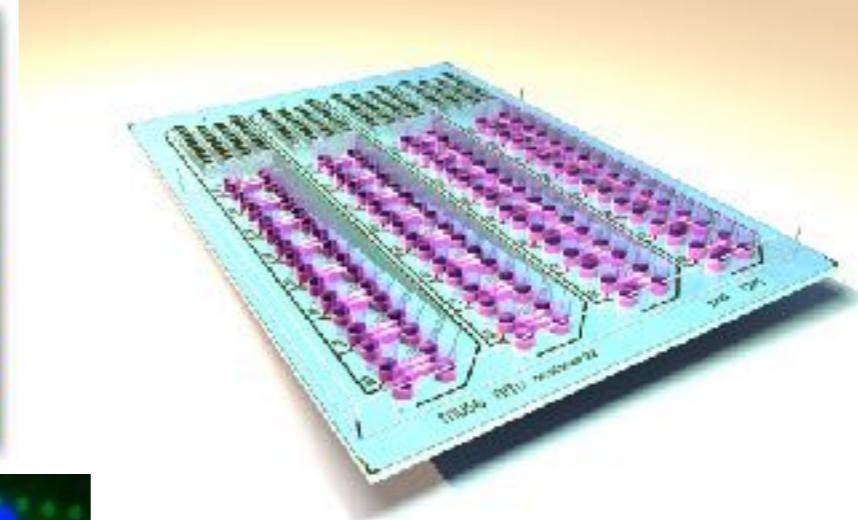
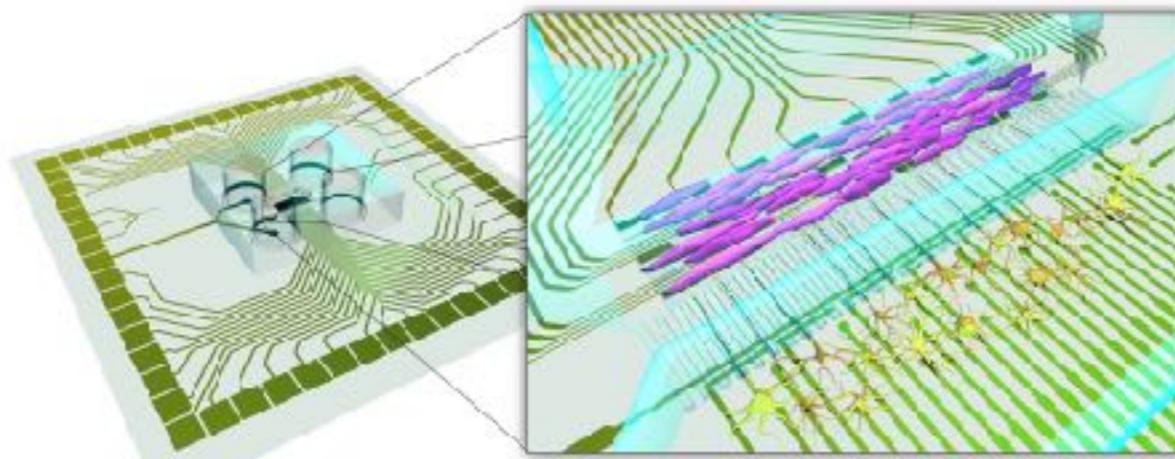


A. Virlogeux et al. *Cell Reports* 22-1 (2018)

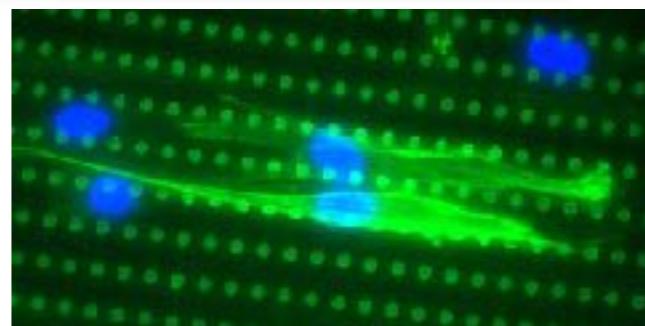


MEA-Neurofluidics

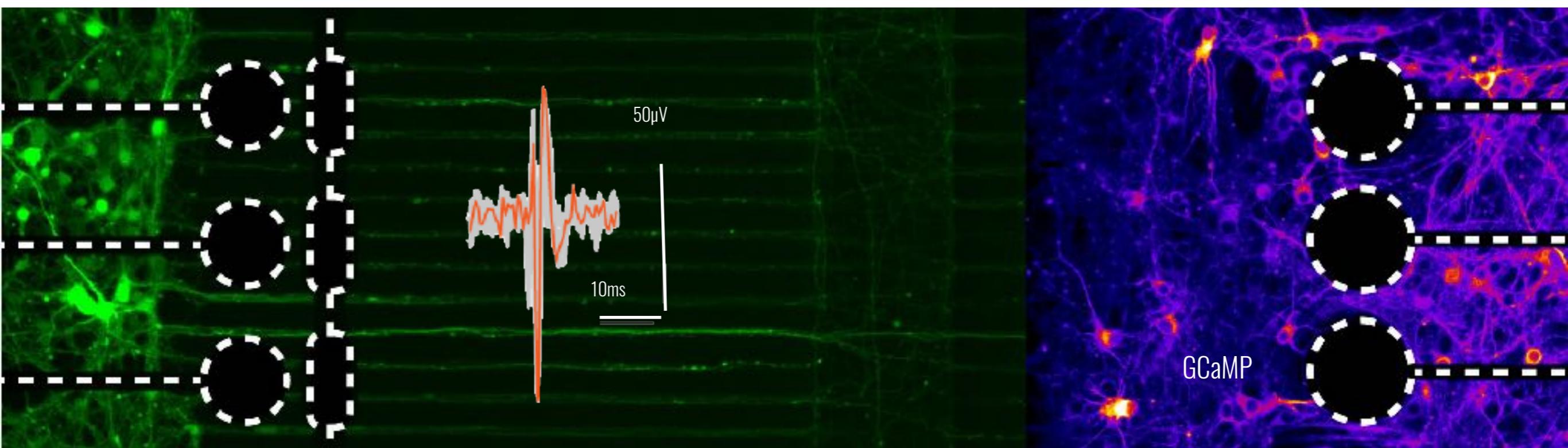
Since 2011 : Development of MEA/Microfluidic platforms for the study of reconstructed neuronal junctions



Cortex/Striatum : Huntington disease
Motoneuron/muscle : SLA and SMA



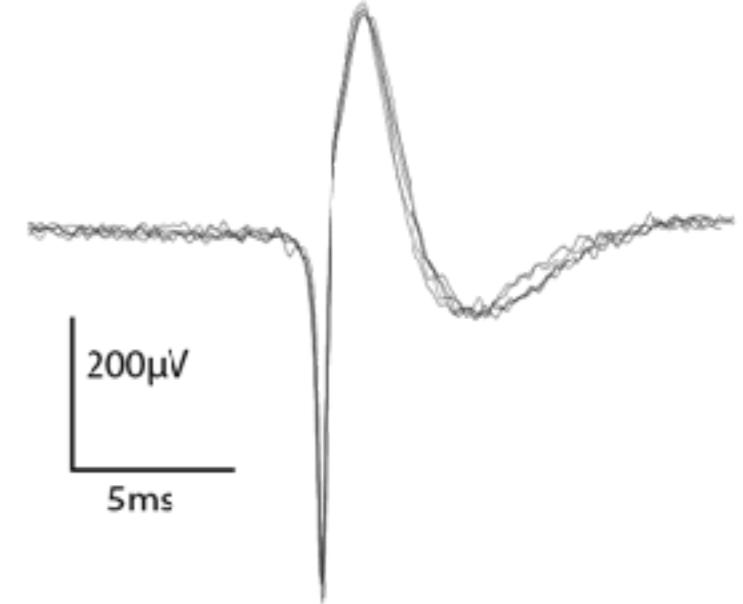
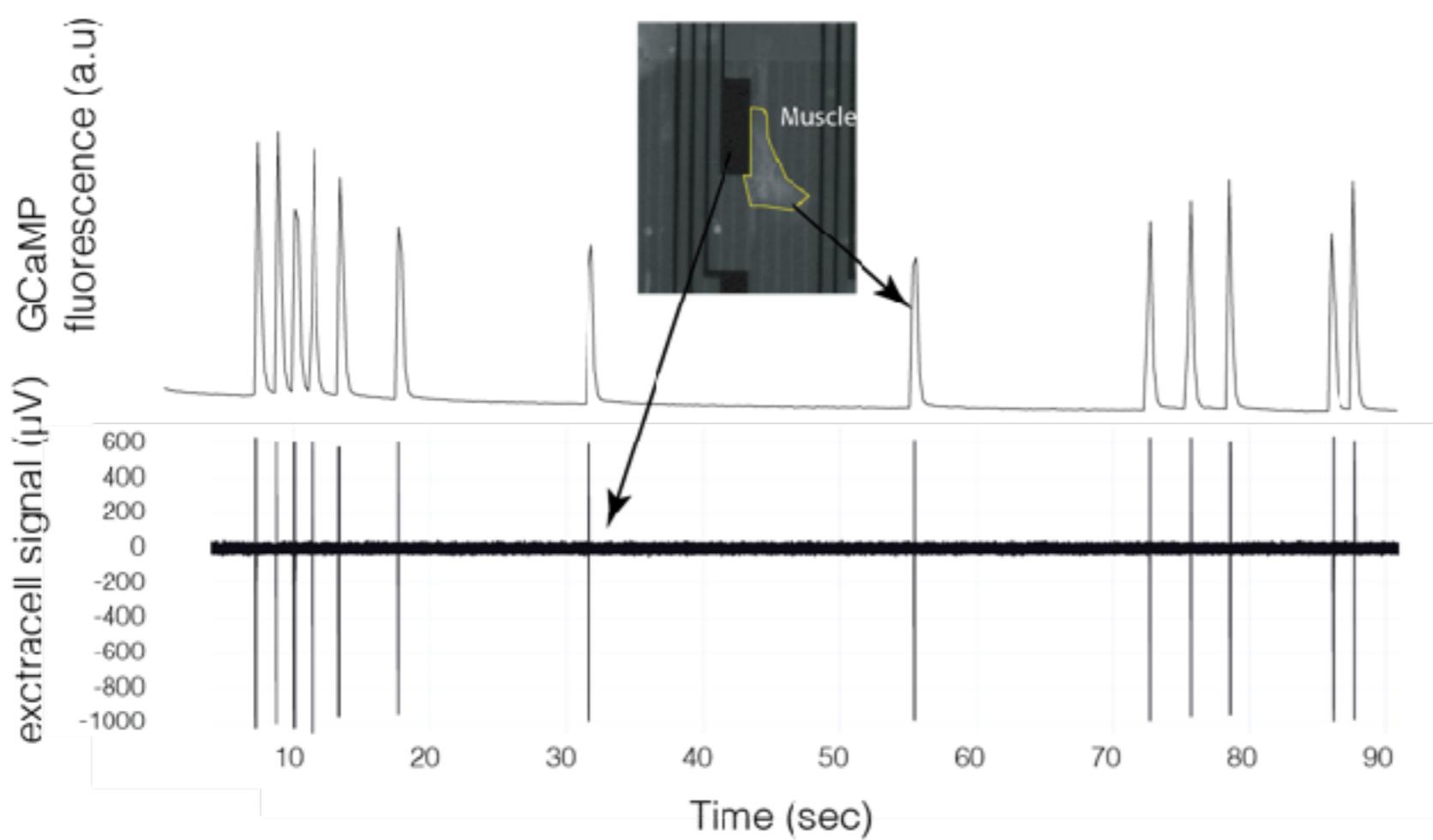
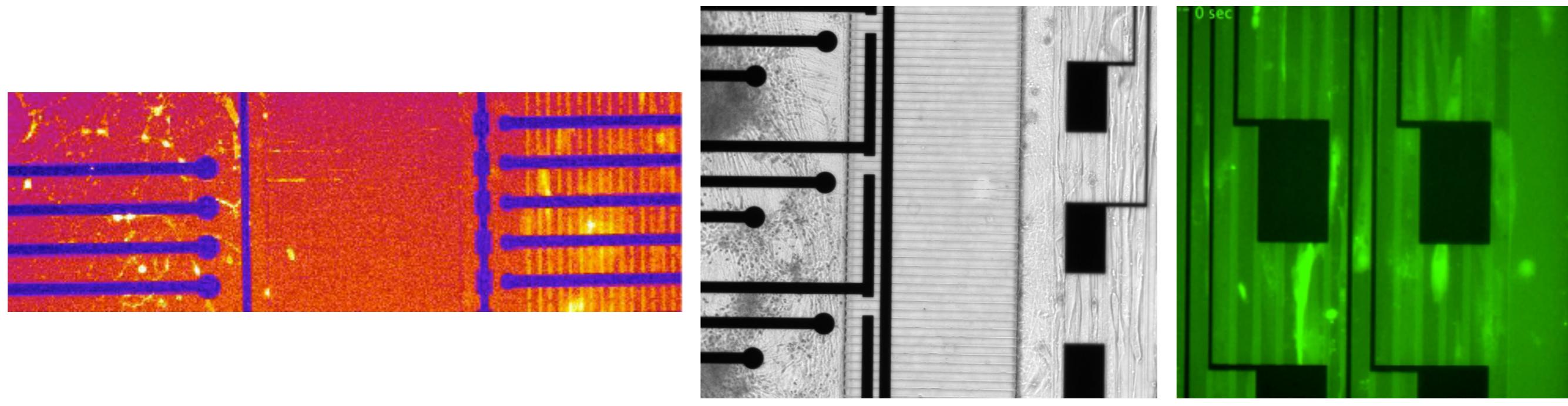
Upscaling toward
Multiwell platform



Fundings (since 2015) : ANR, EU JPND, MUSE, FRM, FRC

Neuro Muscular Junctions on chip

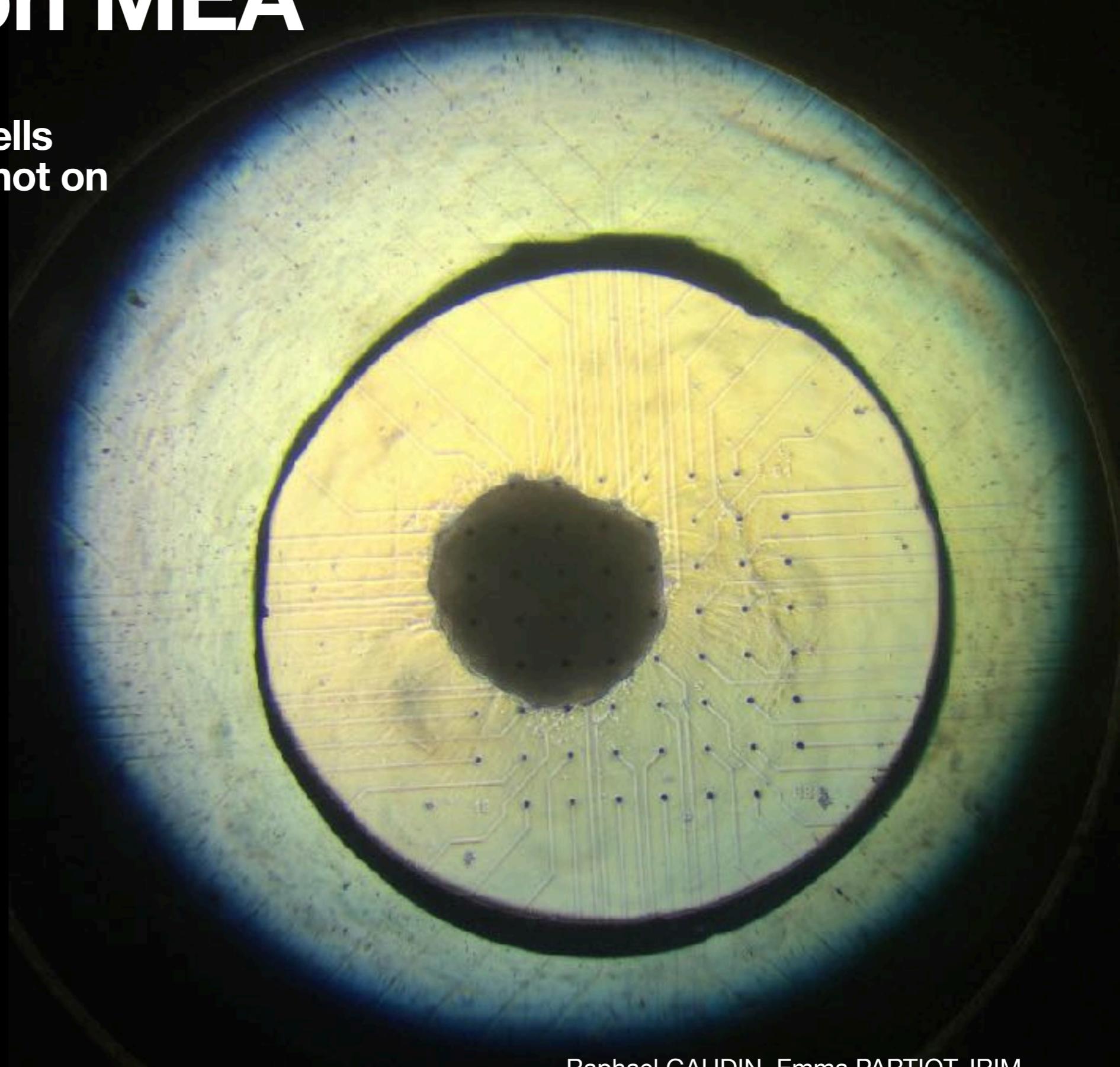
Extracell + GCaMP6 recording



Organoid on MEA

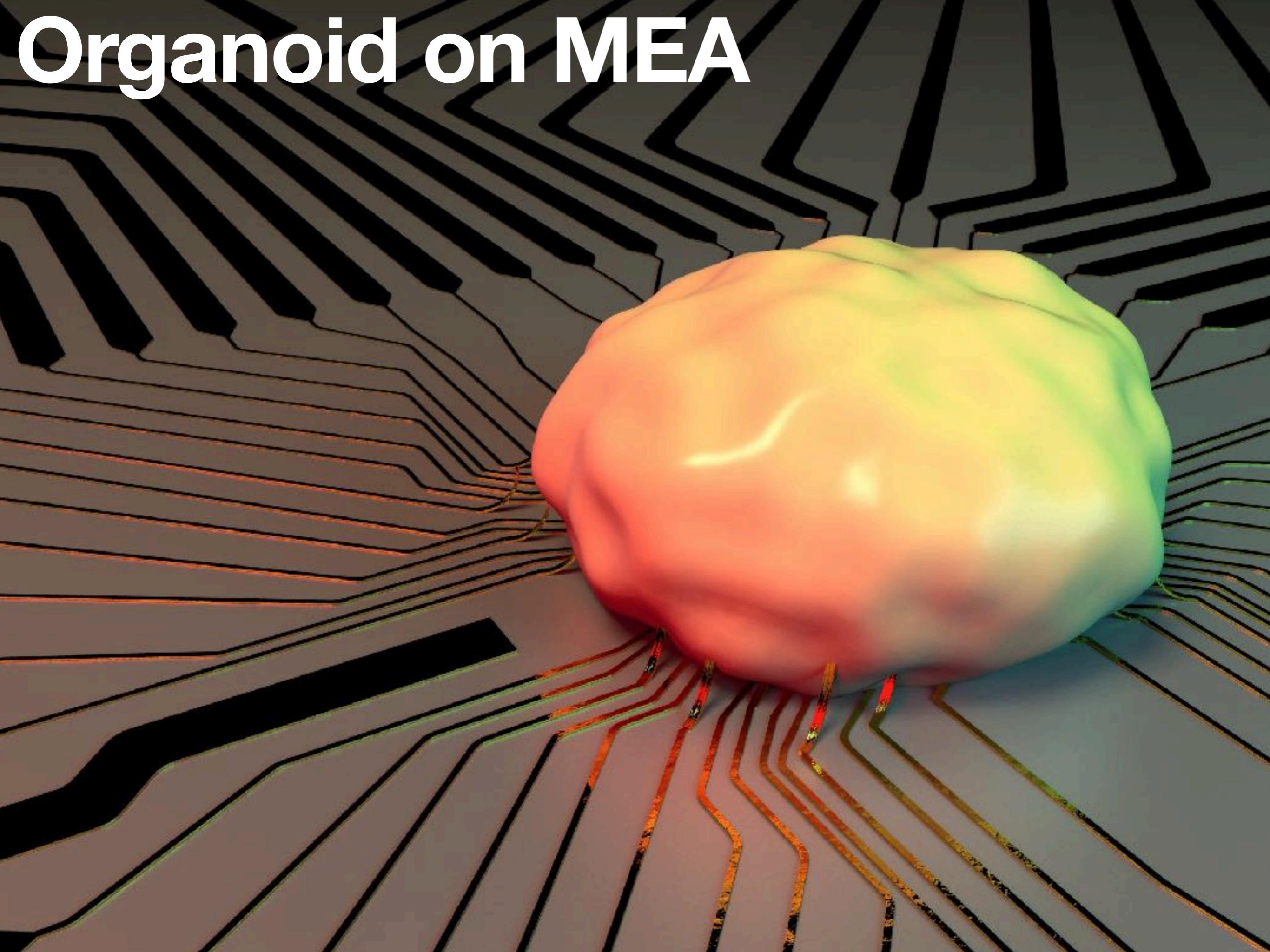
Spheroid shape: active cells
are on the periphery but not on
the surface

It doesn't
work !

