



## Biological characterisation of biomaterials

### Course information

**Course responsible:** Gemma Mestres, [Gemma.Mestres@angstrom.uu.se](mailto:Gemma.Mestres@angstrom.uu.se)

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**Number of credits:** 5 ECTS (hp)

**Course period:** Autumn 2018 (October – December 2018)

**Registration:** no later than September 15<sup>th</sup>

**Language of instruction:** English

**Main fields of study:** biomaterials, materials science, biology, medicine

**Target group:** PhD students performing research on biomaterials, involving departments such as Engineering Sciences, Chemistry, Biology, Pharmacy and Medicine.

**Maximum number of participants:** 25

**Requirements:** Registered in a third cycle program

**Grading system:** pass or fail. Attendance to 80% of lecture is required. The examination is divided in three parts: 40% weekly assignments + 30% individual project + 30% active participation in seminars and activities.

**Course structure:** The course consists of 10 two-hour (45min x 2) sessions based on the biological characterisation of biomaterials, both *in vitro* and *in vivo*. In general, each two-hour session is divided in 45 min lecture + 45 min interactive activities (seminar/discussion/work in groups).

**Aim and scope:** This course aims to give a deeper knowledge about how biomaterials are commonly tested *in vitro* (cell cultures) as well as *in vivo* (animal models).

The **content** of the course is the following:

- 1) Basics about cells and biomaterials
- 2) Protein-biomaterial interactions
- 3) Blood-biomaterial interactions
- 4) 2D and 3D models to characterize biomaterials *in vitro*
- 5) Microfluidic systems to characterize biomaterials *in vitro*
- 6) Evaluation of biocompatibility
- 7) Animal testing
- 8) Legislation and ethics
- 9) Ethical applications
- 10) Planning research towards commercialization

## Preliminary schedule

Rooms located at Ångströmlaboratory; Tuesday and/or Thursday 13-15h (October – December 2018)

Session # /date (room)	Content of each lecture	Teacher
1 (week 40) 2/10 (Beurlingsrummet)	1) Course information & Presentation from teachers 2) Presentation of students' research projects	GM, NF, GHB
2 (week 40) 4/10 (Beurlingsrummet)	1) Planning research towards commercialization 2) Basics about cells and biomaterials	1) PP 2) GM
3 (week 41) 11/10 (Beurlingsrummet)	Protein-biomaterial interactions	KF
4 (week 42) 18/10 (Beurlingsrummet)	Blood-biomaterial interactions	NF
5 (week 43) 25/10 (Fakultetsrummet)	2D and 3D models to characterize biomaterials <i>in vitro</i>	GM
(week 44) Höstlov (no lectures)		
6 (week 45) 6/11 (Beurlingsrummet)	1) Microfluidic systems to characterize biomaterials <i>in vitro</i> 2) Single cell analysis using droplets	1) GM 2) MT
7 (week 45) 8/11 (Beurlingsrummet)	1) Biocompatibility evaluation (application oriented) 2) <a href="#">Introduction to the project</a>	NF
8 (week 46) 15/11 (Fakultetsrummet)	Animal testing	GHB
9 (week 47) 22/11 (Beurlingsrummet)	1) Legislation and ethics 2) Ethical applications	GBH
10 (week 48) 27/11 (Beurlingsrummet)	1) Discussion on ethical applications 2) <a href="#">Questions about projects (voluntary part)</a>	1) GHB 2) GM, NF, GHB
11 (week 48) 29/11 (Beurlingsrummet)	Gap between research world and commercialization. Case studies	PP, GHB
12 (week 49) 6/12 (Beurlingsrummet)	<a href="#">Presentation projects</a>	GM, NF, GHB

GM: Gemma Mestres; GHB: Gry Hulsart-Billström; NF: Natalia Ferraz; MT: Maria Tenje; PP: Philip Procter; KF: Karin Fromell

*\*Project-related session marked in blue\**