Dear reader,

Daniel Zimmermann
Group Editor
Dental Tribune International

Early childhood carries is among the greatest challenges that dentistry have to face today. According to latest figures of the World Health Organisation, infection rates with the Streptococcus mutans bacterium exceed 70 per cent not only in poor countries but also in some parts of the developed world. New detection technologies like laser fluorescence have become available in recent years, but the condition remains a complex clinical problem boasting a multitude of factors.

In our first Paediatric issue, which is included in this edition of DT Asia Pacific, Dr Man Wai Ng from the Boston Children’s Hospital in the US is discussing a new chronic diseases management approach that has proven successful to address the process of the disease. Along with her article, you will also find more insights in other current issues in paediatric dentistry such as the risk of radiation exposure and the treatment of special care patients. I wish you an interesting read with this edition.

Yours sincerely,
Daniel Zimmermann
Group Editor
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Tooth regeneration: news and hurdles

Dr Jeremy J. Mao

Recently, Prof. Cheng-Ming Chuong's group at the University of Southern California demonstrated a specialised stem cell niche that appears to enable repetitive renewal of alligator teeth. These findings, along with several other important reports in the past two years or so, will continue to enrich our understanding of stem/progenitor cells and regulatory molecules that are pivotal to tooth regeneration.

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The remaining tasks for regenerating human teeth however are many: how to replace embryonic tooth germ cells with adult stem/progenitor cells and how to enable alligator tooth successions in humans.

Translation of experimental findings to therapeutics that lead to human tooth regeneration is a lengthy process. An important contribution from Prof. Takashi Tsui's group at the Tokyo University of Science has shown that embryonic germ cells can differentiate into tooth-forming cells and a regenerative tooth. Recently, Prof. Paul Sharpe’s group at King’s College London showed that a combination of embryonic tooth germ cells and postnatal cells also led to regenerated tooth organs.

The field of tooth regeneration has diverged into two subfields: first, a near-term goal to regenerate functional tooth roots that integrate with the alveolar bone via a periodontal ligament, and, second, a long-term goal to regenerate an entire tooth, with enamel, dentine, dental pulp and cementum, that also integrates with the alveolar bone via a periodontal ligament. These two goals were delineated in a recent article in Cell Stem Cell.

Undoubtedly, new discoveries will advance experimental approaches step by step towards regeneration of tooth roots or entire teeth in patients. The question is not whether (for stem cells do form teeth during development), but when we will be able to understand and manipulate stem cells to form teeth in adult patients. The timelines depend on not only scientific progress but also regulatory approval processes.

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