

Oral tissue regeneration is undergoing a paradigm shift right now

The Osteology Foundation marks its 20th anniversary this year. This jubilee will be celebrated at the International Osteology Symposium in Barcelona from 27–29 April 2023. To mark the occasion, we spoke in advance with Christer Dahlin, President of the Osteology Foundation Board and Professor in Oral Surgery and Guided Tissue Regeneration at the Department of Biomaterials Science at the Sahlgrenska University of Gothenburg, Sweden, about the Foundation's beginnings and its impressive path to becoming a global specialist organisation in the field of oral tissue regeneration.

Professor Dahlin, can you take a brief look back in time and tell us when oral tissue regeneration began as a discipline?

Let me start with the beginnings of implant dentistry, as implantology and oral tissue regeneration complement one another as disciplines. For me, the era of implantology began with the pioneering work of the late Per-Ingvar Brånemark from Gothenburg. He operated on the very first patient in 1965, and from 1977 implantology was officially recognised as a treatment concept. In 1982, George Sorb invited all universities from America and Canada to a congress in Toronto, where the Gothenburg

group could present its work. This meeting launched the world-wide spread of implantology. At the same time, André Schröder was working on similar ideas in Switzerland. He had a slightly different philosophy, because Switzerland was and still is number one when it comes to orthopaedic medical devices. The developments took place concurrently, but I would say that the big push and the more structured approach to implant development took place in Gothenburg.

In the mid-1980s, interest in the regeneration of oral tissue grew, as often insufficient bone volume made implant treatment impossible. So, people began to look for new techniques that went beyond traditional bone grafting.

Guided bone and tissue regeneration (GBR and GTR) were the revolutionary treatment concepts that catapulted oral tissue regeneration into the highest disciplinary ranks of dentistry. You have had a significant pioneering role in the development of these treatment concepts. Can you give us more details about the beginnings?

It all started with guided tissue regeneration and the need for better periodontal treatment. At that time, the realistic treatment goal of periodontal disease was to halt progression. In the late 1970s and early 1980s, Thorkild Karring from the University of Aarhus and Sture Nyman from the University of Gothenburg explored different reconstructive approaches using barrier membranes to achieve periodontal reattachment.

As a very young dentist, I attended a postgraduate course with Sture Nyman. I was immediately excited about this biological concept, which I thought must also be applicable to other indications such as bone defects. A few weeks later, I mustered up the courage to call him and convinced him to meet with me and discuss the issue further. Long story short, I travelled to Gothenburg and became his PhD student. Our first experimental study on rats published in 1988 showed the regenerative effect on bone defects. We then wanted to know if it was possible to regenerate bone around dental implants as well and did the first experimental study to demonstrate this, published in



1989. This major publication demonstrated the regenerative effect of oral tissues around teeth and implants. And I was lucky enough to be able to formulate my PhD project from my own thoughts. That was a blessing.

Later, Sture Nyman also moved to Bern to work with Klaus Lang and Daniel Buser. In Gothenburg we did basic research to understand the underlying biology. The first clinical case was then conducted and published in Bern by Daniel Buser and Sture Nyman.

At that time, oral tissue regeneration supported implant dentistry in its growth, but nowadays there's a paradigm shift.

It is a paradigm shift! Thanks to the significant rise of implant treatment within dentistry, oral tissue regeneration has evolved strongly in recent decades. In the future, this area is set to become even more important through the paradigm shift in implant dentistry: what was originally function-oriented intervention has, on top of this, become treatment with high aesthetic standards and minimal invasiveness as a prerequisite. Nowadays, effective techniques of oral tissue regeneration enable implants to be placed correctly from a prosthetic point of view, even in suboptimal bone conditions and despite gingival deficits. Implant dentistry has become more of what it should be: Namely a prosthetically-driven treatment method that focuses on the tooth or the final restoration. Oral tissue regeneration and guided bone regeneration have proven to be very useful in optimising medium to small-size defects instead of doing more invasive surgery with bone grafts.

In this sense, oral tissue regeneration has perhaps been a booster or catalyst for implant treatment, making it a more aesthetically oriented procedure.

Oral regeneration has always developed in parallel with implantology, but now that the trend is back to preserving a tooth as long as possible, it has, in a way, emancipated itself from implantology. What does this mean for research and education, the two pillars of the Osteology Foundation?

Bone regeneration has been the focus of research for decades and is now practised at a correspondingly high level. And for quite some time, it was considered that soft tissue simply follows the bone. This is true to a certain extent, but we also see great potential in optimising soft tissue independently. We can look forward to decisive progress in this area in the coming years. The research for gaining specific evidence is on-going and will provide clinicians in the future with valuable guidelines.

Another trend is the increased use of sophisticated tissue regeneration techniques in tooth preservation. This is also where the

Osteology Foundation comes into play: this organisation is a true specialist in oral tissue regeneration, covering all relevant indications from hard and soft-tissue management to the biologisation of regeneration as well as interdisciplinary regenerative approaches. As such a specialist, we strive to accompany these trends, be it with implant-oriented or tooth-preserving procedures.

To this end, the Osteology Foundation offers a finely balanced system of research funding and training opportunities at every level and in many countries around the world

The Osteology Foundation will mark its 20th anniversary this year. Will there be any celebrations?

The Osteology Foundation is celebrating its 20th anniversary in 2023 with the absolute highlight of the year: the International Osteology Symposium, held 27–29 April in Barcelona. Thanks to its longstanding presence, the organisation can look back on an eventful history and has supported oral tissue regeneration virtually since its beginnings as a discipline. The symposium will provide relevant theoretical and practical knowledge to all interested parties, from the student to the general practitioner to the experienced specialist. This event is a unique opportunity for a deep dive into the exciting world of regeneration: the most renowned experts worldwide will share their knowledge through a multitude of lectures and hands-on workshops. For young and established specialists alike, Barcelona is the place to be this April.

For sure, the unique networking at the International Osteology Symposium for three days can enable one participant to take the next step in their career or another to meet long-lost friends. And everyone will be a slightly better surgeon, practitioner or researcher after their time in Barcelona—simply because the wealth of relevant information and intensive exchange with one's peers are the best way to progress.

Thank you very much for taking the time to talk to us, Prof. Dahlin.

