



Competence Center for Electrophysiology

COMPCEL

COMPCEL is a technical-methodological Competence Center for Electrophysiology.

The purpose of COMPCEL is to offer the professional support and infrastructure for the implementation of scientific electrophysiological experiments for scientists, working groups, and research projects at the Paracelsus Medical University (PMU) at the scientific locations of Salzburg and Nürnberg and beyond. The unique expertise and know-how of COMPCEL will offer unprecedented opportunities to explore and solve electrophysiological questions with experimental models ranging from single biomolecules and cells to tissues and up to the whole animal.

Concept and structure of COMPCEL

- **Objectives:** Consolidation of existing personnel expertise and infrastructural equipment for the efficient, scientifically qualified processing of electrophysiological questions as well as provision of these resources for relevant scientific (sub-)projects of employees, research groups at the PMU or the University Hospital and researchers in the various institutions of knowledge and business in Salzburg and Nürnberg.
- **Participating institutes:** Institute of Physiology and Pathophysiology, Institute of Experimental Neuroregeneration, Institute of Pharmacology and Toxicology, PMU Salzburg, Austria; Institute of Physiology, Pathophysiology and Biophysics, PMU Nürnberg, Germany.
- **Scientific and organizational management members:** Dr. Bruno BENEDETTI, PhD, Senior Postdoc and deputy head of the Institute of Experimental Neuroregeneration, Prof. Mag. Dr. Martin JAKAB, university assistant and deputy head of the Institute of Physiology and Pathophysiology, PD Silvia DOSSENA, PhD interim director of the Institute of Pharmacology and Toxicology Salzburg, and Dr. Gustavo CHAVES-BARBOZA Dr. rer. nat. as head of the electrophysiology unit at the Institute of Physiology, Pathophysiology and Biophysics Nürnberg.

- The basis for the establishment of the operation of COMPCEL is the development and publication of a transparent guideline that regulates the use of technical, methodological, and intellectual resources by COMPCEL.
- The support of COMPCEL to third parties shall be compensated by return services or contributions. These can be of a material (cash or non-cash benefits) and/or immaterial (e.g., authorship in scientific publications) nature. The type of counter-benefit(s) must be determined in advance between the COMPCEL management members and the third party.

Expected benefits and added values

All-in-one, state-of-the-art facility based on the highest scientific qualification and up-to-date technical equipment – "everything under one roof".

- Professional theoretical and technical advice for researchers
- Accurate planning of the investigations to be carried out, creation of a target-oriented experimental design
- Advice and mentoring for the professional execution of electrophysiological experiments
- Support for the analysis and interpretation of the collected measurement data based on the current state of knowledge
- Cost reduction through more efficient use and maintenance of already invested expensive high-tech equipment and experimental setups
- Avoidance of redundant acquisition, operation and maintenance of expensive high-tech devices and measuring equipment
- Optimal use and utilization of the existing electrophysiological measuring equipment as well as the peripheral facilities necessary for their operation (cell culture, etc.)
- Cost-efficient acquisition and minimization of consumption of operating materials and consumables
- Minimization of laboratory animal waste and services for electrophysiological measurements
- Expansion of the existing scientific and methodological focus on electrophysiology at the scientific location
- Creation of new scientific collaborations
- Increase in scientific publication output
- Provide services to industry
- Increasing the economic performance of the Institutes of Physiology and Pathophysiology, Experimental Neuroregeneration, Pharmacology and Toxicology/Salzburg, as well as Physiology and Pathophysiology and Biophysics /Nürnberg

Prerequisites for the establishment of COMPCEL

- Consolidation of the existing electrophysiological facilities of the participating institutes, with minimal financial and organizational effort.
- Laboratory space availability within the participating institutes.
- Close spatial proximity between the Institute of Pharmacology and Toxicology and the Institute of Physiology and Pathophysiology/Salzburg.
- Existing electrophysiological equipment within the participating institutes, which complement each other ideally.

