



A NEW ERA OF PHARMACEUTICAL MATERIALS: THE IDEAS PROJECT TO TRANSFORM THE DRUG FORMULATION PANORAMA

On 1 November 2026, the MSCA Horizon Europe-funded IDEAS Doctoral Network will launch with the goal of addressing a major challenge in pharmaceutical development: drug solubility, in other words, how easily a medicine dissolves in the body. This major barrier can limit drug effectiveness and prevent promising therapies from advancing beyond clinical trials to reach patients. By combining cutting-edge research on amorphous pharmaceutical materials with the training of 15 doctoral candidates across academia and industry, IDEAS aims to transform how medicines are designed and delivered. Its international network of universities, pharmaceutical companies and research organisations will tackle the poor water solubility affecting an estimated 70–90% of new drug candidates.

When life-changing medicines don't reach their full potential

Imagine knowing that a potentially life-changing medicine already exists, yet cannot work as intended in your body. That's the situation that millions of people diagnosed with cancer, diabetes, cardiovascular disease or psychiatric disorders each year currently face. Although treatments are available, they do not always deliver the best possible outcomes. In some cases, researchers may already have identified a molecule capable of treating a condition, but the resulting medicine cannot be absorbed efficiently or reach its intended site of action. As a result, despite years of scientific investment, many potentially life-changing treatments never achieve their full therapeutic potential, limiting patients' access to more effective options for treating and managing their diseases.

Overcoming the solubility barrier

This challenge extends far beyond the laboratory, affecting millions of patients while imposing substantial costs on healthcare systems and pharmaceutical companies. IDEAS seeks to overcome this barrier by developing new ways to improve how medicines dissolve, remain stable and are delivered to the body. At the heart of the project is an innovative scientific concept: amorphous drug formulations. Unlike conventional medicines, which are typically organised in highly organised crystalline structures, amorphous materials lack this rigid arrangement. This seemingly disordered state can dramatically improve how a medicine dissolves and becomes available to the body, in some cases increasing solubility by factors of 10 to 1,000.



16 partners



10 countries



15 Doctoral
Candidates



4.3M € funding



4 years

From molecular instability to smarter drug development

The same disorganised structure that gives amorphous medicines their solubility advantage also makes them inherently unstable, as they can revert over time to less soluble crystalline forms and lose their effectiveness. To address this challenge, IDEAS will combine predictive models, machine-learning tools and advanced experimental techniques to understand and control the molecular interactions governing drug stability and performance.

During the next 4 years, IDEAS, coordinated by Prof. Frédéric Affouard, will support the development of next-generation amorphous drug formulations, AI-powered design tools and more environmentally sustainable manufacturing technologies. By overcoming long-standing formulation barriers, IDEAS could help more patients benefit from medicines that are currently difficult to deliver effectively, improving treatment outcomes, easing the burden on healthcare systems and offering new hope to people living with serious diseases.

Network



IDEAS was born from a clear need: to move beyond empirical approaches and build a deeper, science-based understanding of amorphous pharmaceutical materials. Our ambition is to combine cutting-edge research with interdisciplinary and intersectoral training, so that the next generation of scientists can develop more stable, efficient and sustainable drug formulations, that will benefit the patients.

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