Contact
Konstanz Research School Chemical Biology (KoRS-CB)

Dr. Heike Brandstädtter
Room L 902
+49 7531 88-2237
heike.brandstaedter@uni-konstanz.de

Yvonne Knaus, Diana Oser
Office Managers
Room L 901
+49 7531 88-2142
chembiol@uni-konstanz.de

– chembiol.uni.kn
How many courses do I have to take?
Four courses within three years are compulsory. Of these courses, at least two have to cover the area “Scientific Courses”, one has to cover the area “Transferable Skills & Management Courses”, and one is free of choice.

Course Areas
SC – Scientific Courses
TM – Transferable Skills & Management Courses

Which courses shall I take?
This depends on your educational background and your research interests and should be discussed with your thesis committee.

How to register?
NEW: The enrolment depends on the course type and is done within the system ZEuS or by e-mail.
Please enrol by using the link at the end of each course description on our website:

– chembiol.uni.kn
→ scientific-courses
→ transferable-skills

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Page</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Feb</td>
<td>Gene Expression &amp; Protein Purification Strategies</td>
<td>6</td>
<td>SC</td>
</tr>
<tr>
<td>02 – 03 Mar</td>
<td>Strategic Application for Jobs outside Academia</td>
<td>7</td>
<td>TM</td>
</tr>
<tr>
<td>05 – 06 Mar</td>
<td>Scientific Writing</td>
<td>8</td>
<td>TM</td>
</tr>
<tr>
<td>10 – 12 Mar</td>
<td>Principles and Applications of Flow Cytometry and Cell Sorting</td>
<td>9</td>
<td>SC</td>
</tr>
<tr>
<td>14 – 15 Jul</td>
<td>Protein Folding</td>
<td>10</td>
<td>SC</td>
</tr>
<tr>
<td>20 – 22 Jul</td>
<td>Bioimaging</td>
<td>11</td>
<td>SC</td>
</tr>
<tr>
<td>25 – 26 Aug</td>
<td>Patents in Real Life</td>
<td>12</td>
<td>TM</td>
</tr>
<tr>
<td>01 – 02 Sep</td>
<td>Good Manufacturing Practice</td>
<td>13</td>
<td>TM</td>
</tr>
<tr>
<td>10 – 11 Sep</td>
<td>Writing Research Articles</td>
<td>14</td>
<td>TM</td>
</tr>
<tr>
<td>14 – 16 Sep</td>
<td>Proteomics</td>
<td>15</td>
<td>SC</td>
</tr>
<tr>
<td>23 – 25 Sep</td>
<td>Frontiers in Bioimaging</td>
<td>16</td>
<td>SC</td>
</tr>
<tr>
<td>28 – 29 Sep</td>
<td>Principles for Toxicity Testing</td>
<td>18</td>
<td>SC</td>
</tr>
<tr>
<td>01 – 02 Oct</td>
<td>How to make designer cells and animals – The basics &amp; applications of next generation mammalian genetics</td>
<td>20</td>
<td>SC</td>
</tr>
<tr>
<td>12 – 13 Oct</td>
<td>Analysis and Exploration of Metabolic Networks</td>
<td>22</td>
<td>SC</td>
</tr>
<tr>
<td>14 – 15 Oct</td>
<td>Determination of Macromolecular Structures</td>
<td>23</td>
<td>SC</td>
</tr>
<tr>
<td>15 – 16 Oct</td>
<td>Scientific Presenting</td>
<td>24</td>
<td>TM</td>
</tr>
<tr>
<td>anytime</td>
<td>MATLAB</td>
<td>26</td>
<td>online</td>
</tr>
<tr>
<td>anytime</td>
<td>Good Scientific Practice</td>
<td>27</td>
<td>online</td>
</tr>
</tbody>
</table>
Gene Expression & Protein Purification

Strategies
10 February, 11:00 – 16:00 h

This one-day course covers the following aspects of recombinant protein expression and purification:
– Introduction into recombinant gene expression
– Diverse expression systems (Bacteria, yeast, Baculo virus)
– Cloning strategies
– Tagging and affinity purification of recombinant proteins

Lecturers
Thomas U. Mayer, Elke Deuerling

Course Area
SC

Participants
max. 24

Registration
– chembiol.uni.kn/training/scientific-courses

Strategic Application for Jobs outside Academia

02 – 03 March, 9:00 – 17:00 h

In this workshop we will define necessary steps to identify personal career goals. You will learn which of your specific technical and personal skills are in demand on the job market. Is it enough to browse through job ads or do I have to use my personal or professional network to find a job? What are the options for unsolicited applications? What can I do to ensure that my application gains attention?

