




Silvio Danese

## RUNNING

### Gut-targeted RNA-based nanoparticles for fibrostenotic Crohn's Disease: a novel therapeutic approach


#### Coordinator:


 Silvio Danese, IRCCS Istituto Clinico Humanitas- Humanitas Mirasole SPA, IBD Center, Rozzano, Italy

#### Contact:

sdanese@hotmail.com

#### Partners:

 Ruth Schmid, SINTEF Industry, Department of Biotechnology and Nanomedicine, Trondheim, Norway

 George Loudos, Institution BioEmission Technology Solutions (BIOEMTECH), Athens, Greece

 Didier Betbeder, VAXINANO, Lille, France

 Michele Iafisco, National Research Council of Italy (CNR), Faenza, Italy

Intestinal fibrosis, i.e. the reaction of intestinal tissue to the damage inflicted by chronic inflammation, is a common and potentially serious complication of Crohn's Disease (CD) that, to date, has no effective medical treatment. We previously observed that specific proteins are causally involved in the development of intestinal fibrosis and that calcium phosphate (CaP) nanoparticles conjugated with active compounds against these targets, may represent a valuable drug delivery system and a new therapeutic approach for future treatments of fibrostenotic CD patients. The overall goal of this project is to conceive an innovative nanoparticle-based drug delivery system to the fibrotic gut mucosa, featuring various routes of administration, cell specific targeting, efficient drug release, and maximal retention time in tissues. Furthermore, using a multi-disciplinary approach, we aim at promoting innovation and creativity in specific drug-loaded CaP formulations or preparations, that will be validated both in human primary cell lines derived from fibrotic patients, and in animal model of intestinal fibrosis, thus enhancing the translational aspect of this study. The proposed project is a unique

opportunity to make a jump in our understanding of CD-related intestinal fibrosis, possibly opening new ways for more focused therapy. Additionally, the use of nanoparticles is suggested as a possible way for imaging intestinal fibrosis evolution and treatment, which could potentially open the way to new diagnostic and monitoring methods.