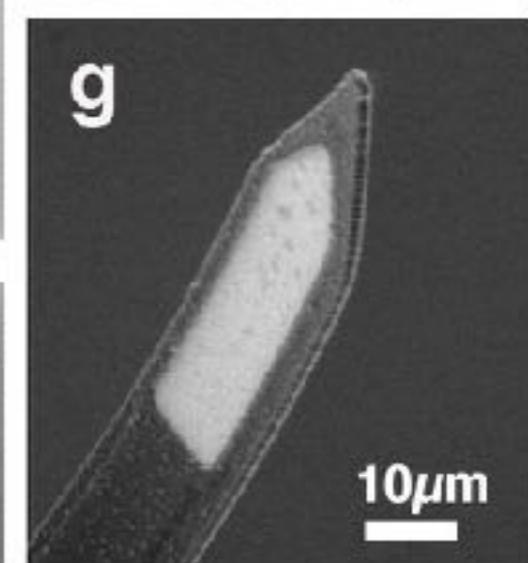
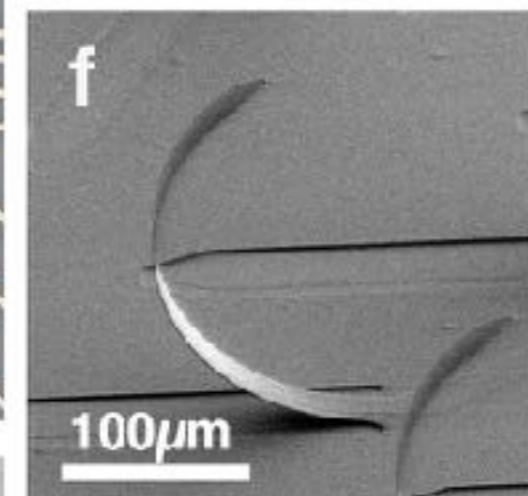
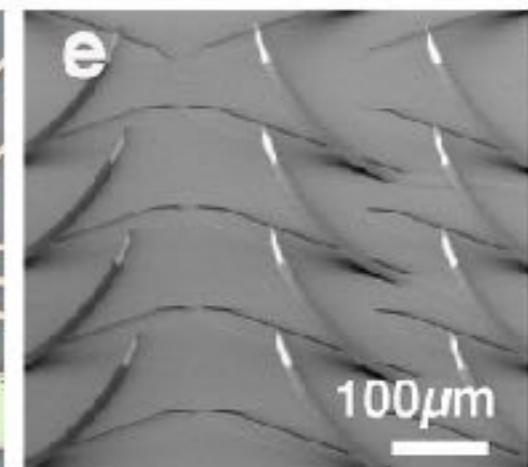
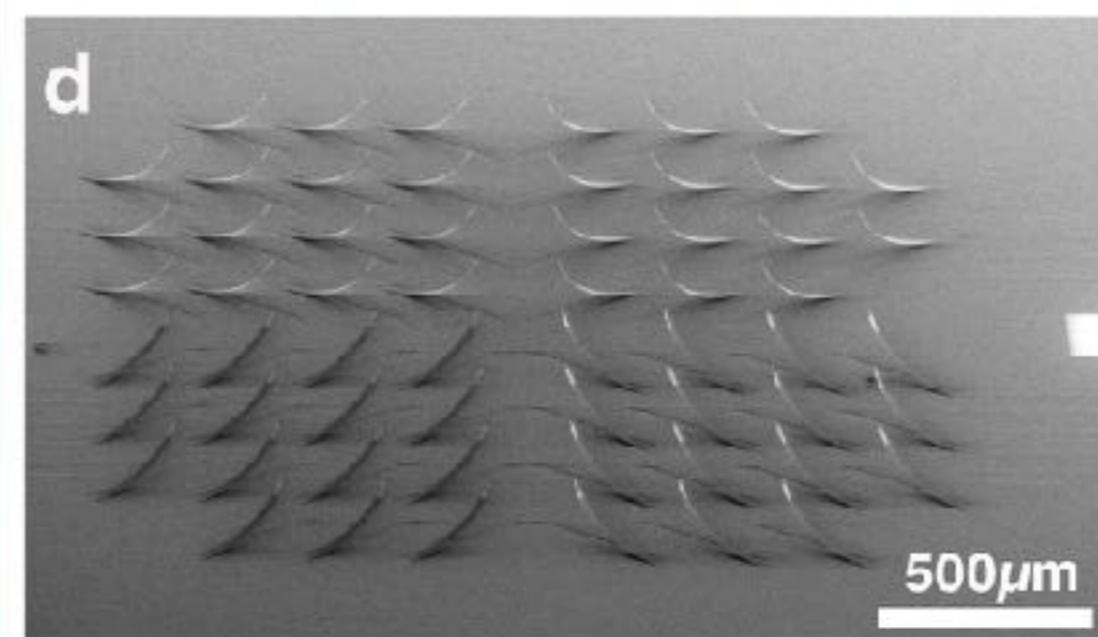
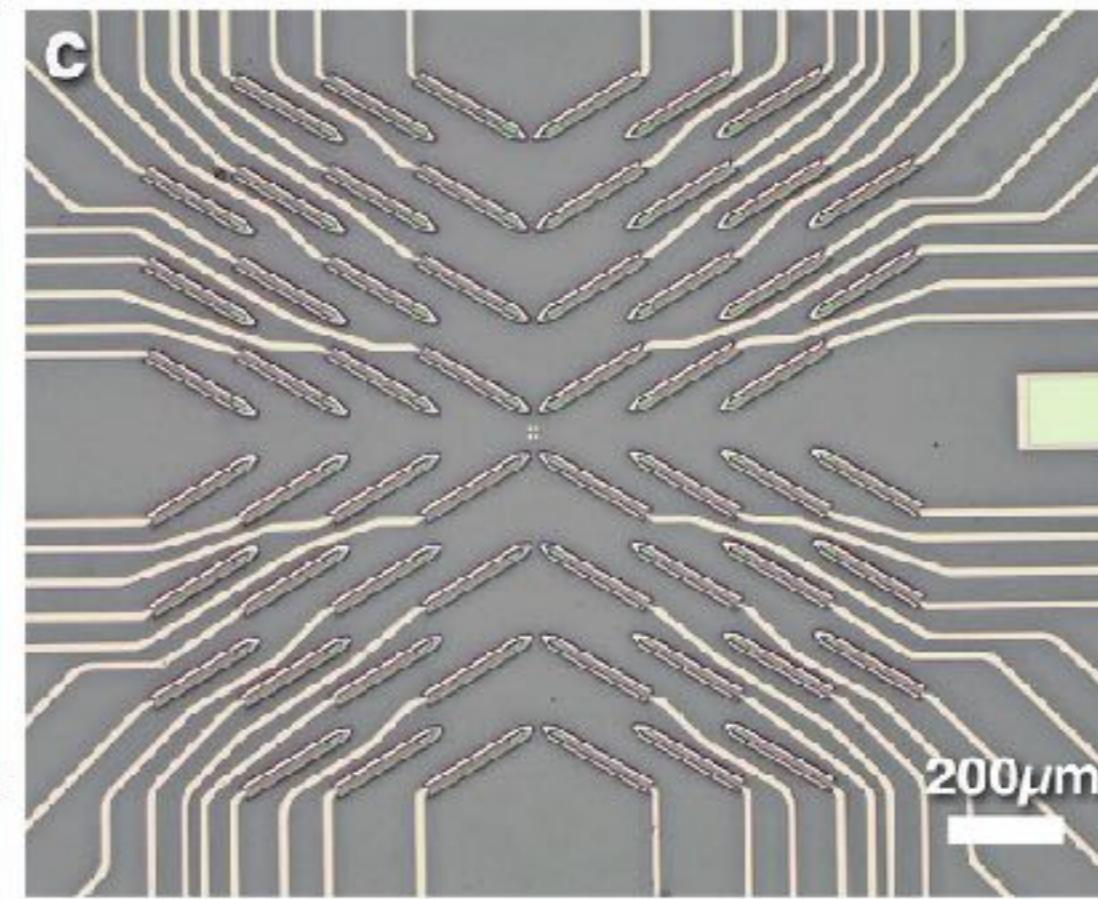
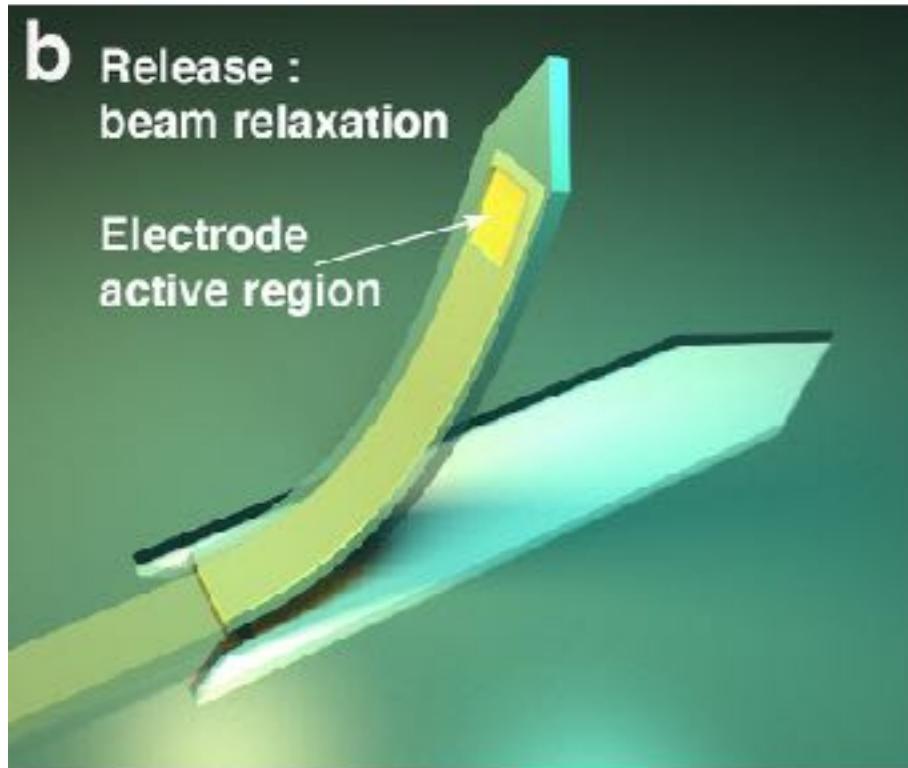
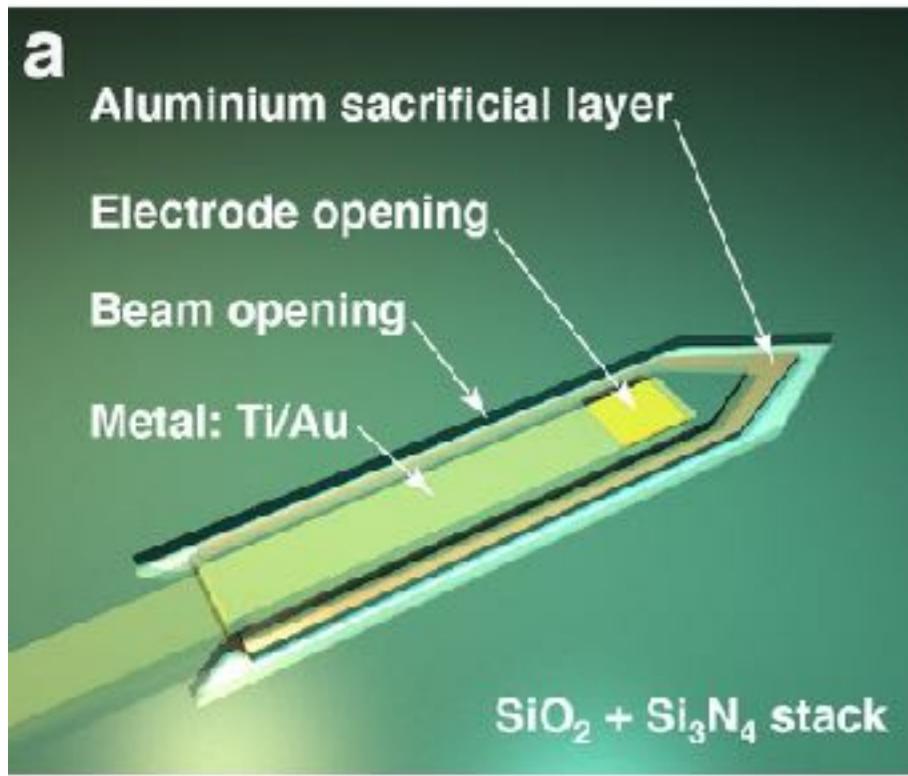


Solution: thin, penetrating
electrodes

Organoid on MEA



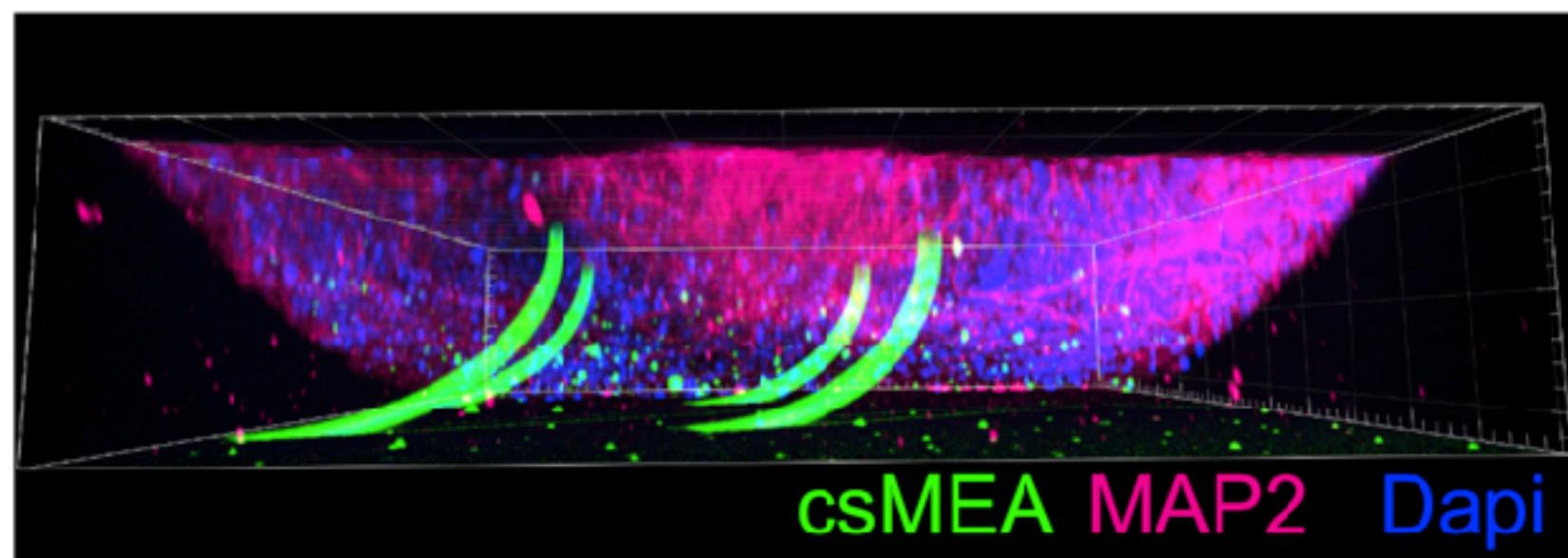
Organoid on MEA



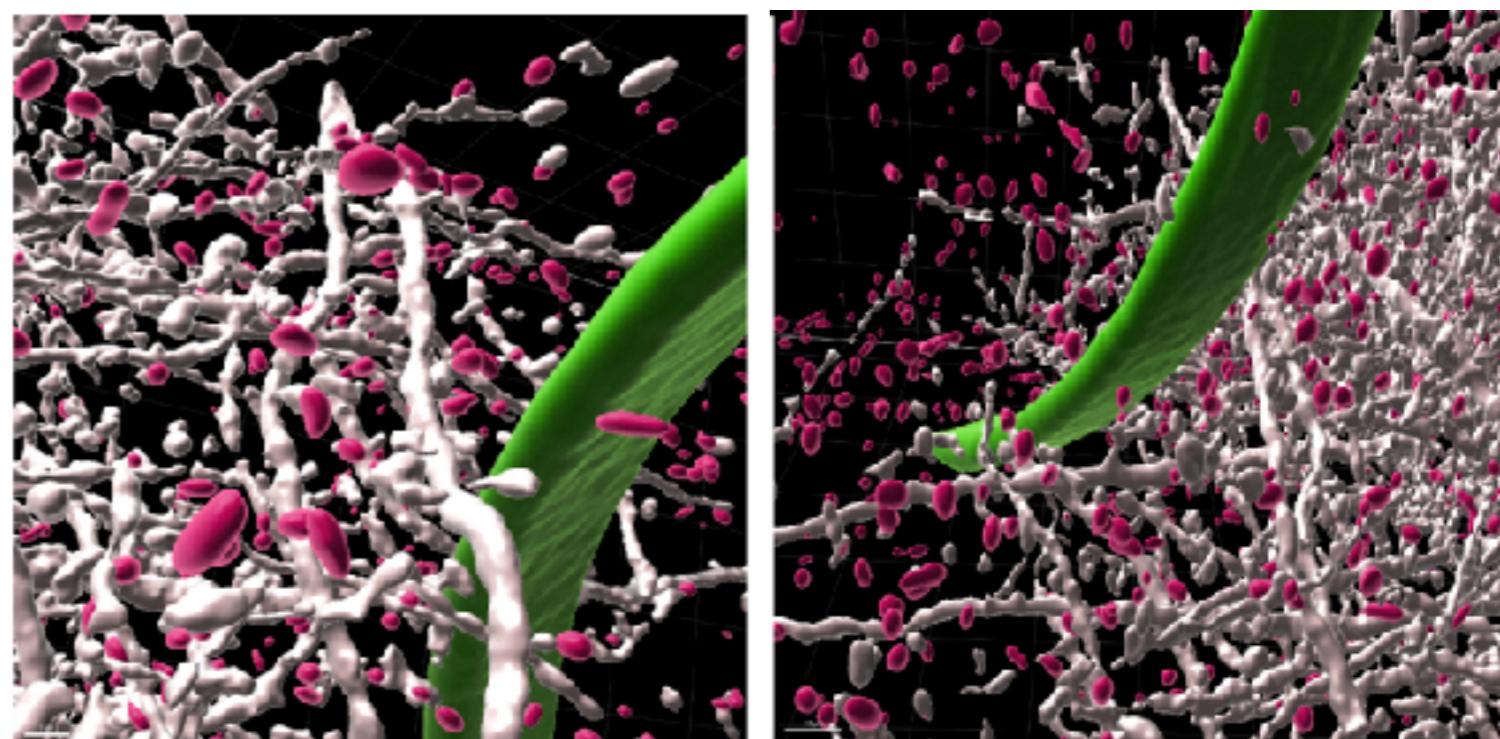
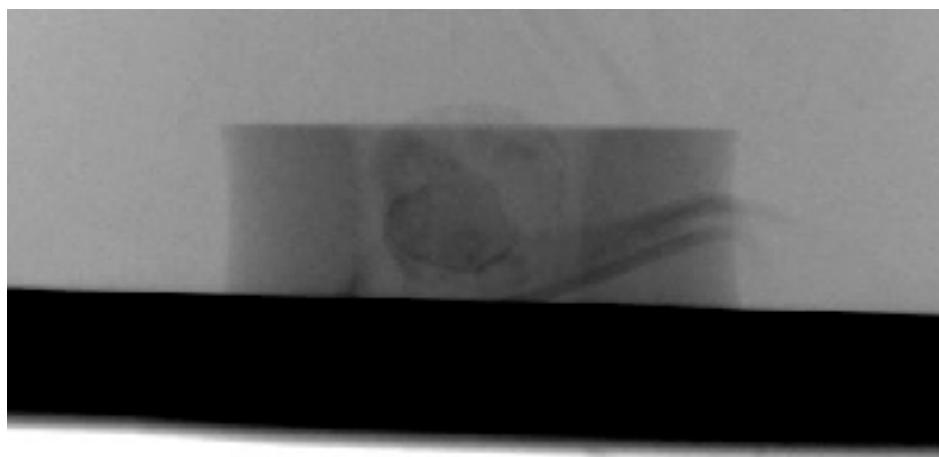
Cantilevers sporting electrodes, built with a planar process

Impalement

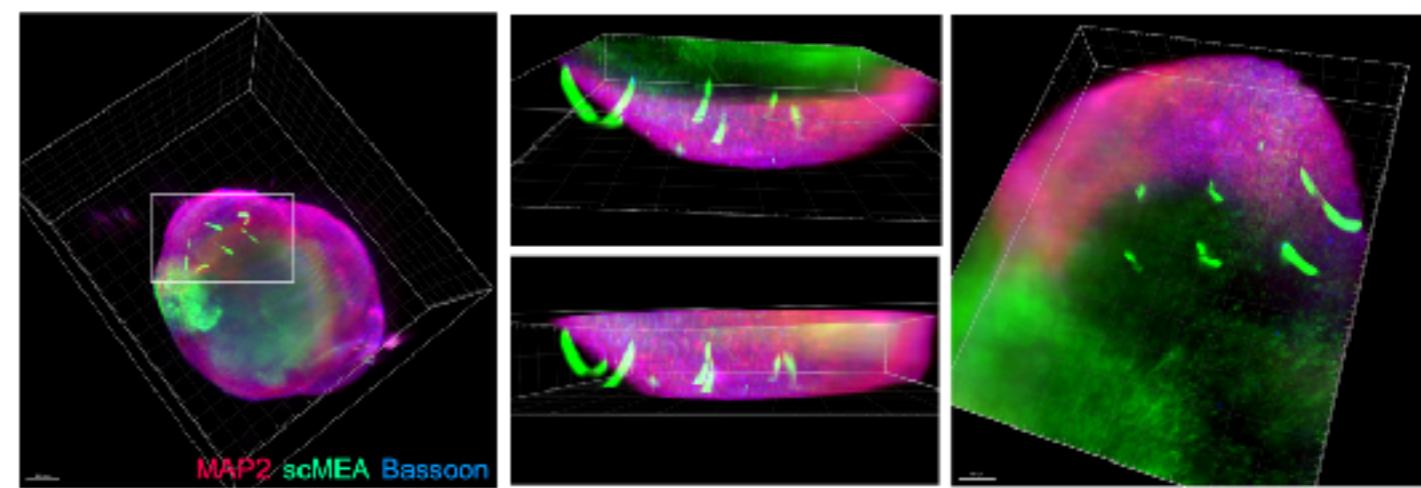
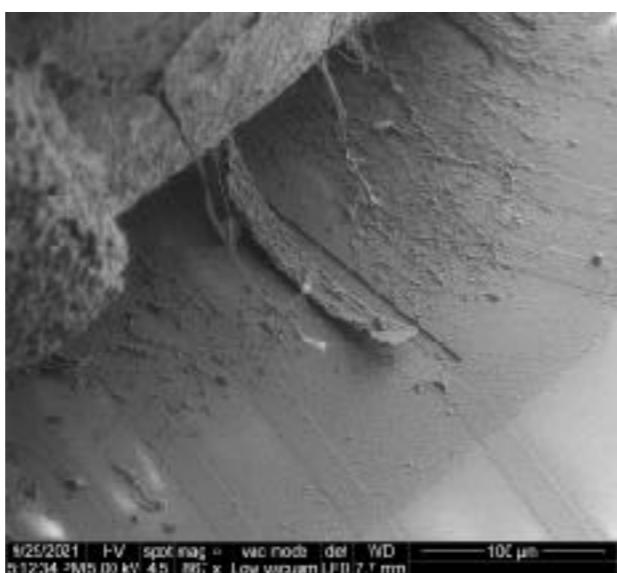
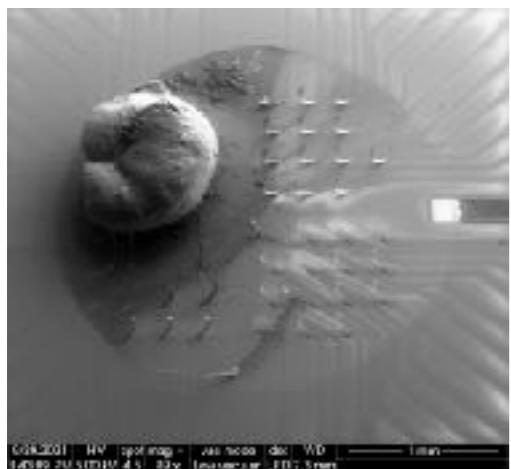
Confocal and
light sheet



