Fluid Force Microscopy

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The available FluidForce Microscopy (FluidFM) facilities

Nanosurf AFM

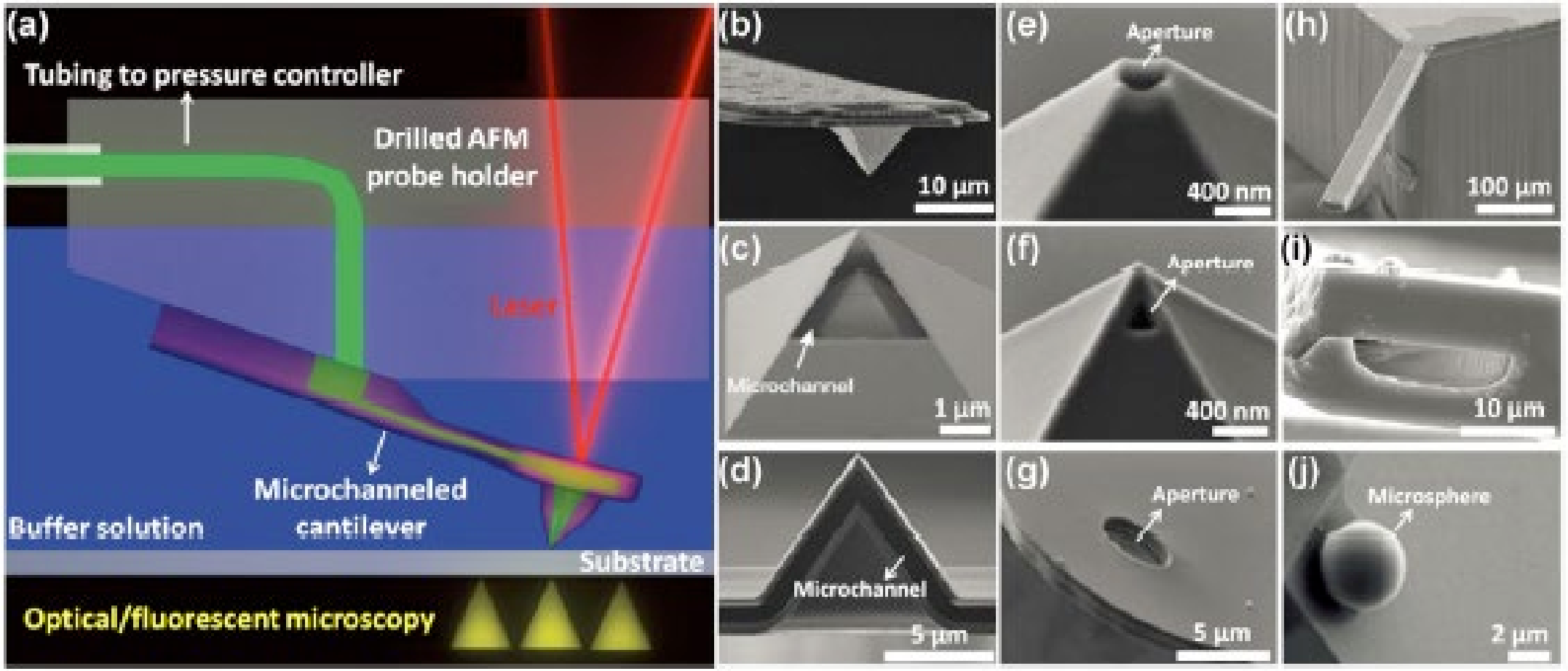
OAK RIDGE National Laboratory | CENTER FOR NANOPHASE MATERIALS SCIENCES

One available user proposal (PI Zhang, Co-PI De Yoreo)

Bruker/JPK AFM

PNNL-Materials Science Group has approved a 500K budget for JPK AFM. The installation should be done in 4-6 months.
One NSF-MRI proposal, (PI Zhang, Co-PI De Yoreo, Key personnel Ginger) is pending for another JPK AFM. MAF will be the host.
JPK AFM is not just a FluidFM!

