Supervisor: Franca Ferrari, Silvia Rossi, Giuseppina Sandri
Lab Staff: Barbara Vigani, Angela Faccendini, Marco Ruggeri
Scientific consultant: Carla M. Caramella
Principal Departmental collaborations: Nanomedicine and Theranostics Lab MedChemLab

Lines of research:

Project leader: Franca Ferrari
**Agri-food waste products as sources of functional components for pharmaceutical and nutraceutical products.**
Aim of this research line is to investigate the use of agri-food waste products, such as those obtained by grapes or olive processing, as sources of functional components (namely natural antioxidant moieties) to be employed for the development of nutraceuticals or of pharmaceutical products intended for wound healing. Due to the high availability and low cost of agri-food waste products, the developed formulations (polymeric scaffolds obtained by electrospinning or microcapsules prepared by spray drying) will provide a significant added value from economic and environmental view points.

Project Leader: Silvia Rossi
**Dual-functioning platforms composed of nanocarriers (nanofibers or nanoparticles) embedded into polymeric matrices (films, sponge-like systems, fibers, in situ-gelling systems) for local drug delivery.**
Aim of this research line is the development of: i) cross-linked electrospun nanofibers based on anionic polysaccharides embedded into polymeric matrices (film, sponge-like dressing), intended for the treatment of spinal cord injuries and for wound healing. Nanofibers act as support for axonal outgrowth or fibroblast migration/proliferation, while the external matrix facilitates the in vivo application, modulates the system biodegradation rate and the release of the loaded drug; ii) Lipid and polymeric nanoparticles loaded into fibers or thermosensitive liquids for the local delivery of drugs in cancer therapy (glioblastoma, vesical cancer) and mucosal inflammatory diseases.

Project Leader: Giuseppina Sandri
**Scaffolds for skin and tendon/ligament tissue engineering.**
Aim of this research topic is the design and the development of polymeric scaffolds for tendon/ligament reparation. Scaffolds are prepared by means of easy scalable processes (electrospinning or casting) and are loaded with inorganic nanoparticles for the healing enhancement specifically at bone to tendon interface. 3D constructs, able to deliver growth factors and/or antibacterial agents are under development. Innovative compositions are under study to avoid organic solvents in the preparation step and to obtain scaffolds characterized by suitable mechanical properties and complete biodegradation.
The research group is actually collaborating with the following foreign Universities: University of Coimbra (Prof. S. Simoes), University of Granada (Prof. C. Viseras and C. Aguzzi), University of Helsinki (Prof. H.A. Santos), University of Beira Interior-Covilhã (Prof. R. Palmeira-de-Oliveira), University of Szged (Prof. I. Eros and E. Csányi, M. Sucsz), Trinity College Dublin (Prof. A. Prina Mello), Tufts University, Medford, Massachusetts, (Prof. L. Black).

**Other informations:** [selected publications (max 5) - website]


B. Vigani, S. Rossi, G. Milanesi, M.C. Bonferoni, G. Sandri, G. Bruni, F. Ferrari, Electrospun alginate fibers: Mixing of two different poly(ethylene oxide) grades to improve fiber functional properties, Nanomaterials 2018: 8, Article number 971