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Press release



Innovative polymers for membrane protein solubilisation

A co-exclusive license has been signed between Erganeo and companies Polyscope and Cube Biotech for the development and marketing of two versions of polymers that show improved solubilisation efficiencies of membrane proteins. This technology is of real value in biochemistry and pharmacology.

The structural and functional study of membrane proteins can be complex because it is usually only possible once the proteins have been extracted from the biological membranes. In order to do this, scientific teams carry out a solubilisation process to extract these proteins from the cell membranes, which can be done with detergents or amphipathic polymers surfactants. Detergents are known to radically change the structure and reduce activity of membrane proteins, rendering further analyses inaccurate. The polymeric alternatives can be divided in two categories. The first involves adding the polymer (amphipol A8-35) after detergent extraction, which stabilizes the protein, but still may cause structural changes in the protein through the initial detergent exposure. The other category includes polymers (e.g. SMA) that are applied directly to membranes without pretreatment with detergents. In this case, the polymer forms a disc containing the native membrane, causing the proteins to retain their structure and improve stability.

The technology developed by researcher Manuela Zoonens and her team (*Université de Paris & CNRS – UMR 7099 Laboratoire de biologie physico-chimique des protéines membranaires*) is a research tool based on innovative amphipols that allows direct solubilisation of membrane proteins without the use of detergent. Thus, their extraction is simplified compared with conventional amphipols (A8-35), with a process comprising a single step, free of detergent. These polymers allow solubilisation for a wide range of membrane proteins, with better results compared to other existing polymers in terms of the yield of extracted proteins at low polymer concentration. Similar to other detergent-free polymers, the stabilisation performed by this system has the additional advantage of not denaturing the structure of the proteins maintained in aqueous solution and of preserving the membrane lipids associated with the study proteins. The novel amphipols are an efficient time-saving solution for biochemical scientists and pharmaceutical laboratories.

This innovation, whose patent was filed by Erganeo in December 2018, was exclusively co-licensed on 25 March 2022 to two companies: *Orbiscope, powered by Polyscope*, a Dutch company specialising in the production and development of polymers, and *Cube Biotech*, a German company providing tools and services for membrane protein and other research. An initial version of polymer (C8) is currently available online, before the marketing of the second version (C2-C6) scheduled for September 2022.



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About Erganeo – www.erganeo.com

Erganeo is a French investment fund that specialises in breakthrough innovations (deep tech) with a major societal impact. We invest early in the game to secure researchers' newest inventions before they are transferred to companies or before start-ups are founded, across a wide range of scientific fields: Biotech, Infotech (Telecom, connected objects, big data, AI) and Energetech (new energy, chemistry, materials), among others. Erganeo aims to accelerate and simplify links between research and industry for the benefit of society. To do so, we finance and accompany the new generation of French researchers and entrepreneurs on the road to international recognition and success.

As a member of the SATT Network, Erganeo draws on the Ile-de-France network in building the foundations of a better tomorrow, tapping into a talent pool of over 20,000 researchers across 350 cutting-edge, leading laboratories. Since it was founded, Erganeo has invested over €41m, thus contributing to the signing of 88 licensing agreements with companies of all sizes and setting up 31 start-ups.

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About Polyscope / Orbiscope – www.orbiscope.com

Orbiscope is an innovation incubator powered by Polyscope Polymers, the global leader in the research, product development, production and supply of styrene maleic anhydride (SMA) derivatives. Orbiscope is committed to aiding companies in keeping up with the continuous evolution and adaptation that are necessary in today's volatile, fast changing world. With respect to Orbiscope's focus on the world trends we already provide solutions within a multitude of markets and are actively working to provide more solutions together with partners and customers. Fields we are actively involved include Biomedical Research, Cosmetics and Medical Devices. While SMA-based copolymers are at the heart of our organization, we aren't limited to them. The amphipols developed in collaboration with the *Université Paris Cité*, *Cube Biotech* and *Erganeo* are a great example of this.

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About Cube Biotech – www.cube-biotech.com

The Cube Biotech team serves the biotech and pharmaceutical community with its expertise on expression, purification, stabilization and functional/structural characterization of proteins. Our projects focus on the pharmaceutically relevant class of membrane proteins. Both products and services are offered. Our strength - We are service providers as well as manufacturers. A broad range of products for the stabilization of membrane proteins and affinity chromatography of proteins are manufactured at Cube Biotech in house at high quality. The product offering is complemented by reagents such as detergents, cell-free expression lysates, nanodisc scaffold proteins, and patented membrane protein crystallization plates. Some particularly relevant membrane proteins (GPCRs) are available as fully characterized preparations. Our services cover the expression, purification, stabilization and crystallization of soluble and membrane proteins for applications like cryo electron microscopy, antibody generation, crystallization and assays.

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