

## Synthesis and characterization of Hyaluronan – Gold Nanoparticles: A nanostructured material for biomedical applications

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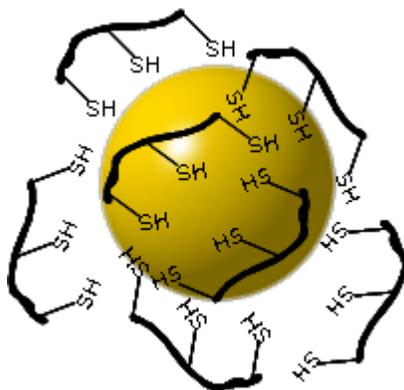
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Hyaluronan (HA) is a glycosaminoglycan with a number of biological roles, such as being a key structural component of extracellular matrix and an important mediator in the leukocyte adhesion and migration. HA is ubiquitous in human and animal tissues, where it exhibits significant structural, rheological, physiological and biological functions. Nowadays, HA is recognized as a high-valuable polymer with several marketed applications in both biomedical and cosmetic industries.

HA helps to maintain a smooth and elastic skin. Because of that, it is being used in many cosmetics products such as make-up and moisturizing creams due to its hydrating properties. The HA chains are cross-linked to generate high molecular weight superstructures with specific architectures and functional activities. The HA cross-linking structure seems to be essential to stabilize its hydrating properties. In addition, HA degraded (with a family of enzymes called Hyaluronidases) oligomers present a lower viscosity and different hydrating properties.

Due to their versatile character and the fruitful results achieved with these systems during the last years of research, Nanoparticles have been proposed as medical and biotechnological nanodevices in a large number of applications. In particular, Metallic Gold Nanoparticles show unique biocompatible and physical properties making them ideal candidates to improve selected molecule delivery by directly improving pharmacokinetics and biodistribution.



Since Gold Nanoparticles - biopolymer (HA) conjugates hold great promise for several biomedical applications, we have designed a nanostructured material composed by a gold nanoparticle core functionalized with HA molecules in its surface. Our intention is also to test this conjugate based on Gold-HA Nanoparticles for cosmetic treatments, with improved features in terms of stability, skin-penetration and water absorption/retaining effect.