Intraocular Lenses with Functionalized Surfaces by Biomolecules in Relation with Lens Epithelial Cell Adhesion

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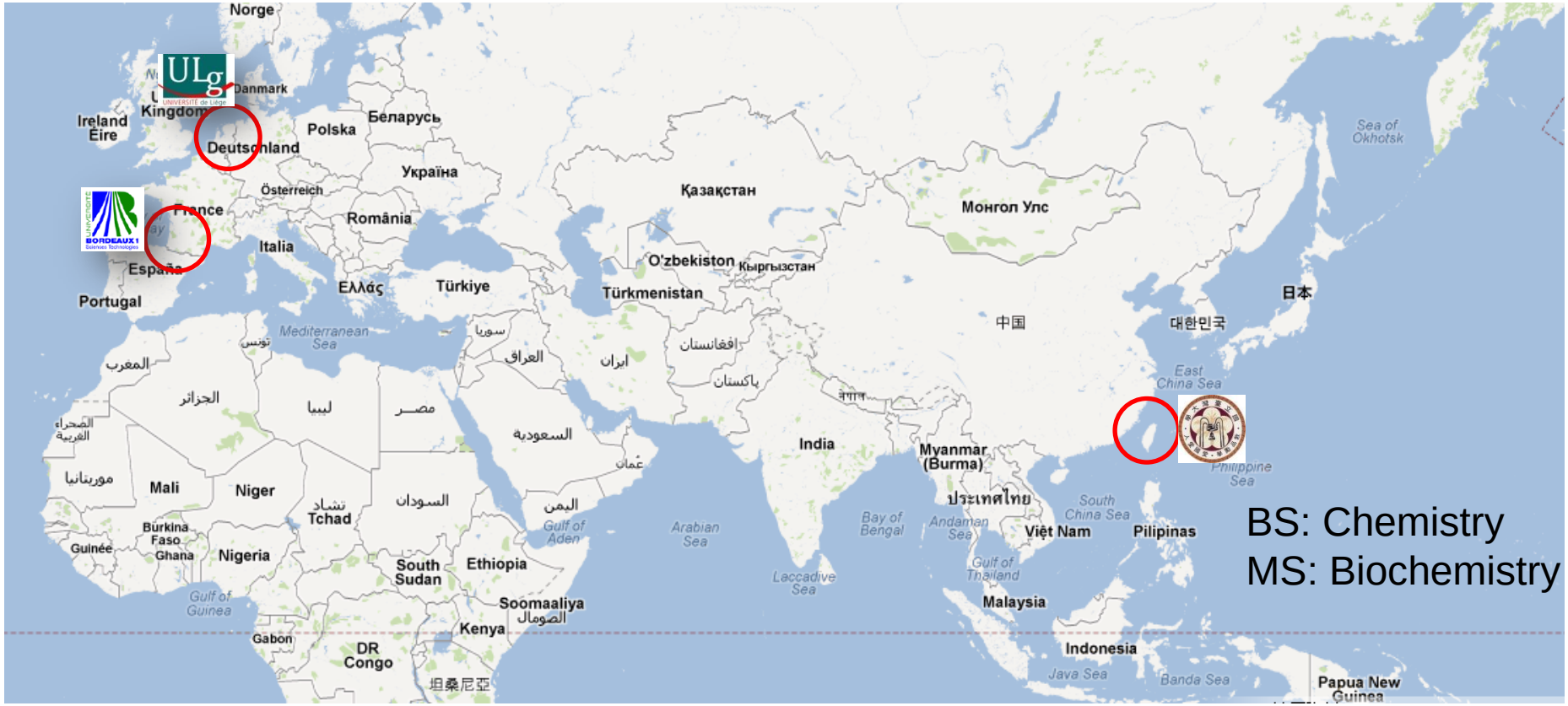
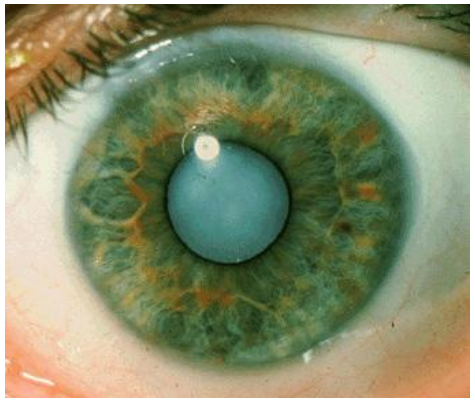
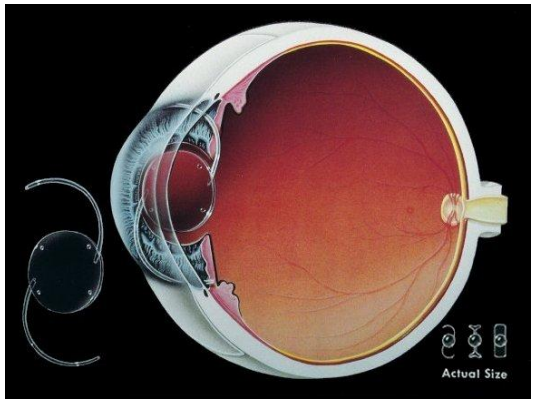
Candidate Curriculum Vitae



