Global experts in
nanotechnology and drug
particle engineering

nanoform
small is powerful

small is powerful

Nanoform is an innovative nanoparticle medicine enabling company that supplies best-in-class nanoforming™ services to the pharmaceutical industry. We are driven by a passion for innovation, and work with our partners to find ground-breaking solutions that enhance drug effectiveness and targeting. "Small is Powerful" exemplifies how our technology can significantly enhance the properties of drug molecules to benefit patients around the world. It also embodies Nanoform's ambition as a growing company that aims to double the number of drug candidates reaching the market.

nanoform.com

"Nanoform have an exciting and innovative platform technology with the potential to rapidly transform pharmaceutical efficiency and effectiveness, utilizing physics to solve the industry's chemistry and biology challenges. It's very exciting to support them on their journey and see the impact they will make to pharma and ultimately patients."

Mike Rea, CEO, IDEA Pharma

Our story

Our story started in 2008 when Prof. Jouko Yliruusi and Prof. Edward Hæggström combined their respective expertise in pharmaceutical chemistry and physics at the University of Helsinki. This extraordinary collaboration produced a novel particle engineering technology with the ability to transform the pharmaceutical industry. Nanoform was founded in 2015 and has expanded rapidly, to become a Finnish success story with global ambition.

Our values

We are a pioneering company driven by a passion for innovation and a commitment to solving our partners' problems.

Innovation

We will always push scientific boundaries to find ground-breaking solutions to drug development problems.

Quality

We pride ourselves on being a high-quality service provider that consistently adds value to your company.

Partnership

We are an engaged partner that works side-by-side with you to find tailored solutions to individual problems.

Transparency

We provide timely and responsive communication at every stage of the project.

Our passion for innovation enables your drugs to reach their full potential.

Edward Hæggström
CEO

small is transformative

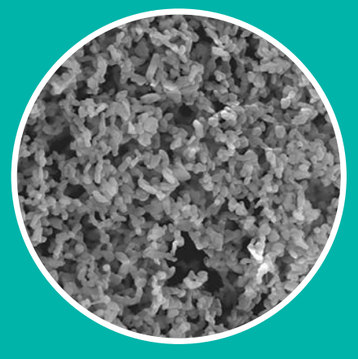
Our best-in-class nanoforming™ technology has the ability to transform the pharmaceutical industry. There is a growing demand for the development of new medicines to meet the requirements of aging populations around the world. To increase the number of drugs reaching patients, drug developers need solutions to complex formulation challenges, including low solubility and bioavailability. Nanoform works with its partners to find exceptional solutions to these challenges through the application of our CESS® nanoforming™ platform.

What is CESS® and how does it work?

Our multi-patented Controlled Expansion of Supercritical Solutions (CESS®) technology is a bottom-up recrystallization technique that enables the creation of API nanoparticles directly from solution. The technique works by controlling the solubility of an API in supercritical carbon dioxide ($scCO_2$) in a process that is free from excipients and organic solvents. CESS® represents a significant improvement over previous supercritical technologies due to the employment of controlled mass transfer, flow and pressure reduction.

Before nanoforming™

mag	det	HV	spot	pressure	dwell	40µm
2	500xLFD	5.00 kV	3.0	39 Pa	20µs	label



After nanoforming™

mag	det	HV	spot	pressure	dwell	5µm
16	500xLFD	10.00 kV	3.0	41 Pa	20µs	label

Benefits of CESS®

Controlled particle shape

Our nanoforming™ process can control the shape of particles, leading to greater uniformity.

Controlled particle size

Our technology can produce nanoparticles as small as 10 nm. Smaller particles have greater active surface areas, which permits an increased rate of dissolution.

Controlled polymorphism

Polymorphic purity tests have shown that different stable single polymorphs can be obtained with different process parameters, enabling polymorphic control through our process.

Discover our innovative use of sparse data artificial intelligence

Our STARMAP® nanoforming™ technology employs sparse data AI for enhanced drug development. The innovation helps define the physical characteristics of drug candidate molecules from limited data to understand how these parameters influence solubility and bioavailability. This utilization of AI, in combination with our particle engineering technology, will enable us to predict the success of nanoforming™ new drug candidates.

