
Center Report: Center of Implant Research

Introduction:

The Center of Implant Research (CIR) of the Clinic of Reconstructive Dentistry at the University of Zurich (UZH) was founded in 2016 as a global platform offering cutting edge facilities and highly qualified staff for the support of clinical research in dental implantology. The Center started the first activities in 2017 at both national and international level. After an intensive operational phase, during which numerous research activities were initiated and collaborations with other research centers were established, the Center is now entering its next stage, with a stronger focus on exploring new research areas and optimizing processes and internal organization.

Vision:

To improve oral health care globally by development and improvement of clinical therapy in the field of implant and regenerative dentistry.

Mission:

To improve and facilitate global clinical research in implant and regenerative dentistry by providing high quality service structures (qualified staff and cutting-edge infrastructure) to multiple stakeholders like scientists, clinicians, university partners, industrial partners, and regulatory bodies.

Particularly, the Center supports research projects in all phases: from idea development to the performance of the clinical trial and related closing activities (data collection and analysis) thanks to research expertise and a competent study management staff coordinating all collaborations and ensuring high standards in the performance of the clinical studies.

Activities and Research:

The significant achievements and developments of the CIR at both national and international levels have led to the establishment of a new organizational structure, including the formation of a managing board under the supervision of the Steering Committee.

Since its inception in June 2023, the board has met regularly to discuss and approve strategic goals in alignment with the mission and vision of the CIR.

Organizational Growth and Clinical Study Updates

Over the past year there have been a few changes to enhance and consolidate the organizational structure introduced in 2023 which is worth mentioning. In addition to a growing study management team, comprising 2 study managers and 2 local study coordinators, a statistician, research scholars and research assistants have further supported research activities at the operational level (Fig.1). This strengthened team has enabled the efficient preparation and execution of an increasing number of new research projects.

Currently, 44 clinical trials are ongoing at the Clinic of Reconstructive Dentistry under the supervision of the CIR. Of these, 30 are monocentric studies, with the Clinic of Reconstructive Dentistry as the sole study site, while 14 follow a multicenter setup, where the Zurich center collaborates with other universities in a leading role.

Additionally, CIR has contributed to initiating and supporting 11 studies conducted across multiple universities worldwide. In 2024, four clinical studies were completed,

and result analysis is currently in progress. The planning phase for 10 new studies has begun, with their implementation scheduled for 2025.

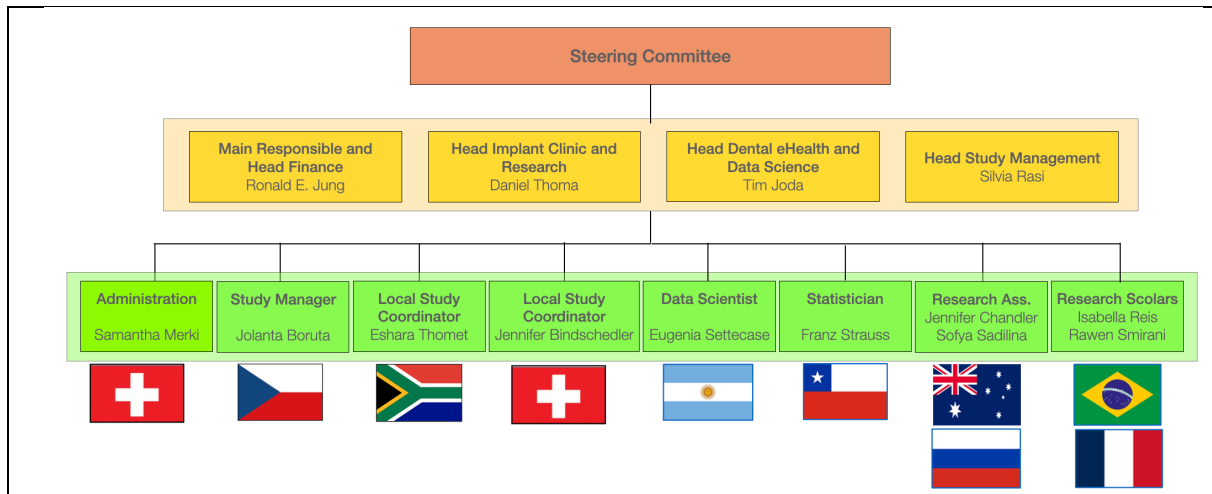


Fig.1

New Research Areas

Although implant and regenerative dentistry remain the primary research focuses of CIR, recent trends in dental care have led to three highly disruptive and innovative new research areas, which are considered to be game changer in dentistry and oral health. Therefore, in 2024 the CIR has strategically allocated resources to the following four innovative initiatives:

- **Epidemiological studies investigating the prevalence, distribution, and determinants of oral health conditions within large populations.**

In this context CIR has supported in the preparation of an epidemiological survey aimed to investigate oral health-related quality of life (OHRQoL) in elderly population (approximately 3'500 subjects).