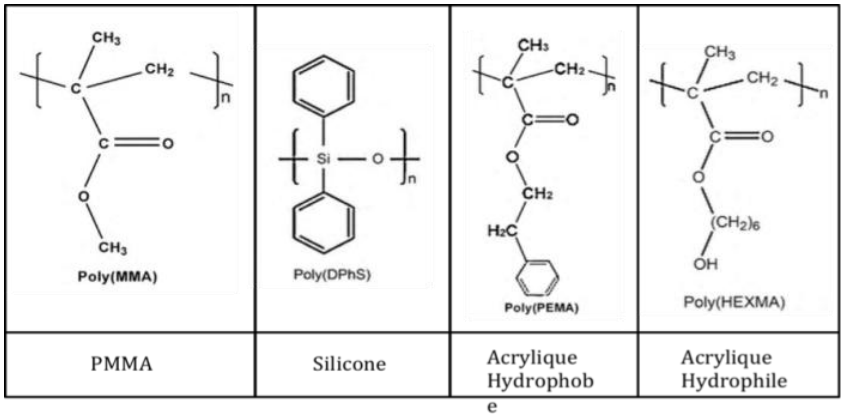
Background of the Project



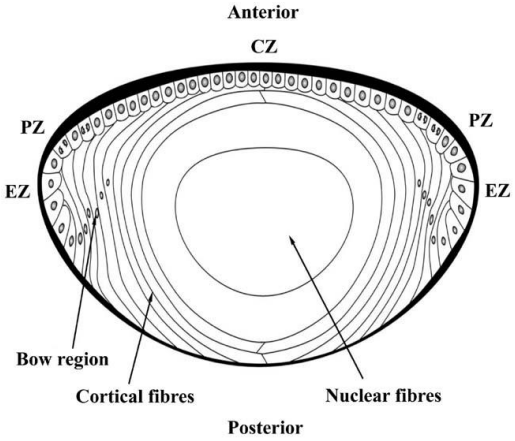
Cataract



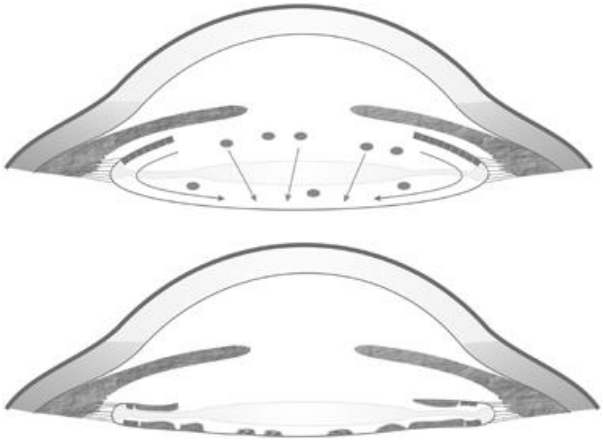
Intraocular Lens



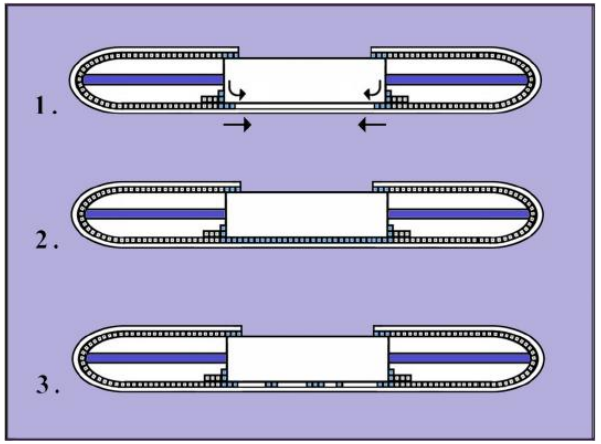
Common IOL Materials



Lens Epithelial Cells

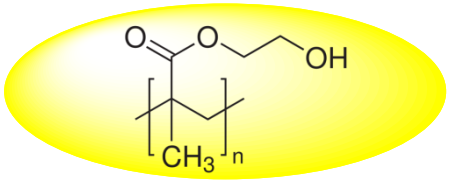


