

# Milk teeth or tooth milk? Milk production by dental stem cells

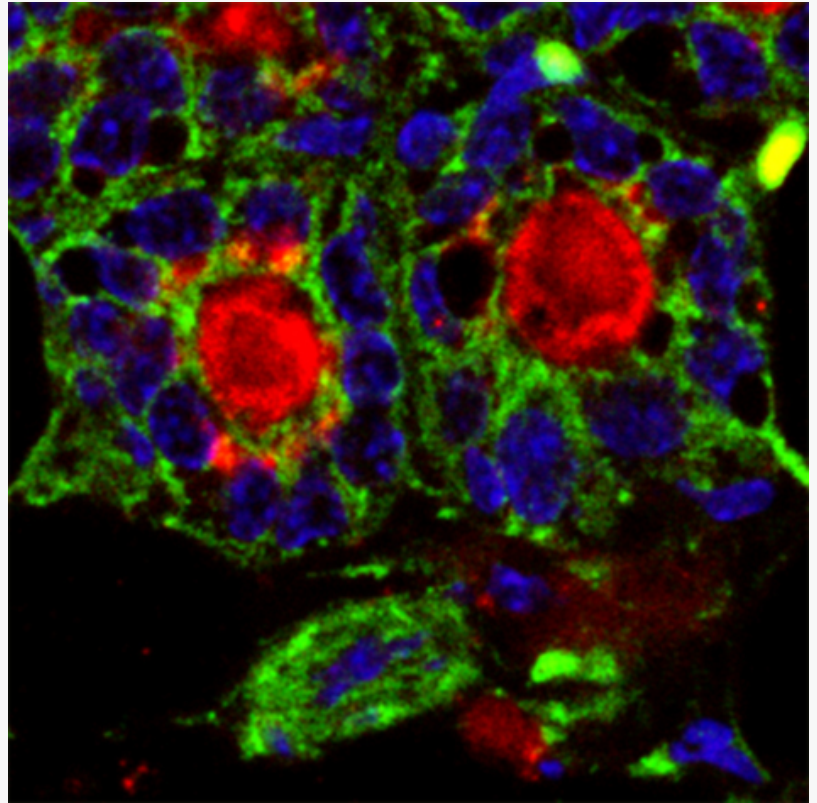
ZURICH, SWITZERLAND, November 2, 2019 /EINPresswire.com/ -- In the last decades, medical and dental research attracted scientists and practitioners who merged genetic and tissue regeneration approaches (stem cells and tissue engineering) to solve fundamental but unmet medical needs. These new disciplines are bringing new information and ideas to improve the daily clinical practice, revolutionizing the medical and dental disciplines. A great effort is being in particular spent to understand how to exploit stem cells and materials to heal and regenerate tissues lost due to injuries and aggressive pathologies, such as cancer.

A team of researchers guided by Professor Dr Thimios Mitsiadis at the Institute of Oral Biology of the University of Zurich, Switzerland, has demonstrated that stem cells isolated from teeth are able to form mammary glands. The experiments were conducted on mice, as dental stem cells were directly injected to the territories where normally the mammary glands develop and after removing all cells of mammary origin.

These dental cells were capable to regenerate the mammary gland, to give rise to all mammary cell populations and, even more strikingly, to generate milk-producing cells.

This pioneer study proves for the first time the exceptional plasticity of dental stem cells to generate other tissues of the body. These findings, recently published in the open access journal "Cells", represent a great contribution to the understanding of the potential of specific stem cell populations to change their fate and thus can be exploited for the regeneration of different organs and tissues.

"We have used advanced genetic, molecular and imaging tools to track and characterize the injected dental stem cells in the mammary glands of these animals. No such studies using dental stem cells were performed earlier from our colleagues worldwide. We have shown that these cells have a unique plasticity and ability to generate non-dental tissues" states Dr Pagella, "Oberassistent" at the Institute of Oral Biology.



Section of a mammary gland generated by dental epithelial stem cells (green: dental epithelial cells, blue: nucleus of cells, red: milk specific protein casein) (Image: Institute of Oral Biology, University of Zurich).

“One of the most severe and common pathological conditions is breast cancer, which is often treated with surgery. The discovery that dental stem cells are able to replace cells from the mammary gland will certainly blow a wind of optimism for stem cell-based therapies that could be used for breast regeneration in the future. Advances in medical and dental research can lead us to better treatment, replacement of old materials, creation of entire organs or regeneration of injured parts of tissues. This really represents the marriage between basic biology and modern medicine and dentistry”, explains Professor Mitsiadis.

Professor Mitsiadis has been working in the dental field for more than thirty years and his reputation is known worldwide. He is the “creator” of the «dents de poule» that in 2003 filled the international media, as he demonstrated that the transfers of mouse stem cells to chicken embryos can lead to the formation of teeth in birds. It is now 14 years since he started to work at the Institute of Oral Biology, and yet these pioneer findings should be also an opportunity to showcase the work of the dental research team at the Center of Dental Medicine (ZZM), UZH.

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