While this project is still ongoing, accessing a sufficiently large elderly population has proven to be a significant challenge. To advance research in this area, interdisciplinary collaborations with other clinics that specialize in elderly care will be essential.

- **Peri-implant health through analysis of crevicular fluids:** The current focus on investigating crevicular fluids surrounding dental implants is ongoing. In collaboration with the Karolinska University of Gothenburg, collection procedures for oral fluids have been established and implemented in newly launched projects.

The next step / long-term goal is to establish an on-site dental biobank for oral fluids with local expertise related to their processing and analysis. The importance of the connection between oral fluids and general systemic health is growing. The on-site biobank will obviate the international transfer of samples for analysis and facilitate an inter-disciplinary approach to collecting data for research purposes by involving various partners of the CIR national network (other clinics and private practices).

- **Patient involvement in decision making.** In an era of patient-centered healthcare, involving patients in decision-making processes is becoming an essential step in the planning phase of research projects. To integrate this innovative approach into the research strategy of the clinic for reconstructive dentistry, a dedicated working group has been formed.

Global implant registry

The global implant registry database has been upgraded and enhanced by the data scientist, who is working towards developing predictive models to explore innovative applications of big data. The registry, which contains comprehensive details on surgical procedures, implant types and sizes, as well as implantation timepoints over the past 20 years, has attracted significant interest from external stakeholders.

This growing interest has driven further advancements in data science, particularly in the area of **Registry-Based Clinical Trials (RBCTs)**. RBCTs represent a novel approach to clinical research, utilizing data from existing medical registries to evaluate the effectiveness, safety, and other aspects of medical interventions. By using pre-existing e-health data, RBCTs reduce the need for large target populations and extensive resources, minimize patient burden, and accelerate recruitment timelines.

The next challenge lies in integrating the vast amount of data generated by various clinical studies into the implant registry, creating a comprehensive database that can support the planning and execution of future RBCTs.

CIR's National and International Network Growth

As part of strategic expansion, CIR has started developing a robust national network in addition to the existing international one. This national network will be specifically composed of private practices led by dentists who have completed specialist training at the Clinic of Reconstructive Dentistry at the University of Zurich. Joining the first 2 private practices in the network from the greater Zurich area, there have been further developments on a national level to include private practices from other regions in Switzerland (Lugano, Geneva, Bern) in clinical studies.

The vision behind this initiative is to create a cohesive and collaborative network of dental professionals who are interested in supporting research projects and learning how to do research by taking advantage of the services offered by the CIR.

On the global front, the CIR international network will expand to the US with the initiation of a multicenter study in collaboration with the School of Dental Medicine at Harvard University in Boston and to Thailand with the participation of Chulalongkorn University in Bangkok to a clinical study, already started in Zurich.

Advancing as a Research Services Provider

In an attempt to diversify its scope of activities, CIR has assumed a new role as a small Contract Research Organization providing research solutions and support to external companies. This initiative is led by the Study Management team through outsourcing research services on a contract basis.

The fifth Steering Committee meeting took place on 18 September 2024. Present at this meeting was the most recently appointed member of the committee, Professor Dr. Frank Rühli. Professor Dr. Rühli is the Dean of the Medical Faculty of the University of Zurich. With his wealth of knowledge and experience including research and leadership roles, he will be an invaluable addition to the steering committee.

Finances:

A large part of the clinical studies are funded through research grants derived from different funding organizations and from industry partners.

In 2024, 11 grants were gained; of these, 6 were competitive grants and 5 grants given by companies.

Another important financing source comes from private donors, based in Switzerland or abroad, who want to give a contribution to the clinical research in the dental field and believe in the CIR as valuable research organization. In 2024, further donations were acquired.

Center of Implant Research – Summary

- **Ongoing research activities**, with **44 active studies** (30 monocentric, 12 multicentric at national and international levels) and **10 studies in the planning phase**.
- **New research directions**, including the application of data science in planning registry-based clinical trials, the establishment of a biobank for oral fluids, and the development of local expertise in their processing and analysis.
- **Expansion of national and international collaborations** to the U.S. (Harvard University, Boston) and Thailand (Chulalongkorn University, Bangkok).
- **Evaluation of CIR** as a small Contract Research Organization (CRO) providing research services to companies in the dentistry field.
- **Appointment of Prof. Dr. Frank Rühli** (Medical Faculty, University of Zurich) as a new member of the CIR Steering Committee.

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