Posterior Capsular Opacification



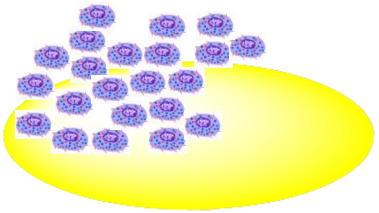
Sandwich Model

Project Objectives

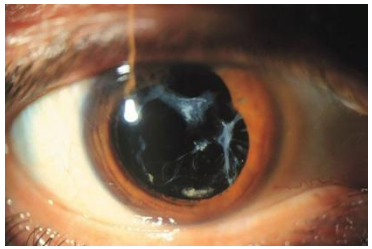


Hydrophilic IOL

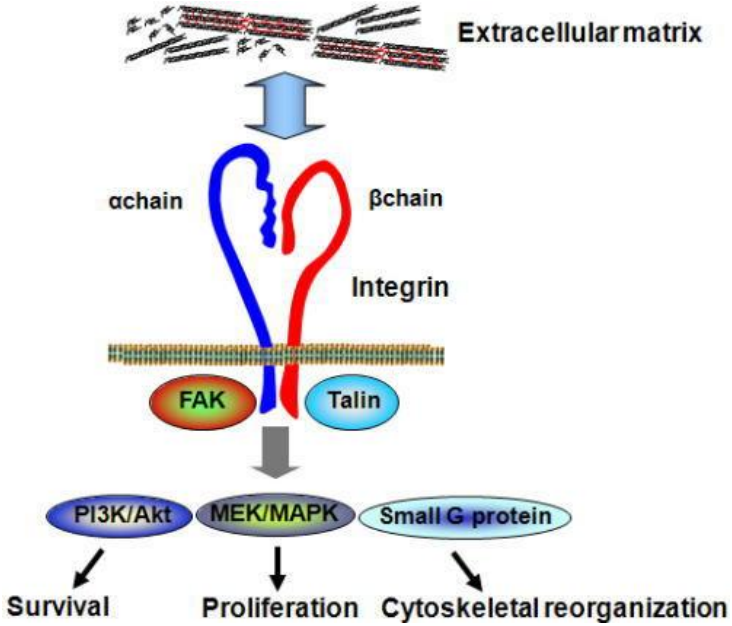
LEC

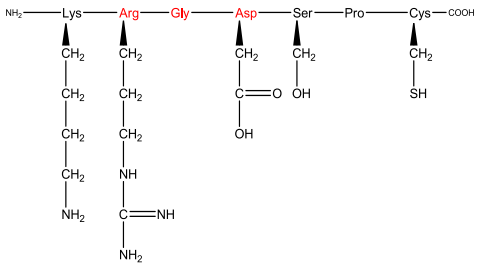


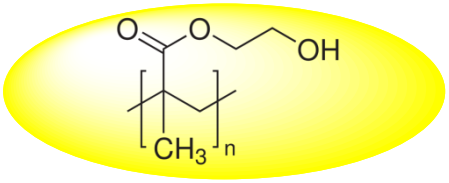