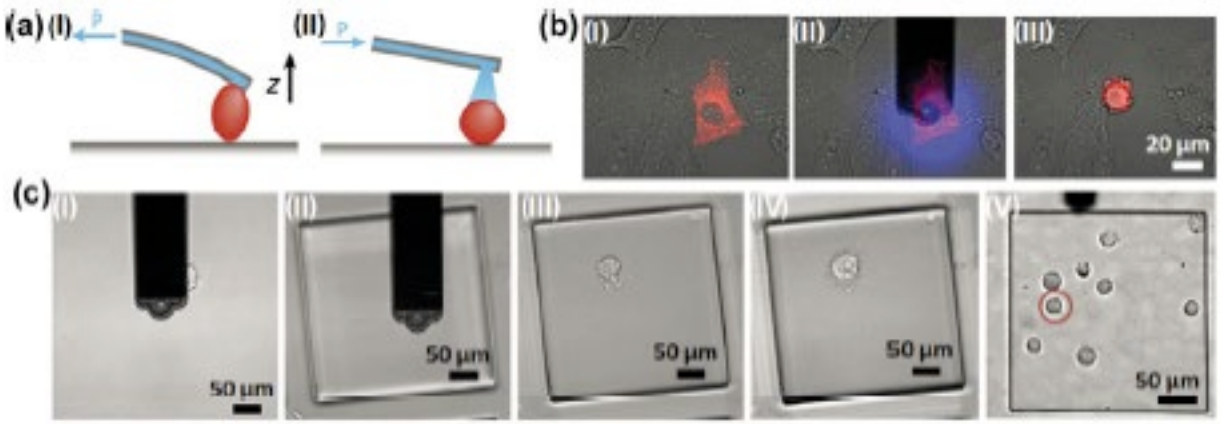
What is FluidFM?



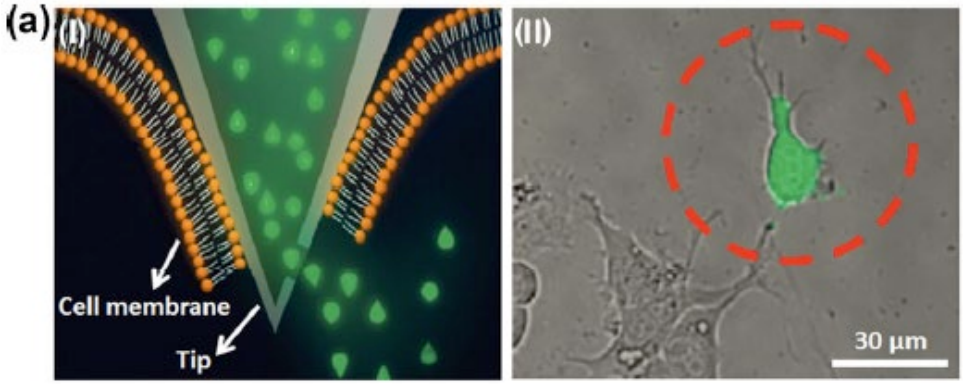
Li, et al., Nano Research 2021

What can FluidFM do?

