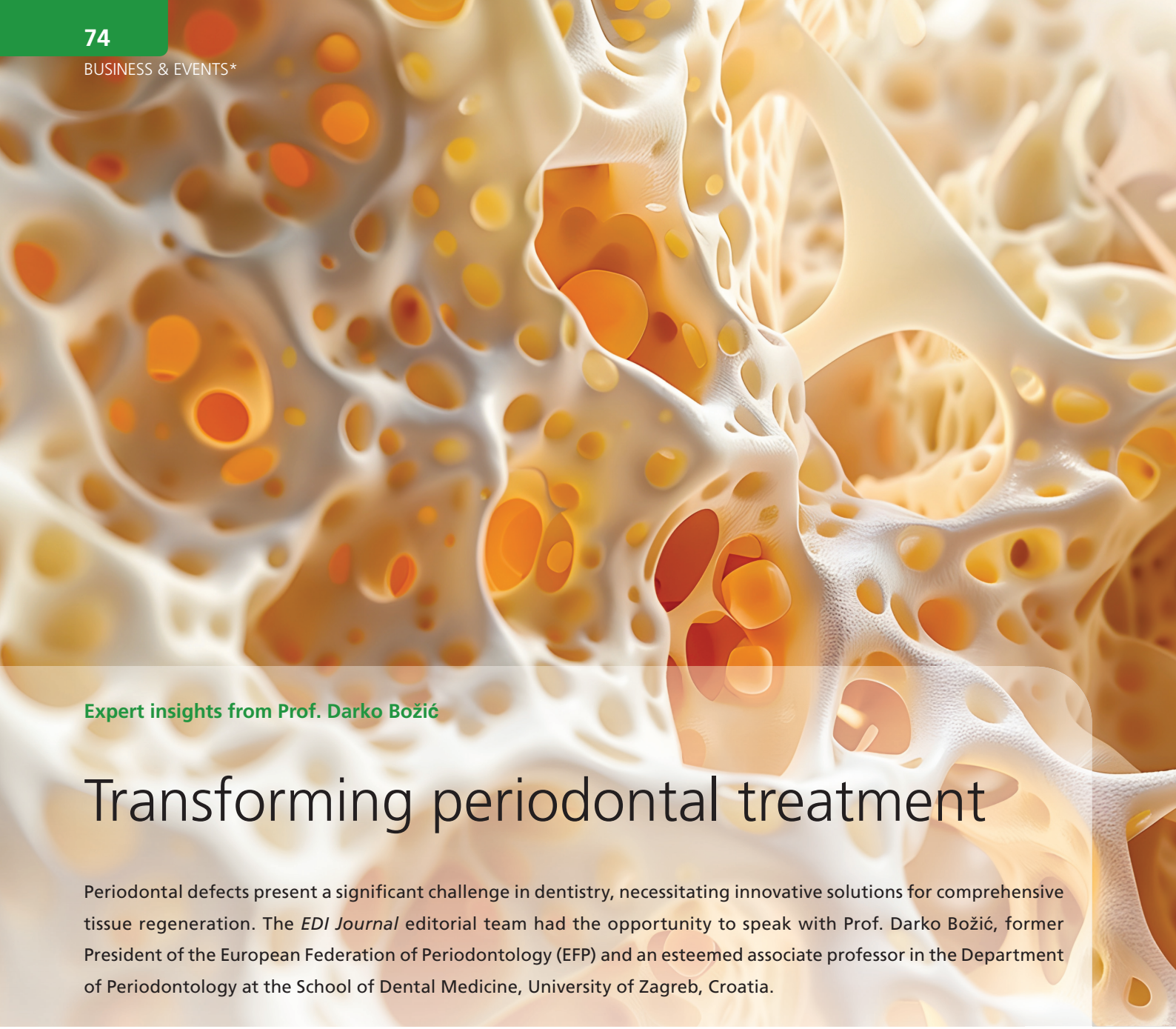

Expert insights from Prof. Darko Božić

Transforming periodontal treatment

Periodontal defects present a significant challenge in dentistry, necessitating innovative solutions for comprehensive tissue regeneration. The *EDI Journal* editorial team had the opportunity to speak with Prof. Darko Božić, former President of the European Federation of Periodontology (EFP) and an esteemed associate professor in the Department of Periodontology at the School of Dental Medicine, University of Zagreb, Croatia.

Prof. Darko Božić

Prof. Božić's academic journey is deeply rooted at the University of Zagreb, where he completed his MSc, PhD, and postgraduate periodontics programme. His passion for periodontal regeneration and growth factors began during his dental studies. Mentored by Prof. Slobodan Vukičević, a pioneer in bone morphogenetic protein (BMP) research, he focused his PhD on the effects of BMPs on cementoblasts. Currently, his research centers on using hyaluronic acid in periodontal and bone regeneration. Prof. Božić's team has participated in a large multicentre trial using enamel matrix derivatives in non-surgical therapy, publishing several studies and investigating the tissue proteomics of periodontal tissue.

Your academic work focuses on growth factors to restore lost periodontal tissues. Are there any emerging trends or future directions in this area that you find particularly promising or noteworthy?

When we talk about periodontal regeneration, we still believe that growth factors are the way forward. In recent years, we have been using hyaluronic acid for periodontal regeneration and evidence shows it helps restore lost periodontal tissues.

We have animal histology, cementoblast *in vitro* study, and a few human clinical trials demonstrating the beneficial effects of this molecule for periodontal regeneration.