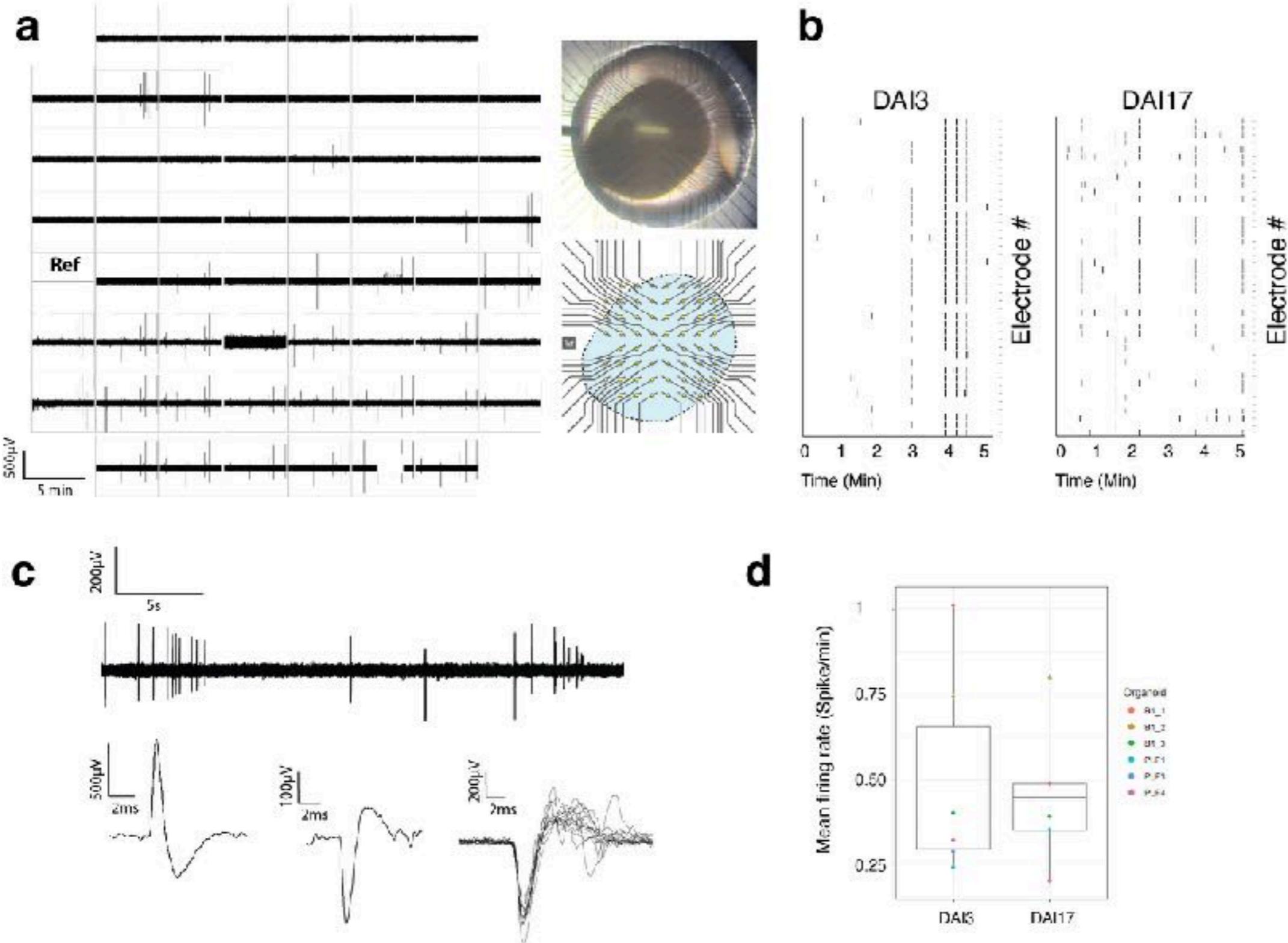
Xrays



SEM



Electrophysiology



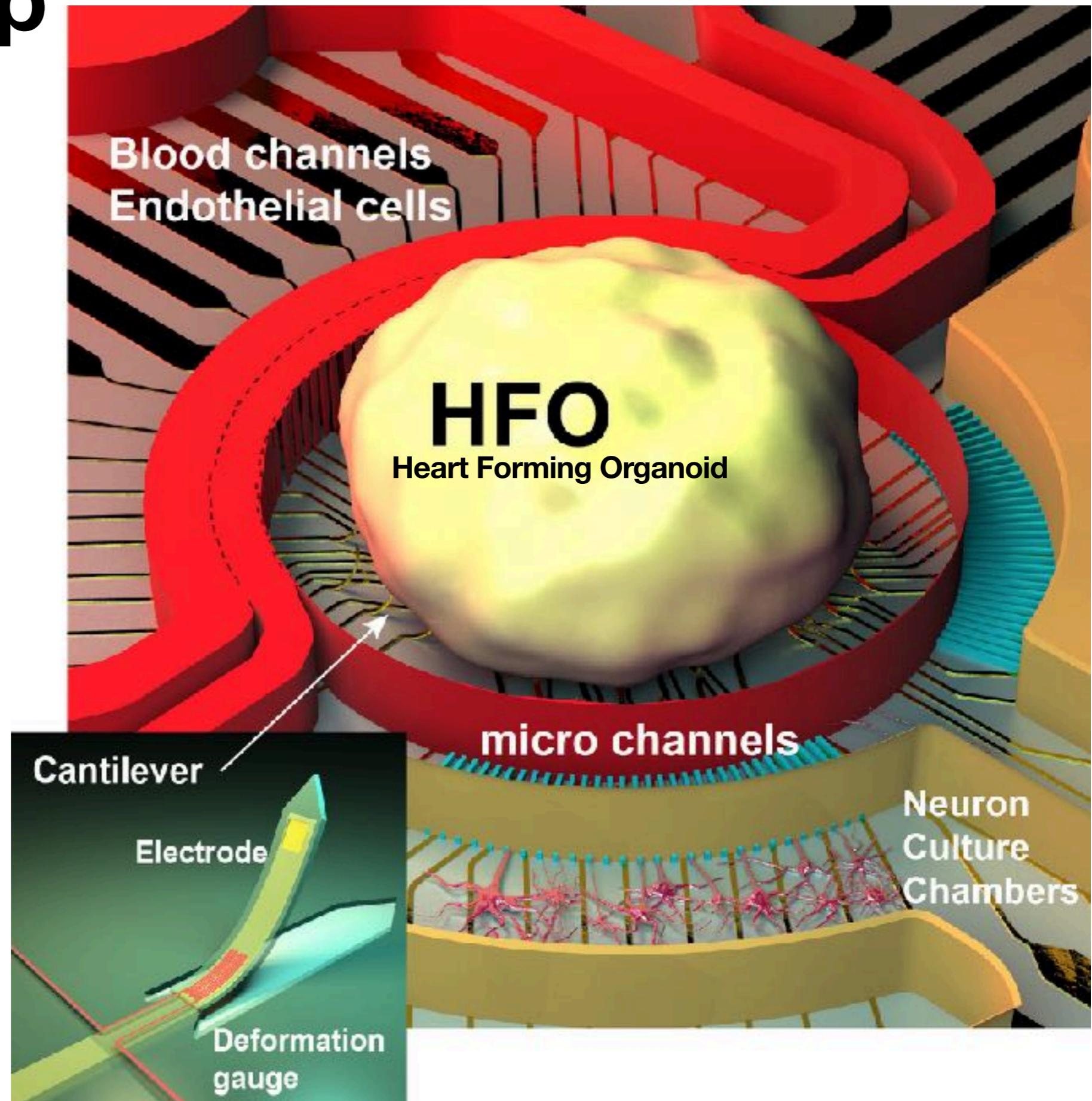
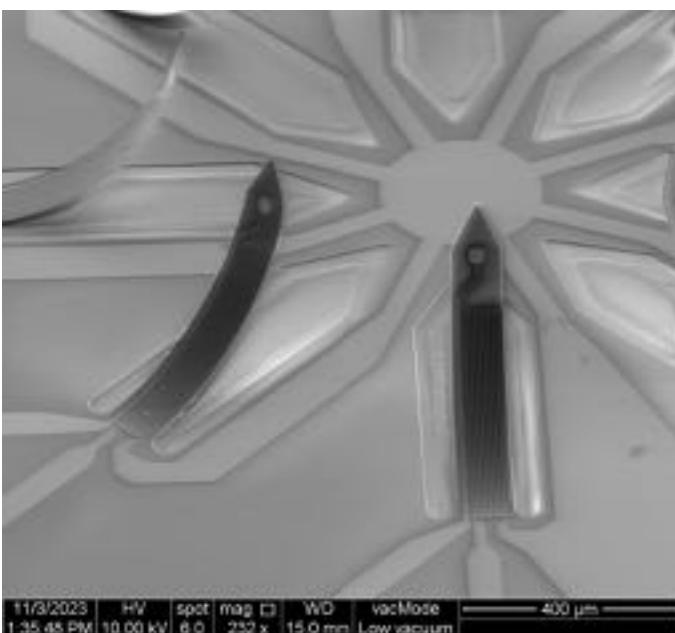
Strong signals (400 μ V) due to electrical insulation of electrodes in tissue.

Heart on chip

Development of a microfluidic system around a cardiac organoid organoid (HFO)

Cantilever array for electrical/mechanical recording

Perfusion / innervation by motor neurons



Part 2.

Photonic force microscopy

Optical Tweezers

Trapping of particles with optical gradient forces

Measurement of particles position / laser beam waist

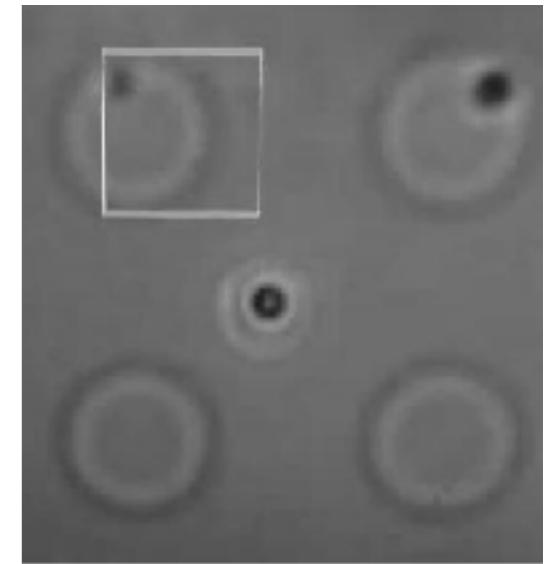
Collab, F.Pedaci, CBS

Optical Tweezers

Quartz cylinder trapped in OT

Vertical position, Torque transfer with polarisation / birefringence

Rotation



**What if we add a tip
at the bottom of the
cylinder?**

Z.Santybayeva, et al. , “Fabrication of quartz micro-cylinders by laser interference lithography for angular optical tweezers”, J. Micro/Nanolith. MEMS MOEMS. 15(3), 034507 (2016), doi:10.1111/1.JMM.15.3.034507

