New research explores relief for xerostomia cancer patients

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Today during the 88th General Session & Exhibition of the International Association for Dental Research, in Barcelona, Spain, presenting author S. Pradhani, University of Delaware, Newark, USA, will present an abstract titled "Salivary Acinar Cells Regenerate Functional Glandular Structures in Modified Hydrogels."

The goal of this research was to create an ECM modified hyaluronic acid (HA) based hydrogel culture system that allows for the growth and differentiation of salivary acinar cells into functional acini-like structures capable of secreting large amounts of protein and fluid unidirectionally. Xerostomia, a condition resulting from irradiation of the head and neck, affects more than 40,000 cancer patients each year in the United States. According to this research, these patients will greatly benefit from the development of a functional implantable artificial salivary gland.

In this study, an IRB approved protocol was established and salivary gland tissue was obtained from patients undergoing head and neck surgery. Tissue specimen was dissociated to obtain acinar enriched cultures. Biomarker studies with the salivary enzyme, α-amylase and tight junction proteins such as zonula occludens-1 and E-cadherin, confirmed the phenotype of these cells. Acinar cells were seeded on HA-based hydrogels to obtain lobular structures with central apoptosing cells and lumen.

An HA-based hydrogel system was developed to aid the differentiation

of acinar cells into lobular acini-like structures. Functionality of these structures was demonstrated by the use of neurotransmitters that enhance their fluid and protein secretion pathways. Future experiments will involve implantation of these hydrogels in animal models to test their functionality in vivo.

This is a summary of abstract #539, "Salivary Acinar Cells Regenerate Functional Glandular Structures in Modified Hydrogels," to be presented by S. Pradhani at 11:45 a.m., Thursday, July 15, 2010 in Room 133 of the Centre Convencions Internacional Barcelona, Spain during the 88th General Session & Exhibition of the International Association for Dental Research.

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