Introduction to the lecture course “Clinical Neuroscience”

FS 2018

Gerhard Schratt

Goal of the course

- Goal of the course: Obtain an overview and basic understanding of the most important neurological (and psychiatric) diseases: **Symptoms, diagnosis, therapies, pathophysiology and disease mechanisms.**

- Expected outcome: Create links of basic science knowledge in biology, chemistry, engineering to diseases and their often lacking or unclear **mechanistic understanding**. Show perspectives toward **new and better therapies**.

From symptoms to disease

- **Symptoms** (weakness, blurred vision, vertigo, memory failure, headache...) – diagnostic procedure, differential diagnosis:
- **Syndrome** (=characteristic group of symptoms), specific, named **disease**
- Several different **diagnostic tools** (imaging, physiological alterations, biochemical parameters...)
- - challenge for disease classification
  - challenge for the appropriate modelling of the disease

Problems in Clinical Neuroscience

- Many diseases show a **spectrum** of manifestations: One or several different diseases? (e.g. schizophrenia, autism, multiple sclerosis...)
- **Multifactorial** background of age, sex, environmental conditions, life style...(search for causative factors!)
- **Genetic vs. environmental** factors
- Frequent **mismatch** between **clinical importance** of a disease or syndrome and its **visibility** in the scientific community (e.g. high visibility for genetic neurodegeneration, poor recognition of chronic pain, headache, sleep disturbances...)

Mechanistic analysis: pathophysiological mechanisms and experimental modelling in animals

- Model must **match** (as many as possible, ideally all!) the central characteristics of the disease **> face, construct and predictive validity**
- Model must be **accessible for experimental manipulations** and analytical dissection (fish/fly > rodents > higher mammals)
- Goal is the formulation of **hypotheses** on the **pathophysiological mechanism** of a specific disease or disease condition
- Derived from these mechanistic insights: **Novel experimental therapies** to stop and reverse the disease, repair damage, compensate lost functions

New therapies: From animal models to clinical application

- Defined stages:

- **Preclinica**l evaluation: Proof of concept in >1 animal species with relevance to man, efficacy, mechanistic insights, - absence of negative effects or toxicity. – Patenting
- **Development**: Large scale production under GMP conditions of clinical grade substances; formulation and **route of application**; devices for easy use

New therapies: From animal models to clinical application

- **Clinical trial Phase 1**: Dosage and way of application, tolerability and safety: absence of side effects and toxicity; open- label (no controls), observation of effects in comparison with historical controls
- **Clinical trial Phase 2**: Efficacy, proof of concept in man. Double-blind, randomized with controls. Limited numbers of test subjects, few sites.
- **Clinical trial Phase 3**: Multicentric, multinational, large numbers of patients and clinical sites (very high costs: hospital days, follow-ups, insurance; administrative costs for patents, regulatory authorities)
- If successful: Drug or device **admitted**, recommended use

Antibodies against Nogo-A to enhance plasticity, regeneration and functional recovery after acute spinal cord injury, a multicenter European clinical proof of concept trial

Von 2016-01-01 **bis** 2020-12-31, Laufendes Projekt | NISCI Website

Projektdetails

Gesamtkosten:

EUR 6 702 978,50

EU-Beitrag:

EUR 4 774 444,75

Koordiniert in:

Switzerland

Thema(en):

PHC-15-2015 - Clinical research on regenerative medicine

Aufruf zur Vorschlagseinreichung:

H2020-PHC-2015-single-stage_RTDSee other projects for this call

Finanzierungsprogramm:

RIA - Research and Innovation action

Ziel

Spinal cord injury is a severe and devastating neurological disorder that leaves patients with permanent paralysis of the body. No treatment is available today to regenerate interrupted nerve fibers and repair the damaged spinal cord. The incidence of spinal cord injury is about newly injured 10’000 people per year in the EU, and due to an almost normal life expectancy more than 200’000 patients are living with a spinal cord injury in the EU. The impact on the individual qua…

Clinical Neuroscience FS2018 (UZH: BIO389/ ETH: 376-1306-00 V)

Mondays from 15.00-18.00 (2 hours lecture + 1 hour patient demo!)
Room: Y15-G-40 (Irchel Campus)
Responsible for module: Gerhard Schratt, Christian Baumann. Lecture Coordinator: Dr. Cecilia Nicoletti

Date	Topic	Lecturer
19.2.2018	Introduction – Diagnostic procedures, Clinical examination, Multiple sclerosis	Gerhard Schratt – Sven Schippling
26.2.2018	Neuromuscular diseases and peripheral neuropathies	Magdalini Polymenidou– Jens Petersen
05.03.2018	Epilepsy and Sleep	Rositsa Poryazova-Neumann – Lukas Imbach
12.03.2018	Amyotrophic lateral sclerosis	Magdalini Polymenidou – Jens Petersen
19.03.2018	Parkinson's disease and movement disorders	Christian Baumann
26.03.2018	Alzheimer's Disease	Peter Brugger - Günter Eisele
09.04.2018	Stroke In Clinic & Translation	Andi Luft
23.04.2018	Brain Tumors	Michael Weller, Caroline Happold and Dorothee Gramatzki
30.04.2018	Autism	Ronnie Gundelfinger
07.05.2018	Schizophrenia	Anastasia Theodoridou
14.05.2018	NeuroRehabilitation	Roger Gassert–Martin E. Schwab
28.05.2018	Planning Clinical Trials	Jan Michel
Vorauss. 11.06.2018	Exam	