OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Tissue Science & Regenerative Medicine
August 26-28, 2013 DoubleTree by Hilton, Raleigh, NC, USA

Elongating the survival of hyaluronan (HA) molecules: Employing HA cross-linkers, modified HA or HA hybrids

Zvi Nevo and Mark M. Levy
Tel-Aviv University, Israel

The study is dealing with a biological system composed of two key player's hyaluronic acid (HA) as a cavity-defect-deficit filler and hyaluronidase as its concealing agent (eraser) that exist and characterize the happenings in the tissue milieu, already in early-fetal life. Later in life many clinical and cosmetic procedures involve HA injections as fillers with the desire for their long acting functions. Smart chemical reactions have to be taken in order to overcome the short turnover fate of HA molecules. The following processes exist in the chemical arsenal to achieve and elongate the fate of survival of HA molecules for tissue engineered constructs, luman and joint fillers. a) HA cross-linkers agents e.g. Divinyl sulphone (DVS); Glutaraldehyde; 1,4-butanediol diglycidyl ether (BDDE). b) Modified HA, e.g. Sodium Tyramine hyaluronate; Sodium palmitoyl hyaluronate; Sodium caproyl hyaluronate. c) HA hybrids, e.g. 1) Biomineralized marine coral-derived calcium carbonate, where the calcite crystals are coated in a viscous globular Na-hyaluronate ; 2) Aromatic dipeptide FmocFF-a protected di-diphenylalanine with self-assembling capacity in aqueous solutions to form well-ordered peptide nanotubes, forming a rigid gel. This hydrophobic construct/intercollate by blending with sodium hyaluronate, yielding a viscoelastic nanofibril hydrogel. 3) HA hydrogel of 2% blended with mixed gel made of two kinds of chitosan. It appears that the above resulted innovative products are approaching the goal of long acting HA molecules due to the higher molecular weight features obtained and the higher resistance to biodegradation.

Biography

Zvi Nevo serves as a Professor Emeritus in the Department of Human Molecular Genetics and Biochemistry at the Sackler School of Medicine, Tel Aviv University. He runs an active laboratory, directing 3 Ph.D. students and 3 students for Master Degree, supported by grants from the Israeli Academy of Science and GIF German Israeli Binational Foundation. His field of expertise is in general developmental, maturation and aging of connective tissues in health and disease, with special emphasis on cartilage and cartilage repair with composite implants. Prof. Nevo serves as a member of the Editorial Board of the American Journal of Cell Transplantation, Cartilage Section. He sponsored 15 Ph.D. students, 12 students for Master Degree and 25 MD for basic science training projects. He has one hundred scientific articles, ten chapters in books and 23 patents.

zvinevo@post.tau.ac.il