Aggregated LEC



Secondary Cataract

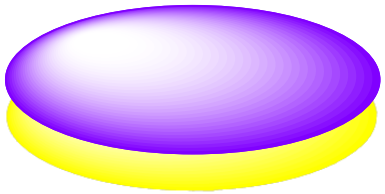






RGD peptide — Surface Functionalization

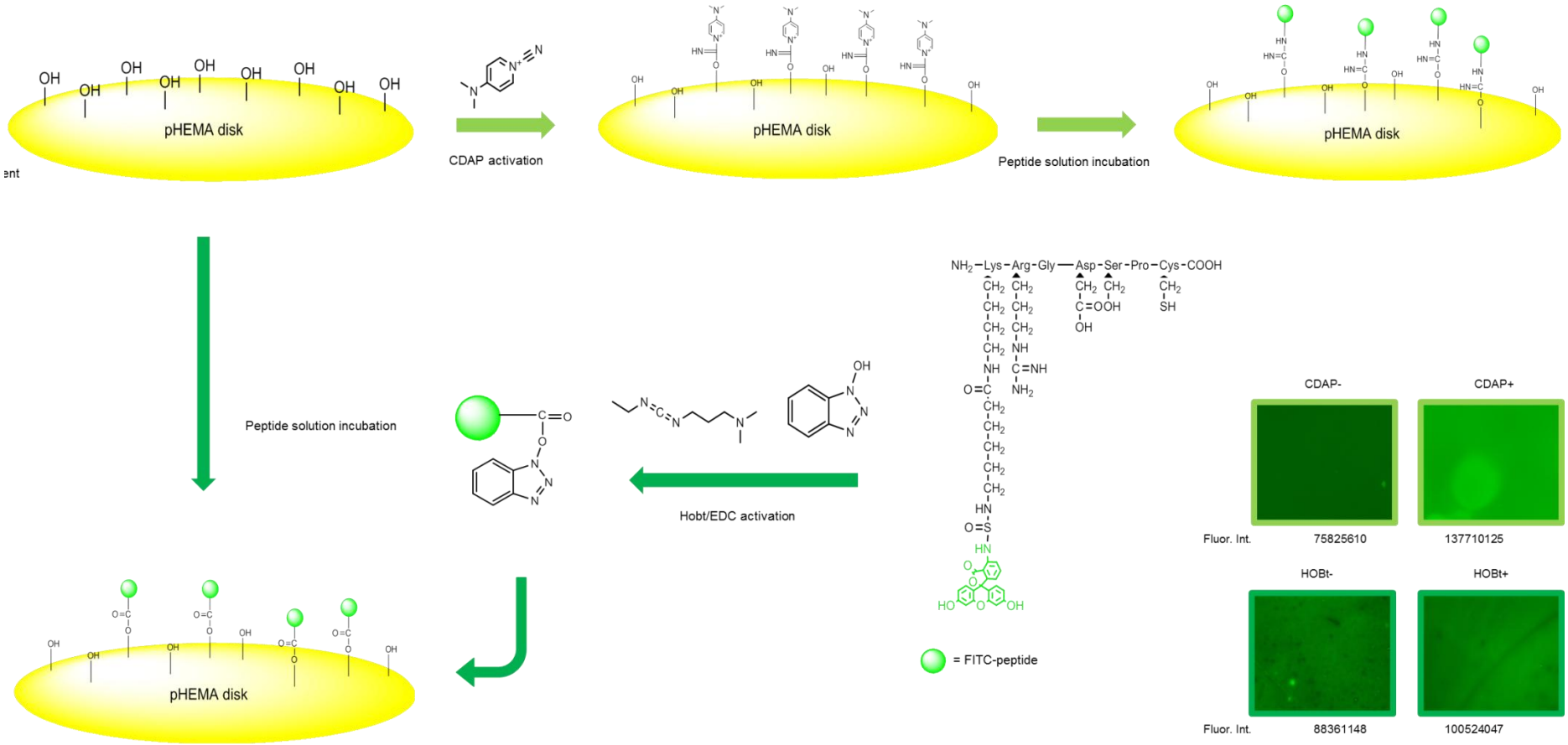
LEC



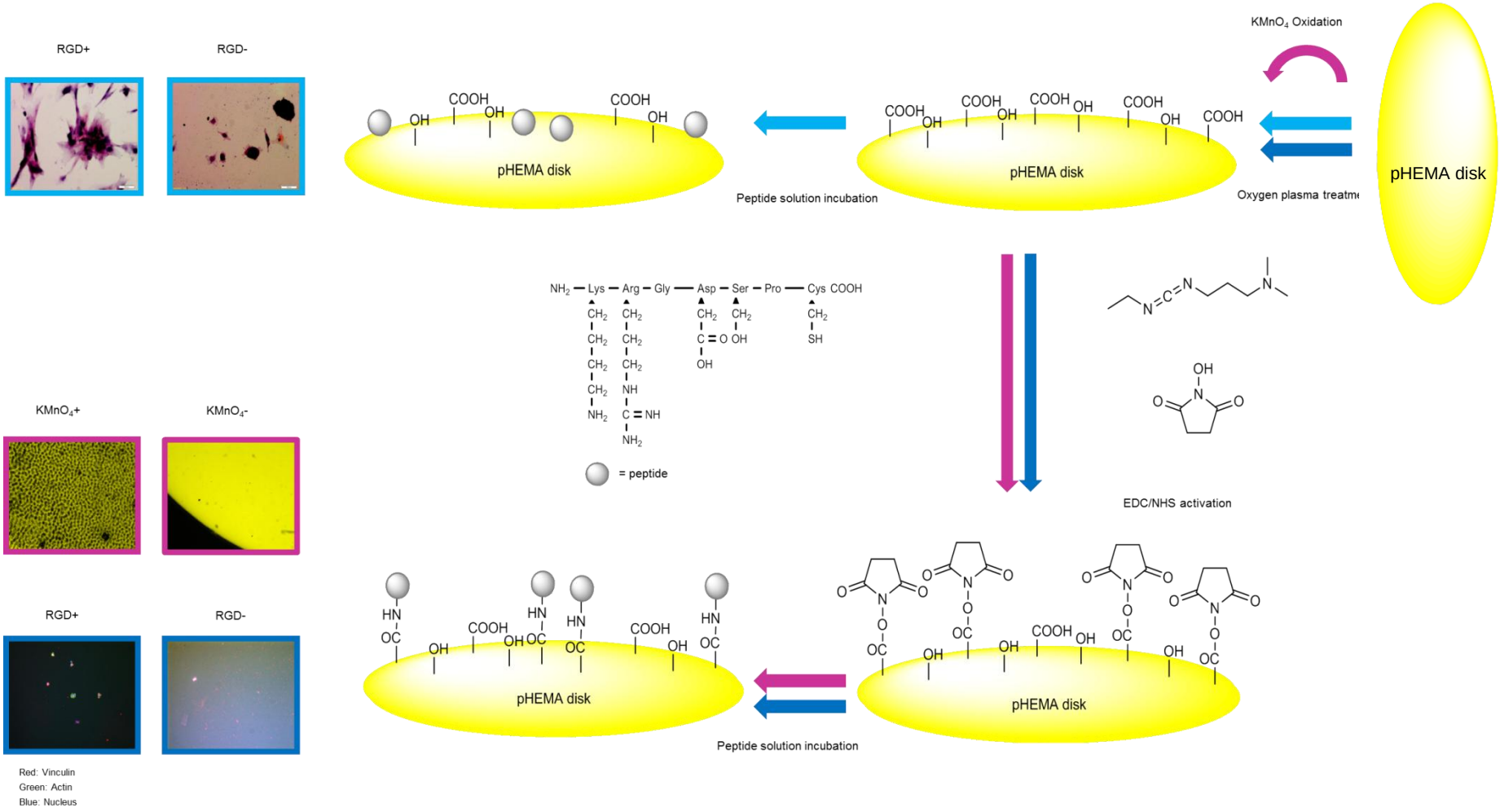
Monolayered LEC

Clear eye

Surface Functionalization



Surface Functionalization