Scientific Expertise

The previous publications of Dr. Bruno BENEDETTI, Prof. Dr. Martin JAKAB, Univ. Prof. Dr. Markus RITTER, Univ. Prof. DDr. Boris MUSSET and PD Dr. Silvia DOSSENA underline their

expertise in the planning, implementation, analysis, and publication of electrophysiological projects. These scientists have been supervising successfully long-term and proceeding internal and external scientific projects and collaborations with local institutions, e.g., internal, with the Institute of Molecular Regenerative Medicine (Prof. L. AIGNER), and external, with Prof. H. KERSCHBAUM, Prof. T. WEIGER (NaWi/PLUS) and Prof. J.W. BAUER (EB House Austria, Research Program for Molecular Therapy of Genodermatoses). In addition, the scientific proficiency and networking ability of the COMPCEL management members is testified by a long record of publications in collaboration with national and international institutions, including, but not limited to, the Ludwig Boltzmann Institute of Arthritis and Rehabilitation (Austria) and the Universities of Vienna (Austria), Innsbruck (Austria), Graz (Austria), Messina (Italy), Torino (Italy), Bari (Italy), Padua (Italy), Tel Aviv (Israel), Pécs (Hungary), Valencia (Spain), Heidelberg (Germany), Jülich (Germany), Frankfurt (Germany), Marburg (Germany), the National Research Council (Italy), Rush University (Chicago, USA), Yale University (USA), and prove their qualification as head of a scientific-methodological core facility.

Techniques offered by COMPCEL

The techniques that are relevant in the context of COMPCEL are:

- Conventional or perforated patch-clamp in whole-cell configuration (voltage-clamp and current-clamp recordings)
- Single-channel patch-clamp
- Combined patch-clamp and fluorescence measurements
- 'Tip-Dip' patch-clamping of reconstituted rheogenic ion transporter proteins in artificial lipid bilayers
- Membrane potential measurements by fluorescent probes (plasma membrane, mitochondrial potential)
- Short-circuit current measurements
- Auditory Brainstem Recordings
- Acute slice preparation (supporting various brain regions of neonatal / young / adult / mouse / rat)
- Single cell patch clamp on acute brain slice preparation (optionally combined with red or green fluorescence)

Logistic and general organization

The COMPCEL equipment will remain located within the respective participating Institutes as indicated in the paragraph "Equipment included in COMPCEL", with the advantage that no dedicated laboratory space will be necessary for the establishment of COMPCEL in the short and medium term. The individual pieces of equipment will keep their original inventory number.

Users of COMPCEL will have access to the cell culture rooms of the participating Institutes. This exclusively refers to the preparation of cells intended for use in electrophysiological experiments supported by COMPCEL.

Requests to access COMPCEL by potential users shall be project-oriented, specific, and reasonably realistic in terms of feasibility and duration in time. Such requests shall be sent via email to the COMPCEL administrative assistant Mrs. Elisabeth MOOSLECHNER (e.mooslechner@pmu.ac.at) and successively redirected to the COMPCEL management members. Following a meeting of the COMPCEL management members, a decision on the acceptance of the request will be taken. In case of a positive decision, a member who will be in charge of supervising the specific project will be identified. This member will serve as a contact between the user and COMPCEL and will negotiate with the user the terms and conditions for access to COMPCEL.

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**Univ. Prof. Dr. med. Markus RITTER
Institute of Physiology and Pathophysiology
PMU Salzburg, Austria**

**Univ. Prof. Sebastien COUILLARD-DESPRES, PhD
Institute of Experimental Neuroregeneration
PMU Salzburg, Austria**

**Priv.-Doz. Silvia DOSSENA, PhD
Institute of Pharmacology and Toxicology
PMU Salzburg, Austria**

**Univ. Prof. DDr. Boris MUSSET
Institute of Physiology, Pathophysiology and Biophysics
PMU Nürnberg, Germany**