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Book of Abstracts

Nanostructured Selenoglyconjugates with Biological Applications

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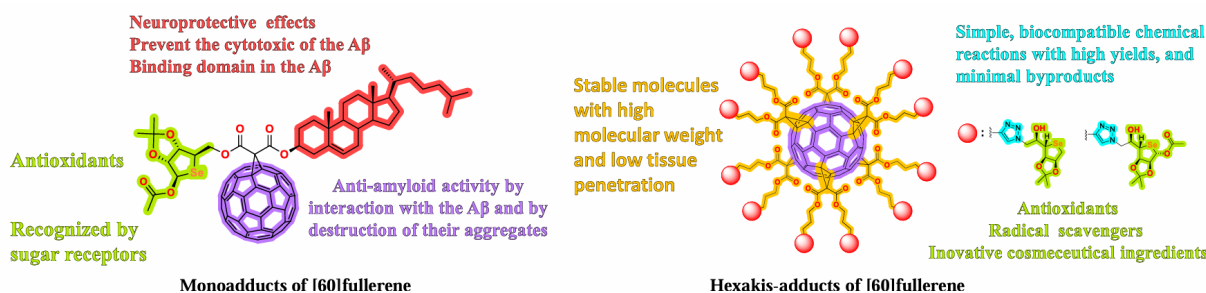
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Selenium was originally described as a toxic product, but it's a crucial trace element for life that appears as selenocysteine and selenocystine. This element is an important antioxidant that protects cells against free radicals, it's necessary for the functioning of the immune system and thyroid gland and helps to reduce joint inflammation.¹ Selenium-containing compounds can be considered sulfur-oxygen isosters in which the presence of the selenium atom gives an enhanced lipophilicity capable of increasing the permeability of cell membranes and increasing oral bioavailability.² On the other hand, the singular geometry and chemical and physical properties of fullerenes make them suitable molecular building blocks for bio-medical chemistry and materials science. Therefore, the antioxidant properties of these two molecules, together with their applications in medicinal chemistry, make them promising precursors of hybrids with biomedical potential.³

In the frame of consolidated research focused on the versatility of Se-containing compounds and based on the synthesis techniques of our research group,⁴ we propose the synthesis of new mono and hexakis-adducts of [60]fullerene-containing selenosugars. Monoadducts of C₆₀ contain fragments with neuroprotective and antioxidant effects, as well as specific anti β -amyloid (A β) properties that make them potential candidates for applications in neurodegenerative diseases. Instead, hexakis-adducts contain fragments of antioxidants considered innovative cosmeceutical ingredients and form hybrids of high molecular weight and low tissue penetration, which are potential candidates for applications in cosmetics development.



The compounds obtained present the behavior of nanoparticles that allow the monoadducts to be potentially able to cross the blood-brain barrier as well as the hexakis-adducts to have low penetrability into the skin.

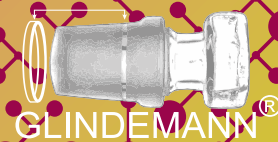
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