UNIVERSITÀ
DEGLI STUDI
DI PADOVA

Patterned-hydrogel - Macroscopic patterning on hydrogel using light and chemical fuel

The main scientific objective to this proposal is to develop novel methodology for the creation of patterns on hydrogels using an external stimulus. Light represents a particularly attractive stimulus because it enables rapid changes with high spatial resolution and does not require physical contact with the material. We will develop transient patterns on hydrogels using light. The approach relies on the spatially controlled release of fluorophores from Au nanoparticles by light-controlled co-factors. The novelty of the system is that all components interact exclusively through non-covalent interactions. The final aim is to obtain self-erasable hydrogels that can be imprinted with different patterns depending on the wavelength used for irradiation. In another approach, we will develop patterns using a catalysis-based strategy. Success of this proposal will open the door to applications in transient or erasable information storage in soft materials. Advantages are the ease of creating highly complex systems, a high degree of flexibility and a complete reversibility of all processes. This project is on the interphase between systems chemistry and nanotechnology providing a great opportunity for the ER to develop skills in these areas. This process will help the ER to become an independent researcher by preparing manuscripts and proposals, engaging with public, understanding IPR issues, networking, participating in conferences. Participation in international research conferences and access to the scientific network of the hosting group will allow the ER to gain visibility. The ER will sharpen his leadership and supervision skills by mentoring MSc and PhD students. The combined package of scientific knowledge and training program will make this project an excellent platform for kickstarting the independent career of the ER.