

Module Independent Studies

Modulübersicht im Studiengang Nano-Science (Master of Science)

Fach-semester	LP				
1.	30	Basic Module Biology (M1)	Basic Module Chemistry (M2)	Focus Module 1 (M4)	Nano-Science III (M7)
2.	30	Basic Module Physics (M3)	Focus Module 2 (M5)	Focus Module 3 (M6)	
3.	30	Independent Studies (M8)			Master Seminar (M9)
4.	30	Master Thesis (M10)			

Requirements:

Successful passing of the Basic Modules M1, M2 and M3
and at least 2 Focus Modules out of M4, M5 and M6

Module Independent Studies

Lehr- /Lernformen*	optional Vorlesungen, Seminare, Übungen, Praktika
Modulinhalt*	Im Rahmen dieses Moduls sollen die Studierenden, nach Rücksprache mit dem Betreuer des Moduls, ihre spezifischen Interessensgebiete innerhalb des Fachs Nano-Science intensiv studieren und bearbeiten. Diese Interessensgebiete sollen im Dialog mit den betreuenden Dozenten erarbeitet und definiert werden, wobei in Studienplänen und Zielvereinbarungen die Lern- und Qualifikationsziele festgelegt werden. Diese Studien können nach Abstimmung mit den betreuenden Dozenten sowohl an der Universität Tübingen als auch an weiteren in- und ausländischen Hochschulen und Forschungsinstitutionen und im Rahmen innerbetrieblicher Praktika erfolgen.
Qualifikationsziele*	Die Studierenden <ul style="list-style-type: none">• vergleichen und analysieren Lern- und/oder Forschungsumgebungen außerhalb der Universität Tübingen;• erweitern ihre Erfahrungen auf alternativen Felder, u. a. in Forschungsinstitutionen, Industrie, Ausland;• können ihre interdisziplinären und interkulturellen Interessen und Fähigkeiten ausbauen;• fokussieren ihre Studien- und Forschungsinteressen auf ein Teilgebiet der Nano-Science

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- gaining of specific knowledge
- Possibilities of passing the module:

at Tübingen university

other universities in Germany or abroad

other research institutions in Germany or abroad

industries in Germany or abroad

Module Independent Studies

27 ECTS
(810h time of work)

approx. 16 weeks (8h per day)
variation possible

- important: this is a self-organized module
- that means: everything has to be organized by yourself!
- every course/event/lecture etc. has to be confirmed by an internal supervisor BEFORE starting the module

Module Independent Studies

Supervisors

Physics

Prof. Martin Oettel, Prof. Hans Joachim Schöpe, Prof. Frank Schreiber

Chemistry

Prof. Reiner Anwander, Prof. Andreas Schnepf, Dr. Claudio Schrenk

Biology

Prof. Klaus Harter, Dr. Anita Jannasch, Prof. Erik Schäffer, Dr. Üner Kolukisaoglu

Module Independent Studies

- please check the Independent studies sheet

DOWNLOAD:

<http://www.mnf.uni-tuebingen.de/fachbereiche/biologie/studium/studiengaenge/nano-science/master-msc/downloads.html>

"Independent Studies"

→ Certificate Independent Studies

- a copy of this must be sent to Prof. Schöpe!
- the supervisor is also a „mentor“ and confirms passing the module finally

Certificate (part)

Name:

Matrikelnummer:

Geplantes Vorhaben				Name Mentor/in (Fachvertreter/in)	
Auslandssemester	Praktikum extern Wiss. Einrichtung	Praktikum extern Unternehmen	Studium Tübingen		
				← kurze Angabe (bei Studium Tübingen genügt ein Kreuz)	
				← Zeitraum	
Vorlage Expose /Studienplan				Datum	Unterschrift
<input type="checkbox"/> ja <input type="checkbox"/> nein					
Bemerkungen					
Vorlage Studienleistungen (3 Basic Modules, 2 Focus Modules)				Datum	Unterschrift
<input type="checkbox"/> ja <input type="checkbox"/> nein					
Bemerkungen					

Module Independent Studies - possibilities

- studying at Tübingen university
- studying at a university abroad
- lab course in a working group (in Tübingen, Germany, or abroad)
- lab course outside university
- combinations

Module in Tübingen

- lab course at a working group with nanoscience topics
- lectures, seminars, etc.

rules

- lab course can be in maximum 15 ECTS points
- Important: Having a 15 ECTS lab course, a subsequent master thesis is not possible there
- confirmation required for all lectures and seminars