Photonic force microscopy



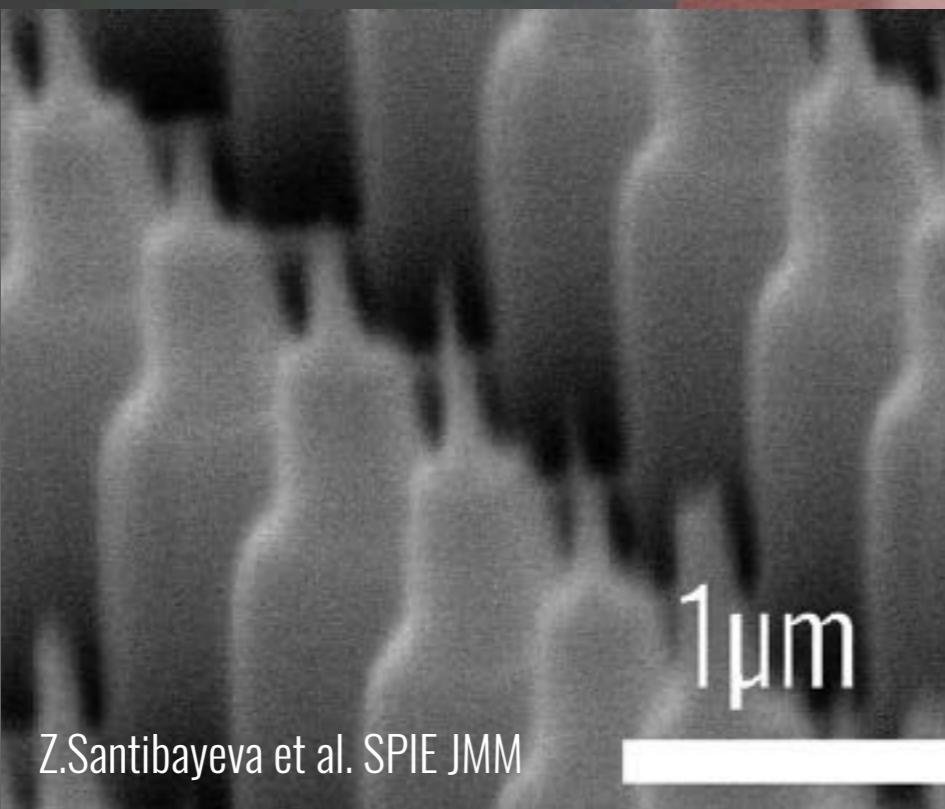
Collab, F.Pedaci, CBS

AFM without cantilever

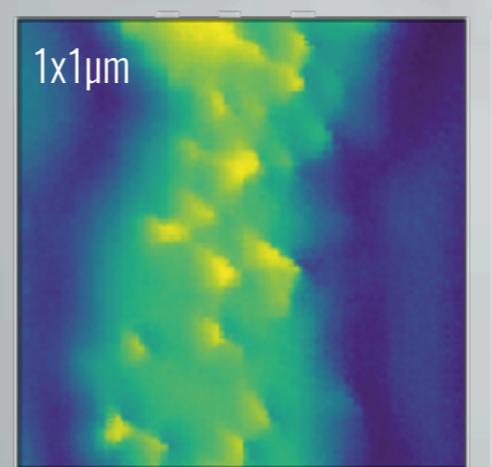
Optical Tweezers

Weak force pN / nN

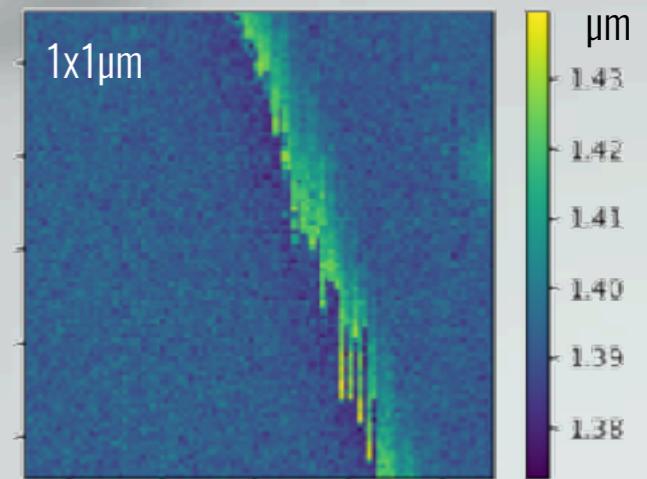
Microcylinders with sharp tips



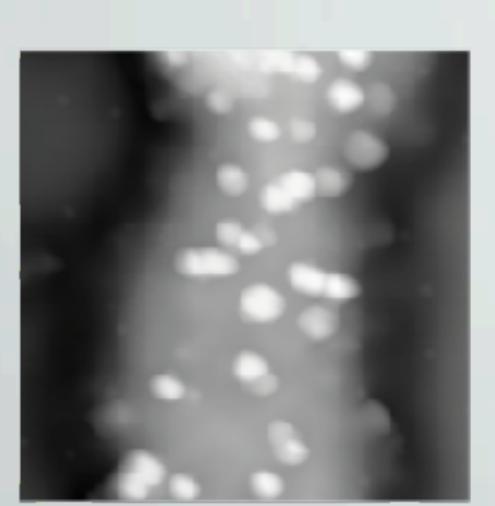
Z.Santibayeva et al. SPIE JMM



PhFM



Microtubule



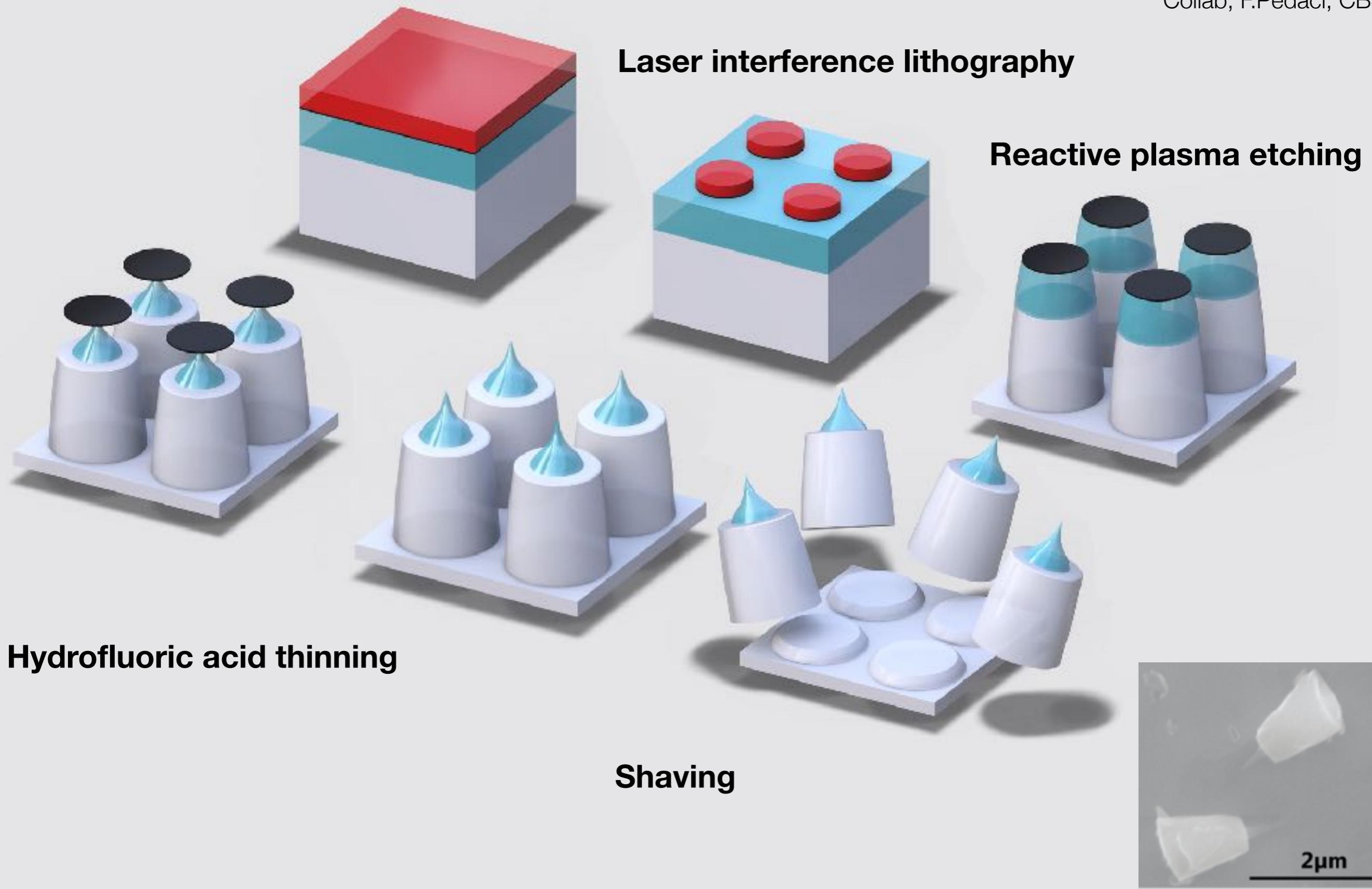
AFM

70 nm
60
50
40
30
20
10
0
-10
-20
-30
-40

Microfabrication process chart



Collab, F.Pedaci, CBS



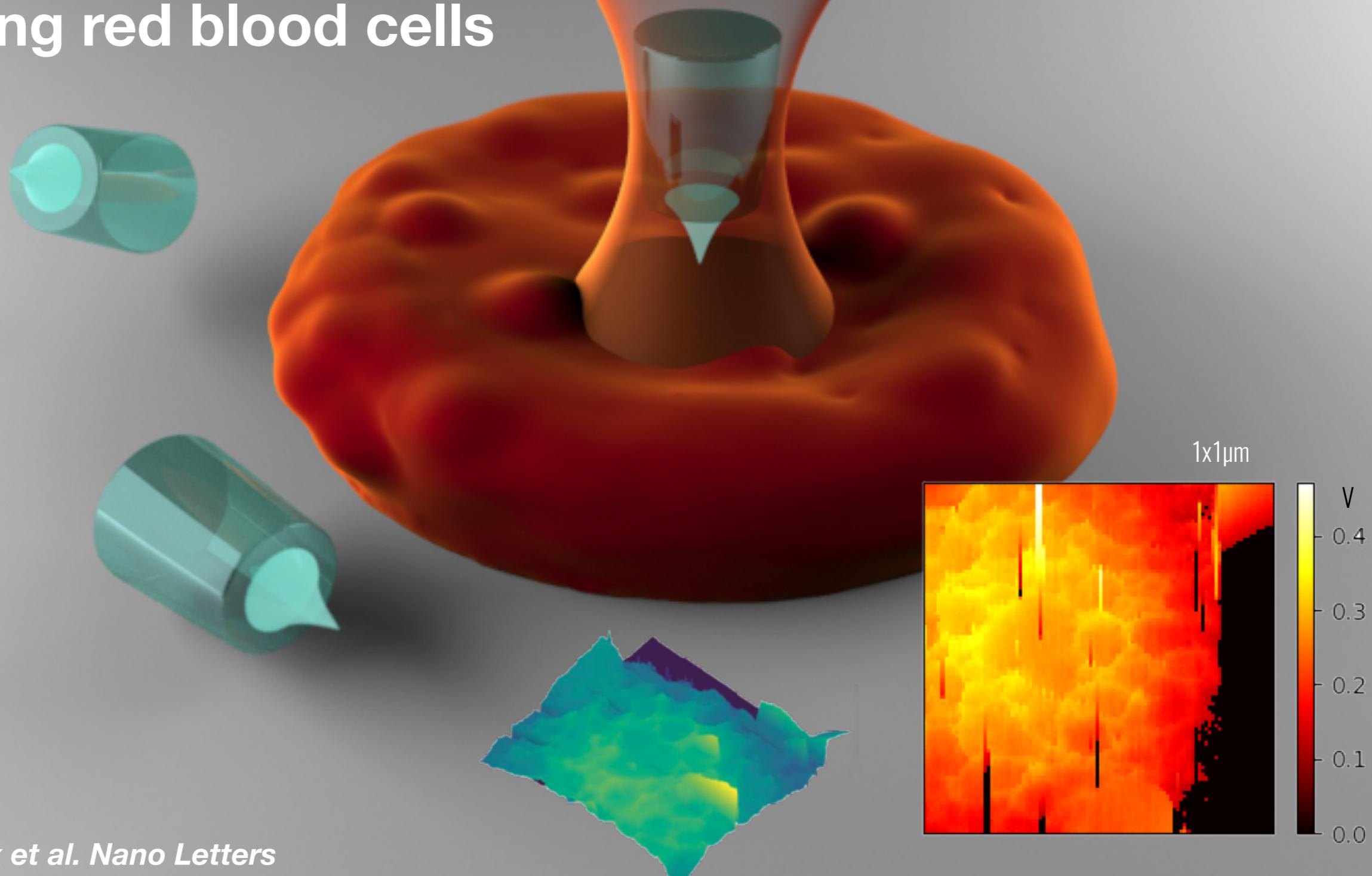
Photonic force microscopy



Collab, F.Pedaci, CBS

Collab, F.Pedaci, CBS

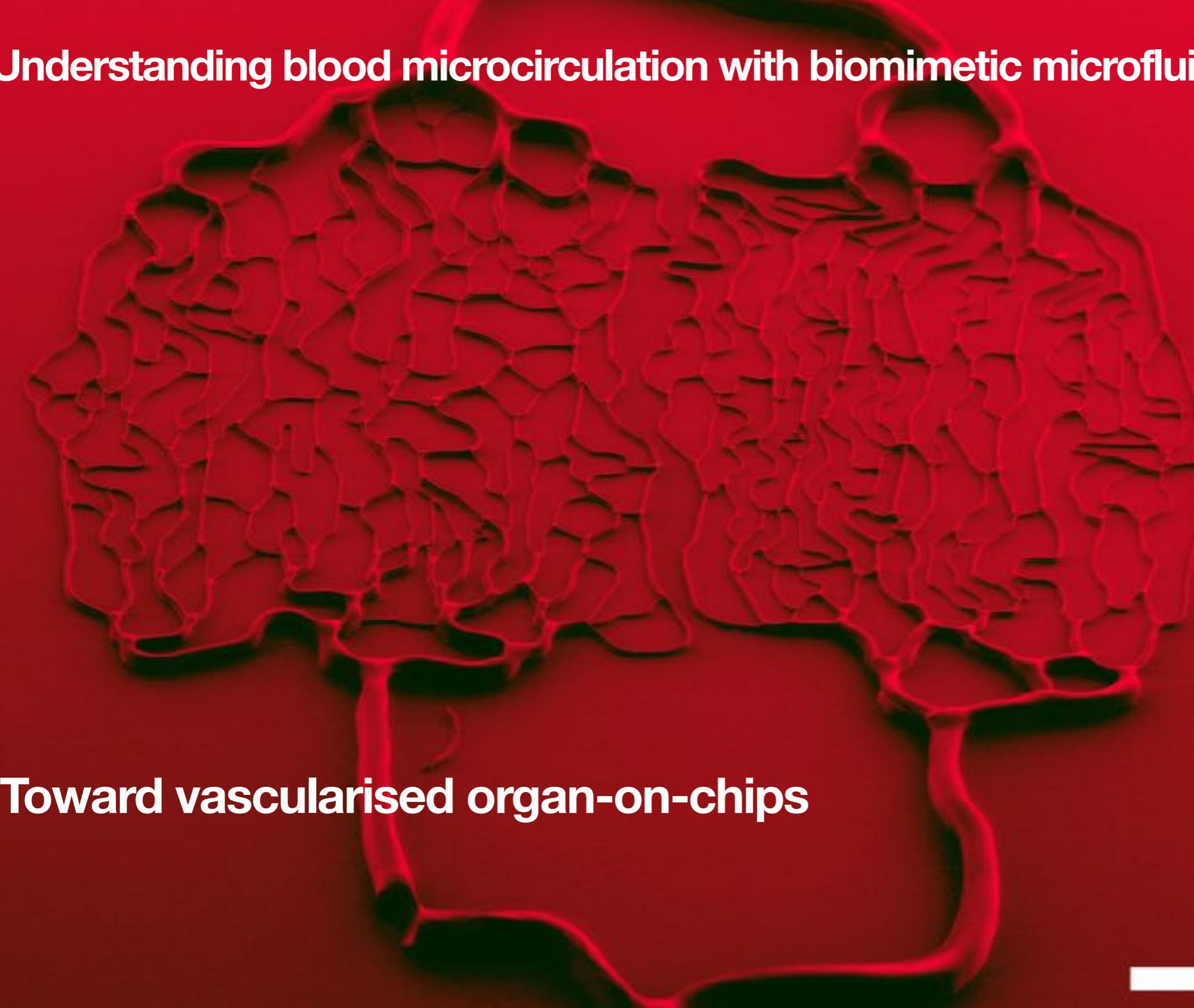
Scanning red blood cells



Part 3. Blood, vascular networks and vessels

Artificial Vascular Networks

Understanding blood microcirculation with biomimetic microfluidic replicas



Toward vascularised organ-on-chips

1 mm

Hemophysics

For physicists, blood is a **complex fluid**

Suspension of **highly deformable** cells

Shear thinning, viscosity \searrow shear rate

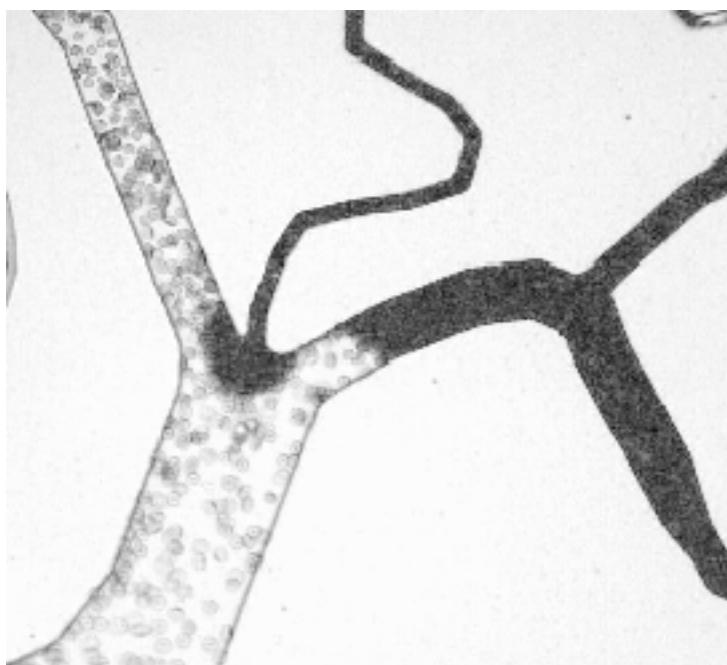
Aggregation / cell deformation

Cell free layer

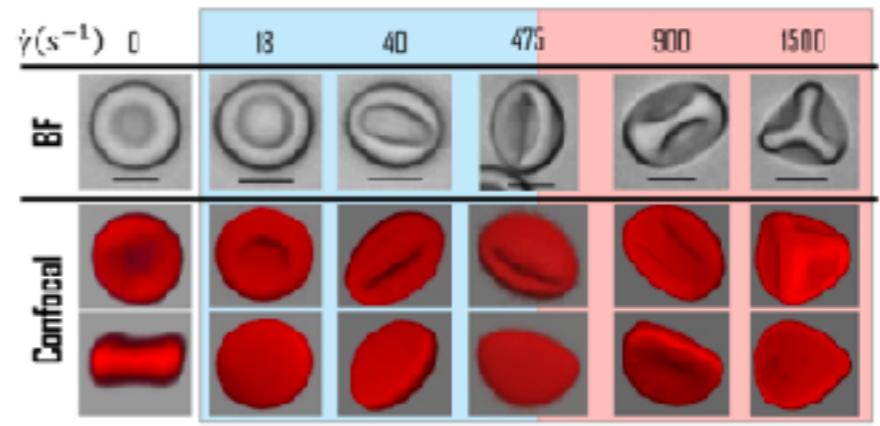
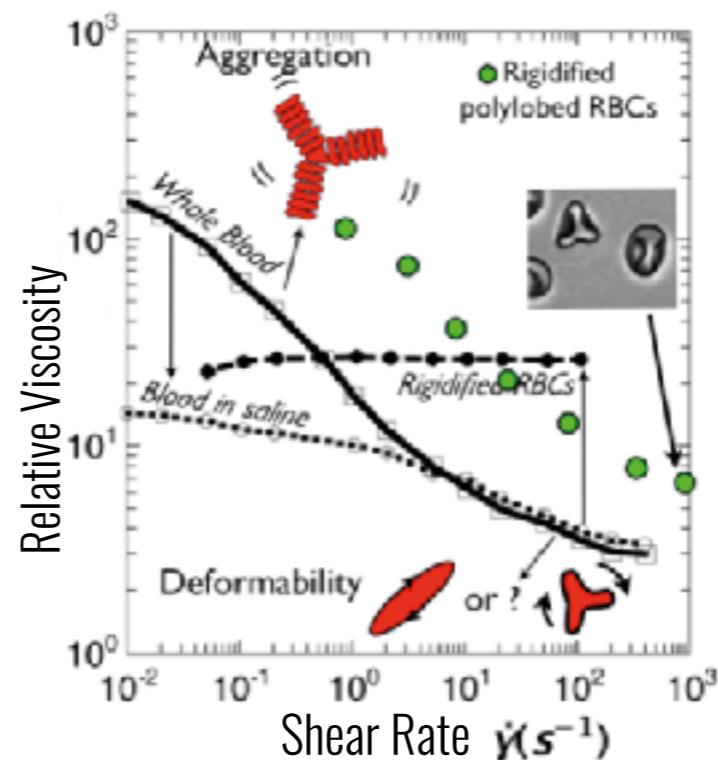
Margination / diffusion

Anti Weissenberg effect ?

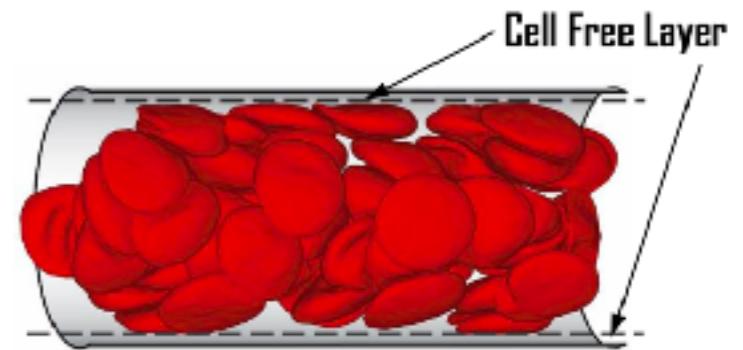
Surface tension ?



Rigidified RBCs : Stroke on a chip



L. Lanotte , M. Abkarian et al.
A new look on blood shear thinning PNAS (2016).



Trilobe shape
Simulation
Yales2bio
S.MENDEZ, IMAG
Montpellier

... and blood flows in **complex vascular networks**

Vascular network

of a murine lymph node

1mm long

0,2 mm³

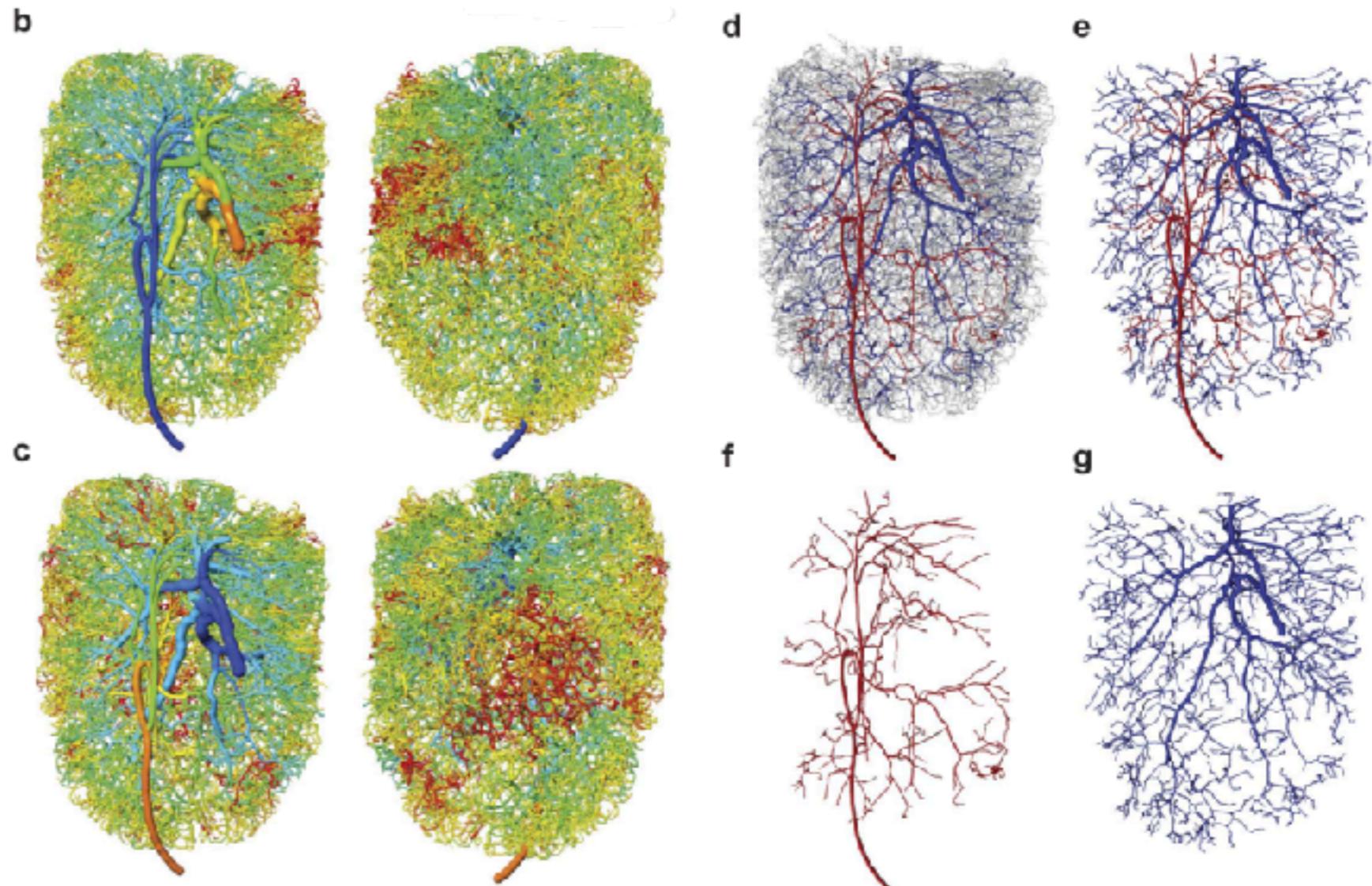
16 000 vessels

12 000 Nodes

90cm long network

One input

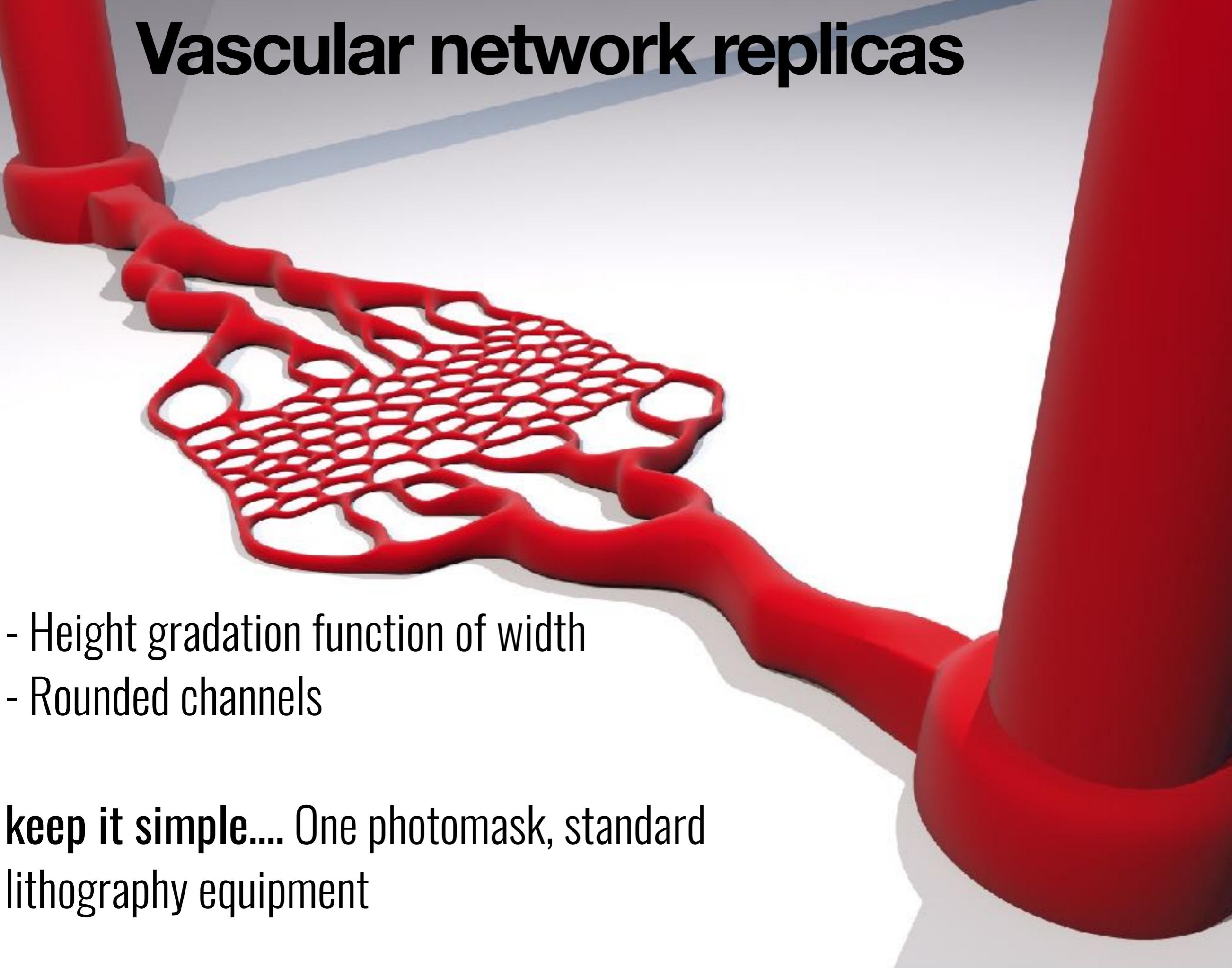
One output



Organ-wide 3D-imaging and topological analysis of the continuous microvascular network in a murine lymph node P. Rod Dunbar, Sci. Rep. 5:16534

Difficult to reproduce in microfluidics....

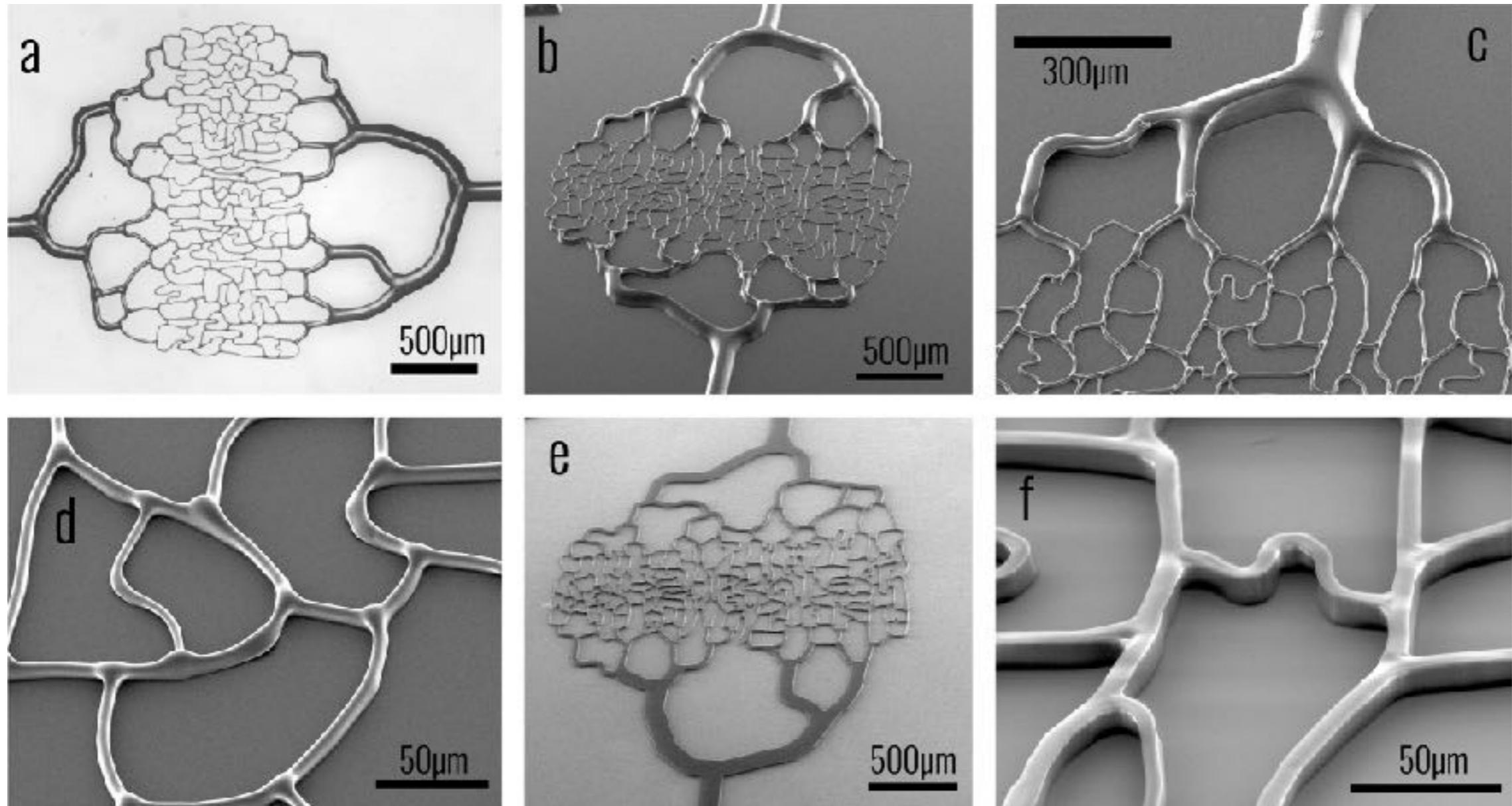
Vascular network replicas



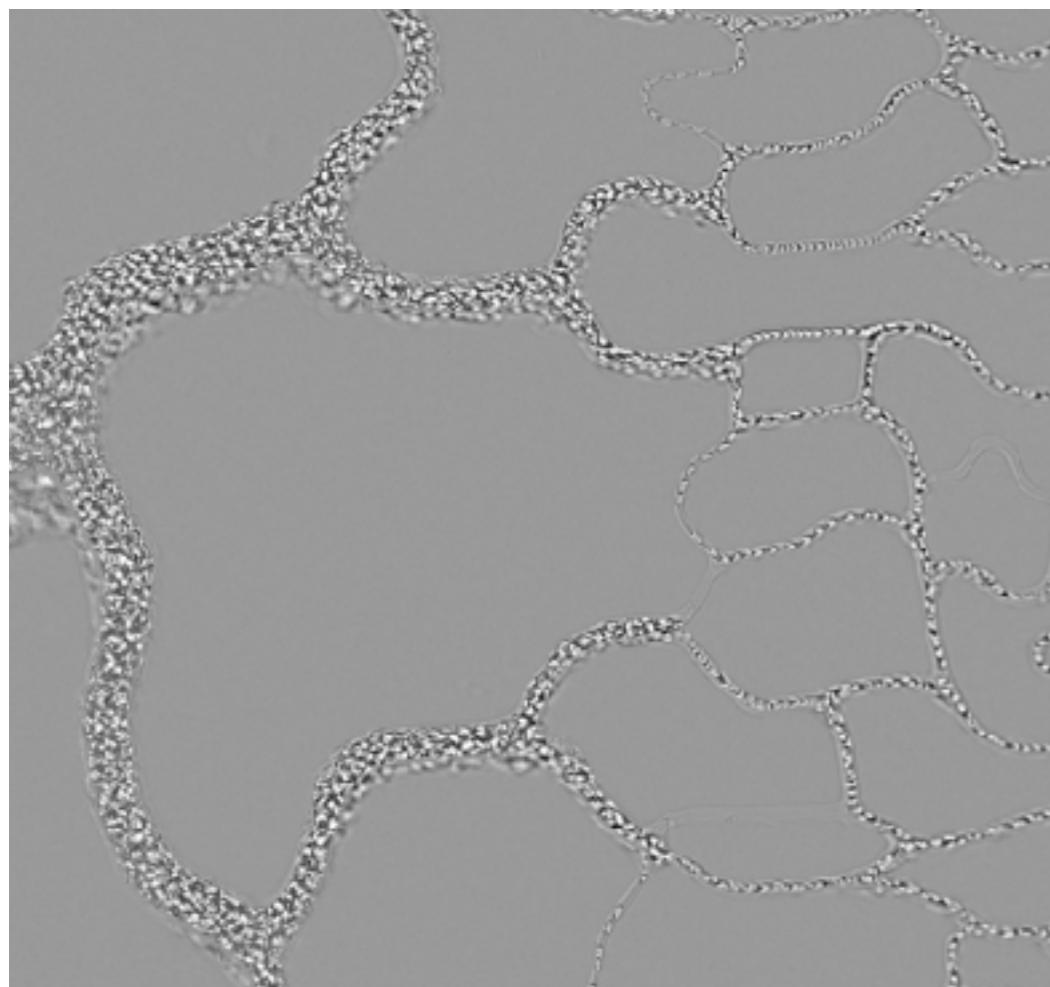
- Height gradation function of width
- Rounded channels