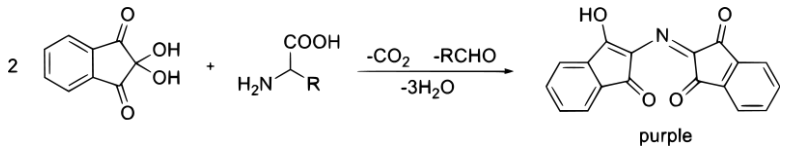
Surface Characterization

XPS

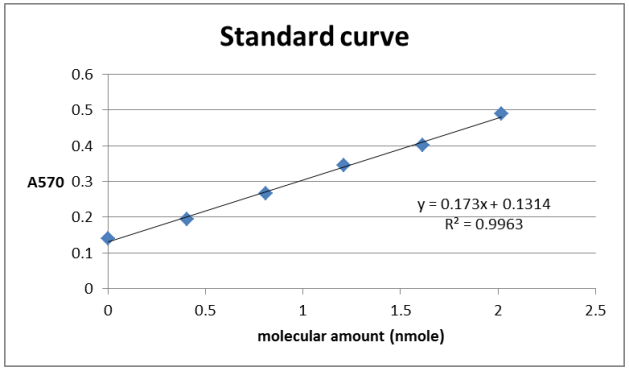
Atomic Percentage (%)

Atomic %	C	O	N	C/O	C/N
Polymer control	68.9	31.1	-	2.21	-
0 mM RGD	68.9	31.1	-	2.22	-
1 mM RGD	72.1	27.0	0.9	2.67	80.16
10 mM RGD	67.6	29.9	2.5	2.26	27.32