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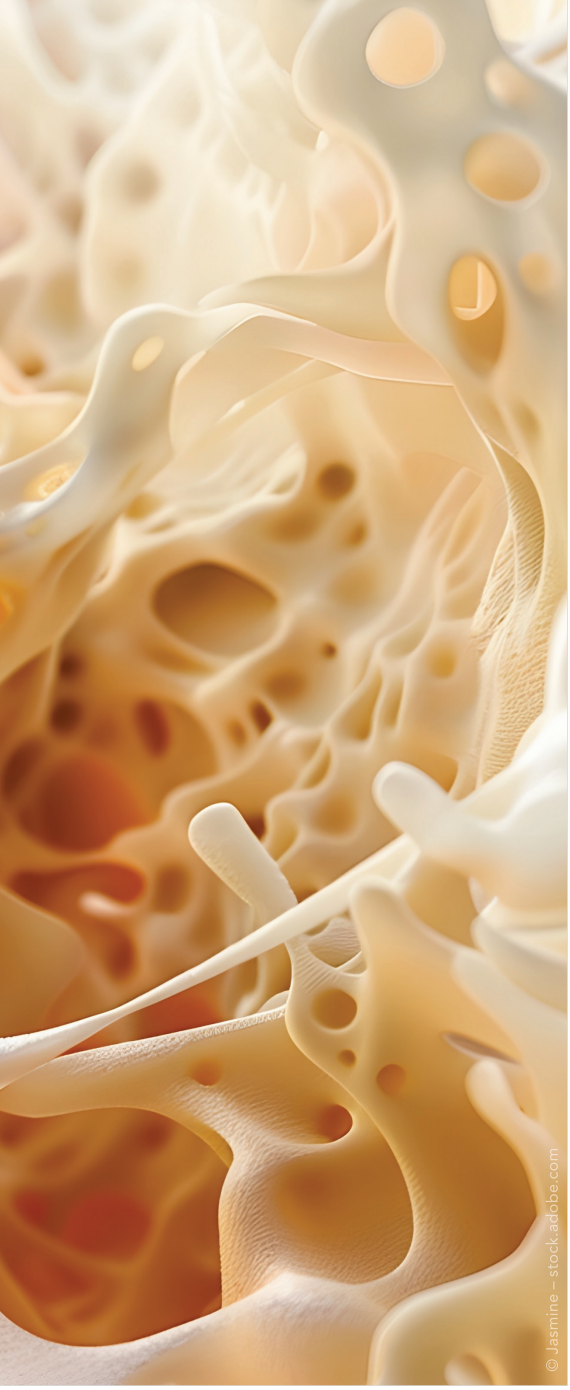

We know that enamel matrix derivatives or nanomaterial derivatives for the last two decades have been also in the clinical site, PDGF (Platelet Derived Growth Factor), and I still think in the future a BMP will be one of the growth factors that will be used successfully for periodontal regeneration.

At the symposium supported by the OSSTEM Scientific Community in London later this year you plan to lecture on xenogeneic collagen matrices, is this the material you use in your practice now? Would you say it is more effective than connective tissue grafts or other alternatives?

At the symposium in London, my presentation will focus on collagenous xenogeneic matrices for soft-tissue reconstruction around implants. While many still consider the connective tissue graft as the gold standard, I would say it probably is. Based on my experience over the past several years, I've found collagenous xenogeneic matrices to be a viable alternative. These matrices show promising clinical indications as replacement grafting materials, effectively enhancing and thickening soft tissues around implants.

Additionally, our observations indicate a significant increase in keratinised tissue width over time with the use of collagenous matrices. However, it's important to note that a certain amount of keratinised tissue is necessary for fibroblasts from the keratinised mucosa or gingiva to integrate into the matrix and induce soft-tissue keratinisation.

I would say that daily for minor defects and minor concavities around implants, collagenous matrices are as effective and even exceptionally good, and well tolerated by the patients as compared to the connective tissue graft. I will demonstrate clinical cases and provide more evidence during my presentation at the symposium in November.

Hyaluronic acid is known for its versatile applications in dentistry and is praised for its regenerative properties. Could you please elaborate on the findings from your recent study regarding the effects of hyaluronic acid on mineralised tissue markers and cementoblast-specific genes?

I believe that growth factors continue to represent the most promising and effective strategy for advancing periodontal regeneration. The problem with the growth factors was that carriers are difficult to identify which is a good carrier for a certain growth factor. Is beta-TCP (β-tricalcium phosphate) as effective as hydroxyapatite, demineralised porcine bone, demineralised bovine bone, or an allograft?

In our recent study on inducing some mineralised associated genes in cementoblasts, we demonstrated that hyaluronic acid significantly improves and enhances gene expression even after eight days. This finding is particularly noteworthy, as many growth factors typically exhibit a peak in induction followed by a decline in cellular activity.

In cementoblasts treated with hyaluronic acid, we observed a sustained elevation in gene expression levels. Additionally, both our research and other studies indicate that hyaluronic acid can also induce osteoblast differentiation.

Considering these findings, hyaluronic acid emerges as a versatile molecule capable of inducing both periodontal and bone regeneration. Over the past six to seven years, I have used it monthly for bone regeneration, consistently achieving exceptionally good results.

Do you think the application of the HA will be a game changer in periodontal tissue regeneration?

I believe that among the numerous molecules available on the market, hyaluronic acid, in particular, stands out as an exceptionally beneficial compound for successful periodontal and bone regeneration. Whether referred to as a protein or a molecule, its effectiveness in promoting tissue regeneration is well-supported by research and clinical evidence.

Thank you for your time, Prof. Božić!

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