

Naturwissenschaftliche Fakultät

The Faculty for Natural Sciences (Naturwissenschaftliche Fakultät) is one of five faculties at the Friedrich-Alexander-Universität Erlangen-Nürnberg. It consists of the separate research and teaching units **Biology**, **Mathematics**, **Earth Sciences**, **Physics** and **Chemistry and Pharmacy**. All of them cooperate strongly with other faculties within the University, especially with the faculties for Medicine and Technical Sciences. The cooperation range from joint research projects and interdisciplinary research centers to extensive exchange of undergraduate and graduate courses.

Department of Chemistry and Pharmacy

The organization chart summarizes the Department of **Chemistry** (Anorganische Chemie, Organische Chemie, Physikalische und Theoretische Chemie) and **Pharmacy** (Pharmazie und Lebensmittelchemie). Altogether 23 research and teaching Professors hold appointments – covering the areas of Chemistry/ Molecular Science and Pharmacy/Food Chemistry. Further support comes from 24 permanent and 55 non-permanent scientific staff members. In addition, externally funded research grants total on average to ca. 4.5 Million Euro per year, which help in financing 75 additional scientists. All members of the institutes publish more than 200 articles per year in highly ranked international journals.

Major research activities at the Department of Chemistry and Pharmacy

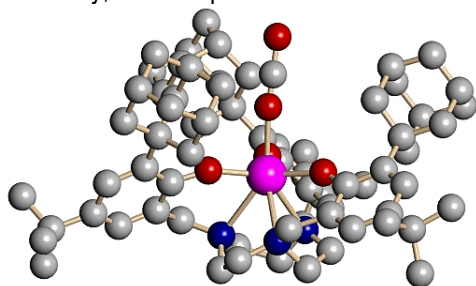
The research activities of the Department of **Chemistry** and **Pharmacy** cover a wide spectrum that ranges from basic to applied research in the areas of chemistry, biology, pharmacy, and pharmaceutical science. These are strongly linked to each other, have a manifold of interactions and interdisciplinary research projects within the University (Sonderforschungsbereiche, Graduiertenkollegs) and with other national and international institutions (DFG-Schwerpunktprogramme, EU, BMBF, Volkswagenstiftung, DAAD, Humboldt-Stiftung, Bayerische Forschungsförderung, etc.). Consequently, the Department of **Chemistry** and **Pharmacy** create the *molecular bridge* between the Faculties for Medicine and Technical Sciences.

Current research objectives concentrate on two major areas:

MOLECULAR MATERIALS – metal complexes, electron transfer, nanostructures, modeling, and catalysis

The synthesis and characterization of molecular materials are of central interest to the research activities in the various research groups of **Chemistry**.

Hereby, as an important class of materials redox-active metal complexes constitute the major thrust of SFB 583.



These are used, for example, to catalyze chemical reactions. Also, carbon-rich conjugated π -systems, which exhibit unprecedented materials properties, such as mechanical strength, molecular magnetism and electrical conductivity, are of interest.

Additional incentives in the studies of metal complexes and alternative molecular architectures are also their supramolecular assembly and integration into hierarchically ordered nanostructures. Many of these tailored materials undergo photoinduced charge separation processes between redox-active subunits. Consequently,

new systems are developed, which will help to solve fundamental challenges of the future, such as the shortage

of energy and other resources. A specific strength of the chemical research in Erlangen is the computer assisted determination and modeling of molecular architectures, of their properties and transitions.

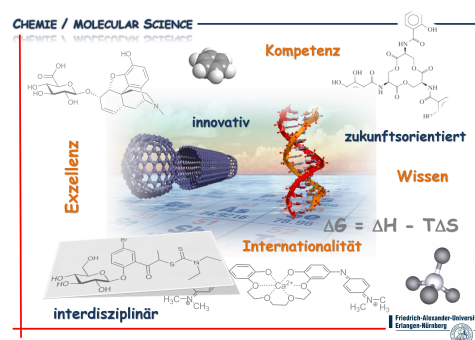
BIOACTIVE MOLECULES – Neurotropic Agents, Biologicals, and Protein Conjugates

Within the context of the subject *Bioactive Molecules*, novel neurotropic agents are designed, synthesized and examined for of their activity towards signaling proteins. As target proteins, G-protein coupled neuroreceptors, Tet-repressors (SFB 473) as well as prion proteins are addressed. To examine target protein modifications occurring during food treatment but also are detected and functional consequences are analyzed by means of biological tests. For the understanding of effects of large-scale processes during the preparation of therapeutic proteins on protein folding and aggregation, stabilization, particle formation, and drying rate of biotechnologically obtained proteins are explored.

Education at the Institutes of Chemistry and Pharmacy

The institutes provide the following programs of study:

- Chemie Diplom – BSc/MSc (start: WS 2006/07)
- Molecular Science – Bachelor (start: WS 2001/02)
- Molecular Science – Master (start: WS 2004/05)
- Chemie Lehramt – Gymnasium / Realschule
- Chemie Lehramt – Grundschule / Hauptschule
- Pharmazie – Staatsexamen
- Lebensmittelchemie – Staatsexamen



In compliance with the Bologna recommendation, the former Diplom-Studiengang **Chemie** is replaced by a consecutive Bachelor/Master program. The new program is conceptualized as a three-year program, for the Bachelor part, and a two-year program, for the Master program.

The consecutive interdisciplinary Bachelor/Master program **Molecular Science** was successfully started at the Faculty for Natural Sciences in WS 2001/02 with the Bachelor program; the Master program followed in WS 2004/05. After the initial phase of 4 semesters there are two options within the **Molecular Science** degree program: *Molecular Nano Science* or *Molecular Life Science*. During the master program, the course of study is intended to provide students with an education in *Nanotechnology* or *Life Science* by choosing the modules *Molecular Nano Science* or *Drug Discovery*. Each program emphasizes practical experience in addition to traditional course work.

Altogether, about 1120 students are educated and trained in the aforementioned programs – in 2007 about 320 beginners have been registered. In addition, the Department of **Chemistry and Pharmacy** is involved in the education of twelve other Diploma or BSc/MSc programs ranging from medical to technical sciences: per year more than 1200 students from other programs attend classes and lab courses in the various fields of chemistry.

With respect to the education of future school teachers there exists a close cooperation with the Faculty of Education – Didactics of Chemistry.