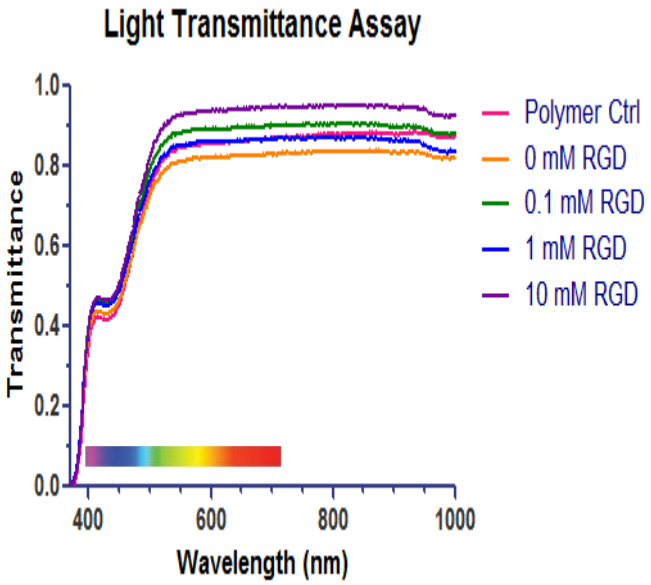
Ninhydrin

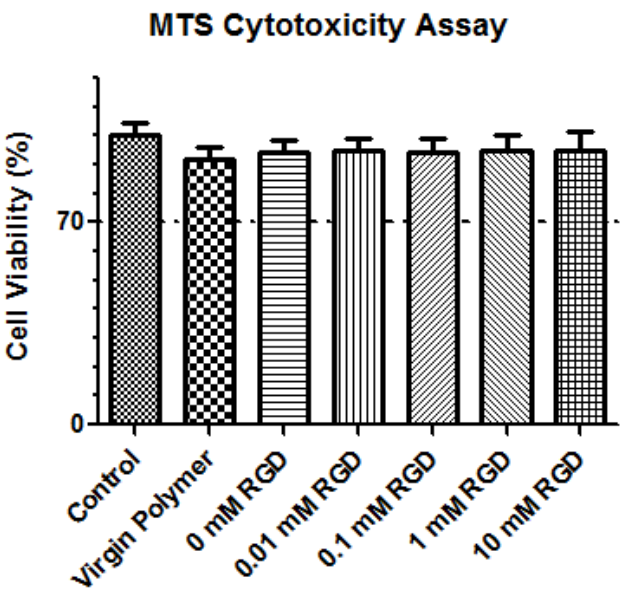


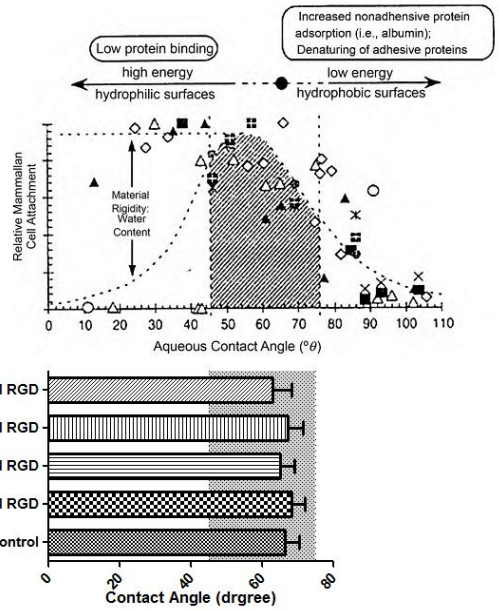
	1mM RGD
calculated peptide surface density (nmole/mm^2)	0.02358
