



Spin-off of the VUB Department of Chemical Engineering.

Established in December, 2010.

Milestones

- **2011:** PharmaFluidics enters into a license agreement with VUB and becomes a recognized VUB spin-off company.
- **2012:** PharmaFluidics industrial partner for innovation mandate Phase 1 'Development of pillar array based LC-columns with ultra-high peak capacities'.
- **2012:** First contract development agreement with large Pharmaceutical Company.
- **2012:** Proteomics chip yields 1000,000 theoretical plates in 20 min.
- **2013:** IWT approves entering Phase 2 of the Innovation Mandate with PharmaFluidics as industrial partner as go/no-go criteria have been fulfilled.
- **2013:** Demonstration of sub-micron plate heights implementing a novel support structure format for HPLC.
- **2013:** Development of generic ultra-stable membrane contactor.

PharmaFluidics BVBA

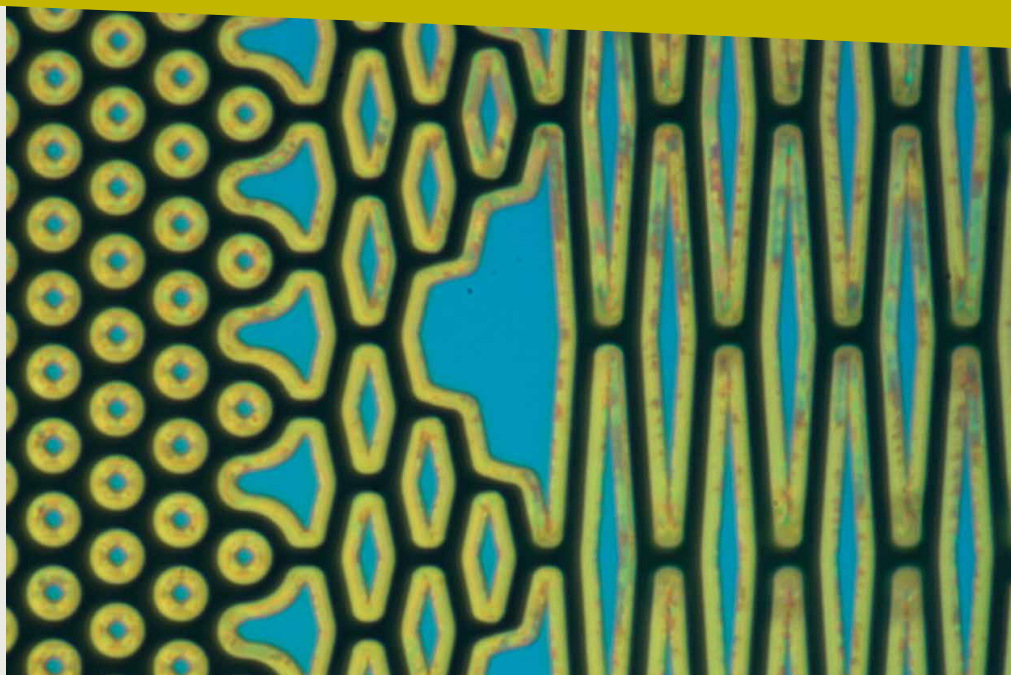
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Microfluidics engineering for analytical and chemical processes

PharmaFluidics BVBA is a microfluidics company that offers integrated **milli- to nano-engineered solutions for mixing, reaction and separation**, with a focus on pharmaceutical processes and specialty chemistry.

The company offers **tailored solutions for processes** that benefit from its unique expertise in micro- and nano-structured devices for the control of laminar flows in shallow, high-aspect ratio (width/depth) structures. Numbering up as a paradigm in microreactor technology does not always prove to be a viable option. Careful redesign in many cases offers much more flexibility at a lower cost, without sacrifices on the performance.

PharmaFluidics BVBA was founded in 2011 as a spin-off of the Department of Chemical Engineering (CHIS) at the VUB by Dr. ir. Wim De Malsche, Prof. Dr. ir. Gert Desmet, Prof. Dr. ir. Joeri Denayer and Dr. ir. Paul Jacobs. The company represents a unique combination of know-how, and has access to state-of-the-art clean rooms and micromachining capabilities that enable it to provide its clients with innovative products and novel concepts. During the last decade, the department of Chemical Engineering has played a pioneering role in the development of **miniaturized devices for analytical and general chemical engineering applications**.