Our nanoforming™ services provide solutions to complex formulation challenges

Pharmacokinetic improvements

Low drug compound solubility is a major cause of attrition in the pharmaceutical industry. Nanoforming™ increases the active surface area of API particles, enabling significant improvements in dissolution rate and bioavailability. Increased bioavailability also results in reduced side effects through the lower dosage required for a therapeutic effect.

Additional drug delivery applications

Our nanoforming™ technology can produce nanoparticles small enough to cross the blood-brain barrier (BBB) for treatment of central nervous system disorders, such as ALS, Alzheimer's disease and Parkinson's disease. Nanoparticles can also be used for novel applications in ocular, pulmonary and transdermal drug delivery.

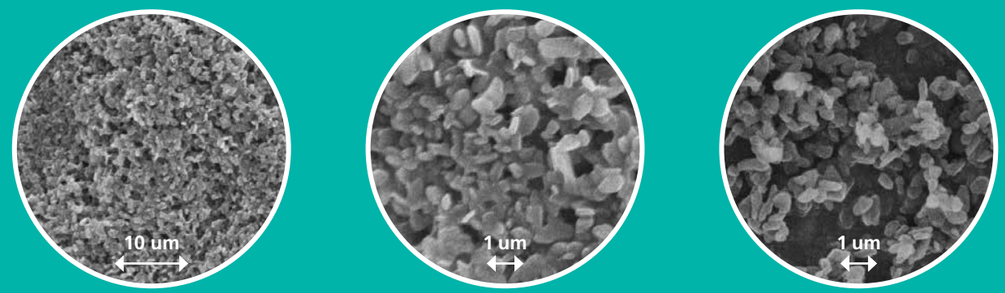
Commercial opportunities

Our particle engineering services can improve the performance of both NCEs and drugs currently on the market by enhancing formulations. The commercial opportunities of our work also include life cycle extension, additional patent protection and the creation of barriers to generic competition.

Piroxicam study evidences superior pharmacokinetic profile of nanoparticles

We assessed the difference in suspension stability and pharmacokinetic behaviour between Dv50 350 nm piroxicam particles produced by the CESS® process and Dv50 2 µm piroxicam particles produced by a standard micronization.

Nanoformed™ Dv50 350 nm piroxicam particles and micronized Dv50 2 µm piroxicam particles produced suspensions that were easily re-dispersible.



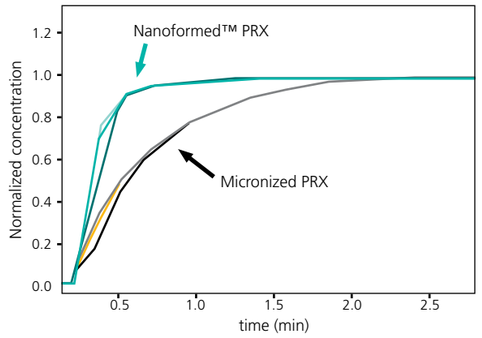
Nano APE suspension | Nano API suspension | Nano API bulk dry powder

Scanning Electron Microscope (SEM) images of the material show that the piroxicam nanoparticles remain as individual primary particles in suspension, and do not agglomerate.

I am very impressed with Nanoform's excipient-free technology and how it can enable different drug delivery applications.

