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 Tribune spoke with Dr Minoru Ueda from Nagoya University in Japan about key tissue-engineering strategies and their potential for dentistry.

DTF/DWD: 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 very old. 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 issue 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 breast inflammation or heart infarction. The dental pulp stem cell is one of the most important cells derived from oral tissue.

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

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 please 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.

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 periodontal diseases 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.

Dr Minoru Ueda

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