REGENERO

New Drugs and Technologies in regenerative medicine

Main partners involved

All the Researchers of Drug Science Department – University of Pavia – are involved in the project

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The problem

Three of the major challenges in medical sciences are 1) the **prevention** of diseases through the study of genetic and environmental risks by innovative epidemiological methods, 2) the **treatment** of pathologies with drugs directed to novel targets and 3) the **regeneration** of tissues and organs, restoring damages and/or slowing the progression of severe degenerative diseases. Although extremely challenging, the "**regenerative**" approach to pathologies seems to be the most promising, as underlined by the progresses in stem cell research and in the peripheral tissues bio-engineering (e.g. burn skin). However, restoring some damage human tissues, such as Brain or Spinal Cord, still faces important barriers, since their complexity.

The solution

The project aims to unify expertise from different research fields and to contemporarily addressing the multiple aspects of the "degenerative" process. In detail, the identification of **new molecules** with **repair/protective potential** will be associated to the development of **bioactive therapeutic platforms**, able to both effectively deliver drugs and promote tissue repairing. Moreover, since sustained **inflammation** plays a crucial role in degenerative mechanisms, it will be kept in consideration during the drug discovery process.
In the context of the project, mucosae (colorectal, buccal, oesophageal), skin, bones (maxillo-facial, intervertebral disk), cartilages, cardiac muscle and nervous tissues will be the main tissues investigated.
Lastly, the **multidisciplinary** nature of the Research Groups involved will assure the sharing of diverse and complementary skills, from **Medicinal Chemistry**, to **Pharmaceutical Technology**, to **Biomedical Engineering**. Moreover, the project is based on "cutting-edge" drug

discovery approach, which originates from the continuous and tight relationship between academic research and industry. Therefore, this flexible organization will allow the conversion of scientific discovery into health improvement (**translational medicine**). The final aim of this proposal is to bring together research, clinicians, scientists and industry partners.

Goals

- Identify **new potential drugs** able to promote tissue repair/regeneration and, when appropriate, to control bacterial growth
- Develop **bioactive therapeutic platforms**, able not only to load the actives (e.g. drugs, cells) maintaining their therapeutic properties, but also to enhance their efficacy.
- Promote the **translation** of medical advances from the laboratory to clinical services.

Publications within the field

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