**keep it simple.... One photomask, standard
lithography equipment**

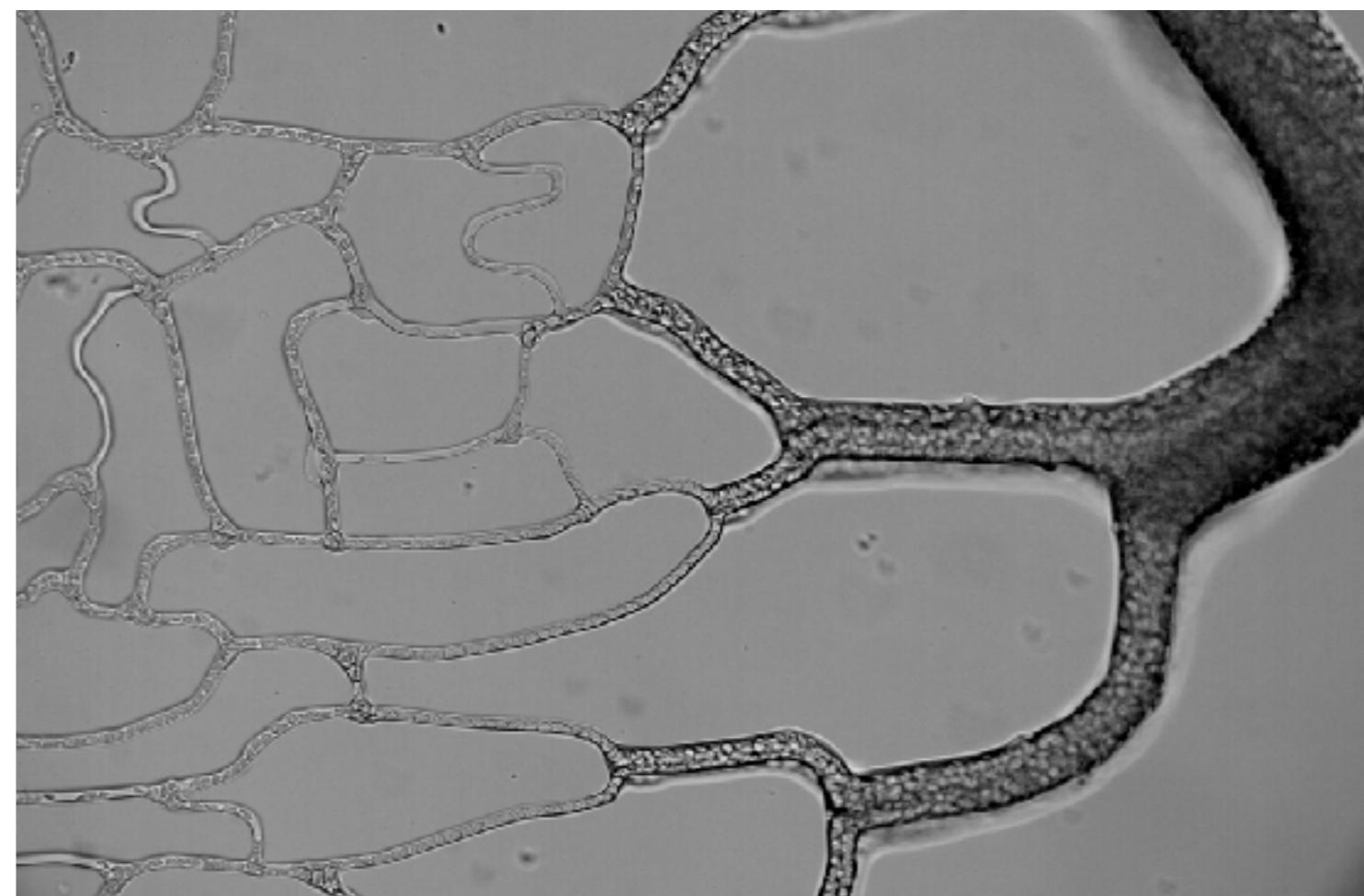
Microfabrication



Blood flows @ trees



Arteriole tree

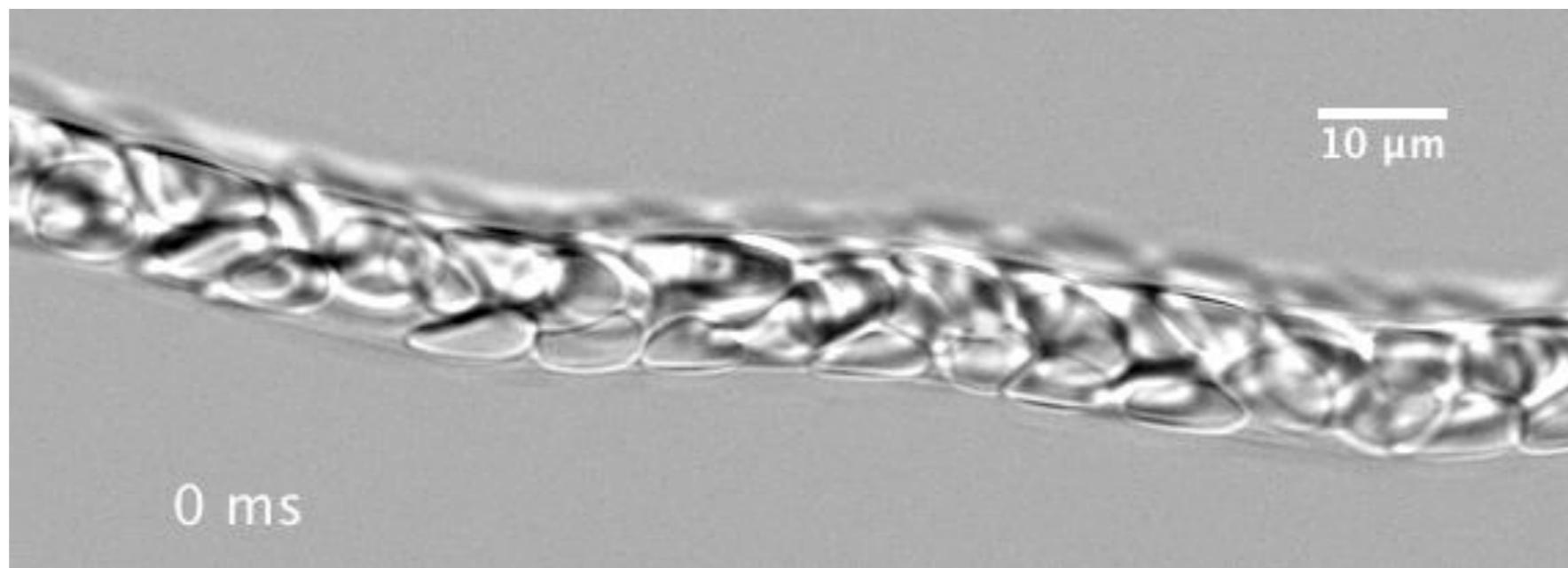
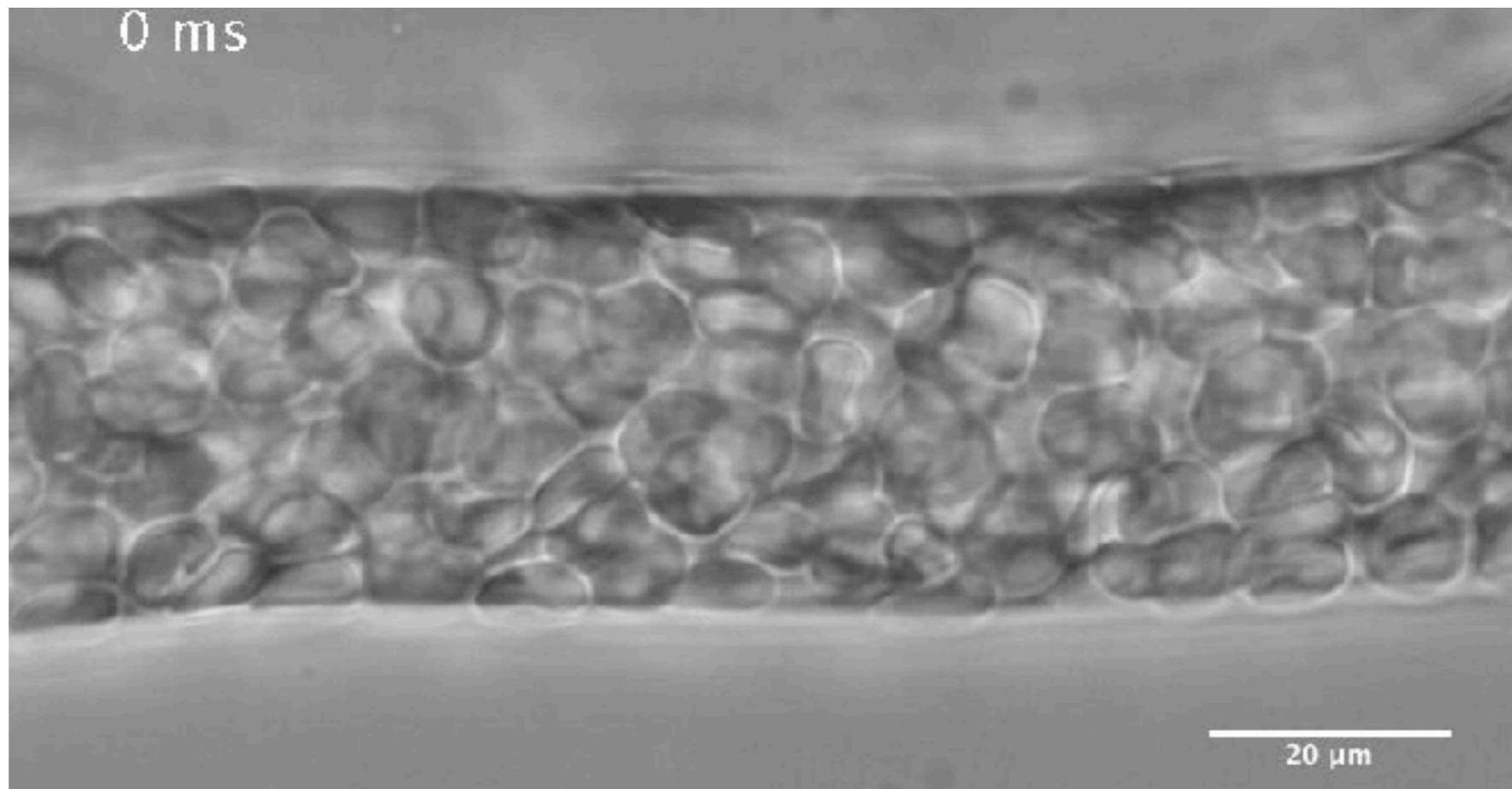


Veinule tree

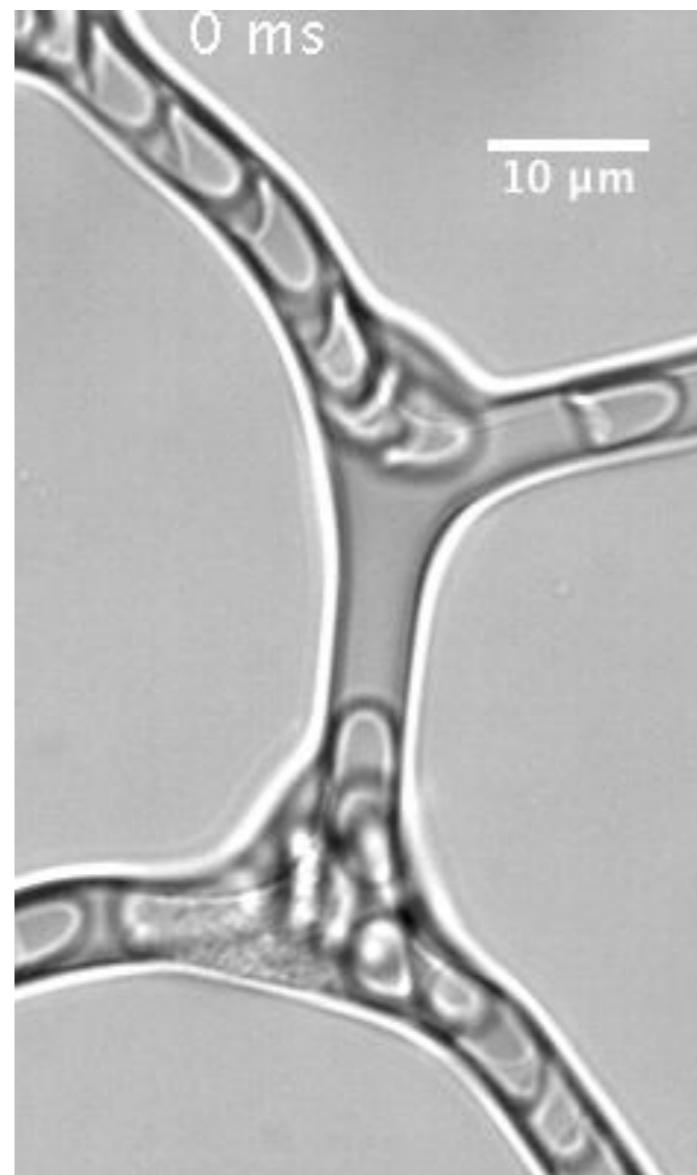
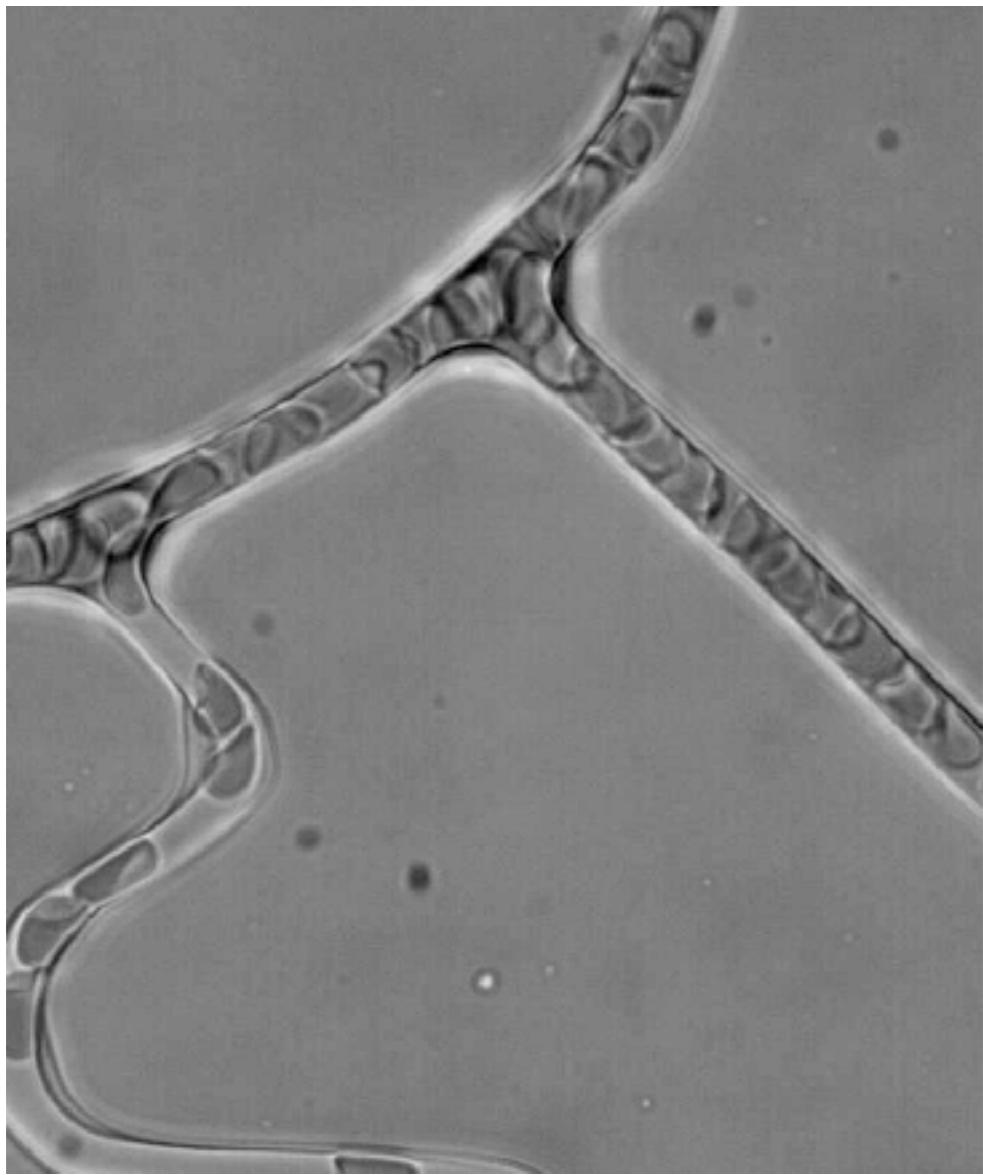
45% Ht washed blood in PBS/optiprep, 1-100 mbar pressure controlled

Blood flows @ arterioles

Cell compaction



Blood flows @ bifurcations



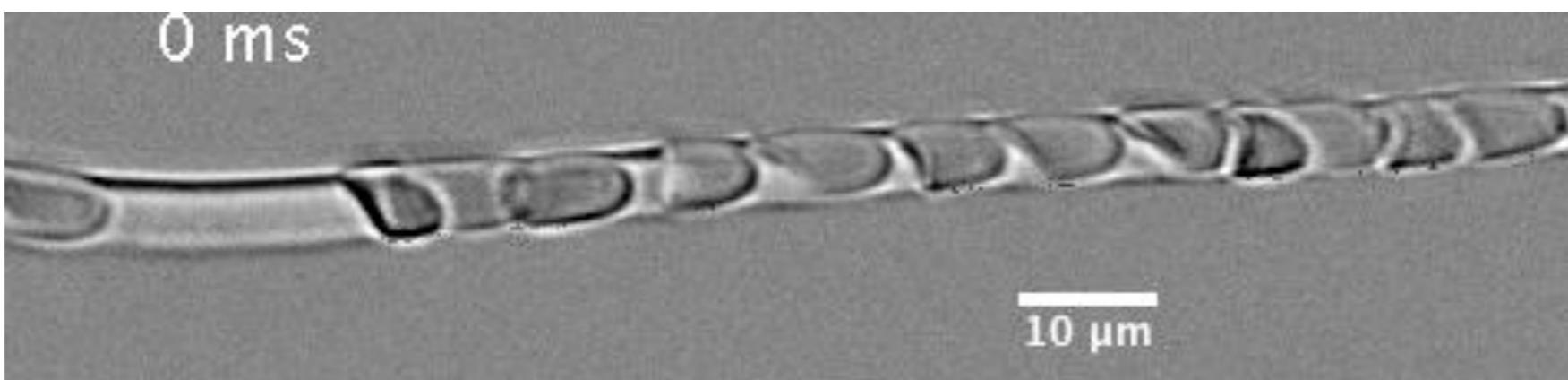
As observed *in vivo* :

Silent channels
change in flow
direction

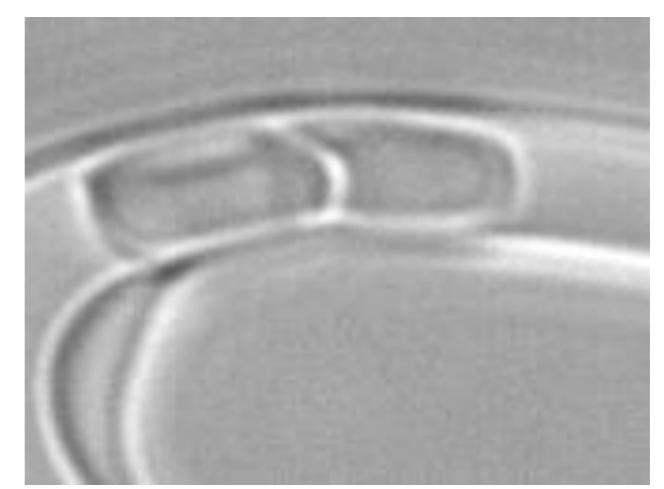
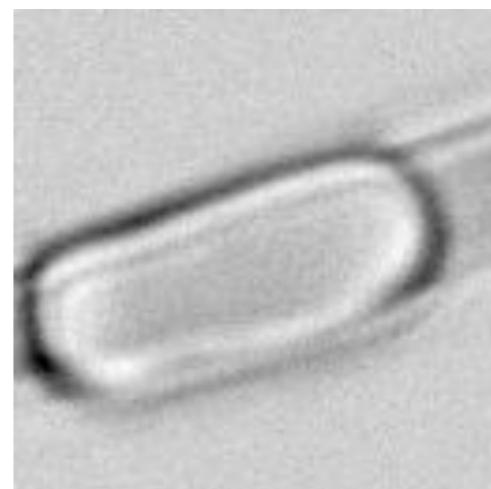
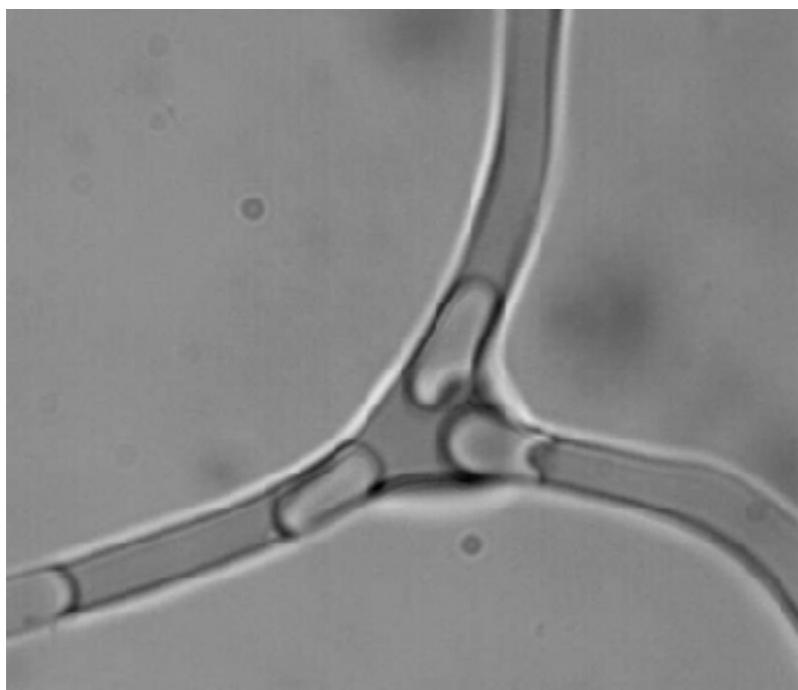
Local hematocrit

Inhomogeneity of the flow repartition and of the cell density

Blood flows @ capillaries



Parachutes, dynamic rouleaux, clustering, tank treading



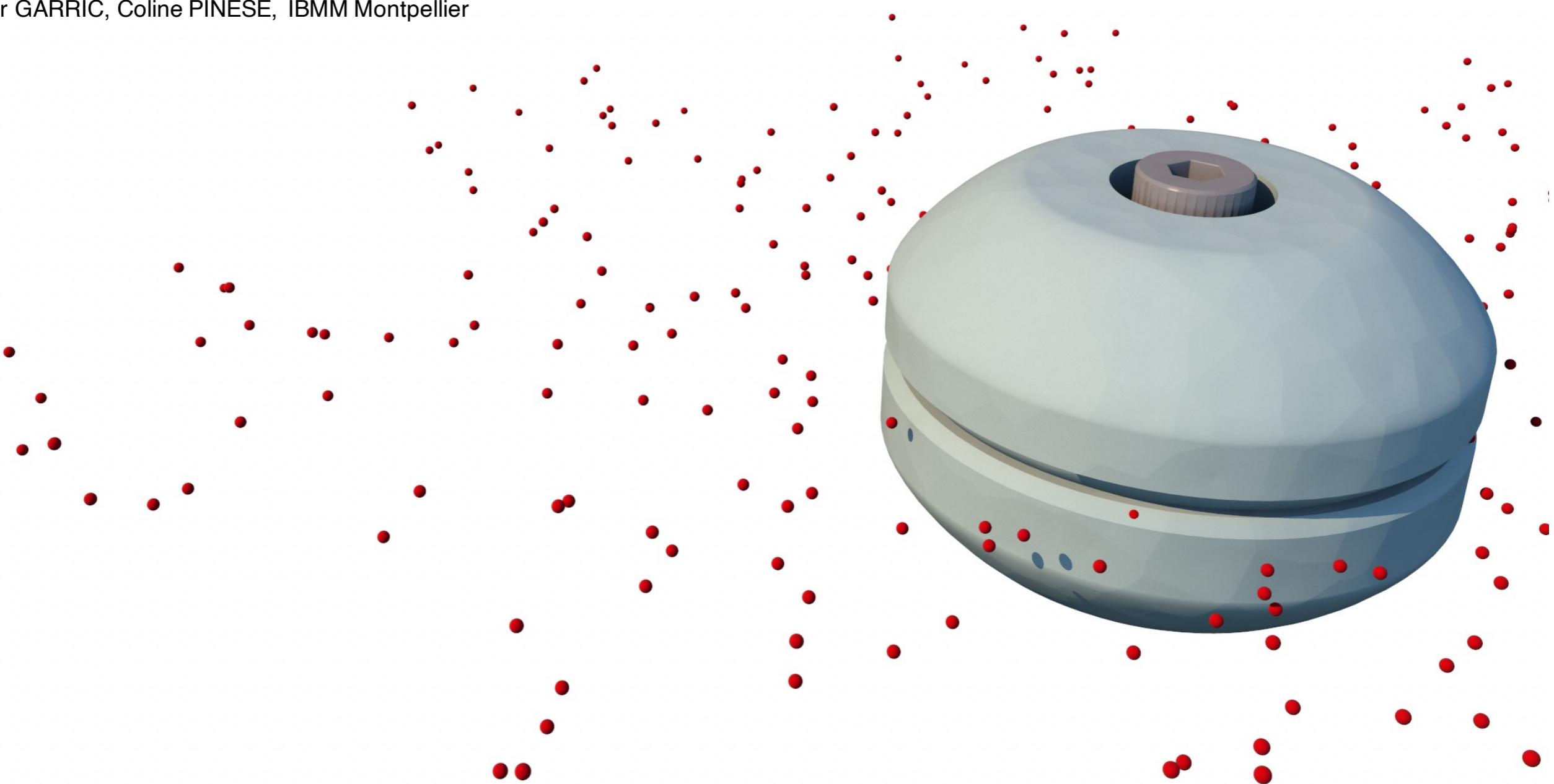
Part 4.

