‘These are exciting times in which we live’

An interview on stem-cell research in dentistry with Prof. Thimios Mitsiadis, head of the Institute for Oral Biology at the University of Zurich

Dental Tribune Germany: Prof. Mitsiadis, which factors determine the formation of enamel?
Prof. Thimios Mitsiadis: This is a very complex process, which is determined by the dental epithelium at a very early stage and different to that of the skin epithelium that covers the body.

There is a multitude of transcription factors, one of which is Ptx2, which governs the formation of oral and dental epithelium.

Based on this, there are other transcription factors. At the moment, we only know of Tbx1, which co-forms the ameloblasts. Of course, there are further transcription factors that we do not yet know much about and that are regulated by certain growth factors.

The transcription factors occur within a very tight timeframe to form enamel. It is a highly complex process from the beginning to the final formation.

Which factors may disrupt the formation of enamel?
Dental enamel can be damaged in which 1,535 children and adults received dental care at no charge. More than 900 volunteers, including 170 dentists and 87 hygienists, were involved in the setup, two treatment days and cleanup of this inaugural, large-scale oral health care event, held at the La Crosse Center.

Medical professionals from Wis-
Dental erosion is a growing problem, which is certainly driven by the increase in life expectancy. However, statistics demonstrate that younger patients are also increasingly being affected. What is the cause of this development from your point of view?

Yes, it is a fact that loss of enamel has been detected mostly in elderly people. In my opinion, two factors have to be considered. Nowadays, we know much about prevention, but in the past many people did not take care of their teeth sufficiently.

General health conditions and other diseases were considered more important. Research and medication in these areas have improved significantly. Over time, however, we realized that we had not paid sufficient attention to our many dental problems.

Another possible reason is migration. We tend to travel more and live in various countries. For example, I was born in Greece, but now live in Spain with my Spanish wife. My children, therefore, possess features of both nations. This may result in abnormalities and deterioration of enamel.

What innovative perspectives have arisen from these new findings?

These are exciting times in which we live. It is evident that in the near future – in about 20 to 50 years – we will be able to create new tissue with the aid of microbiology and genetics. Clinical studies that examine the use of dental stem cells for the regeneration of jawbone are already under way.

This is proof that progress in this regard is being made. We just need more information on how to achieve natural protection.

What progress has been made in stem-cell research for the formation of enamel?

We recently formed a European consortium with researchers working with stem cells in Germany, Finland, Switzerland, Italy and France. The consortium's objective is to isolate stem cells from teeth, the face and the head, and to use them to generate products.

Distraction osteogenesis vs. autogenous

Endosseous implants fare equally well after either distraction osteogenesis or autogenous bone grafting, according to a new report published in the September 2009 issue of the Journal of Oral Implantology, the official publication of the American Academy of Implant Dentistry and of the American Academy of Implant Prosthodontics.

Following alveolar reconstruction, endosseous implants support and retain the prosthesis. Therefore, it is important for the method of alveolar reconstruction to be highly compatible with the subsequent implantation. The authors conducted a retrospective analysis to determine whether distraction osteogenesis or autogenous bone grafting offers a greater chance of clinical success.

The authors included 82 consecutive patients from the patient population of Loma Linda University in a retrospective analysis of the two alveolar reconstruction techniques.