Module in Tübingen

possible lectures or seminars

- in general all lectures, which are not used in bachelor studies
- master events in physics, chemistry and biology
- all others need a confirmation

studying at university abroad

- lectures with nanoscience topics
- confirmation of supervisor required, that lectures fit to the module
- point of orientation: lecture topics in Tübingen

lab course at a working group abroad

- scientific topic related to nanoscience
- confirmation of supervisor before starting
- exposé required

lab course outside the university

- related to nanoscience topics
- MPI, Fraunhofer, research institutions, industries
- **exposé**
containing a detailed overview of topics and projects, which are planned, is required
- confirmation of the supervisor necessary

Exposé

Project title: **Electrospray deposition of polymer micro- and nanostructures as potential carriers for drug delivery**

Outline

This research project aims at the synthesis and characterisation of polymeric micro- and nanoparticles as drug carriers systems. The particles will be synthesized by means of electrospraying, using Spraybase® instruments and two main strategies will be used for the encapsulation of the model drug. In the first approach the drug will be dispersed into the polymer solution to be electrosprayed. In the second method a core/sheath approach will be pursued utilising coaxial electrospraying. Biocompatible polymers soluble in organic solvents like polycaprolactone(PCL), poly(lactic-co-glycolic acid) (PLGA), chitosan as well as water soluble polymers that can be cross-linked after deposition, like PVA will be employed. PCL and PLGA are amongst the most used polymers in nanoscience which are FDA approved. PCL of different molecular weight and various PLGA with different lactic acid to glycolic acid ratios will be considered. For characterisation purposes the model drug will be modified with a fluorescent probe and the distribution of the drug will be elucidated by means of fluorescence microscopy while size and morphology of the particles will be evaluated using SEM (scanning electron microscopy). Finally the two most promising polymer-drug systems will be selected for release studies.

Exposé inkl. Projektplan

Training and responsibilities

- The student will receive appropriate training in the relevant techniques by Spraybase scientists
- The student will be asked to describe experiments and discuss results in weekly reports
- At the end of the 3 months the student will be asked to summarise findings and submit a final written report

Growth and development

The 3 months internship will enable the student to acquire competencies that will enhance the prospects of reaching independent thinking and autonomy in a laboratory environment. Amongst the transferable skills the student will acquire:

- Training in state-of-the-art electrospaying instrument
- Work experience in a private company
- Expertise in microencapsulation through electrospaying, one of the emerging technologies in nanoscience
- Training in microscopy techniques like fluorescence microscopy, scanning electron microscopy

Exposé inkl. Projektplan

Project plan and work-packages

WP1, Nov 2016: Electrospraying training

Deposition micro/nano particles of PCL

Study of the effect of experimental parameters (polymer concentration, solvent system, flow rate, emitter diameter, working distance) on particle size and morphology

Optical/Fluorescence Microscopy training

SEM training

WP2, Dic 2016: Generation of micro/nano particles with PLGA, chitosan, PVA.

SEM characterisation

WP3, Jan 2017: Drug encapsulation, dispersion method

Evaluation of entrapment efficiency

SEM characterisation

Fluorescence microscopy

WP4, Feb 2017: Drug encapsulation, coaxial electrospraying

Characterisation of core/sheat particles (technique to be decided yet)

Release studies (UV-Vis) on best 2 systems from WP3 and WP4

WP5, 1-6 March 2017: Final report

combinations

combinations possible, e.g.:

- industries, combined with a lab course at Tübingen university
- lectures in Tübingen, combined with lab course at a university abroad

studying abroad - funding

- Erasmus
- DAAD
- Fulbright fundings
- exchange programs of Tübingen university (e.g. CIVIS, etc.)
- Auslands-BAFÖG
- Promos-Program

studying abroad

Dezernat für Internationale Angelegenheiten

Austauschprogramme

Wilhelmstraße 9 (Eingang: Nauklerstraße 2)

D-72074 Tübingen

Tel.: +49-7071-29-76448

Fax: +49-7071-29-5404

intrel@uni-tuebingen.de

Öffnungszeiten:

Montag-Freitag, 9-12:00 Uhr, außer Mittwoch

studying abroad

<http://www.uni-tuebingen.de/international/studieren-im-ausland.html>

detailed information:

- exchange programs
- funding
- information events
- application processes
- **application deadlines**

Independent Studies Seminar

is equal to consultation hours

Prof. Dr. Hans Joachim Schöpe

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Dr. Claudio Schrenk

claudio.schrenk@uni-tuebingen.de