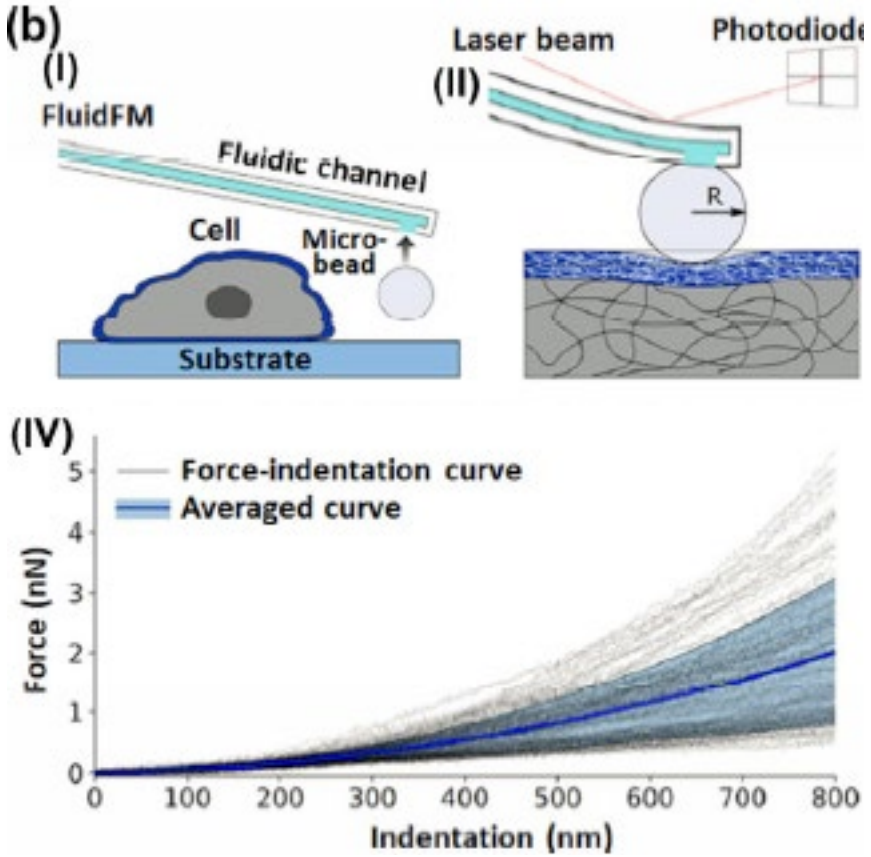
FluidFM has promising applications in single-cell biophysics.



