Heparan sulfate biomaterials retain structure and function after gamma irradiation

January 25 2018

Credit: Mary Ann Liebert, Inc., publishers

A new study has shown that heparan sulfate, a desirable natural material for use in bioengineered tissues and orthotic implants, can withstand the stress of gamma irradiation for sterilization and retain its structure, binding ability, and biological function. The ability to use a low-cost sterilization method such as gamma irradiation will make heparan sulfate-based biopolymers more broadly applicable for treating a range of disorders, as described in an article publishedin *Tissue Engineering, Part A*.

The article entitled "Retention of the Structure and Function of Heparan Sulfate Biomaterials After Gamma Irradiation" is coauthored by Simon Cool, PhD, Institute of Medical Biology, Singapore and Yong Loo Lin School of Medicine, National University of Singapore and colleagues from these institutions as well as Victoria University of Wellington, New Zealand and Lee Kong Chian School of Medicine, Singapore.

The researchers examined the effects of gamma irradiation on a form of heparan sulfate that enhances the effects of bone morphogenetic protein 2 (BMP2) to stimulate bone growth. They demonstrated that irradiation did not significantly affect HS3's ability to enhance the osteogenic effects of BMP2 on mouse myoblasts in the laboratory. Gamma irradiation also did not significantly reduce calcium deposition.

"This article exemplifies the need to characterize the effects of sterilization on the structure and function of biopolymers before their use in tissue engineering applications," says *Tissue Engineering* Co-Editor-in-Chief Antonios G. Mikos, PhD, Louis Calder Professor at Rice University, Houston, TX.

More information: Raymond A. A. Smith et al, Retention of the Structure and Function of Heparan Sulfate Biomaterials After Gamma Irradiation, *Tissue Engineering Part A* (2017). DOI: 10.1089/ten.tea.2017.0263

Provided by Mary Ann Liebert, Inc