



Investigating structure, function and diseases of the nervous system is one of the greatest challenges to biomedicine for the coming decades.

The neurosciences in Frankfurt am Main have always been a highly prominent area of research and are well prepared to meet these challenges.

The ICN aims at leading Frankfurt's Neuroscience community to scientific excellence in both research and teaching.

This is going to be fostered by:

- Boosting exchange and communication between the various workgroups in basic and clinical research
- Supporting young researchers and establishing a new Master Program "Interdisciplinary Neuroscience"
- National and international cooperation in the field of neuroscience, including cooperation with industrial partners
- Public relations work, including a series of regular public lectures on current topics

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You can support our work with your donation:

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Projekt-Kto: 30150420
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Donations to the ICN are tax deductible

INTERDISCIPLINARY CENTER FOR NEUROSCIENCE

- Founded in 2006
- Center with more than 40 research groups
- Involvement of six faculties:
 - Medicine
 - Biological Science
 - Psychology
 - Biochemistry, Chemistry and Pharmacy
 - Physics
 - Informatics und Mathematics

as well as the

- Max-Planck-Institute for Brain Research
- Max-Planck-Institute for Biophysics
- Frankfurt Institute for Advanced Studies

How does the brain work – a biological, philosophical and cultural challenge for modern society!

How did the brain develop? How does it function? How does our brain learn? What is the seat of our personality? Is there a free will?

To answer these questions scientists within the ICN apply the most up-to-date anatomical, cell biological, molecular biological, physiological and computational methods.



Diseases of the nervous system – A humanitarian, social and economical challenge for modern society!

Within the overaged society the prevalence of age-related diseases of the nervous system has considerably increased. It is the aim of the ICN to explore the causes of neurological diseases and to shorten the time from bench to bedside.

Examples of our work:

- **Gene variant protects from pain**

Scientists from the Frankfurt Center of Pharmacy could show that the overproduction of an enzyme cofactor essential for the synthesis of certain neurotransmitters contributes to pain sensitivity and chronicity. Humans with a certain variant of this gene produce less cofactor and have a lower risk for chronic pain following, e.g., nerve injury or inflammation.



- **Research on Alzheimer's disease**

Alzheimer's disease is the most common form of dementia among older people. It causes a slow destruction of major parts of the brain and a corresponding increase in the severity of the symptoms. In Germany, more than a million people suffer from the disease. Scientists in the ICN work on risk factors, prevention, methods for early diagnosis, and the improvement of therapies.

- **Research on Parkinson's disease**

In Morbus Parkinson certain types of neurons are lost whereas similar neurons within a closely related brain region are considerably more resistant. Scientists in the ICN could demonstrate that differences in electrical activity in response to stress are of prime relevance for survival or death of these neurons.

- **Infection and multiple sclerosis**

New insights of ICN researchers in the immunoregulation of the brain have lead to a better understanding of neurological diseases such as multiple sclerosis and help developing novel therapies.

- **The world in our head**

The Brain Imaging Center uses most up-to-date imaging techniques to analyze the human brain. The various methods applied, including magnetic resonance imaging, allow complex brain functions to be visualized.

- **Blue light controls muscles of a worm**

Scientists in the ICN succeeded in introducing an algae-derived ion channel activated by blue light into the nervous system of the small threadworm *Caenorabditis elegans*. This allows to "telecontrol" the worm by external light application and to elucidate the functional role of individual nerve cells within the network of the worm's nervous system.