Cancerology

CAPDCM

Capture and destruction of metastatic cells

Jean-Marie RAMIREZ, Isabelle Guiraud, IBMM Nîmes
Benoît CHARLOT, Sébastien MEANCE, IES Montpellier
Xavier GARRIC, Coline PINSE, IBMM Montpellier

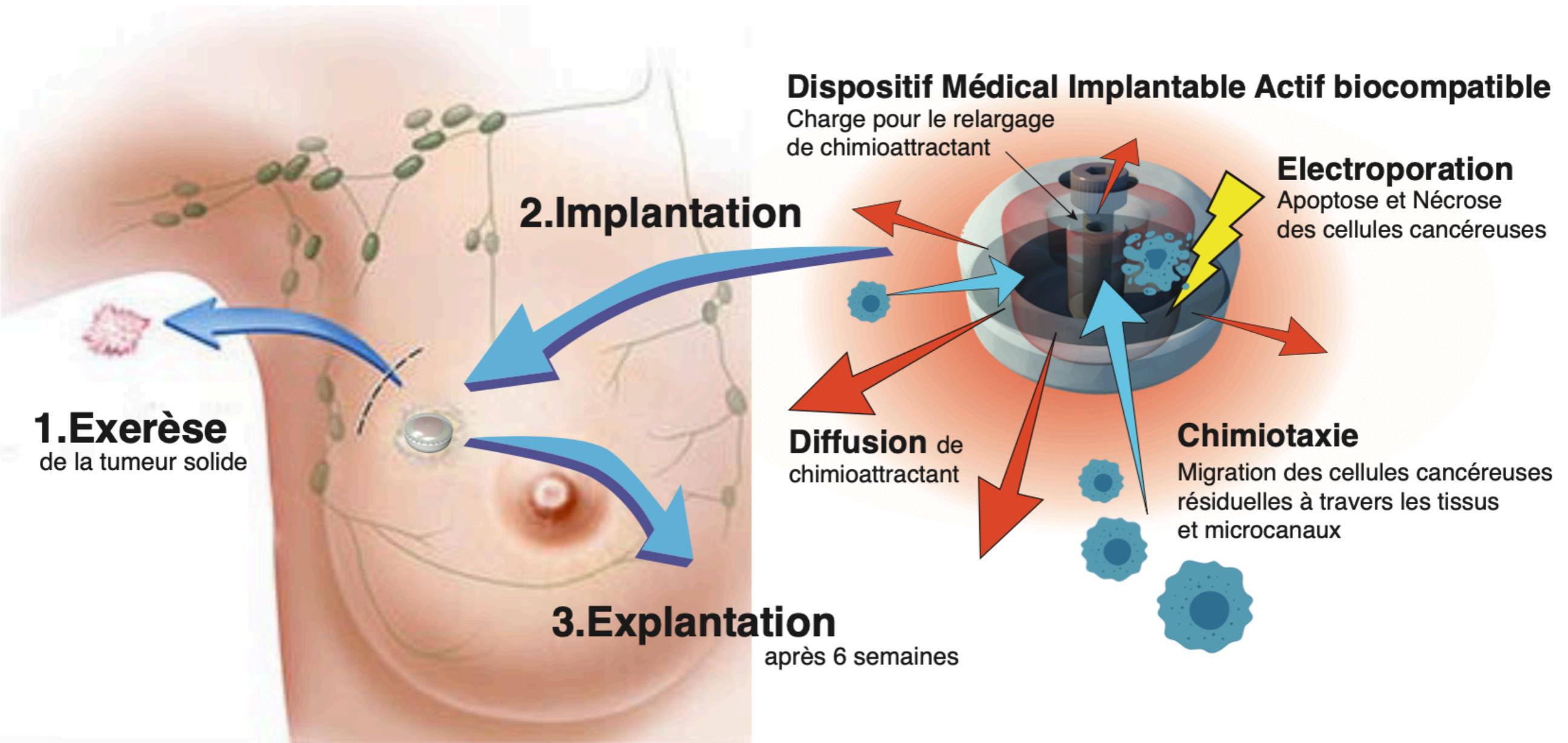


IBMM
Institut des
Biomolécules
Max Mousseron

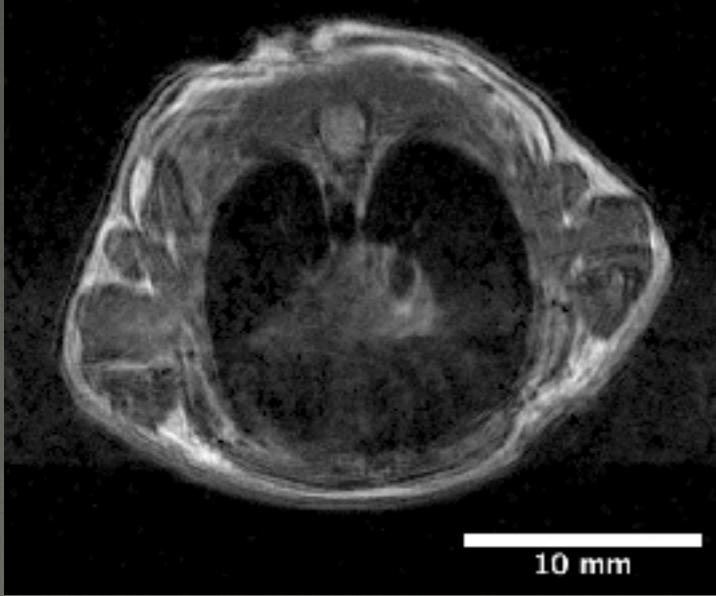
Université de Montpellier
FACULTÉ
de
MÉDECINE
Montpellier Nîmes

axLR
SATE

An implant to avoid cancer recurrence and the spread of metastasis



0.00 mm



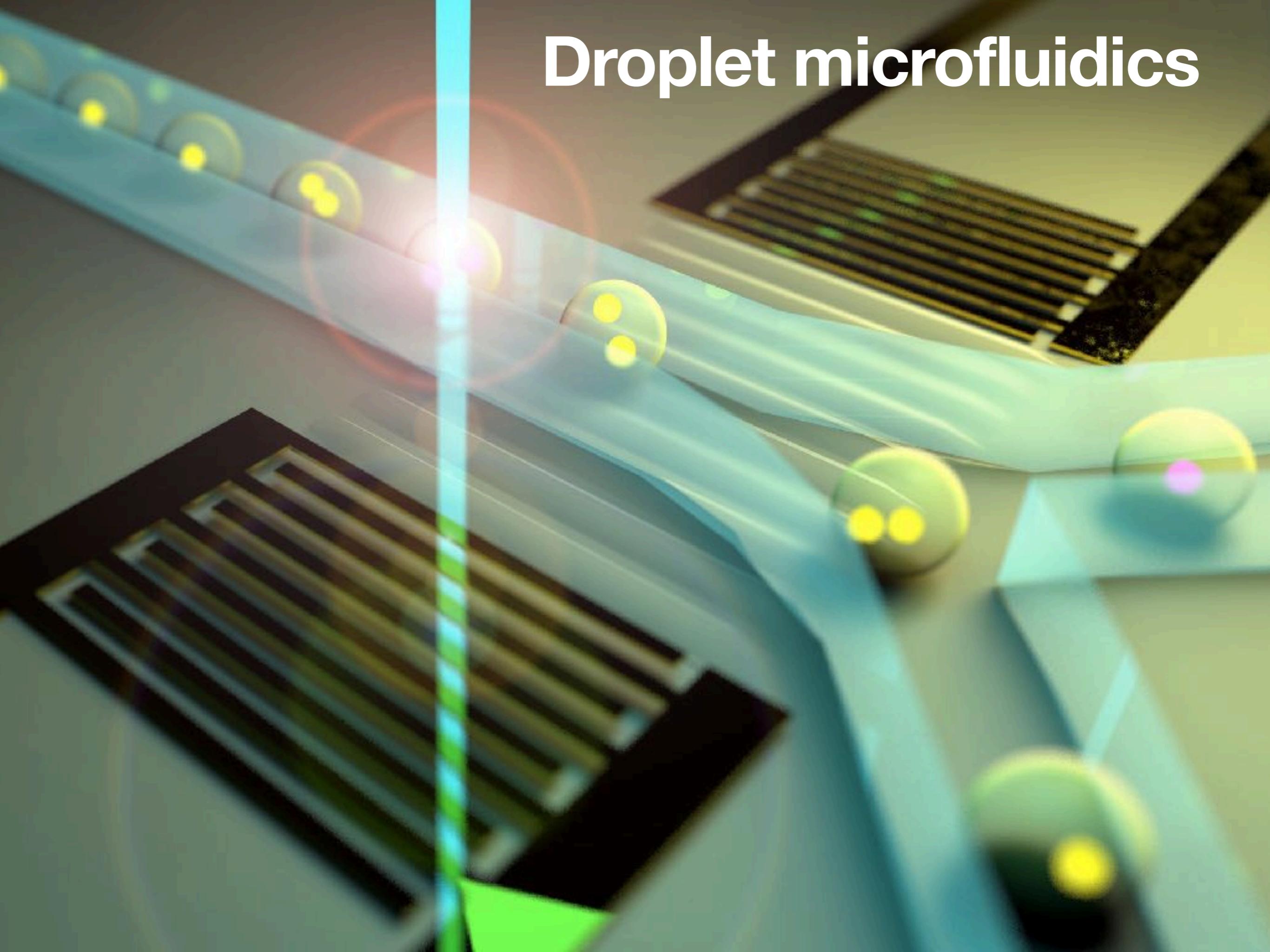
Microchannels hot embossing

300µm



Part 4. Droplets

Droplet microfluidics

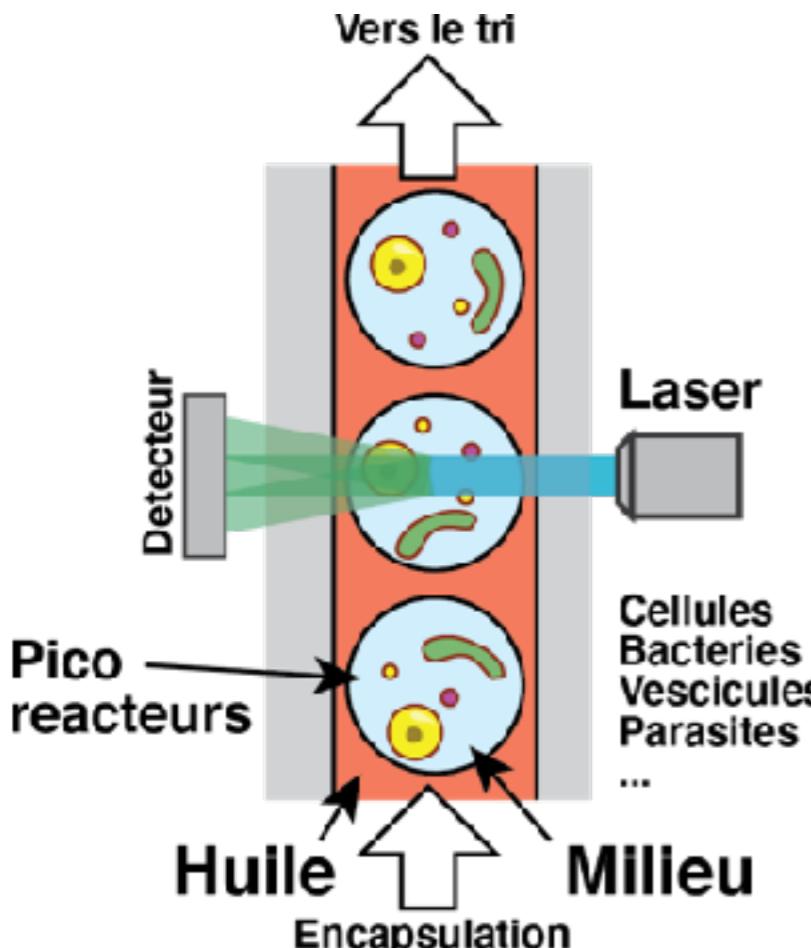


Screening fluidics

Georges Gaudriault, Evelio Ramirez Miquet, Benoit Charlot



Development and exploitation of a droplet screening **Lab On Chip**



Between Cytometry and High throughput screening **microfluidics** allows :

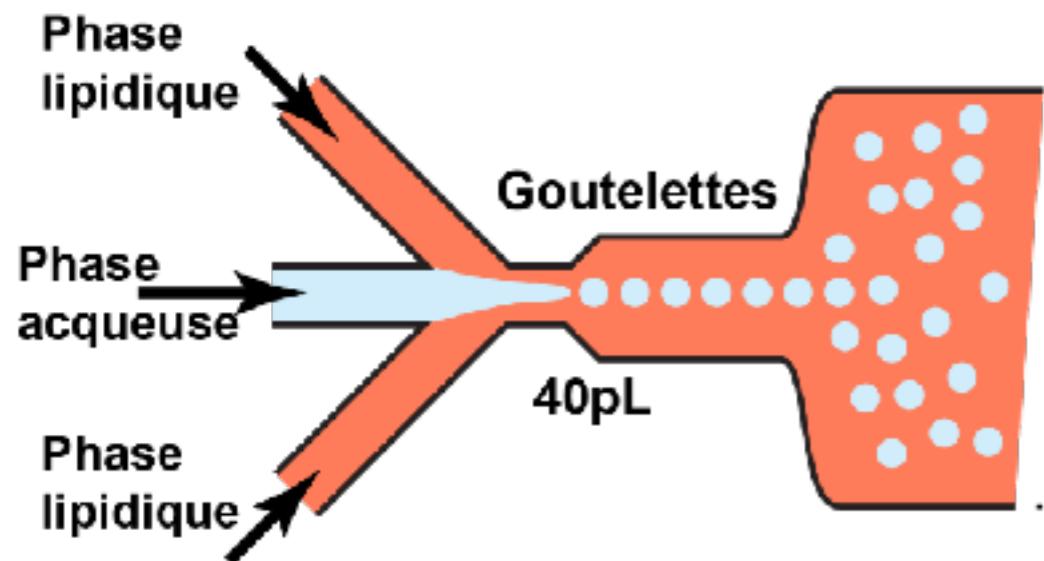
Optical testing	Laser, fluorescence
Sorting	DEP, SAW
droplets	40 pL
at high frequency	7 kHz

Applications : search for antibacterials, antibodies, enzymes,

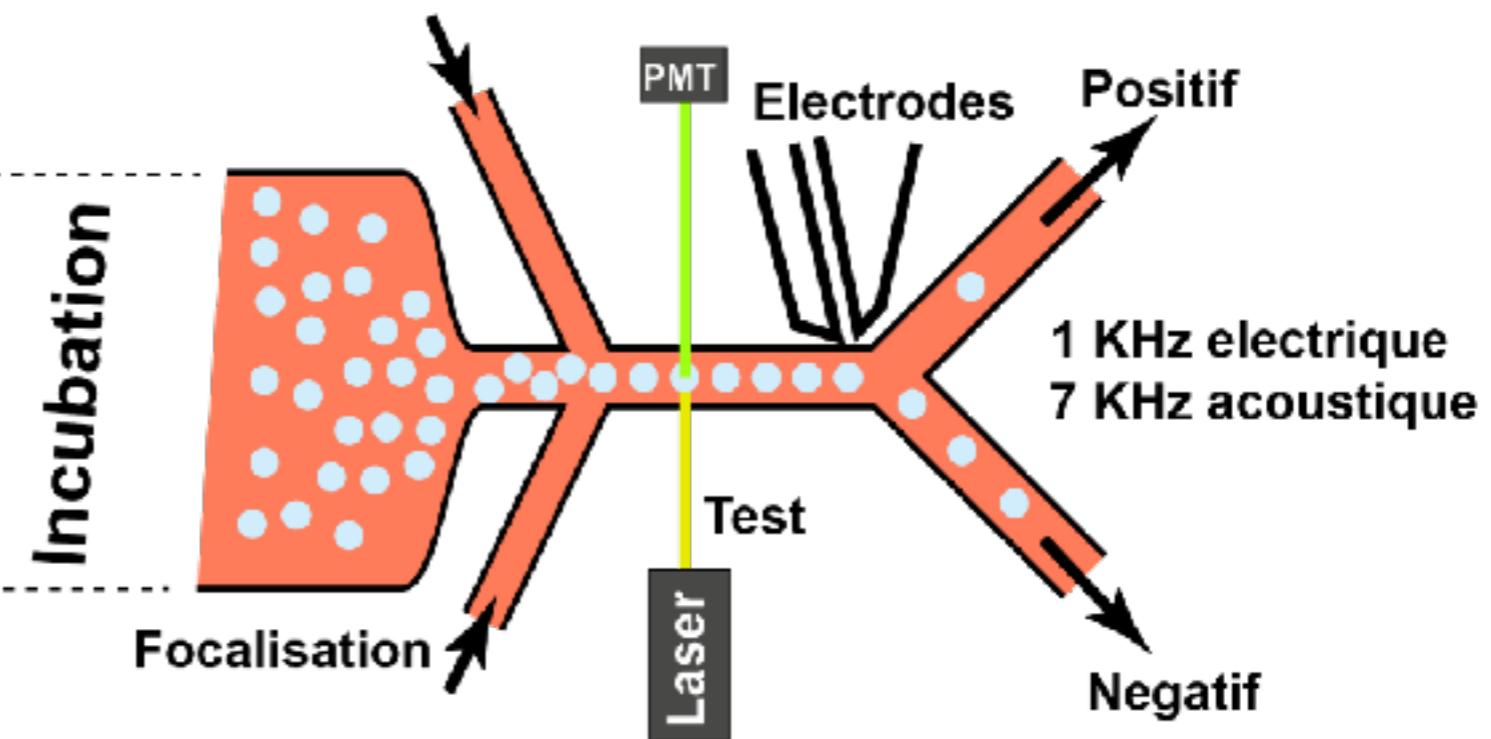
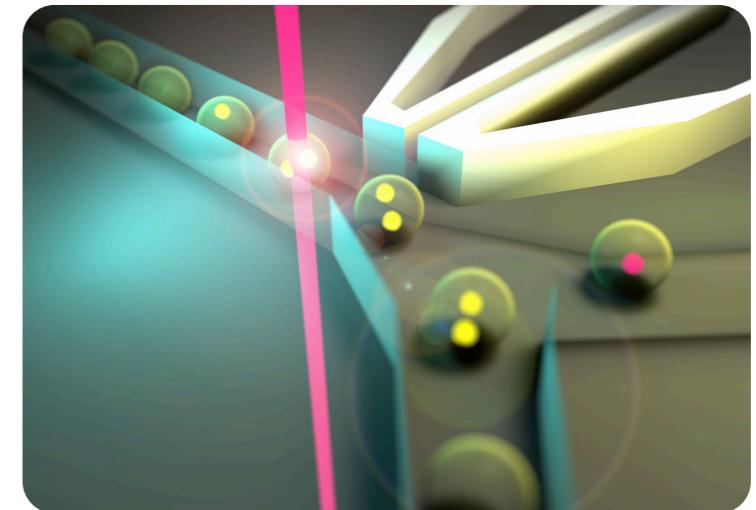
Screening fluidics

Principle : Fluorescence Activated Droplet Sorting

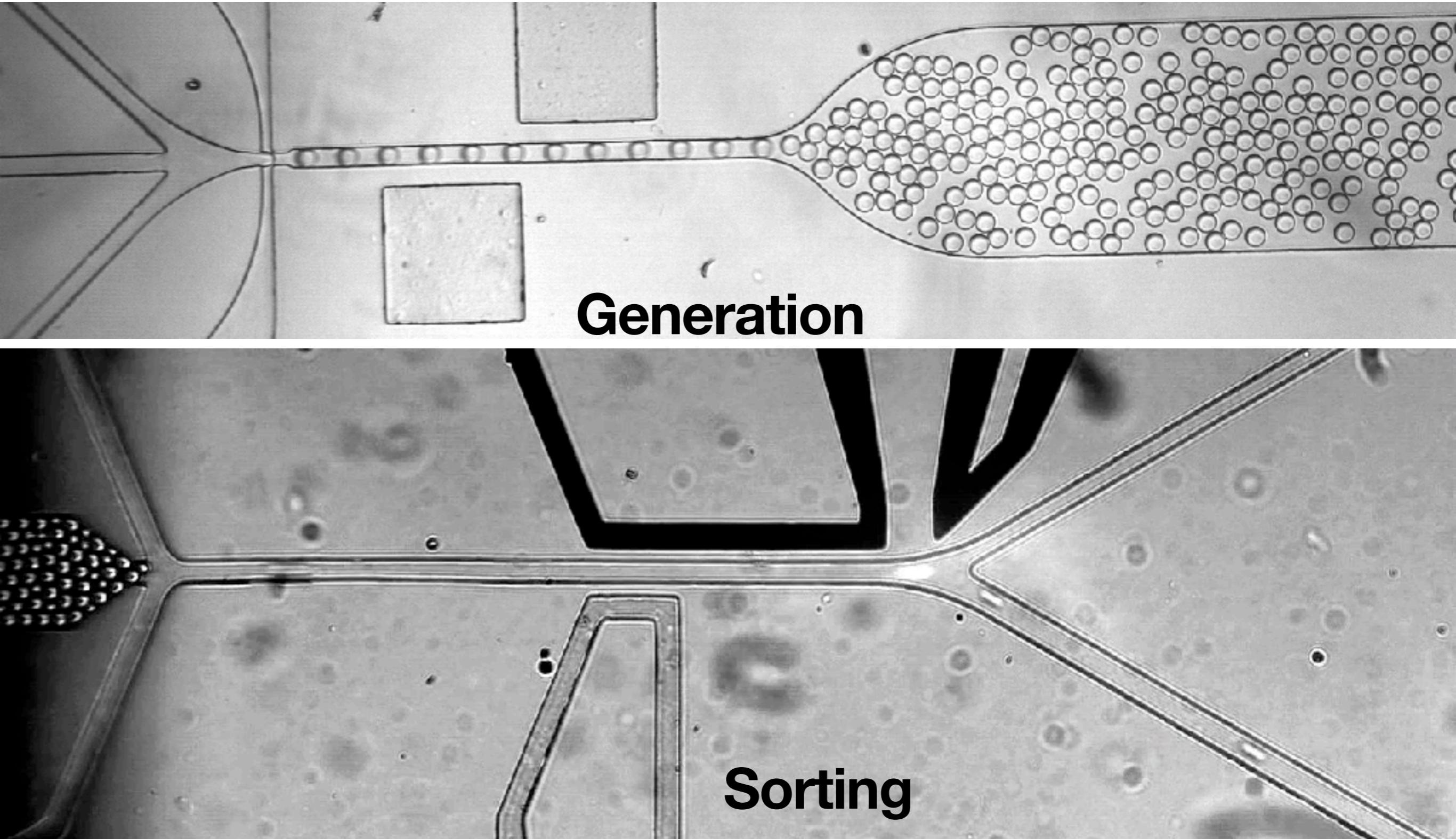
Encapsulation



Tri



Screening fluidics



Maturation start : Q4 2023

Acknowledgments



Benoît CHARLOT
Sebastien MEANCE
Audrey PELLICER
Oramany PHOUPHETLINTHONG
Patricia LOREN



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Emma PARTIOT
Marylène MOUGEL
Marius SOCOL
Joelle EID



Marianne FENECH



Eve MOUTAUX
Maxime CAZORLA
Antoine BOURRIER
Antoine LEGRAIN
Aurélie GENOUX
Frederic SAUDOU



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Johan SORET
Pauline DUC
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Gilles CARNAC
Albano MELI
Alain LACAMPAGNE



Eran PERLSON



Edouard BERTRAND
Hussein KAKARI
Flavia MAZZARDA



Pim PIJNAPEL



Univ. Montpellier



Univ. Grenoble



anr



Labex NUMEV



ISite MUSE



Occitanie Méditerranée



Europe



ANNEES RECHERCHE SUR LE CERVEAU

Agences nationales de financement

Associations

BE FBI 8 Novembre 2023

14 :20-14 :30 **Point d'étape AO nouveaux nœuds (Edouard)**

* Auditions 10 Janvier, 17h-18h: Normandie; 18h-19h: Alpes. Présentations 20-25 minutes (responsables noeuds), suivi de 20-25 min de questions (SAB + CN).

