

THINK NANO

Nanoparticles can stabilize vaccines and pharmaceuticals, increase the bioavailability of drugs and deliver substances to their target site. With the new technology platform developed by leon-nanodrugs, nanoparticles for healthcare will be produced faster, easier and more economically in the future.

When the first vaccines against Covid-19 based on mRNA were approved for use, nanotechnology also came into the focus of the broader public. Naked mRNA degrades readily. Therefore, in order to stabilize mRNA and deliver it to the target cells to trigger an immune response successfully, it was packed inside nano-sized transport capsules. These capsules, or "lipid nanoparticles" (LNP), act as a vehicle for genetic material or other active pharmaceutical substances. With LNPs, substances can be targeted to specific regions of the body, which is of great advantage in cancer therapy, among others.

leon-nanodrugs, a Munich-based start-up, has been active in the nanotechnology space since 2011, with a clear goal: to make the production of therapeutics based on nanoparticles easier, more efficient and more economical through fast and seamless scale-up. To this end, leon-nanodrugs has developed the NANOnow technology, with its proprietary jet impinging reactor, in which substances collide at high speed. This patented platform is a breakthrough technology designed for continuous, reliable

encapsulation of mRNA, biomolecules or other active pharmaceutical ingredients (API) into lipid nanoparticles with a reproducible size between 10 nanometers and up to 70 micrometers.

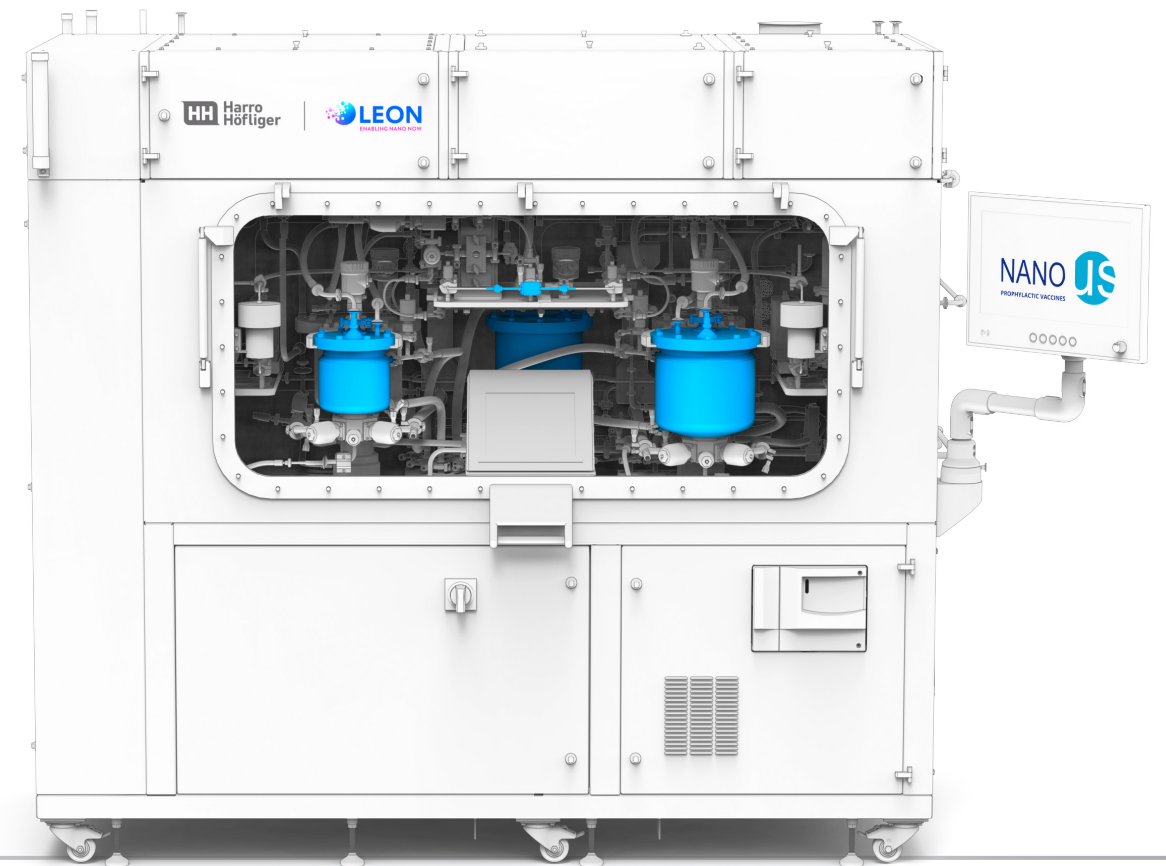
NEW POSSIBILITIES

NANOnow has long outgrown the laboratory environment. In cooperation with Harro Höfliger, the assembly of the fully-automated aseptic device, NANOUS, for the GMP-compliant nano-encapsulation of APIs on a commercial scale is under way. This manufacturing device is particularly suited for flexible production of LNP-based vaccines, enabling encapsulation of active substance for 6 to 8 million vaccine doses per day. It features an integrated process analysis technology (PAT) that enables real time product release.

"Staying true to our motto 'One process, one reactor', which perfectly complements

Harro Höfliger's philosophy 'From Lab to Production', NANOnow can be implemented in various production systems. Scale-up takes place using the same reactor core and therefore is much faster, since new validation of the process is not required," says Dr. Setu Kasera, Head of Science and Engineering at leon-nanodrugs. "This opens up new opportunities to make LNP-based medicines widely available for public healthcare and targets unmet needs of pharmaceutical and biotech industries, as well as contract manufacturers (CDMOs)."

Harro Höfliger is not only responsible for the development and production of NANOUS; their Pharma Services department also supports leon-nanodrugs in product development work. Further joint applications of nanotechnology are in the pipeline, for example for personalized medicine, another increasingly important future market.



leon-nanodrugs GmbH