for cell/tissue engineering. Based on the rational design principles, we could synthesize carriers of lipid moieties, in order to form well characterized amphipathic structures and self-assembled molecules.

Furthermore, we mention the exploitation of the amphipathic structure of a new class of molecules in synthesizing HDL models, which interact with lipoproteins, involved in cholisterinemia. We rationally designed a-helical amphipathic peptide models as mimics of HDL amphipathic helices in order to prevent LDL oxidation and thus generate potent anti-atherogenic agents. Indeed, our constructs could be served as atheroprotective candidates in the field of cardiovascular diseases.

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Design and Synthesis of MBP_{83-99} Epitope Conjugated with Mannan for the Immunotherapy of Multiple Sclerosis

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Key words: Multiple sclerosis, immunotherapy, MBP_{83-99} Epitope, synthesis

Muliple Sclerosis (MS) is the most common autoimmune disease of the Central Nervous System (CNS). There is evidence that MS patients have Th1 immune response with secretion of inflammatory cytokines like IL-2, IFN-γ, TNF-α. A new strategy for the treatment of MS is to switch the immune response from Th1 to Th2 with secretion of anti-inflammatory cytokines like IL-4 and mostly IL-10. Experiments have shown that peptide analogues conjugated with the oxidized form of mannan lead to Th1 immune response whereas reduced form of mannan leads to Th2 immune response. The aim of this project is to modify the Th1/Th2 ratio by conjugating the MBP_{83-99} epitope with oxidized and reduced mannan.

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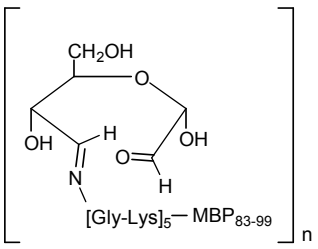
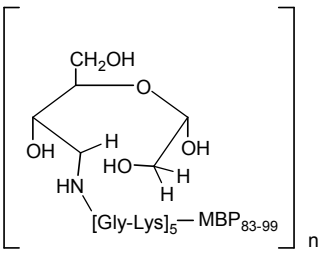


Oxidized Mannan



Reduced Mannan

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Bridging CD4+ and CD8+ Epitopes for Anti-Cancer Vaccine Design

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Key words: Anti-cancer vaccine, CD4+ and CD8+ epitopes

Anti-cancer antigen responses have been detected in many tumor patients. CD4+ and CD8+ epitopes have also been identified, but their responses are not accompanied by tumor regression. In order to improve the cancer vaccine strategy, we propose the design and preparation of conjugates, which incorporate CD4+ and CD8+ epitopes from the same cancer antigen for testing their potency to elicit anti-tumor responses.A Sequential Oligopeptide Carrier, SOC_4, formed by the repeating tripeptide Lys-Aib-Gly, was synthesized on a Wang resin by the Fmoc strategy. Lysines were introduced as Fmoc-Lys(Alloc)-OH and Fmoc-Lys(Mtt)-OH. This orthogonal protection allowed the synthesis of different epitopes on the Lys-$N^{\varepsilon}H_2$ groups. After the removal of the Mtt group (1.8% TFA in DCM), the CD8+ epitope was synthesized. The synthesis of the CD4+ epitope was performed by the Fmoc strategy after the catalytic removal of Alloc by $Pd(PPh_3)_4$. The obtained conjugates, after cleavage from the resin with TFA, were purified by HPLC and identified by ESI-MS. Biological studies for evaluating T cell stimulation are currently in progress.

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Development of a Capillary Electrophoretic Method for the Determination of Antioxidants and Malondialdehyde in Biologic Samples

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Key words: Antioxidants, malondialdehyde, biologic samples, determination, capillary electrophoretic method

Oxidative stress is involved in the pathophysiology of many ocular disorders, such as age-related macular degeneration, cataract and glaucoma. Tears and aqueous humor nourish and protect the eye and are rich in antioxidants, such as ascorbic acid, uric acid, tyrosine, cysteine and glutathione. The aim of the present work was to develop a novel method for the simultaneous determination of three antioxidant molecules (ascorbic acid, uric acid and tyrosine) and of MDA (lipid peroxidation indicator) both in reflex tears and aqueous humor by high performance capillary electrophoresis. Tears were collected with Schirmer strips and the aqueous humor samples following surgical procedure. After pilot experiments, optimum separation is achieved in a 25 mM borate buffer, pH 10.0, containing 100 mM sodium dodecyl sulfate (SDS) at the temperature of 25 °C and 20 kV (normal polarity). The developed HPCE method has good repeatability, precision and high sensitivity.