calculated OH surface density (nmole/mm^2)	1.109527
turnover ratio (%)	2.125229



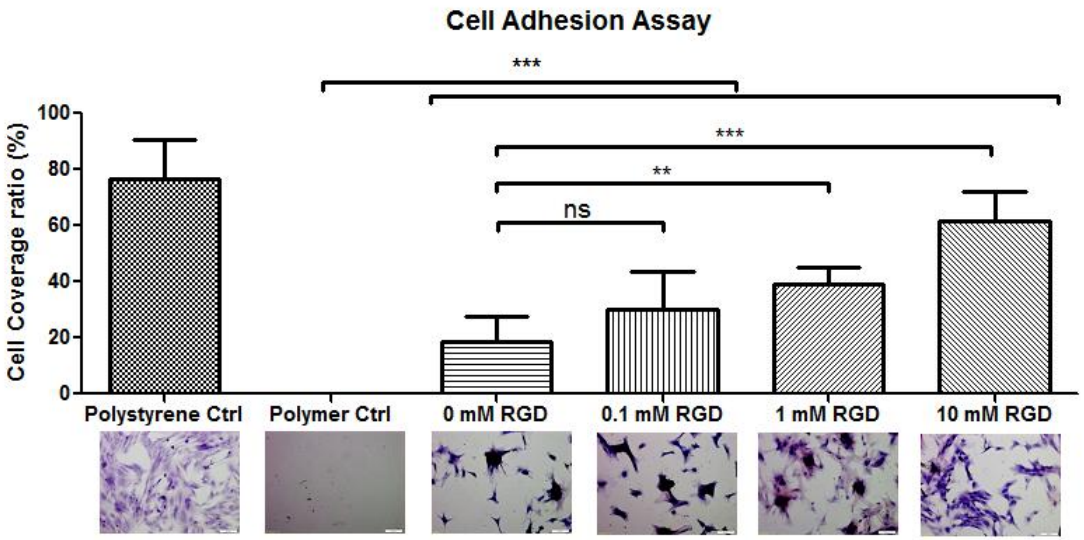
Grafting of peptide do not alter its functions required for IOL implantation