BE FBI 8 Novembre 2023

14 :30-14 :55 **FBI : prochaine mandature (Edouard)**

* En cours: recherche directeur adjointe affaires internes. Offre parue, merci de faire circuler et de motiver les candidats éventuels

* Fin de mon mandat le 31 décembre 2023 ➔ besoin de passer la main.

* Evénements 2024:

-Evaluation 2020-2024

-Basculement ligne 172

-Création UAR FBI-core

* Calendrier :

-Recherche candidat(e) jusqu'au 31 février 2024.

-Changement de direction: 31 Juin 2024

-Biseau possible sur 2024 avec changement au 1^{er} Juillet, et je ferai le dossier d'évaluation.

BE FBI 8 Novembre 2023

14 :55-15 :00 Point sur l'AO R&D PF (Etienne)

Call R&D 2024

Objectifs: Donner du temps aux Ingé plateforme pour faire de la R&D

Budget: 40-45k€ (sur 2024)

Critères:

- Qualité scientifique, innovation de la proposition dans le contexte local et national
- Adéquation des ressources avec le projet proposé
- Démonstration de l'implication réelle de l'ingénieur

Calendrier :

Dead line dépôt 24/11

Votes jusqu'au 1/12

Validation/diffusion des résultats le 6/12

Dépenses « service fait » pour le 31/12/2024

BE FBI 8 Novembre 2023

15:00-15 :10 Préparation de l'Annual Meeting de FBI (Caroline)

Les représentants de noeud sont invités à relayer le lien d'inscription à l'événement (<https://france-bioimaging.org/fbi-special-events/fbi-annual-meeting-2023/>) au sein de leur nœud.

A noter que de dépôt d'abstract pour les talks et les posters est ouvert jusqu'au 17/11.

Les frais d'inscription à un événement en lien avec la microscopie (FOM, ELMI, EMC, COMULIS conference, etc.) en 2024 seront pris en charge par FBI pour le meilleur talk/poster.

Le programme actualisé au 08/11/23 est ci-joint



France-BioImaging Annual Meeting 2023

Multiscale mechanobiology of cells and cell systems

December 13th-14th, 2023

Venue: Centre de Biologie Intégrative (CBI), Toulouse

Draft Programme

Wednesday, December 13th, 2023

08:30 - 12:00	<p>Visit of the Toulouse node</p> <p>📍 Meeting point: CBI (<i>Université Paul Sabatier, 118 Route de Narbonne, Toulouse</i>) from 8:30 to 9:00</p> <p>Core facilities visits from 9:00 to 12:00</p> <ul style="list-style-type: none">- METI (electron microscopy)- CMEAB (electron microscopy)- LITC CBI (light microscopy)- RESTORE site dentaire (light microscopy)- I2MC (light microscopy & cytometry)- IPBS (cytometry) <p><i>Description of the core facilities available here</i></p>
12:00 - 13:00	Registration Booth & Lunch
13:00 - 13:10	Opening day 1 FBI & Noeud Toulouse - Edouard Bertrand & Olivier Gadal
13:10 - 13:25	France-BioImaging: Latest news and opportunities - Edouard Bertrand
13:25 - 14:25	<p>2023 activities & outcomes from the mission officers of France-BioImaging</p> <p><i>Chair: TBD</i></p> <p><i>10' presentation + 2' Q&A</i></p> <ul style="list-style-type: none">● Mission Inter-Infrastructures - Jean Salamero● Mission Tech Transfer - Etienne Henry● Mission Data - Emmanuel Faure● Mission Formation - Fabrice Cordelières● Mission Intégration - Cédric Matthews
14:25 - 14:45	Toulouse node - Olivier Gadal
14:45 - 15:15	Coffee break / poster session
15:15 - 15:35	Alsace node - TBC
15:35 - 15:55	EuBI news, external users access funding opportunities and outreach - Marianna Poli (EuBI Communication officer)

15:55 - 16:55	Round-table on “Sharing good practices for Technological WGs management”
16:55 - 17:00	Wrap-up of day 1
19:00	Dinner & Social event

Thursday, December 14th, 2023

08:15 - 08:30	Registration Booth	
08:30 - 08:45	Opening day 2 - Hosting committee	
<i>Multiscale mechanobiology of cells and cell systems</i>		
08:45 -09:15	S1 Opening Keynote Speaker: Virgile Viasnoff (Joint CNRS/NUS lab BioMechanics of cell contacts UMI 3639) - TBC	
Session 1- Selected talks 15' & 5' Chair: TBD		
09:15 - 09:35	Selected Talk	
09:35 - 09:55	Selected Talk	
09:55 - 10:15	Selected Talk	
10:15 - 10:45	Coffee break / poster session	
10:45 - 11:15	S2 Opening Keynote Speaker: Jérôme Solon (Biophysics of Morphogenesis Laboratory, Biofisika Institute CSIC-UPV/EHU) - TBC	
Session 2- Selected talks 15' & 5' Chair:		
11:15 - 11:35	Selected Talk	
11:35 - 11:55	Selected Talk	
11:55 - 12:15	Selected Talk	
12:15 - 13:30	Lunch/ poster session	
13:30 - 14:00	Pitches “FBI tools for the community” (tech transfer projects) 6' each	
14:00 - 15:00	France-BiolImaging technological working groups Parallel sessions WG1c: Multiscale & correlative microscopies	FBI-AS Open desk session 1 for Toulouse Node users

	<p>WG1d: Tissue microscopies, new contrasts & preclinical applications</p> <p>WG2a: High content screening & Intelligent imaging</p> <p>WG INFRATECH Plant Imaging</p> <p>WG INFRATECH Organoids & regenerative medicine</p> <p>WG Mechanobiology (TBC)</p>	
15:00 - 15:30	<i>Coffee break / session poster</i>	
15:30 - 16:30	FBI-AS Open desk session 2 live	
16:30 - 17:00	FBI technological working groups: wrap-up of the parallel sessions and perspectives Session chairs + Edouard Bertrand	
17:00 - 17:15	Prizes, Wrap-up & Farewell	

BE FBI 8 Novembre 2023

15 :10-15 :25 **Retour sur la participation de FBI au African Biolmaging Meeting & Global Biolmaging Exchange of Experience Meeting en Afrique du Sud (Jean, Caroline, Fabrice)**

Participation à deux événements organisés à Stellenbosch, Afrique du Sud: ABIC community meeting 2023 (22-24/10) et GBI EoE 2023 (25-27/10)

renforcer les liens/projets existants avec la communauté africaine, dans la continuité du travail engagé avec nos collègues de Cape Town et AMI: faciliter l'accès aux équipements de microscopie aux chercheurs africains, montée en expertise, carrière, création de hub plateforme de microscopie en Afrique. Jean Salamero a présenté le retour d'expérience du premier programme AFJIBI lancé au printemps 2023 et à ouvert la discussion sur des points de collaboration à envisager: formation initiale et analyse de données. Présentation du webinaire Afrique-France le 6 décembre. De nouveaux contacts et discussions ont eu lieu avec des chercheurs Sénégalais, Camerounais et Nigérien, entre autres. Projet de participation aux séminaires du Centre Suisse de Recherches Scientifiques en Côte d'Ivoire pour présenter les initiatives FBI dirigées vers les chercheurs africains et les opportunités existantes pour l'accès à des équipements en France. + FBI très bien intégré dans le discours des partenaires locaux.

De continuer le développement de liens avec la communauté de bioimagerie latino-américaine, notamment avec l'Argentine à l'occasion de la création du centre franco argentin de coopération à l'Université San Martin BA (JP Grovel, ambassadeur du centre en France). Possibilité de mise en place d'échanges pour du transfert de projet R&D, formation en TAI

Valorisation de la mission Formation: thématique de cette édition du GBI, promouvoir une approche FAIR du matériel de formation. Contacts établis et discussions avec de potentiels partenaires européens, américains.

Excellent retours sur l'initiative

Perspectives de financement: CZI et Wellcome

Co-construction avec l'Afrique: organisation du Webinaire, discussion autour de leurs besoins

Présentation orale et poster

ABIC & GBI EoE October 22-27

Protea Hotel & Conference Venue, Stellenbosch

Caroline Thiriet, FBI External Affairs Manager

Fabrice Cordelières, FBI Mission Officer "Training"

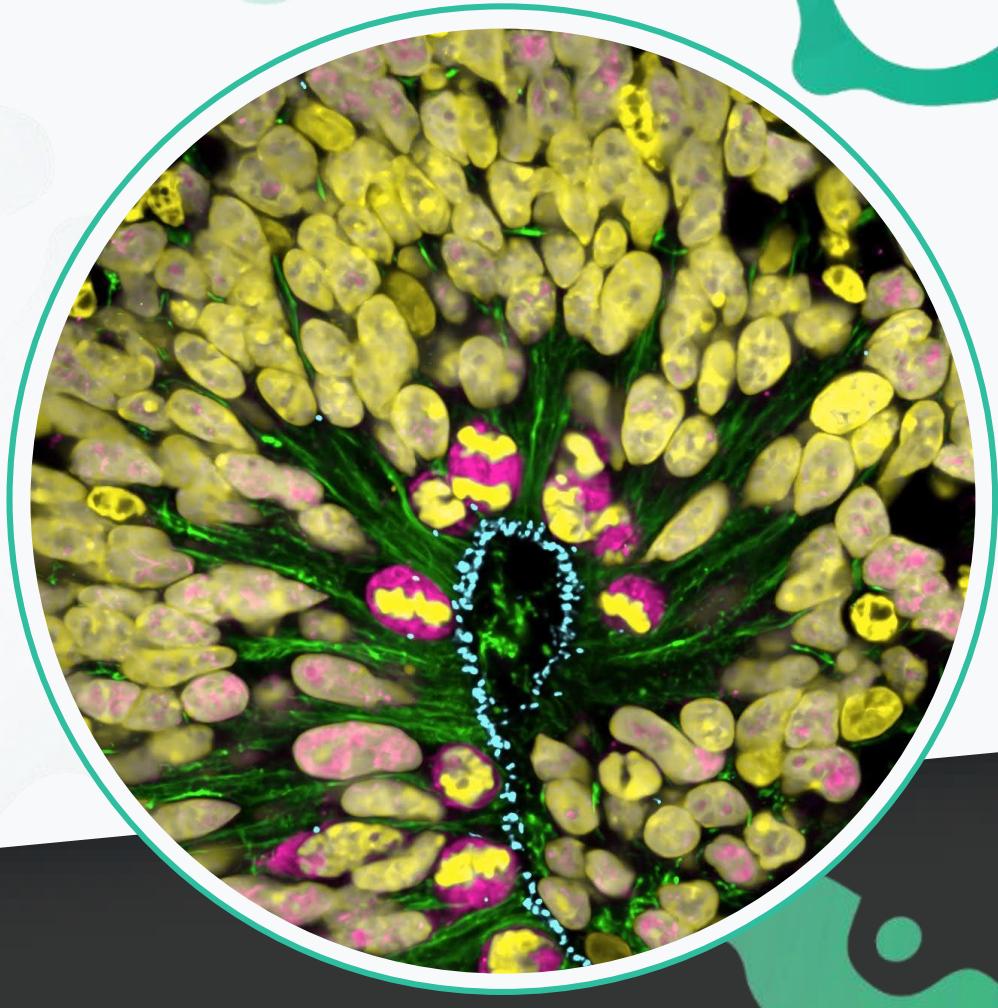
Jean Salamero, GBI MB member & FBI Mission Officer
"inter-Research Infrastructures activities"



Funded by the Horizon 2020
Framework Programme of
the European Union



FRANCE-BIOIMAGING



Summary :ABIC meeting, an African community meeting

Presentation of Diverse network and Active community in bio-medical imaging in AFRICA:

- SABI – South African Biolmaging
- ABIC - African Biolmaging Consortium
- AMI - Africa Microscopy Initiative
- AFSINNET - 8 countries in Africa involved, based in Ivory Coast – African Spectral Imaging Network
- AAS -African Academy of Science (or during GBI ?)

Presentation of international collaborators and their program:

- France Biolmaging ([see next](#))
- AIC Janelia/ UCT cape town
- GBI/Euro-Biolmaging ([see later](#))

Round Tables with (among others)

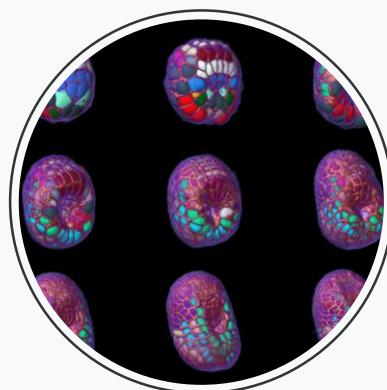
- Funders :CZI; B&M Gate foundation, Welcome Trust
- Industrials: Zeiss, Thermofisher, Separation....

ABIC, What's next ?

- Capacity building and Training (+ Other initiatives such as Trends in Africa...)
- Mapping Imaging resources in Africa ([see next](#))
- Challenges/issues (among many, language/cultural barriers)
- Future directions.....

Some slides from our FBI presentation at ABIC.

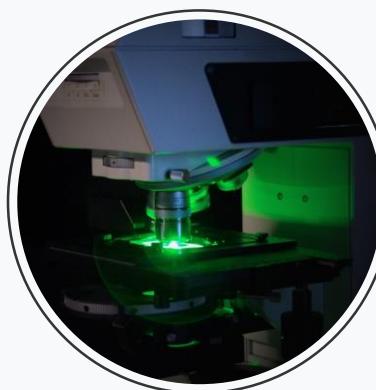
Providing researchers with **access**
to state-of-the art and innovative **imaging technologies and expertise**.



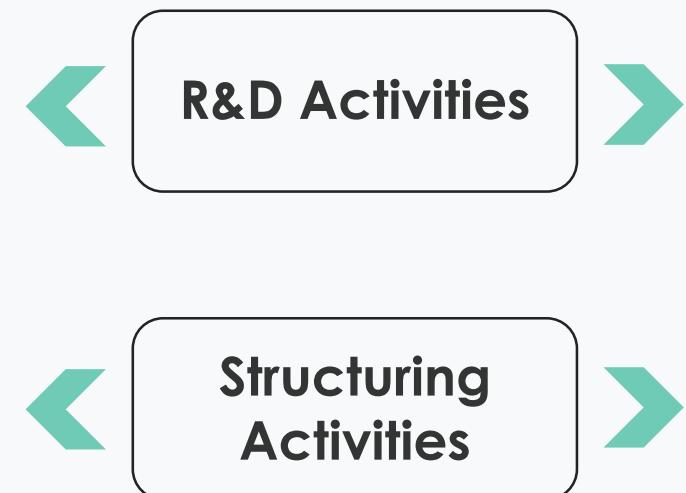
Innovation



Training



Access



FBI-Training

TOWARDS FAIRISATION OF TRAINING MATERIAL

→ *Fabrice Cordelières presentation @GBI EoE*

Aimed at end users

- As a prerequisite to access
- As a way to improve curriculum
- As a way to switch career

Aimed at core facility staff

- For life-long training
- As a way to catch up with new technologies
- To prepare technology transfer
- To keep track and value experience



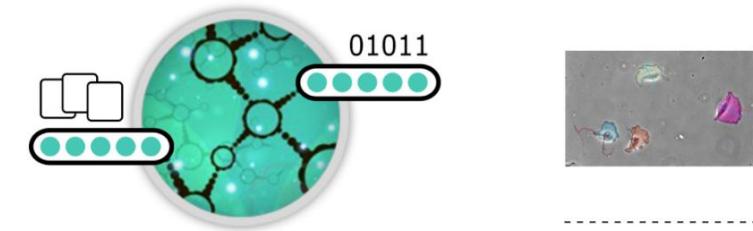
Bioimage analysis services: FBlAS Open Desk

OFFERING REMOTE OPEN-DESKS IN BIOIMAGE ANALYSIS TO THE USER COMMUNITY

- Offered to any user of FBI. Discussions are private and confidential.
- 3 sessions of 1 hour.
- For each session: 3 concurrent slots. A slot is booked in advance through the FBI portal
- Each slot = 1 user and their image analysis problem vs 2 – 3 analysts that will try to solve it immediately.

Rules:

- 60 minutes max.
- Really try to address the problem: Go beyond passive advices, get the images, work on them and try to deliver a working solution or data.



Join us for Bioimage Analysis sessions at the FBlAS Open-desk.

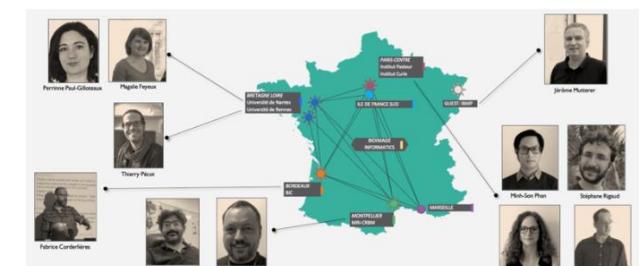
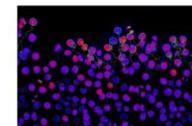
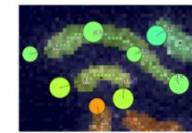
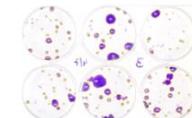
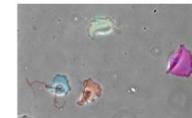
Wednesday, March the 23rd, 2pm – 5pm

The analysts of France-Bioimaging organize an open-desk in Bioimage Analysis. Join us to talk about the challenges you face when analyzing your microscopic data and let us try to solve them.

The open-desk consists of short sessions with imaging experts where you can ask any question related to image processing you come across in your research projects. If you have any question about bioimage analysis, it is the right place to be!

During individual 1-hour sessions, a group of analysts will meet with you online and try to solve your problem on the spot. If not possible in 1 hour, they will help you to find potential methods to answer your question.

Interested? [Book a session here](#)



A program to disseminate access to microscopy instruments and promote experience sharing in bioimaging



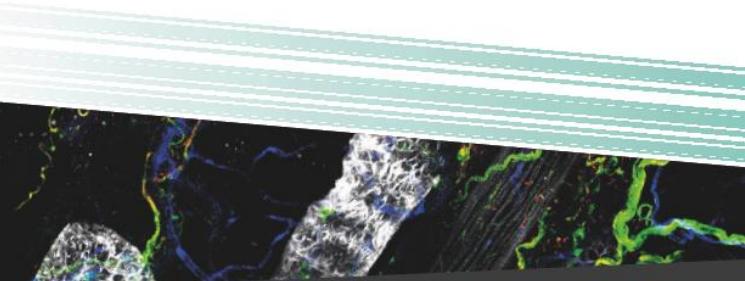
**Africa-France
Joint Initiative
for Biological Imaging**

2 CALLS FOR FUNDING!

to support collaborative initiatives between African and French scientists

- External Access: **up to 5k€**
- Twinning Exchange: **up to 4k€**

Submit your proposal by **April 30st, 2023**



More information:
[france-bioimaging.org/
africa-france-joint-initiative-for-biological-imaging-en](http://france-bioimaging.org/africa-france-joint-initiative-for-biological-imaging-en)



FRANCE BIOIMAGING

Program 2023-2024 (closed)

- **Call 1) ACCESS.** Projects from African users that demonstrate the need for at least one technology and/or expertise available in a core facility or FBI R&D team, which is not readily available on the African continent (full cost coverage, 2-3 weeks).
- **Call 2) TWINNING.** Staff exchange between an imaging center or laboratory wishing to open an imaging service in Africa and one of its counterparts within the FBI perimeter (travel coverage, other expenses to be determined between partners, ~2 weeks).

Outcome

→ **11 eligible and validated projects:**
8 in "Call-1 Access" and 3 in "Call
2-Twinning"

→ **Pan-African participants**

(Cameroon is missing in the map)

→ **5 FBI nodes participating**

→ **Project topics:**

- ◆ plant biology
- ◆ marine biology
- ◆ infectious diseases
- ◆ cancer
- ◆ biomaterials



Access Call 1: Study of otolith shape as a tool for determining the stock structure of sole fish (*Cynoglossus senegalensis*) by Image Analysis: towards sustainable management of fishery resources



Professor Khady DIOUF- Head of the Marine Biology Laboratory at the Institut Fondamental d'Afrique noire Cheikh Anta Diop, UCAD Dakar.



Dr Perrine PAUL-GILLOTEAUX- Scientific Head of the MicroPiCELL FBI-Platform in Nantes. Image Data Analysis Specialist.

Topic :

- Otoliths shape can vary according to disparate environmental (sea coast stress) and genetic factors, or differences in body condition or growth. *Cynoglossus Senegalensis* stocks are in a critical phase.