In the first part the participants will learn how to convincingly present their individual highlights in the CV. In the second part, participants get the opportunity to train self-presentation and professional appearance for interviews, phone calls and recruiting events and they will be primed for specific situations when confronted with awkward questions or unexpected challenges.

Lecturer
Barbara Hoffbauer

Course Area
TM

Participants
max. 12

Registration
– chembiol.uni.kn/training/transferable-skills-management-courses
Scientific Writing
05–06 March, 9:00–17:00 h

The 2-day workshop conveys the know-how of scientific writing and creates a basis for long-term development of participants' scientific writing skills. The goal is to improve the quality of produced texts but also to make the writing process more efficient and even enjoyable.

To enable the maximum possible transfer of learned skills, the trainer employs interactive and collaborative methods including writing sessions, reflection, peer feedback, practical exercises, discussions with the group and in pairs, and Q&A rounds.

Lecturer
Martina Michalikova

Course Area
TM

Participants
max. 12

Registration
– chembiol.uni.kn/training/transferable-skills-management-courses

Principles and Applications of Flow Cytometry and Cell Sorting
10–12 March, 10:00–17:00 h

This course will provide theoretical and practical training on flow cytometry and fluo-rescence-activated cell sorting (FACS). The morning lectures outline principles of flow cytometry, the properties of fluorophores and common applications of flow cytometry. The BD acquisition software FACSSuiteTM and FACSDivaTM as well as the analyzer LSRFortessa and FACSVersa and the sorter FACSARia will be introduced. Laboratory sessions in the afternoon will address sample preparation, instrument construction, operation and data acquisition. A basic knowledge of flow cytometry techniques is not required.

Lecturers
Annette Sommershof, Ricarda Schwab

Course Area
SC

Participants
max. 8

Registration
via e-mail to flowkon@uni-konstanz.de

In cooperation with

flowkon
Flow Cytometry
Protein Folding
14 – 15 July, 9:00–17:00 h

This three-day course provides theoretical and practical insights into protein folding. The sessions will cover the following topics: Protein folding problem, energy landscape theory, unfolding/refolding of proteins, chevron plot analysis, monitoring protein folding of a model protein directly in the lab, fluorescence stopped-flow spectroscopy, kinetic vs. equilibrium studies.

This course is recommended to doctoral researchers with a dissertation project either in structural biology or biophysics, or an interest or cooperation intent in biophysical and/or kinetical research questions.

Lecturer
Michael Kovermann

Course Area
SC

Participants
max. 8

Registration
– chembiol.uni.kn/training/scientific-courses

Bioimaging
20–22 Juli, 9:00–17:00 h

This three-day course will cover the following themes by lectures, demonstrations, and hands-on:

– Wide-field Fluorescence Imaging
– Laser Scan Confocal Microscopy (Point Scanning and Spinning Disk)
– Total-Internal-Reflection (TIRF) Microscopy
– Image Analysis

A basic knowledge of microscopy techniques is of advantage but not a prerequisite.

Lecturers
Elisa May, Martin Stöckl, Carolin Bottling

Course Area
SC

Participants
max. 9

Registration
– chembiol.uni.kn/training/scientific-courses

In cooperation with
**Patents in Real Life**

25 – 26 August, 09:00 – 17:00 h

This course points out the strategic impact of patents in academia and industry. The participants will learn to identify chances and risks of patents and achieve competence in raising the really relevant questions in the field of patents. Basic knowledge and fundamentals of patent law are covered as far as required. Objectives:

- Refreshing knowledge on patents (basic principles, patentability, filing process, and related issues)
- What’s the purpose of a patent? (a question anything else than trivial!)
- And how this purpose can get achieved?
- Patent strategies
- Why? – Oh, now I understand! – The tremendous role of the self-confident and competent “patent amateur”
- Good claims – bad claims: Common faults and how to avoid them
- Non-disclosure agreements and know-how protection
- Patents as a valuable source of information
- Exciting and promising career opportunities with relation to patents.

**Lecturer**

Gerhard Auer

**Course Area**

TM

**Participants**

max. 10

**Registration**

- chembiol.uni.kn/training/transferable-skills

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**Good Manufacturing Practice**

01 – 02 September, 9:00 – 17:00 h

Manufacturing and distribution of medicinal products are worldwide highly regulated and supervised by national or international regulatory authorities. The European Union (EU) has created a complex framework of directives and regulations, harmonising the legislation of the member states. The core are the Good Manufacturing Practice guidelines (GMP). These are intended to ensure that during manufacture of medicinal products production, processing, testing, packaging, and holding stringent quality standards are strictly followed.

The two-day course will provide an overview about the complex structure of the EU GMP guidelines, its basic elements, and its application to different pharmaceutical dosage forms. The course will be conducted via interactive presentations summarising important aspects and connections between the individual parts and chapters of the guidelines. In addition, there will be short workshops to get familiar with specific requirements of the guidelines, quizzes as introduction to the presentations, and questions & answer sessions.