Manipulations



Delivery, injection and extraction

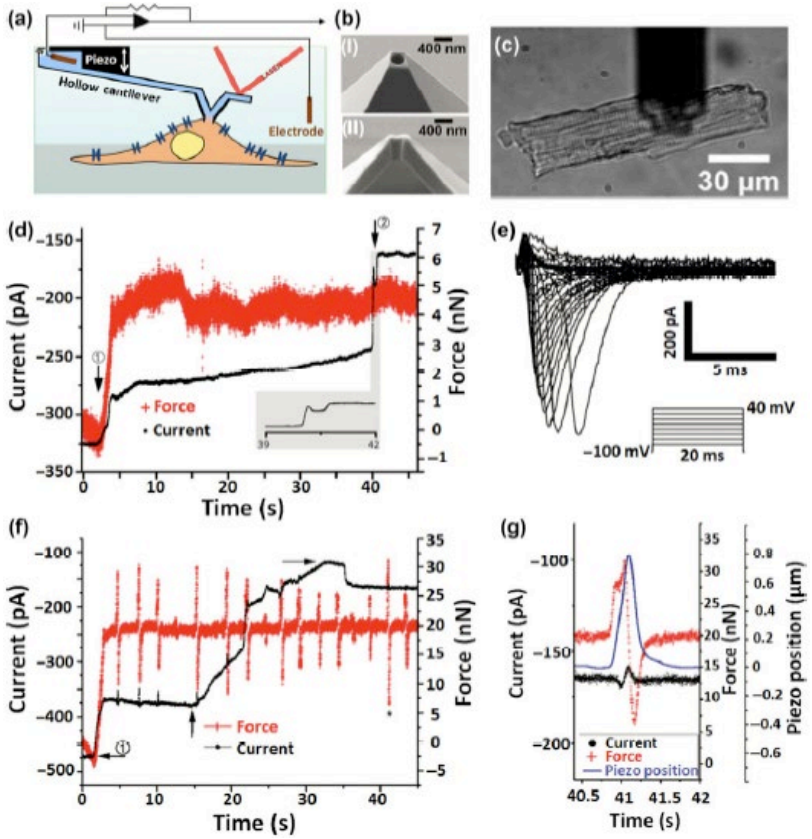


Mechanical measurements

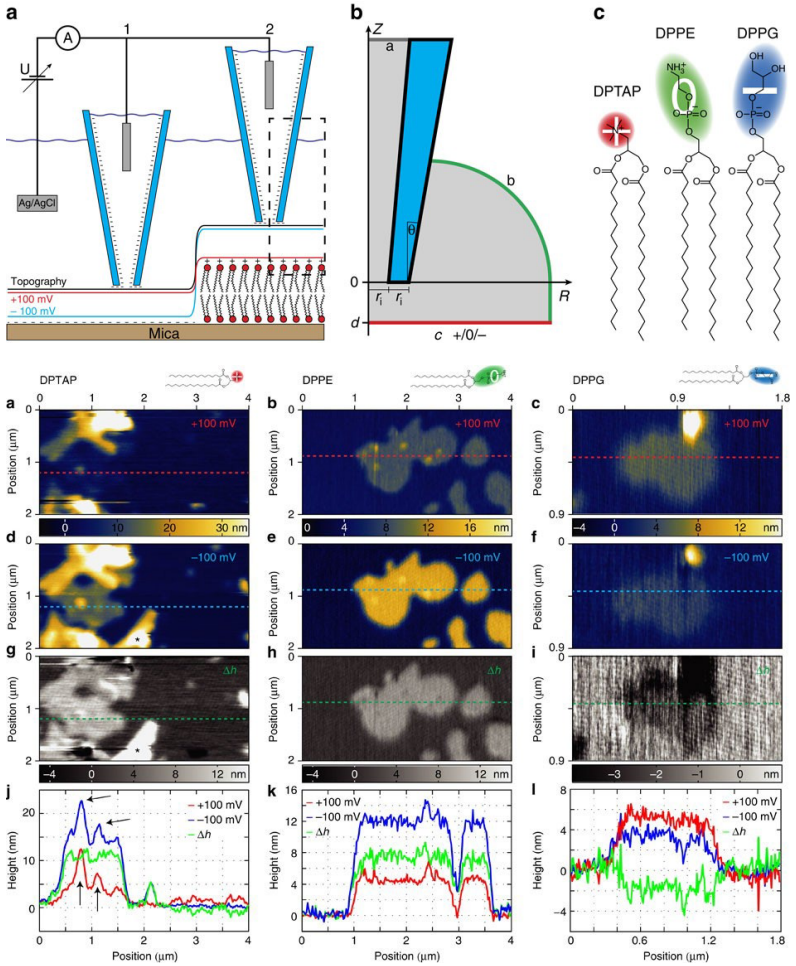
Li, et al., Nano Research 2021

What can FluidFM do?

FluidFM has promising applications in single-cell biophysics.
Single-cell patch clamp/scan ion conductance microscopy



