

Company profile

EmulTech – revolutionizing the drug delivery industry

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EmulTech is a formulation development and technology company dedicated to the innovative formulation of biomolecules, to improve the delivery, and efficacy of biopharmaceuticals.

We were founded in 2009 as a spin out from TU Eindhoven, The Netherlands. Our current facilities at Brainport Eindhoven employ six FTE and are financed by various Dutch and European subsidy programs and loans.

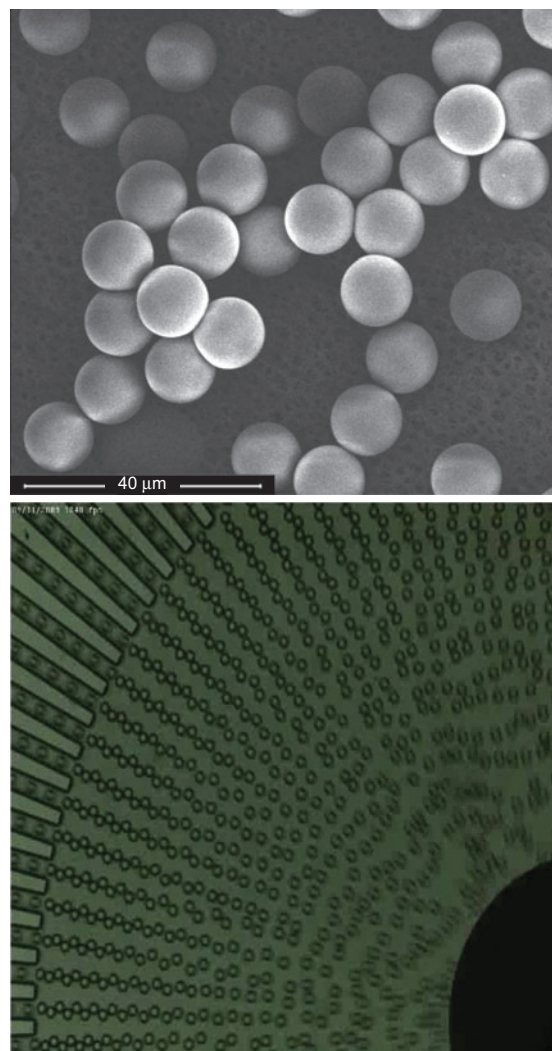
EmulTech currently offers the technology platform Emulsion Technology for Micro Encapsulation (ET4ME). This patented microfluidic technology answers today's market demands for uniformity, solubility, tailored release, benign processes and reproducibility.

Platforms

Injectable PLGA delivery systems: This project aims to produce micro particles out of aliphatic polymers, mainly poly(lactic-co-glycolic acid) PLGA, in ET4ME. PLGA is a copolymer which is used in a host of Food and Drug Administration (FDA) approved therapeutic devices, owing to its biodegradability and biocompatibility.

The recent introduction of ET4ME by EmulTech answers today's industry challenges. The controlled microfluidic technology offers an effective and powerful approach to design the controlled release of any drug type, especially poorly soluble drugs. Polymer microspheres are formulated with a highly defined size, encapsulating the API in a polymer matrix, typically of the PLGA type. Choosing the polymer establishes the release duration, ranging from weeks to months, and choosing the defined, monodisperse size establishes the zero order kinetics of the release. The system operates under aseptic, closed conditions and eliminates the need for complex work-up steps. Scale-up is achieved by massive parallelization, ensuring product consistency throughout the pharmaceutical development pipeline. This control over drug

delivery formulation, offers a tool to bring a product to the market within record time.



Chitosan delivery system: This project aims to produce chitosan microparticles in ET4ME. Chitosan, a polycationic biopolymer, has favorable characteristics, e.g., cationic charge for uptake by mucosae. It is widely recognized in the field of health for its many interesting properties such as biocompatibility and biodegradation.

In this project, the treatment of sublingual desensitization with recombinant allergens encapsulated in particles of chitosan will be evaluated *in vivo* in an animal model. This vaccine formulation is likely to induce tolerance and increase the efficiency of an allergen against respiratory allergies.

EmulTech ET4ME: Emulsion Technology for Micro Encapsulation (ET4ME) is a highly versatile technology based on a microfluidic process. The features presented below ensure cost-efficient and timely development of products, with better therapeutic effects, less side effects and better patient compliance.

ET4ME differentiates itself from other particle formation processes in the following aspects:

- It is based on measurable parameters. Particle formation now becomes a measure-and-make process and is no longer trial-and-error.
- It is compatible with various APIs, ranging from small molecules to complex biomolecules.
- It results in highly uniform products. Each particle is formed individually in the same manner, leading to uniform size, loading and morphology.
- It is highly batch-to-batch consistent. Droplet formation is based on a physical process, so fixed process parameters give fixed product characteristics.
- It is highly reproducible during scale up. Mass parallelization is possible to upscale to large volumes, while maintaining the fixed product characteristics. Know-how and technology is available in-house to develop to full-scale production plants.
- It is a closed system. As a result, degradation by air/oxygen can be eliminated.
- It easily produces particles aseptic. Inline filtration in the closed system ensures a sterile process. Also, smart process design ensures easy cleaning of the system.
- It is a static system with no moving parts. Therefore, the system does not inflict high temperatures or high shear on fragile and precious components. It also makes the system very reliable and stable in operation.

EmulTech management

Fränk de Jong – Chief Executive Officer



Fränk is an industrial engineer and business manager from the Eindhoven University of Technology and holds a Master's degree in Innovation Management. As CEO, Fränk is responsible for the long-term direction of the organization. As a result, he is also involved in business development and fund raising. Fränk's key strength is

his ability to manage complex multi-stakeholder projects.

Robin de Bruijn – Chief Technology Officer



Robin is a chemical engineer from the Eindhoven University of Technology and holds a Master's degree in Process Engineering. Robin provided an important contribution to the development of the microfluidic technology, and currently leads the development projects where the technology is applied, as

well as the further engineering of the process to commercial scale. As CTO, Robin is responsible for long-term technological development programs. Robin's key strength is his ability to translate complex technological situations in easy comprehensible concepts.

Please, visit www.EmulTech.nl for the animation of ET4ME and for further information about EmulTech.