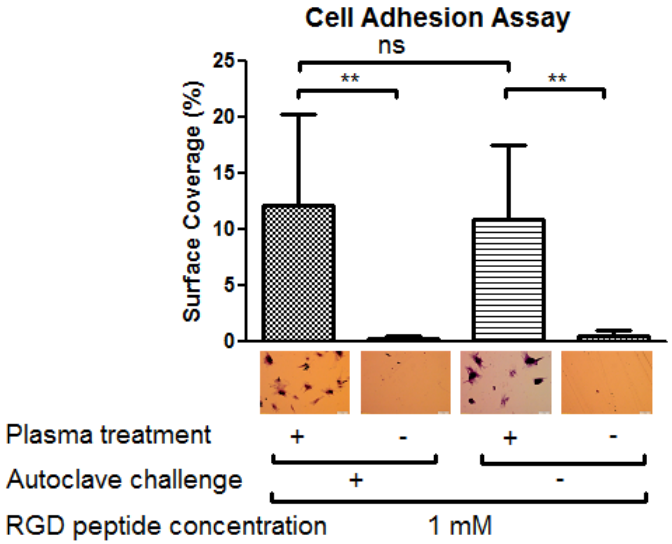






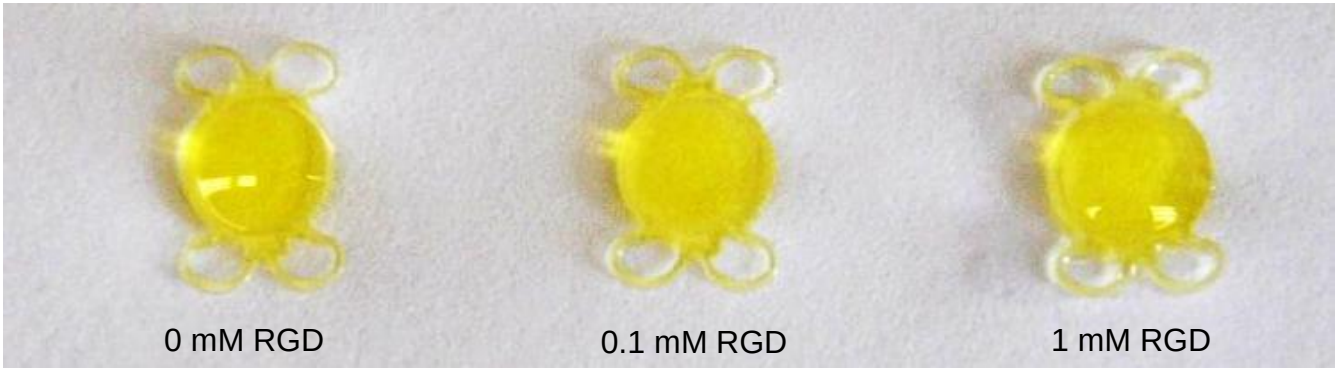
Immobilization of peptide greatly enhance LEC adhesion



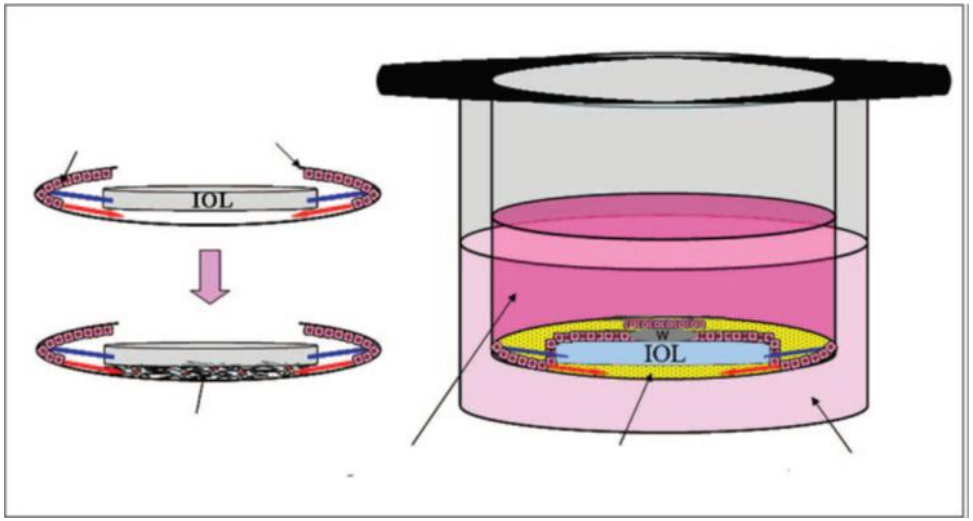


Conclusion & Prospective

- Possibly enhanced properties for RGD grafted IOLs



- Biological functional assay needed



Acknowledgement

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ERASMUS MUNDUS

Activated hydroxyl group determination