

# Biocompatibilization of polymer devices

## SENIOR SCIENTIST:

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## Research Field and Subjects

The laboratory is dedicated to the design and the organic synthesis of biologically active molecules, and to the use of such molecules for the biocompatibilization of polymer materials by selective surface modifications.

The molecules of interest are:

- ▶ peptidomimetics of the RGD sequence as ligands of  $\alpha_n\beta_3$  integrins (cell membrane receptors of endothelial cells, and others);
- ▶ peptidomimetics of the LDV sequence as ligands of  $\alpha_n\beta_1$  integrins (cell membrane receptors of leukocytes);
- ▶ high-affinity inhibitors of thrombin (enzyme involved in the blood coagulation cascade).

The polymer devices of interest are:

- ▶ cell cultivation supports made from PET, PEEK, PS, PMMA, ...
- ▶ filtration membranes made from PBT, PVDF, ...
- ▶ home-made polymer films displaying chemical heterogeneities at the nanometer scale.

The materials surfaces are modified by:

- ▶ wet-chemistry treatments;
- ▶ covalent grafting of the biologically active molecules *via* appropriate spacer-arms.

The biocompatibility of the surface-modified polymers is evaluated by:

- ▶ adhesion assays of mammalian cells;
- ▶ blood coagulation assays;
- ▶ selective cell filtration assays.

## Products and Services

- ▶ Organic synthesis of complex molecules
- ▶ Structural analysis of organic molecules
- ▶ Surface analysis by radiolabelling and fluorine tagging
- ▶ Cellular adhesion assay

## Main Equipment

- ▶ IR (infra-red spectroscopy)
- ▶ UV (UV-visible spectroscopy)
- ▶ NMR (nuclear magnetic resonance spectroscopy)
- ▶ Mass (mass spectrometry)
- ▶ GC (gas chromatography)
- ▶ HPLC (high performance liquid chromatography, analytical and preparative systems)

## Representative References

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### Partnership

- ▶ Baxter, Nivelles
- ▶ UCL Unité de biochimie
- ▶ UCL Unité de chimie des interfaces

### STAFF

Total: 8

### KEY WORDS FOR R&D

adhesion, mammalian cells  
 biocompatibility  
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 enzyme inhibitors  
 hemocompatibility  
 medicinal chemistry  
 organic synthesis  
 polymer chemistry  
 peptidomimetics  
 surfaces and interfaces, chemistry

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