

<b>Module number</b>	<b>275 – from SS 2013 = EM 13</b>
<b>Module name</b>	<b>Biological Systems as Bioreactors</b>
<b>Program of Study</b>	MSc mandatory module
<b>Offered</b>	Once a year, summer semester
<b>Module coordinator</b>	PD Dr. Michael Kleine
<b>Module advisor</b>	PD Dr. Michael Kleine
<b>Courses and teachers</b>	<b>Lecture:</b> Structure and use of bioreactors for the production of recombinant proteins, PD Dr. M. Kleine <b>Seminar:</b> Bioreactors, PD Dr. M. Kleine
<b>Prerequisites</b>	Advanced understanding of genetics and gene technology
<b>Language</b>	English
<b>Module capacity on campus students</b>	Maximum 12 Registration starts one week before the lecture begins at PLANTON GmbH, Am Kiel-Kanal 44, 24106 Kiel, Tel 0431-380150
<b>Module capacity off campus students</b>	
<b>Course types (classroom/ total workload)</b>	Lecture, (30 h /90 h), Seminar (30 h/90 h)
<b>Schedule</b>	Weekly
<b>Grading</b>	Oral exam 100% PD Dr. M. Kleine
<b>ID-card</b>	Required for exams
<b>European Credit Points</b>	6
<b>Module Objectives</b>	Advanced understanding of the structure and function of different biological reactors (plants, animals, microbes, cell cultures) and its use for the production of recombinant proteins for pharmaceutical and industrial applications.
<b>Contents</b>	<ul style="list-style-type: none"> <li>- Description of different protein expression systems: plant, animal, microbes, cell culture systems. Molecular structure of expression vectors, transfection technology and culture conditions</li> <li>- Analysis and monitoring processes, e.g. chromatography, mass spectrometry etc.</li> <li>- Downstream purification processes</li> <li>- Adaptation of these processes to a technical scale</li> <li>- Economical and ecological aspects</li> <li>- Approval processes</li> </ul>
<b>Module Skills</b>	Professional and practical key competence
<b>Study Resources</b>	Printed contents, review articles and textbooks, internet links. Production of Recombinant Proteins (2004), Gerd Gellissen (Editor), Wiley-VCH, Weinheim Molecular Farming – Plant-made Pharmaceuticals and Technical Proteins (2004), Rainer Fischer, Stefan Schillberg (Editors), Wiley-VCH, Weinheim