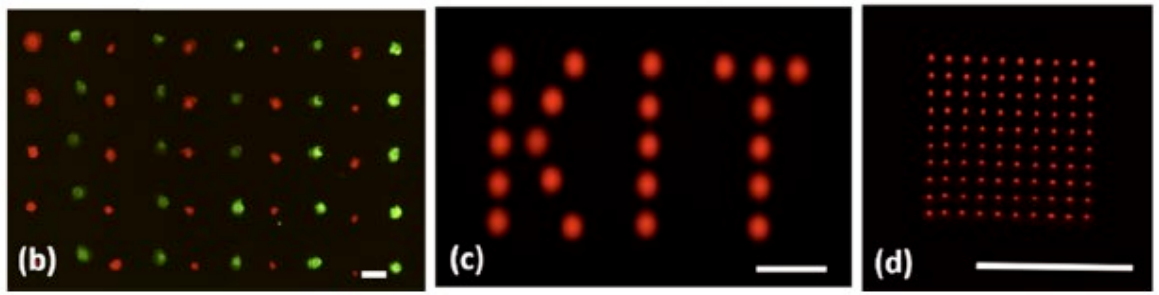
Li, et al., Nano Research 2021

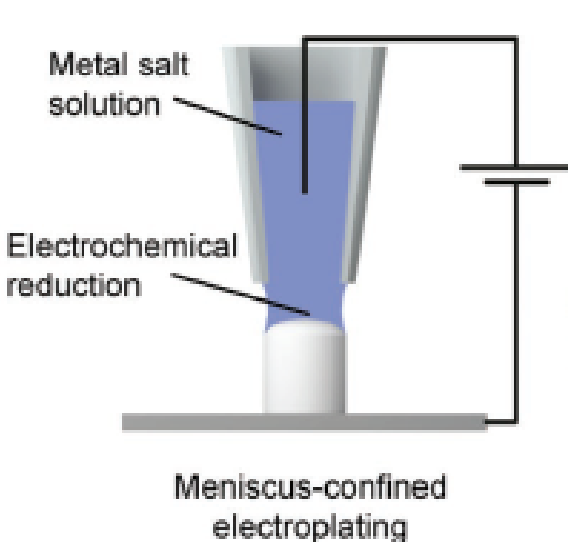


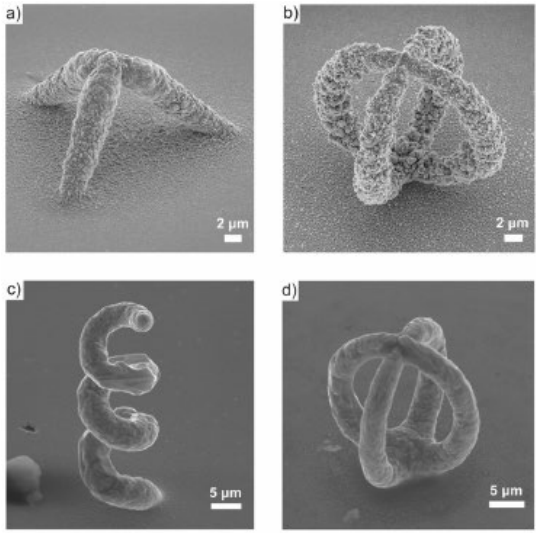
Klausen, et al., Nat. Comm., 2016

What can FluidFM do?

