

INTRATUMOURAL CONTROLLED RELEASE DRUG DEPOTS FOR FOCAL CANCER TREATMENT

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NanoZolid® is an injectable and bioresorbable biomaterial for focal controlled release drug delivery without the need for post-treatment surgical implant removal. This study concerns an injectable, two-component drug formulation based on calcium sulfate that solidifies *in vivo* to form a solid local depot (NanoZolid®). Due to an optimisation of the microstructure using high pressure (isostatic pressure during re-crystallization) of one component of the biomaterial, the drug release rate can be controlled (Fig. 1). Injectable depot formulations based on biomaterials for long-term drug release have numerous applications for local and focal treatment of cancers while reducing systemic side-effects, e.g. for anti-cancer drug substances such as cytostatics, immuno-active agents and hormones.

The department of Laboratory Medicine, Experimental Cancer Medicine, at Karolinska Institutet in Huddinge, Sweden, conducts world-leading research in cancer medicine. One major goal is to improve the survival rate and quality of life for cancer patients treated with cytostatics and stem cell transplantation through increased treatment efficacy and decreased or eliminated side effects.

By combining the know-how related to the NanoZolid® technology with the well-reputed research at Karolinska Institutet, the project interweaves the expertise of three different areas of science: the sciences of biomaterials; dosage form design; and, dedicated cancer research.

Stefan Grudén will describe the project, the technology and its potential for cancer treatments, at the 5th Annual Formulation & Drug Delivery Congress. The scanning electron microscopy image below shows the microstructure of the depot (Fig. 2) ■

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Stefan Grudén holds a position as Director of Pharmaceutical R&D at the Uppsala-based Swedish pharmaceutical company LIDDS and is also a PhD student at Karolinska Institutet, Stockholm. He has worked in the science field of dosage form design and development and held senior positions for 20+ years and has been an invited speaker at the Swedish Pharmaceutical Society on the conference Optimizing Drug Delivery to the Target and on the Nordic Innovative Drug Delivery Meeting. He has recently published two papers; one describing the NanoZolid® technology, and one preclinical study investigating intra-tumoral injections in mice.

Moustapha Hassan: Professor at the Dept. of Lab. Medicine, Karolinska Institutet, Huddinge, Sweden

Niklas Axén: Associate Professor and inventor of the NanoZolid® technology, LIDDS AB, Sweden

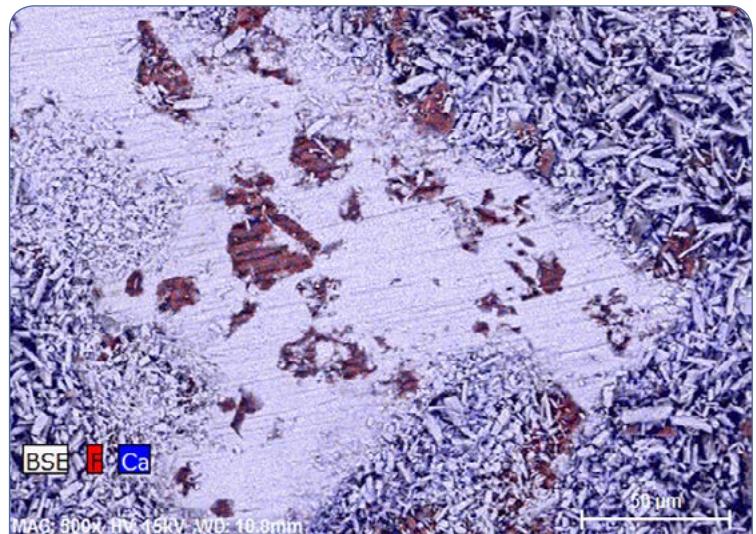


Fig. 2: Scanning electron microscopy (SEM) with energy dispersive X-ray analysis (EDX) mapping image of microstructure of NanoZolid® in solidified form, showing precipitates of 2-hydroxy-flutamide (red) in the porous matrix as well as in the densified granules (white-grey).

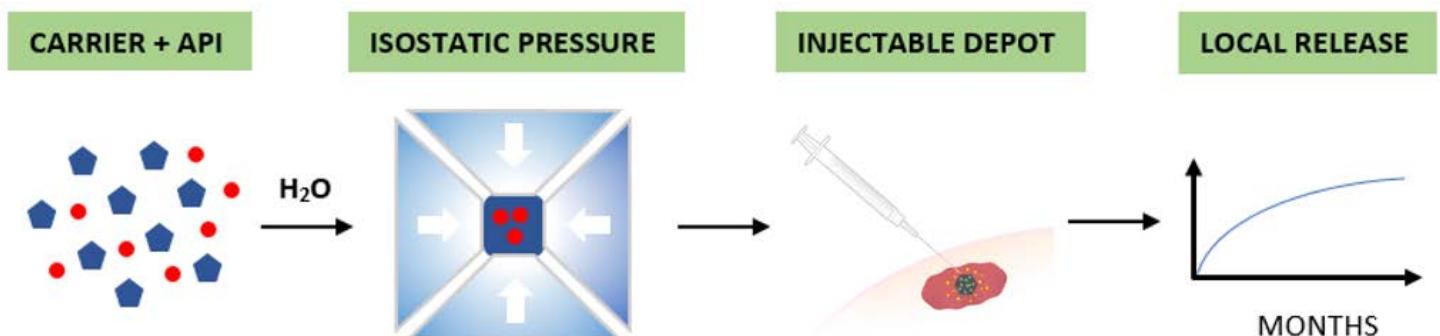


Fig. 1: Schematic illustration of the NanoZolid® technology