Christer Johansson
CEO, AQPS

In vitro dissolution

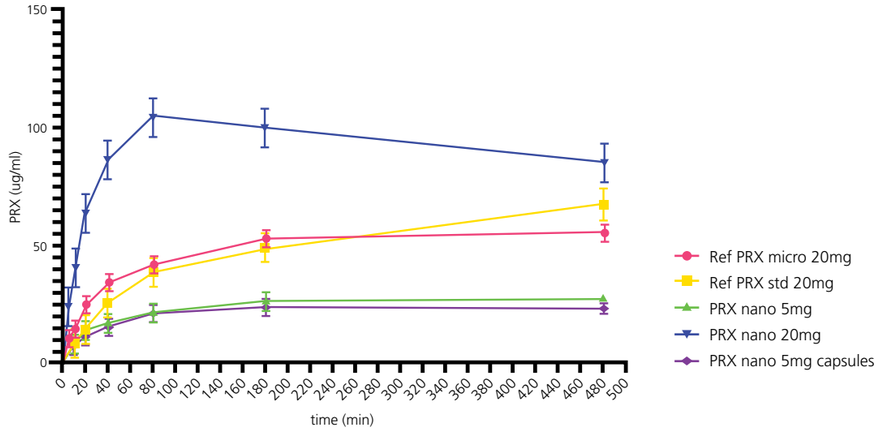


Micronised API PSD
d90: 8.5 micrometers
d50: 2.1 micrometers
d10: 0.5 micrometers

Nanoformed™ API PSD
d90: 8.5 micrometers
d50: 2.1 micrometers
d10: 0.5 micrometers

Piroxicam nanoparticles showed improved *in vitro* dissolution compared to their micronized counterparts.

Piroxicam in plasma



A further study compared the pharmacokinetic profile of Nanoformed™ piroxicam with the micronized piroxicam formulations. It demonstrated that Nanoformed™ piroxicam with 20 mg/kg oral dose has superior pharmacokinetic properties compared to those of the microparticle (p-value < 0.01 at 80 mins) and standard particle reference formulation (p-value < 0.01 at 80 mins), with faster Tmax, higher Cmax, and larger AUC.

No difference (>0,9999) was observed between the 5 mg/kg nanoformulated oral suspension and the 5 mg/kg nanoformulated capsule dosing groups, which indicates that both dosing formulations can be used in future studies.

Based on these results, a possible dose reduction could be achieved with the 350 nm API particles. A larger dose reduction is expected when using smaller nanoparticles.

The results of this case study have important implications for the pharma industry. This is because decreasing the dosage of a drug is beneficial for the patient and because it can reduce manufacturing footprint, CAPEX, and environmental burden.

small is clever

We are a small group of highly skilled professionals united by a passion for problem solving. Our multidisciplinary team consists of talented individuals from across the globe, and brings together scientists and world-renowned experts in pharmaceutical business development. Every member of our team is dedicated to accelerating your compound to market.

Our team

At Nanoform, we believe in pushing boundaries to find exceptional solutions to pharmaceutical development challenges. Our work has innovation at its heart and we encourage our employees to apply their specialist knowledge to new fields. We are proud of the supportive environment we have developed, which allows our staff to grow and embark on exciting new challenges.

Nanoform combines exciting science, enthusiastic people and represents a fantastic partnership opportunity for our clients.

Satu Lakio
Pharmaceutical Development Manager

Nanoform is a fast-growing technology-driven company that has attracted talented and motivated people. In my mind, our team and the technology are our greatest strengths.

Maria Lume
Senior Scientist

Our facilities

Our facilities are located at Cultivator II within Viikki Life Science Park – Finland's largest bioscience hub. We have doubled our capacity to handle potent APIs and provide nanoformed™ materials for clinical trials through the construction of our GMP manufacturing plant. The six-fold growth in capacity has enabled us to meet the growing demand for formulations with improved solubility and bioavailability. We are committed to continual improvement in the areas of Environment, Health and Safety (EHS), to ensure compliance with Good Manufacturing Practices (GMP).

We help partners around the world by nanoforming™ APIs for a range of therapeutic areas.

Edward Hæggström
CEO

See what small can do for you

1

Initial evaluation

We first perform an initial evaluation to understand compound characteristics. Our extensive conversations with partners enable us to fully define what we aim to achieve and the challenges involved.

2

Proof of concept and process

A proof of concept study is initiated to determine the feasibility of nanoforming™ the material. A proof of process study is then performed to find the optimal process parameters for consistent, reproducible results.

3

Scalability assessment and manufacture

A demonstration batch is produced at a larger scale before being moved into a GMP facility for clinical production.

Nanoform's high quality and innovative spirit is an unbeatable combination.

Antti Iitiä
CEO, OY LS LINK AB

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