Required :

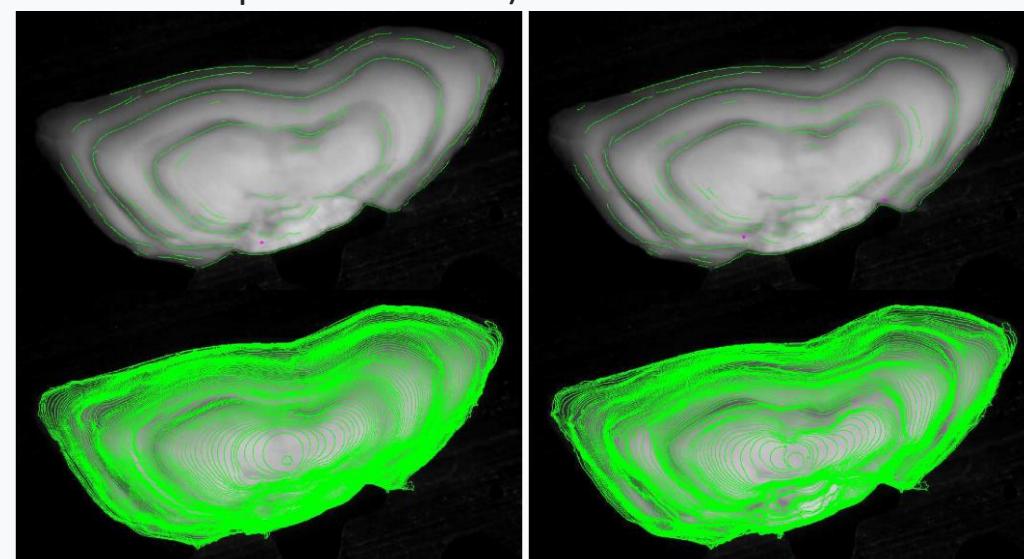
- Upgrade imaging technologies (better calibration support for students and technicians in the acquisition of data)
- Image analysis tools (open source!) and training (ImageJ Plugins, others)

Availability:

- Image data basis (665 C.S. otolithes images; i.e; ICCAT)
- Imaging platform (multiple modalities HTP WF, Color+3D; IFREMER training)
- Previous studies on otholit shapes (α -Shapes) by A. CHESSEL (FBI-IdF South)

Scientific and Societal Objectives :

- Reproducibility (build image acquisition and analysis workflow)
- Training materials for local transmission
- Automation of processes linked to deposit in a data center for public access
- Scientific advice for fisheries management and aquaculture in West Africa



Chessel et al., Extracting Growth Rings and Accretionary Structures. Biosignals 2008

Access Call 2 : Twinning Program. Build together future collaborations between African and French BioImaging Core Facilities



Dr Wasswa WILLIAM senior lecturer at Mbarara University of S & T in the department of Biomedical Sciences and Engineering. Head of the Advanced Medical imaging and Artificial Intelligence Lab. Mbarara Univ, Uganda.



DR Julien FERNANDES Research Engineer – Center for Technological Resources and Research – Unit of Technology and Service Photonic BioImaging (FBI-PC), Institut PASTEUR, France

How :

Exchange/mobility between Mbarara University of Science and Technology (<https://www.must.ac.ug>) and Institut Pasteur-Paris (<https://research.pasteur.fr/en/team/photonic-bioimaging-utechs-pbi/>)

Overall Objective :

-Strengthen the imaging and microscopy research within the East African Community and Africa at large

How :

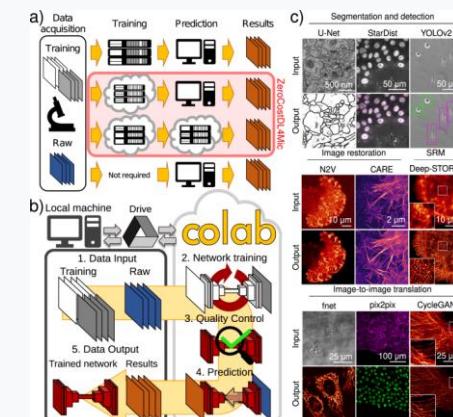
- To organize onsite networking sessions between Dr. Wasswa William and other researchers at Institut Pasteur, France, and between Dr. Julien Fernandes and researchers at Mbarara University of Science and Technology, Uganda.
- Physical imaging meetings with purposefully selected participants, presentation of different research projects/areas, core strengths and competencies, compare practices, profiling imaging equipment at each imaging lab, focus on AI for Microscopy

Outputs :

Short term, identified areas of collaborations including the core imaging needs from the African partner

Middle term, a MoU between Mbarara University of Science and Technology (MUST) and the Institut Pasteur (IP)

Long term, establishment of an East African center of excellence in Imaging at Mbarara University of Science and Technology



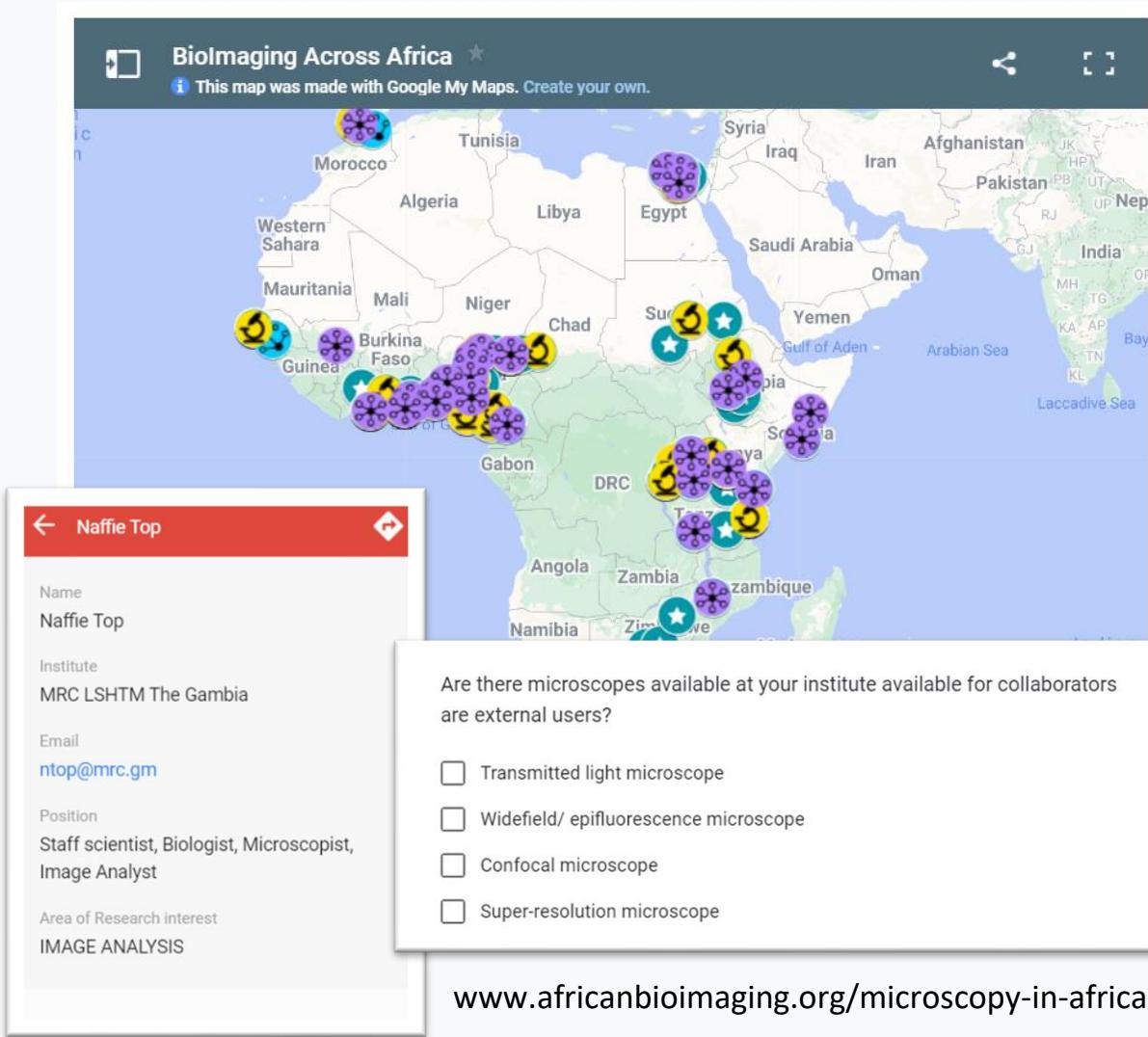
Conclusions: Food for thought

→ Keep on collecting **needs and priorities** to better address the challenges the African scientists are faced with when they require the use of biological imaging . **New contacts**

- **New Africa France Joint Initiative Program in 2024-2025:** with a mixed "Twinning/Project Access" call for project in 2 phases:
 - Experiment is done on one of the FBI sites (project + exchange)
 - Exchange of experience on-site visit (exploitation of data and see what can be done in situ to continue)
- **Dedicated FBI Image Analysis Open-desk session for African scientists.** **Plebiscit**
- **FBI members participation in AMI/ABIC training initiatives** → **See CSRS, Côte D'Ivoire**
- FBI is organizing an **Afrique-France Joint Initiative for BioImaging 2024 Webinar** on Dec. 6, 2023 (in French), where ABIC and AMI initiatives will be presented → help outreach towards French speaking African countries. **TBC (some work to do, some information to add such as help mapping Imaging in Africa. See the next 2 slides)**
- Middle to long term: Helping to set up a new "**Open Imaging Facility**" in West/North Africa.

FBI ACTION To be defined now... With whom ?

ABIC: Microscopy infrastructure and expertise in Africa (from John Woodland, UCT)



It would be helpful to understand the landscape of microscopy infrastructure and expertise in Africa...

1. Where are the microscopes?
 - Are they working?
 - Are they new/second-hand/donated?
 - Are they part of a core facility, must one apply, etc.?
2. Where (and who) are the people?
 - Users, operators, etc.
3. Is the information we currently have up to date?

Microscopy infrastructure and expertise in Africa

Bioimaging Across Africa ★
This map was made with Google My Maps. Create your own.

Naffie Top

Name
Naffie Top

Institute
MRC LSHTM The Gambia

Email
ntop@mrc.gm

Position
Staff scientist, Biologist, Microscopist, Image Analyst

Area of Research interest
IMAGE ANALYSIS

15/11/2023

- *Full details of your team/facilities/instrument(s)*
- *Is your instrument working? If not, what's the problem...?*
- *How did you get it?*
- *What else is out there...?*

Will help us to identify needs, trends, interventions, recommendations, areas of research expertise...

- Would YOU like to help us expand and consolidate our database?
- **Come and chat or drop me a line at john.woodland@uct.ac.za**

Quelques contacts Africains supplémentaires

Olatunji Sunday Vinka

- BSc, MSc, Ph.D.
- Senior Lecturer at Adventist School of Medicine of East Central Africa, Adventist University of Central Africa
Kigali, Rwanda

Libert Brice Tonfack

BSc, MSc, PhD

Professor (Associate) at University of Yaounde I <http://www.uy1.uninet.cm>
Cameroon

Aimé R. SANHOUN

Microbiologist

Université Nangui Abrogoua, Côte d'Ivoire Centre Suisse de Recherche Scientifiques
Côte d'Ivoire

**MAIN TOPICS: TRAINING AROUND THE GLOBE,
BUILDING IMAGING CORE F
and CAREER PATH FOR IMAGING SCIENTISTS**

SUMMARY

- Started with local official talks (NRF, UCT, AAS...) & Core Facilities visits (Cape Town, Typerberg, Stellenbosch)
- **Training around the Globe.** For Europe: EuBI ([announcement by Antje Keppler of the Wellcome Trust funding towards LMICs. Imaging4All \(i4A\)...Presentation to be added](#)) and FBI ([Fabrice Talk, presentation to be added ?](#))
- **How to set up an imaging core facility and Train the trainers sessions .** Sessions & Breakout room ([not very informative for us](#)). More interesting : **Remote and hybrid training, image analysis and data management**
- **Article:** « *Charting a course for success: International recommendations for Imaging Scientist careers in core facilities* “ ([see later](#))
- **INFRADEV 2024:** *Strengthen the bilateral cooperation on research infrastructures with Africa.* ([see later](#))



Infrastructural barriers in bioimaging There are major challenges with:

the high costs of imaging equipment and infrastructure, the lack of availability of and access to imaging facilities,
the lack of technical expertise necessary to support researchers in acquiring and processing complex imaging data

While these barriers affect researchers in all settings, their negative impact was far greater in low- and middle-income countries.

Wellcome funding for bioimaging

Based on the findings in the report,initial bioimaging funding activities.

Addressing the lack of opportunities to access imaging facilities and training for researchers based in low-resource settings

We aim to increase access to bioimaging facilities and training in bioimaging methodologies for researchers in low- and middle-income countries.

This activity, launching in January 2024, will see a series of funding calls delivered via a partnership with [Global Bioimaging \(GBI\)](#), a global consortium of imaging infrastructures. Their established network and understanding of the global bioimaging landscape will maximise reach and impact.

GBI Paper :Charting a course for success: International recommendations for Imaging Scientist careers in core facilities (~45 co-authors)

Introduction

Imaging core facilities play a crucial role in modern research, promoting collaboration and acting as catalysts for the establishment and advancement of an efficient and sustainable research ecosystem. Over time, as cutting-edge technologies have become increasingly expensive and technically challenging to master, the importance and prominence of core facilities has grown. Concurrently, core facilities have evolved beyond their traditional role of providing access to equipment and basic training to become integral contributors to the development, refinement, and applications of highly specialised imaging technologies. They are at the forefront of innovation, empowering and supporting researchers in their quest to explore new frontiers in science and technology. Fundamental to imaging facilities are ***Imaging Scientists*** who provide the expertise, advice, and training to maximise impact and support researchers pursuit of imaging-related excellence. Imaging Scientists are becoming increasingly involved in, and instrumental to the success of, cross-disciplinary research projects that require the application of multiple advanced technologies.....However, significant challenges remain on the path to proper recognition of the value and impact of these Imaging Scientists and what they contribute to the research enterprise. There is often misalignment in performance indicators and limited opportunities for promotion, career advancement and job security.



INFRADEV-2024-01-02: Strengthen the bilateral cooperation on research infrastructures with Africa

HUB TEAM RETREAT

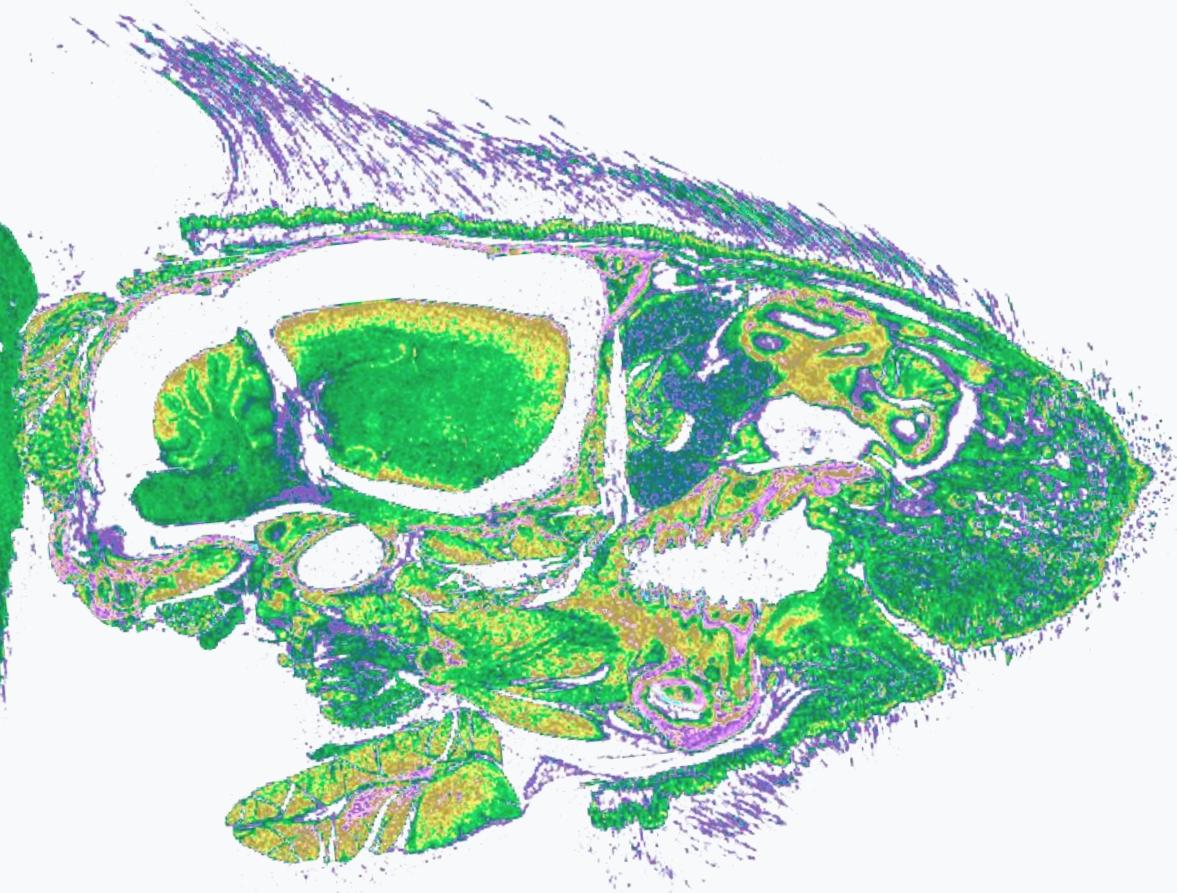
20.9.2023

What needs to be defined:

- Potential African partners:
 - SABI – South African BioImaging
 - ABIC - African BioImaging Consortium
 - AMI - Africa Microscopy Initiative
 - AFSINNET - 8 countries in Africa involved, based in Ivory Coast – African Spectral Imaging Network
 - **AAS -African Academy of Science (great contact with Lise Korsten. President)**
- Industry partners:
 - Zeiss is keen to build a small imaging centre where they can showcase their latest technologies.
 - **Nikon (relace)**
- Euro-BioImaging Nodes:
 - France BioImaging has expressed interest in this call
 - PPBI Node in Portugal has expressed interest in this call
 - Finland - FiAM has expressed interest in this call
- Bring in charity organizations, Gates Foundation and CZI. They might be able to pay for staff. Their presentation in Cape Town had an emphasis on HIV, HPV, resistant Tuberculosis. **Think beyond... One HEALTH**



Topic description



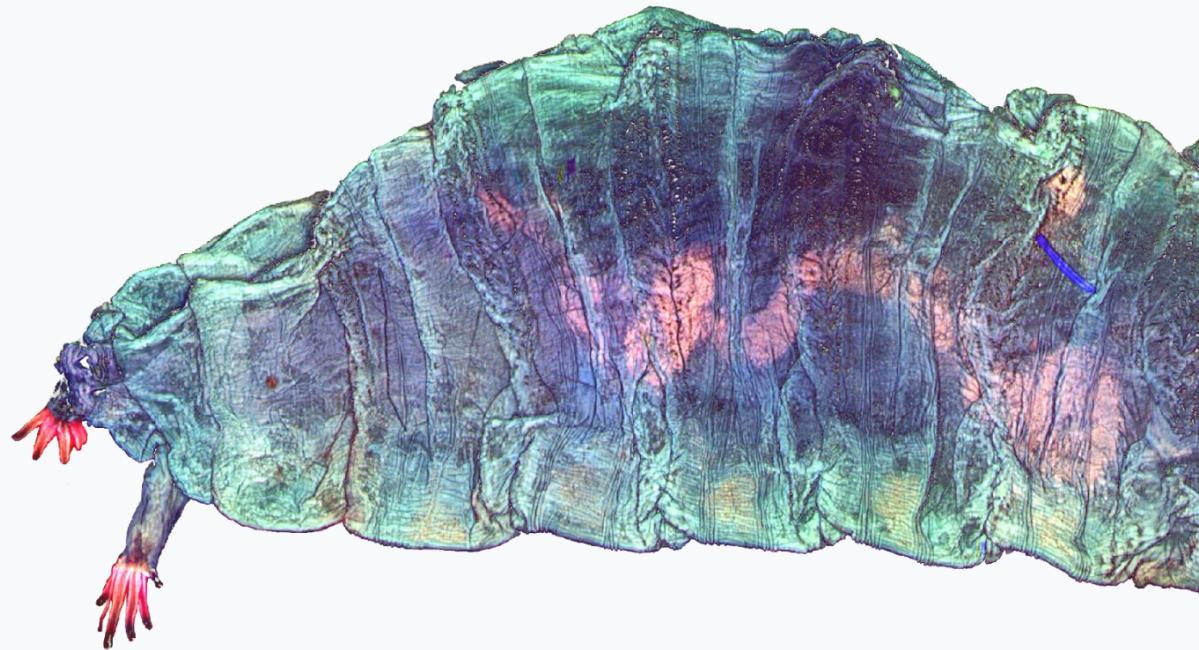
Expected Outcome:

Project results are expected to contribute to all the following expected outcomes:

- Contribution to the new Commission strategy with Africa, notably to the following specific objectives:
 - Rapidly enhance learning
 - Knowledge and skills
 - Research and innovation capacities
 - Attention to female and young researchers
- Enhanced research capacities in Africa
- Enhanced Euro-African cooperation in R&I.

Budget Overview:

- Topic: HORIZON-INFRA-2024-DEV-01-02 - Coordination and Support Actions
- Budget (EUR) - Year 2024: 1'500.000
- Stages: Single stage
- Opening date: 06 December 2023
- Deadline: 12 March 2024
- Contributions: €1'000.000 to €1'500.000
- Indicative number of grants: 1



AUTRES RETOURS, CONCLUSION et PERSPECTIVES

Renforcer les liens/projets existants avec la communauté africaine, dans la continuité, avec nos collègues de Cape Town et AMI: faciliter l'accès aux équipements de microscopie aux chercheurs africains, montée en expertise, carrière, création de hub plateforme de microscopie en Afrique.

Présentation du webinaire Afrique-France le 6 décembre, + nouveaux contacts et discussions avec chercheurs Sénégalais, Camerounais et Nigérian, entre autres.

Projet de participation aux séminaires du Centre Suisse de Recherches Scientifiques en Côte d'Ivoire. Présenter initiatives FBI dirigées vers les chercheurs africains, opportunités existantes pour l'accès à des équipements en France. + FBI très bien intégré dans le discours des partenaires locaux.

Continuer le développement de liens avec la communauté de bioimagerie latino-américaine. Argentine création du centre franco argentin de coopération à l'Université San Martin BA (JP Grovel, ambassadeur du centre en France). Possibilité de mise en place d'échanges pour du transfert de projet R&D, formation en TAI

Valorisation de la mission Formation: thématique de cette édition du GBI, promouvoir une approche FAIR du matériel de formation cf presentation par Fabrice). Contacts établis et discussions avec de potentiels partenaires européens, américains (**Canada and BINA**)

Perspectives de financement: CZI et Welcome

BE FBI 8 Novembre 2023

15 :25-15:30 **Demande de subvention pour des évènements scientifiques (Alexandre)**

2024 AQV (Approches Quantitatives du Vivant) meeting (15-17/05/2024, Vogüé, 140 participants attendus).

Demande de Fabien Montel, budget de 41 k€ avec demande à FBI de 1 500 € -> vote d'une subvention de 1 500 € sous condition d' apposition du logo FBI sur le programme et d'une présentation de l'IR.

=> **Edition 2024** de la journée « Translational Neuroscience Day» de NeurATRIS (M-A Colle, Nantes). Demande de co-organisation (Neuratraris, FLI, FBI). Qui est intéressé pour être co-organisateur ?

FIN du BE à 15h30

Prochain BE le 20/12/2023 à 14h sur zoom