**Lecturer**

Bernd Renger

**Course Area**

TM

**Participants**

no restriction

**Registration**

- chembiol.uni.kn/training/transferable-skills
Writing Research Articles
10 – 11 September, 9:00 – 17:00 h

The writing of well-argued and clearly-structured research articles is a key competence for doctoral researchers in the life sciences and natural sciences.

In this workshop you investigate the writing process from first ideas to finished text, explore your individual strengths and development areas in the context of scientific writing and analyse the section and paragraph structure of research articles. Further, you understand attributes of clear research articles, practice effective techniques for improvements of text quality, know how to improve the cooperation with co-authors and supervisors and develop time and self-management strategies for productive writing.

Lecturer
Philipp Mayer

Course Area
TM

Participants
max. 10

Registration
– chembiol.uni.kn/training/transferable-skills-management-courses

Proteomics
14 – 16 September, 9:00 – 17:00 h

This three-day course comprises morning lectures and hands-on experiences in the afternoon, hereby treating the following topics:

– General intro (proteomics workflow, mass spectrometers, ESI-/MALDI-ionisation, mass analysers)
– ESI-MS and MALDI-MS practice
– Sample preparation – theory and practice
– LC-MS and fragmentation techniques – theory and practice
– Special applications (SILAC, ICAT, protein quantification)

This course is addressed to doctoral researchers who want to learn basics and applications of mass spectrometry of proteins and protein mixtures.

Lecturer
Andreas Marquardt

Course Area
SC

Participants
max. 10

Registration
– chembiol.uni.kn/training/scientific-courses

In cooperation with
Frontiers in Bioimaging
23 – 25 September, 9:00 – 17:00 h

Fluorescence microscopy over the last decades has evolved into an invaluable tool to study a multitude of samples. However, in cell biology, many subcellular processes happen on size scales at or below the resolution limit of light microscopy, what requires superresolution microscopy approaches to visualize these fine details. This course will cover the principles of super resolution microscopy (structured illumination, localization microscopy).

The course will cover one additional advanced light microscopy technique. Either holotomography, a novel approach to visualize subcellular compartments, independent of fluorescence labels, or a different technique like camera based FLIM, lightsheet or STED microscopy will be demonstrated.

The course will show the application of these microscopy approaches in research, their strengths and prerequisites. Introductory lectures for the different topics are followed by demonstration and hands-on sessions at the instruments. Also sample preparation is covered. Hereby, participants are welcome to bring along their own samples, in which case they should consult with Dr. Martin Stöckl.

For course participation, basic knowledge of the principles of light microscopy (e.g. participation in one of the Bioimaging courses) is expected.

Lecturers
Elisa May, Martin Stöckl

Course Area
SC

Participants
max. 8

Registration
– chembiol.uni.kn/training/scientific-courses

In cooperation with

Bioimaging Center
Principles of Toxicity Testing
28–29 September, 9:00–17:00 h

Toxicity testing of chemicals and drugs is essential for their market approval by authorities, such as the European Chemicals Agency (ECHA), the European Medicines Agency (EMA) or the US Food and Drug Administration (FDA). Moreover, in academic research, toxicity testing often forms the basis to elucidate the molecular mechanisms of cellular processes.

As a joint venture of the four Toxicology groups at University of Konstanz, this two-day lecture course provides an overview of state-of-the art methods and principles of toxicity testing. This covers a concise introduction into the fundamentals of toxicology, in-vitro and in-vivo toxicity testing, genetic toxicology, and systems toxicology. Furthermore, we've invited guest speakers from pharmaceutical and chemical industry.

Lecturers
Aswin Mangerich (coordinator), Daniel Dietrich, Julia Höng, Marcel Leist, Stefan Schildknecht, Barbara Birk Hans-Jörg Martus, Philip Bentley

Course Area
SC

Participants
max. 30

Registration
– chembiol.uni.kn/training/scientific-courses
How to make designer cells and animals – The basics and applications of next generation mammalian genetics
01 – 02 October, 13:30 – 17:30 h

Genetically modified human cells and genetic manipulation of the mouse are the current gold standard for basic and applied research in biomedicine. Novel breakthrough technologies now facilitate and accelerate genetic engineering in mammals and open unprecedented opportunities for targeted as well as genome-wide experimental approaches.

This 2-day lecture course will introduce the current state-of-the-art in genetic manipulation of cells and organisms. In particular, we will discuss application of recombinases (Cre, Flp), integrases (ΦC31), and CRISPR/Cas enzymes for manipulation of the mammalian genome, from targeted gene disruption to seamless gene replacement and transcriptional manipulation. Medical application of these technologies in the form of gene replacement and correction therapies will be presented. Furthermore, the course will cover standard and innovative reverse genetic approaches in the mouse, which allow global or conditional (tissue-specific and/or inducible) gene manipulation.

