

# MICROFLUIDIC ASYMMETRICAL FLOW FIELD-FLOW FRACTIONATION ( $\mu$ AF<sub>4</sub>)

AF<sub>4</sub> is an analytical method surpassing the SEC in many aspects in the separation of nanomedicines characterization. Its miniaturization would accelerate and improve the development of nanotherapeutics.

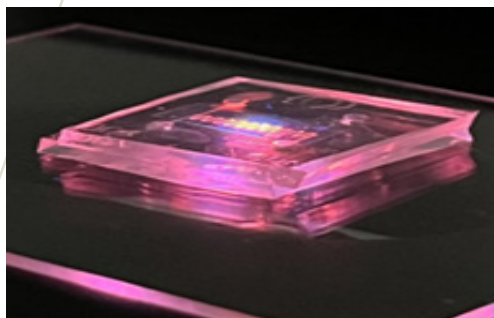
**ERG\NEO**

L'AVENIR EST FAIT D'AUDACE

## PRESENTATION

Nanomedicine and biotherapeutics are progressively replacing traditional small drug therapeutics. Lipidic nanoparticles for covid vaccines is one of the most recent and successful example. The field success is strongly related to analytical techniques such as SEC chromatography and size analysis.

AF<sub>4</sub> flow separation is an attractive alternative to SEC to separate a wider range of nanoparticles. Yet, the experimental complexity and resources it requires limit its current capacities. Thanks to our expertise in thermoplastic, we can miniaturize it, intensifying its performances and overcoming its current limitations.



Experimental setup including the pressure controller plugged chip during the experiment

Field-flow fractionation - Analytical chemistry - Nanomedicines - Separation sciences - Microfluidics - Biotherapeutics

## DEVELOPMENT PHASE

- ✓ Current status : TRL3 (design and fabrication confirmed, experimental setup installed, waterproofing of the chip confirmed)
- ✓ Next phase: (I) flow control, elution and flow focusing (II) separation of analytical standards

## CONTACT

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## COMPETITIVE ADVANTAGES

- Higher resolution separation
- Lower sample consumption
- Fast, simple and cheap fabrication process
- Performed in purely aqueous mobile phases
- Easy and rapid changes of conditions
- Wider size range of separation than chromatography

## APPLICATIONS

- Biotherapeutics (extracellular vesicles, immunotherapies)
- Nanomedicines (polymer / lipidic nanoparticles, inorganics)
- Environmental science (see work of J. Gigault, CNRS researcher)
- Hyphenated detection (coupling with detectors among whom Absorption UV and visible / mass spectrometer, refractometer, light scattering analyzer)

## INTELLECTUAL PROPERTY

- "Dispositif microfluidique de fractionnement en continu à écoulement asymétrique et procédé d'utilisation correspondant" Salmon, Gahoual, Houze, Mignet, EP3756001A1
- US Patent pending