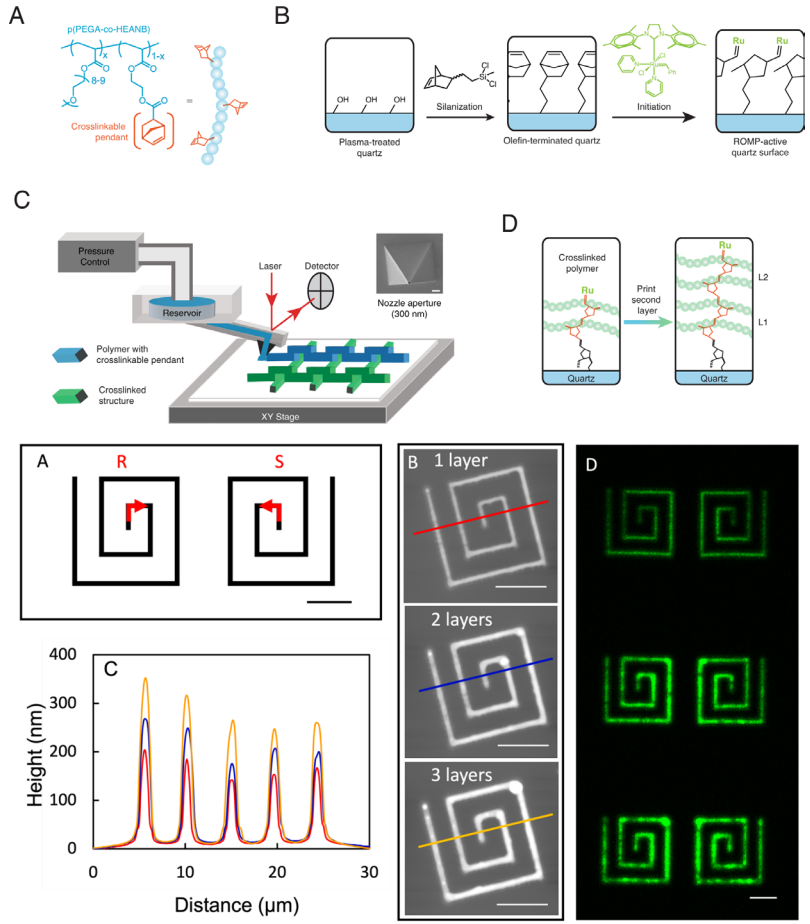
Nano-print and nanofabrication







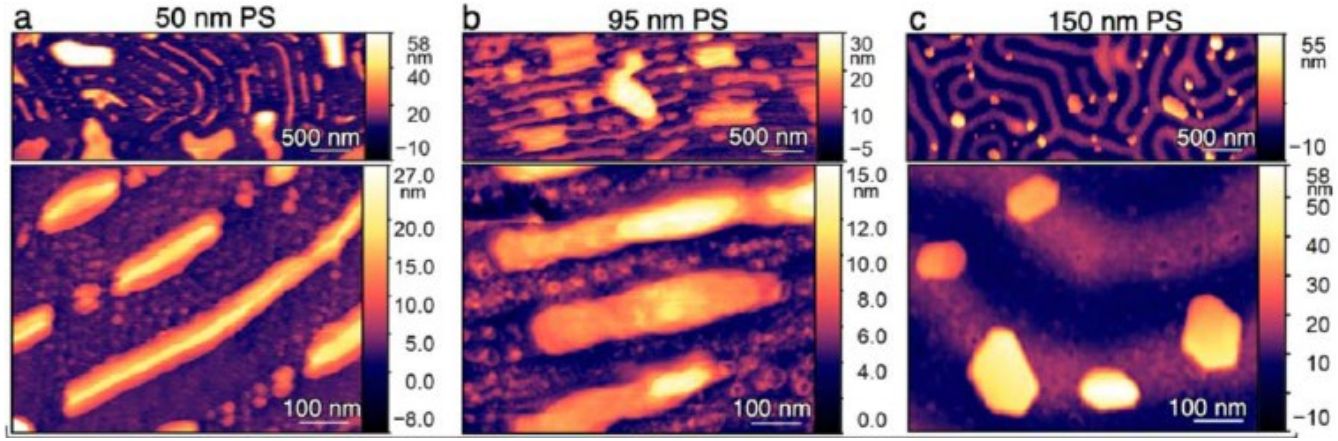
Berganza, et al., ACS Appl. Mat. Inter. 2021, Hirt, Adv. Mat. 2017, Additive Manufacturing 2022, 53, 102718



Pattison, et al., Nat. Comm. 2022, Huang, et al., Micromachines 2023

FluidFM's opportunities at CSSAS

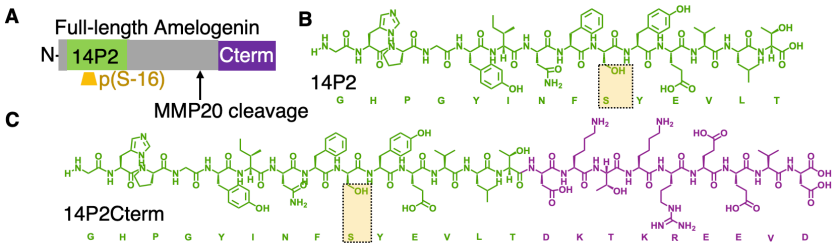
A programmable robot for automated synthesis



Akkineni, et al. Nano letters 2023

Multi-component patterns for nano-reactors, etc.

Biomineralization,
NPs attachment, etc., or
multi-round writing with FluidFM



Biomolecular ink
(Peptide, peptoid,
DNA, etc.)

