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EDITORIAL
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Editorial: Insights in Regenerative Dentistry: 2021

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Editorial on Research Topic

Insights in Regenerative Dentistry: 2021

I am not certain to whom the the term "Regenerative Dentistry" can be attributed but Hal Slavkin (University of Southern California) was certainly among the first to propose that advances in basic discovery research of dental/oral development would provide the basis for understanding how these tissues might be regenerated/repaired/restored in a clinical context.

Hal is a visionary who pioneered basic research in dental and craniofacial biology by creating the Center for Craniofacial Molecular Biology at USC in 1991. I established a similar center in Craniofacial Developmental Biology at Kings College London in 1994 and together we launched the first Gordon Research Conference in Craniofacial Morphogenesis and Tissue Regeneration in 2004 held in California and alternating with a site in Tuscany, Italy. In 2013 in response to an increasing demand, myself and colleague Ana Angelova introduced a non-clinical Masters course in Regenerative Dentistry and KCL aimed specifically at young dentistry graduates wishing to understand more of this field to pursue their own research and teaching. To date this course has graduated 70 students, many of whom have progressed to PhD and to run their own regenerative research labs and developed teaching courses to educate dental undergraduates in the future impact of tissue regeneration in dentistry.

It is fair and obvious to say that regeneration of hard tissues has overwhelmingly been focussed on bone but increasing insights and progress in tooth and oral soft tissue development and regeneration are being made and these are reflected in this Research Topic.

A report from the Waddington lab, (Brown et al.) reviews the current state of knowledge for the effects of extracellular vesicles on osteogenic differentiation and in particular discusses the efficacy of these approaches in the context of future clinical applications. A current: "hot topic" in cell differentiation, namely the role of energy metabolism in the control of cell fate is summarized by Fujihara et al. as the role of cell metabolism on osteogenic reprogramming and differentiation in the context of periodontal regeneration. A research study presented by Komada et al., provides new insight into cementum formation using an experimental model of regenerative endodontic procedures. Dental pulp cells with stem cell-like properties were first described over 20 years ago and although their *in vitro* osteogenic differentiation has been well-characterized, far less is understood about their potential to form odontoblasts-like cells *in vitro*. Sulistyowati et al. describe the effects of treating dental pulp cells with histone deacetylase inhibitors and show inhibitors such as Tricostatin A and Suberoylanilide can promote odontoblast-like cell differentiation.

The papers in this issue thus provide insights into a range of important areas in Regenerative Dentistry including periodontal tissue restoration and dentine regeneration. The very latest advances in the use of extracellular vesicles to promote bone regeneration and an understanding of the impact of metabolism on cell behavior (a current "hot topic") are presented. Without

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doubt there is far more to come in this area and I look forward to reading more in the near future and passing this knowledge onto students.

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The author confirms being the sole contributor of this work and has approved it for publication.

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The handling editor MS is currently organizing a Research Topic with the author PS.