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Dentistry of the 21st century: dental stem cells

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Регенеративная медицина представляет самостоятельную бурно развивающуюся дисциплину. Отмечается особое значение регенеративной медицины в стоматологии 21го века.

The term "regenerative medicine" was first found in 1992. Only in the beginning of the 21st century practical researches started.

There are a lot of academic and practical research works devoted to the latest developments in regenerative dentistry including dental stem cell culture, tooth bioengineering, the role of stem cells in tooth repair and regeneration. The First International Conference on Dental and Craniofacial Stem Cells held in 2011 assembled for the first time the world's leading scientists in the field of dental and craniofacial stem cells. Diseases and injuries affecting the craniofacial complex have a high impact on facial appearance and quality of life. The discovery of stem cells derived from dental and craniofacial tissue caused great enthusiasm and interest due to the possibilities for regeneration and the clinical practices. This field offers great potential for the treatment of craniofacial tissues affected by chronic diseases, trauma, congenital anomalies, and tumors.

Stem cells are master cells in the body that can transform into many types of cells that form nerves, bone, teeth, cartilage, and muscle. Some of the unique characteristics of stem cells are the basis for the field of regenerative medicine, which uses the body's own ability to maintain and repair itself to treat diseases, trauma, and tumor resection defects. Dr. Jeremy Mao, professor and director of the Tissue Engineering and Regenerative Medicine Laboratory at Columbia University, reported that dental stem cells were investigated to grow teeth; they have been shown to regenerate muscle fibers. Stem cells are characterized by: plasticity; ability to differentiate into various types of tissue; capacity to expand rapidly and stem cells from teeth can be expanded in vitro to therapeutically relevant numbers; possibility to recover and cryopreserve dental stem cells for potential use in future regenerative therapies.

In conclusion, it should be noted that patients will be able to regrow damaged or missing teeth with their own dental stem cells. Regenerated teeth or tooth components would be a long-lasting alternative, whereas dental implants may fail and may not change to mold to surrounding jawbone that undergoes changes over time. Dental stem cells are studied to grow teeth. And there is a step from restorative dentistry to regenerative one.

Keywords: regenerative medicine, regenerative dentistry, dental stem cells