FluidFM

writing

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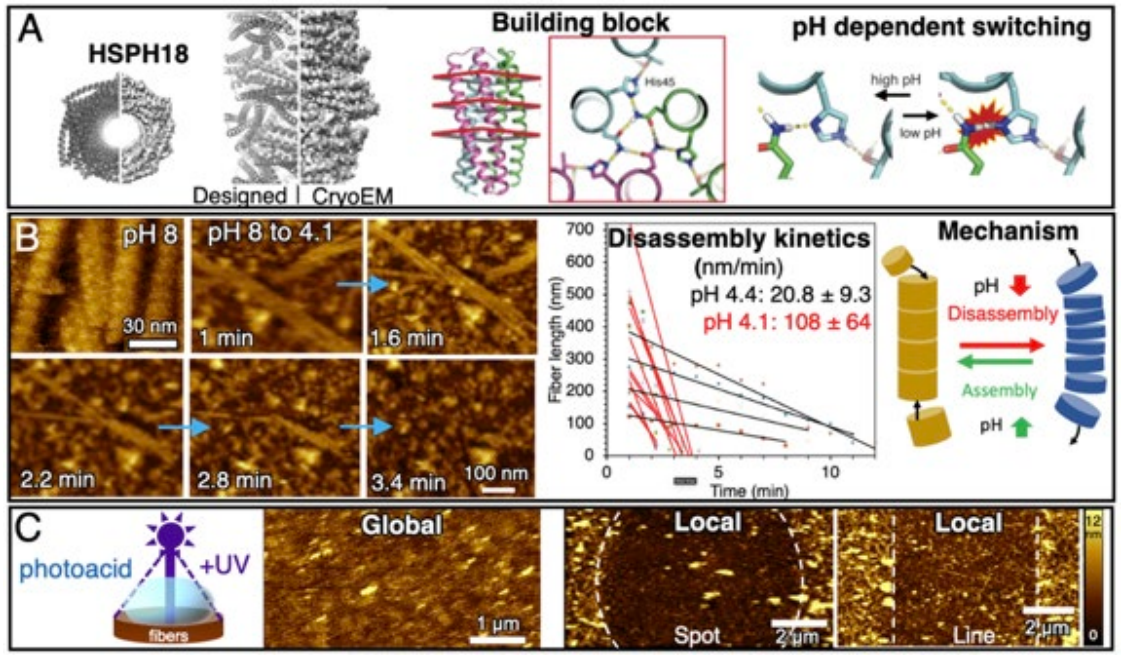
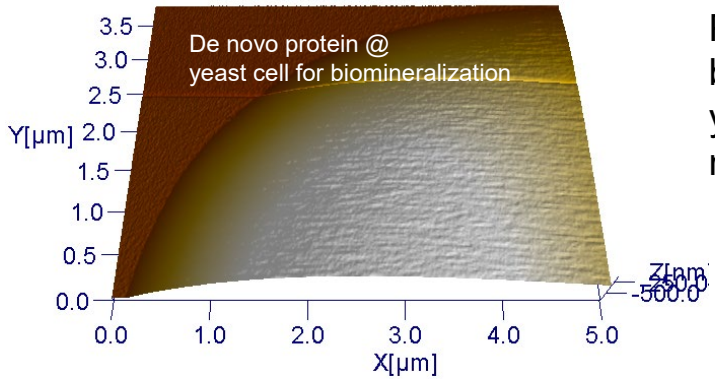


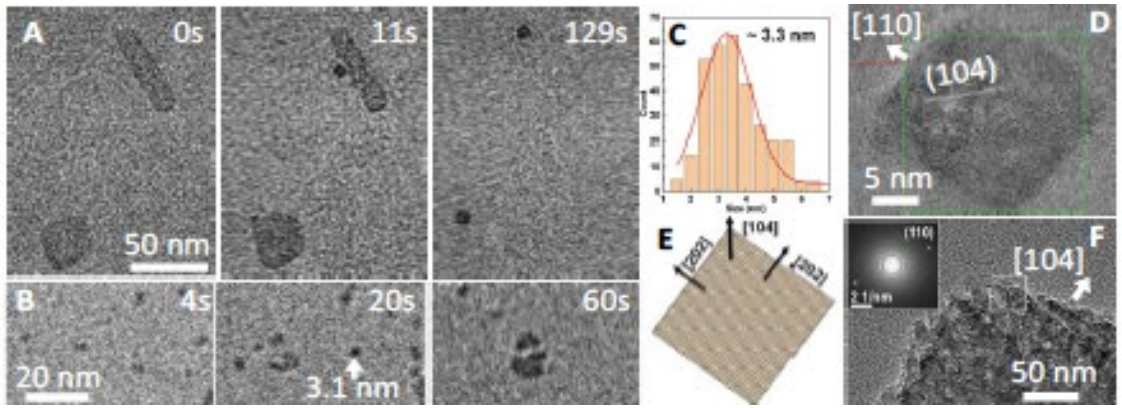
Shen, et al., Nat. Nano. 2024

Deliver stimuli for assembly/crystal phase transition, etching, doping, etc.

CSSAS' success needs your efforts !



Possibility of in vitro biomineralization on yeast cells with the de novo proteins



DFS of the engineered yeast cells vs. $CaCO_3$/ZnO/TiO_2 different facets

Acknowledgments

Thanks for your attention !

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