Asia News

“Oral tissue contains a kind of powerful stem cell”

A short interview with Dr Minoru Ueda, Japan

Tissue engineering is based on the concept that the human body or parts of it can be regenerated using stem cells. Since the 1980s, several kinds of tissues and organs have been generated worldwide using cultured living cells. Dental Tribune Asia Pacific in cooperation with FDI’s World Dental Daily spoke with Dr Minoru Ueda from Nagoya University in Japan about key tissue-engineering strategies and their potential for dentistry.

DTWD&D: Dr Ueda, tissue engineering is a relatively new approach in regenerative medicine. How did it find its way into dentistry?

Dr Minoru Ueda: The basic concepts and strategies for tissue regeneration are generally well understood. To regenerate any tissue, we need stem cells, growth factors and a scaffold. In the field of dentistry, we have made much scientific progress in terms of materials, which gives us an advantage over other fields of medicine. We began with developing high-quality materials and then expanded to using stem cells.

What key tissue-engineering strategies are currently being developed for dentistry and how do they work?

The most important tissue for dentistry is bone. We are establishing technologies for bone tissue engineering and apply these clinically to implant surgery. Secondly, we are focusing on stem cell science. Oral tissue contains a kind of powerful stem cell that can be used to treat systemic diseases, such as brain injury or heart infarction. The dental pulp stem cell is one of the most important cells derived from oral tissue.

Which dental conditions will be the first to be treated or cured by tissue engineering?

Atrophied alveolar bone and severe periodontitis.

Is it possible to reconstruct complex tissue defects made up of multiple cells?

Yes, it is. We have succeeded in reconstructing the structures that make up periodontal tissues, which are cementum, bone and periodontal ligament in humans.

There is different legislation around the world regarding stem cell research. Could you explain how the situation in Japan differs from other parts of the world and its effect on your research?

We do basic research using animal cells and human stem cells, but research using embryonic stem cells (ES) and induced pluripotent stem cells (iPS) must be performed under the control of ethical committees of each university. In order to use ES or iPS, we need special permission from our university and government. Clinical studies based on basic research also require approval from our university and government. It is actually very difficult to gain approval compared to other countries. So it is easy to conduct basic research but very difficult to conduct clinical studies in Japan.

Current debate in the field of cosmetic dentistry centres on whether dentists should be allowed to inject osteogenic cells into patients for non-dental reasons. What is your opinion on this matter?

Dentists should not be allowed to inject any cells by themselves for non-dental reasons. However, for cosmetic reasons, dentists can inject stem cells into the oral and maxillofacial areas, especially into the face because cosmetic problems such as wrinkles are not a dis-ease. The surface structures of an implant are very important, but this is not a main factor for enhancing the living cell around the fixture.

What effect will tissue engineering have on the dental practice during the next 20 to 25 years?

Tissue engineering could provide a new treatment method for diseases that have not been treatable thus far, such as severe periodontitis and atrophied alveolar ridges. Also, cosmetic therapy using tissue engineering in the oral and maxillofacial regions will become commonplace in the dental practice.

Thank you very much for the interview.

This interview is published with permission from FDI World Dental Federation.

International Imprint

Licensed by Dental Tribune International

Group Editor/Managing Editor DT Asia Pacific
Daniel Zimmermann
newsroom@dental-tribune.com
Tel. +49-341/4 84 74-107

Editorial Assistant Claudia Salwiczek
salwiczek@dental-tribune.com

International Editorial Board

Dr. Naser Rarghi, Ceramics, USA
Dr. Karl Beng, Endodontics, Germany
Dr. George Freeman, Esthetics, Canada
Dr. Howard Glazer, Ergonomics, USA
Prof. Dr. B. Keryi, Conservative Dentistry, Switzerland
Dr. Edward Lynch, Restorative, Ireland
Dr. Zs. Maros, Implantology, Israel
Prof. Dr. Georg Meyn, Restorative, Germany
Prof. Dr. Raphael Scharer, Functional, Austria
Dr. Martin Steigmann, Implantology, Germany

Published by Dental Tribune Asia Pacific Ltd.

© 2009, Dental Tribune International GmbH. All rights reserved.

Dental Tribune makes every effort to report clinical information and manufacturer’s product news accurately, but cannot assume responsibility for the validity of product claims, or for typographical errors. The journal also does not assume responsibility for product names or claims, or statements made by advertisers. Opinions expressed by authors are their own and may not reflect those of Dental Tribune International.