Finally, we will highlight the use of genome-wide CRISPR/Cas libraries for forward genetic screens and the potential of genetically altered human iPS cells to mimick human disease phenotypes.

The programme will consist of lectures and an interactive team work session. This course will be interesting to doctoral researchers from all graduate schools at the Department of Biology.

Lecturers
Christoph Hauck, Aswin Mangerich, Christiaan Karreman

Course Area
SC

Participants
max. 24

Registration
– chembiol.uni.kn/training/scientific-courses
Analysis and Exploration of Metabolic Networks
12 – 13 October, 10:00 – 15:00 h

This two-day course will introduce the following topics by lectures, demonstrations, and practical hands-on sessions:

– online resources for metabolic networks
– mapping metabolomics data onto networks, analysing, exploring and visualising data
– standards for metabolic network exchange and visualisation

Lecturers
Falk Schreiber, Karsten Klein, Michael Aichem

Course Area
SC

Participants
max. 10

Registration
– chembiol.uni.kn/training/scientific-courses

In cooperation with

Determination of Macromolecular Structures
14 – 15 October, 9:00 – 17:00 h

This two-day workshop enables life scientists to effectively create figures based on quantitative data that add impact to their publications.

The workshop is divided into two one-day modules: “Principles” and “Applications”. On the first day, the “Principles” module focuses on understanding the purpose of a figure, choosing the most appropriate plot type, and the science of perception. This part is primarily concerned with the art of visual communication and integrates participants’ own examples into the teaching process.

On the second day, the “Applications” module focuses on the practical implementation of the data visualisation principles discussed. This is done using the R statistical programming environment with the participants’ own data.

Lecturers
Michael Kovermann, Olga Mayans

Course Area
SC

Participants
max. 10

Registration
– chembiol.uni.kn/training/scientific-courses
Scientific Presenting
15–16 October, 9:00–17:00 h

Do you want to have more confidence and impact in your presentations? Do you want to relax and enjoy presenting your research in your team, in meetings and at conferences? This workshop uses a mix of practical exercises, discussion and video feedback to help you get your message across with confidence and clarity. The workshop is highly appreciated by doctoral researchers in the first phase of their studies.

– Assess your own presentation strengths and weaknesses
– Develop a critical awareness of effective presentation style to give and receive constructive feedback
– Build on and practice the English language of presentation
– Learn strategies for dealing with unexpected or difficult situations
– Design and use PowerPoint slides more effectively
– Develop confidence and enjoyment in public speaking

Lecturer
Millie Baker

Course Area
TM

Participants
max. 10

Registration
– chembiol.uni.kn/training/transferable-skills-management-courses
**MATLAB**

Online

MATLAB is a high-level language and interactive environment for numerical computation, visualisation, and programming. Using MATLAB, you can analyse data, develop algorithms, and create models and applications. Three “self-paced” online courses are available that cover the topics to the same extent than an on-site training:

– Fundamentals
– Data Processing and Visualisation
– Programming

**Dates**

Anytime

**Registration**

– [matlabacademy.mathworks.com](http://matlabacademy.mathworks.com)

**Please note**

Since there will be no course confirmation, the online course cannot be considered as equal to courses of the KoRS-CB course programme.

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**Good Scientific Practice**

Online

How should research results be documented? What is the right way to cite? How to handle with image sources? This online course has been designed to give an introduction on questions of good scientific practice including how to wisely plan and organise the research project and which legal aspects, such as in labour law or copyright law, are relevant for doctoral students.

Five modules are available containing comprehensive information, including tests to check the knowledge gained as well as supplementary information material. The final module provides a certificate.

**Dates**

Anytime

**Registration**

via e-mail to chembiol@uni-konstanz.de
(to obtain your licence key)

**Please note**

This course is obligatory for new KoRS-CB fellows within the first six months of the thesis. You will receive your licence key unasked within the first weeks.
Further Training Offers

Academic Staff Development

– uni.kn/asd
Terms & Conditions: The graduate schools GBS, GCh, KoRS-CB reimburse the fee for its doctoral students. Please communicate during the registration which graduate school you belong to.

Career Service

– uni.kn/studieren/beratung-und-service/career-service
Terms & Conditions: The graduate schools will reimburse fees individually upon request.

Research Support Office

– uni.kn/forschungssupport

Hochschul Didaktik Zentrum Universitäten Baden-Württemberg

– uni.kn/asd/angebote/hochschuldidaktik

– chembiol.uni.kn