

EDITORIAL

Translational Medicine

Dear readers, it is with great pleasure that I present to you RAD 43 (2016), the thirteenth volume of our journal, which has been continually published annually or semi-annually since 2006.

In the present volume, we have published three excellent articles. Some of them were written by members of our Editorial Board (Iva Dekaris, Vida Demarin). I cordially thank our distinguished colleagues and all the others authors of the mentioned articles for their contribution.

The present volume, in addition to the three mentioned articles, introduces abstracts from the 3rd International Conference on Regenerative Orthopaedics and Tissue Engineering, entitled *New Insights in Cartilage Repair*. The Conference was organized by the Department of Medical Sciences of the Croatian Academy of Sciences and Arts and the University of Zagreb, in cooperation with the Croatian Orthopaedic Society – Section for Translational Medicine, and held on the 4 November 2015 at the Academy Palace. It was devoted to the review of recent progress achieved in the research of cartilage repair and regeneration in the view of the modern concept of translational medicine.

Tissue Engineering and Regenerative Medicine (TERM) and Tissue Engineering and Regenerative Orthopaedics (TERO) form a part of a new wave of scientific and biotechnological revolution in medicine, or rather orthopaedics, the final aim of which is complete regeneration of damaged tissues of the bone and joint system. This is a very dynamic and interdisciplinary area, in which expert from diverse domains take part and cooperate on an equal footing; it is hence most common for a team to include – for instance – a medical doctor, a biologist, a chemist and an engineer. The key moment in any research of this kind is the move from laboratory, experimental environment to clinical, human medicine. This step is referred to as translation; translational research in medicine is today the most important concept, through which basic scientific research is being transformed into practical, applicable knowledge.

Articular cartilage has an extraordinary biomechanical performance and simple structure. However, it is vulnerable to multifactorial damage and insufficient to self-repair, isolated in the articular capsule without nerves or blood vessels. Restoration of hyaline cartilage in

osteoarthritis (AO) is a clinical challenge to recreate normal functionality over a long period. Pre-clinical trials have achieved promising outcomes in cartilage regeneration using MSCs. The rationale and technologies of MSC-based hyaline cartilage repair involving tissue engineering, 3D biomaterials and growth factors is elaborated in translation and application of MSC-based chondrogenesis for OA treatment. In the articular cartilage repair process, it is imperative to consider the type of biologic and the method of delivery to achieve the desired effect in cartilage repair. A number of spatiotemporal strategies are discussed for the controlled delivery of bioactive factors in cartilage tissue engineering applications. Focal chondral and osteochondral knee lesions are common conditions which are hard to treat when involving young active patients with high expectations of symptoms relief. (Pecina M, Vukicevic S (2014) Tissue engineering and regenerative orthopaedics (TERO). Int Orthop 38: 1757-1760).

In orthopaedics in the last two decades, the process of the so-called autologous transplantation of chondrocyte, by which a chondrocyte sample is taken from the patient and multiplied in the laboratory, followed by being returned to the place of the damaged articular cartilage, was developed. Today, it is already possible – thanks to 3D printing technology – to print live articular or nasal cartilage. The day when it will be possible to develop tailor-made whole joints and bones by using the same method is not far either.

Readers are informed of all the newest knowledge on current options for repair and regeneration of cartilage in a summarised form – published abstracts of articles from the 3rd International Conference on Regenerative Orthopaedics and Tissue Engineering.

The last article in this volume of RAD, entitled *Twenty-Five Years of the Functional Endonasal Endoscopic Sinus Surgery in Croatia*, shows that 25 years ago, endonasal endoscopic sinus surgery was rather avant-garde, similar to today's application of 3D printing technology in the repair of articular cartilage.

I gladly announce that in the upcoming volume of RAD, we plan to publish abstracts from a major international symposium, entitled *What's New in Refractive Eye Surgery* (Iva Dekaris). This symposium will take place on 10 June 2016 at the Academy Palace in Zagreb. We hope that RAD 43, now in front of you, will prove as interesting and informative as the previous volumes. Major interest for our journal has been confirmed by ca. 150,000 visits to our articles published on the website hrcak.srce.hr.

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