This solid theoretical background and access to state-of-the-art manufacturing form an optimal basis for bringing new microfluidics-driven solutions to the market. A crucial feature that enables outperformance of competing microfluidic approaches is the **proprietary distributor structure**, which is grafted at interface regions between functional units.

Chemical and pharmaceutical companies can expect huge benefits from the implementation of micro-reactors in their process flows. The developed analytical devices are also indispensable to **life science branches in academia and public institutions**, which can typically benefit from a tenfold performance improvement as compared to traditional technologies used to date.

Services offered by PharmaFluidics

Problem analysis

- Matching new concepts to user needs
- Assessment of the theoretical expectations and practical limitations based on detailed modeling and thorough investigation of the process conditions
- Feasibility study & preliminary design
- Validation by experimental verification on prototype-systems
- Cost estimate based on comparative study of possible technology options

Fabrication: meso, micro and nano

- Rapid prototyping
- CNC milling, diamond turning, nano-milling, laser melting-deposition
- Silicon, glass, metal (Al, Steel), polymers (a.o. POM, PMMA, PEEK, PTFE)
- Class 100 cleanroom at our disposition for entire process flows bringing sub-micron features within reach.

Processes

- Mask-design
- High aspect ratio etching
- Wet etching
- Embossing
- Bonding

Prototype manufacturing & testing

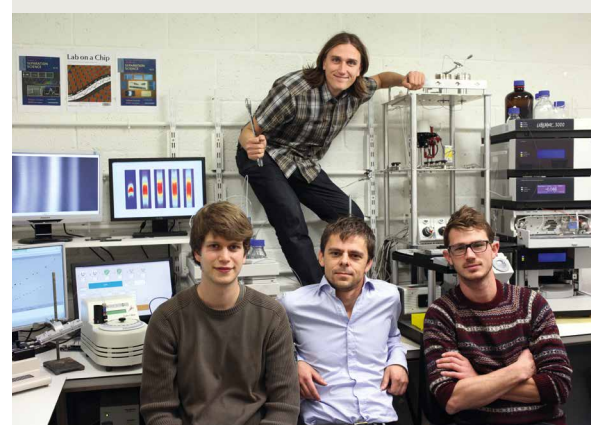
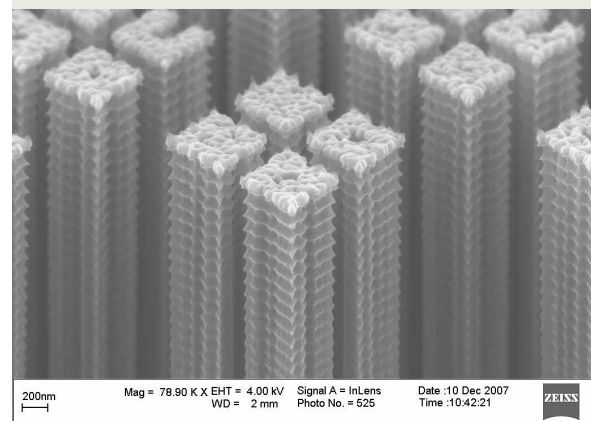
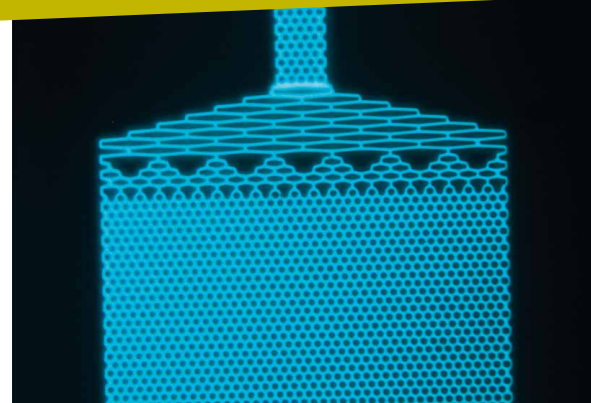
- Housing and interfacing of microfluidic components
- High-pressure reversible connections (up to 100 bar)
- Detection and analytics
- HPLC, nano-LC
- UV-Vis
- Proof-of-principle testing

Automation

- Computer controlled operation
- Data recording

Small and medium scale production of microfluidics systems.

Large scale production: development of large scale production strategies for large volume devices and negotiation with candidate foundries.



From left to right in the front: Jonas Hereijgers, Wim De Malsche, Jeff Op De Beek. In the rear: Manly Callewaert

'PharmaFluidics takes care of the fluidics, the user can fully concentrate on his application'

Wim De Malsche, CEO



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Transfer
Interface
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