GDR « B2i »

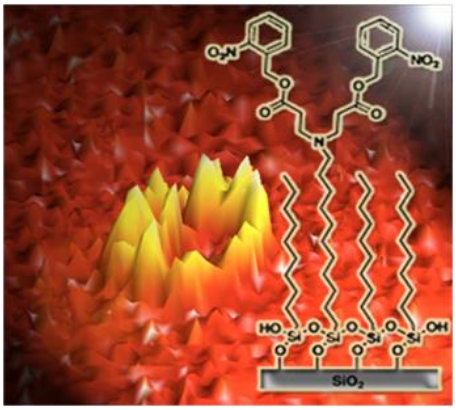
Bioingénierie des Interfaces

Goals

The mission of the Bioengineering Interfaces Research Group (B2i) is to federate the French and French-speaking European communities around a multidisciplinary theme whose research activities focus on biointerfaces.

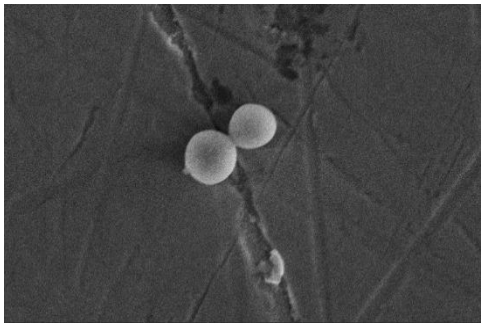
The purpose of the GDR B2i is to encourage synergies between the different disciplines in order to allow the emergence of innovative and transversal projects. Faced with current public health challenges, medical devices (biomaterials, implantable devices), biochips, Lab-on-a-chips, biosensors and nanomaterials are used in a wide range of applications ranging from medical to environmental analysis through food control (dosage of GMOs, mycotoxins, pathogens, etc.).

The bioengineering of interfaces therefore aims to control the physical, chemical and biochemical properties at the interfaces of materials in order to control their stealth and specificity.



Engineering of mixed SAMs on SiO_2

Titanium #Total hip prothesis



S. aureus @ titanium surface

4 thematic axes

Development of complex biointerfaces: functionalization, printing and nano-structuring

Characterization of biointerfaces, opportunity and perspectives: towards *operando* characterization and *in silico* calculations

Biointerfaces at the heart of medical devices

Transversal action: A major issue: microorganism/surface interactions

200 researchers involved coming from **50** research teams

Prospective

The multidisciplinarity and transversality of biointerface research is clearly highlighted when considering the fields of research of GDR B2i teams.

From a scientific point of view, the actions of GDR B2i have highlighted new scientific directions but also new needs both in the development and in characterization of biointerfaces. Thus, the scientific axes have seen their scopus redrawn by the arrival of new teams, but also with the creation of a new transversal axis targeting the wanted or unwanted interactions between microorganisms and interfaces.
Thus, new ways of functionalization and development of complex interfaces are investigated with the contribution of nanostructured architectures in 3 or 4 dimensions but also with more selective and multifunctional functionalizations. *In-situ* and/or *operando* characterizations, but also the coupling of spectroscopic and microscopic techniques are highlighted while emphasizing *in silico* calculations aspects. New directions towards the field of biomedicine are undertaken, with applications in the field of on-board sensors and miniaturized devices; we also note the emergence of the application for diagnosis and therapy of the use of nanoparticles. Finally, a major issue, which is the interaction between various microorganisms and surfaces, is now addressed; these interactions can be harmful as in the case of biofilm formation or desired in the context of the detection of pathogens or the use of microorganisms in the field of energy.

Finally the GDR B2i wishes to:
1) increase its European influence with in particular the integration of French-speaking European laboratories providing new skills both in characterization (with for example the JRC laboratory in Ispra in Italy), and in development and application (with the CSEM in Neuchâtel in Switzerland).
2) increase interactions with industrial partners and end-users with the creation of a “industrial club” but also the integration of laboratories working in applied fields with new research teams from INSERM in Strasbourg (Biomaterials Bioengineering) of CEA / CNRS / UGA with the Metals and Organs team of LCBM in Grenoble or the Engineering team for Applications in Life Sciences of the UPR CNRS LAAS in Toulouse.
3) increase its network and the training of young researchers by creating a club of doctoral and post-doctoral students who would allow them to take a more active part in the life of GDR B2i, to be a driving force for new actions and for the future to create at the end of the 10 years life of the GDR B2i. This club would also make it possible to set up networking for the future of young graduates and their integration into the world of research, both academic and industrial.

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Site internet du GDR : https://events.femto-st.fr/GdR_B2i/fr

cnrs GDR Groupement de recherche B2i Bio-ingénierie des interfaces