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# Functionalization of squid chitosan with angiogenic peptides for the development of new biomaterial

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The study and development of materials of marine origin has been growing over the years due to their interesting and sometimes unique characteristics and availability in nature. Chitosan, produced by deacetylation of chitin, the second most abundant natural polymer, has a great potential for biomedical applications due to its biocompatible, biodegradable and antimicrobial properties. Moreover, due to its chemical variability, chitosan can be also processed into different forms, such as membranes or hydrogels, which can be used for instance in burn treatments and tissue regeneration. On the other hand, bioactive peptides sequences present in different ECM-proteins also been exploited in the development of biomaterials, for instance through functionalization of biopolymers, aiming to modulate cell behaviour, namely promoting cell adhesion, growth or differentiation, supporting mineralization of angiogenesis, among others. Here, we propose to develop new biomaterials based on marine origin chitosan functionalized with a bioactive peptide capable to promote the formation of new blood vessels, which can modulate the inflammatory response and improve the wound healing process. Chitosan was produced from squid pens following a in-house developed methodology (patent pending), as confirmed by FTIR. The molecular weight of the chitosan (995,2±0,5 kDa) was measured by GPC and NMR was used to calculate the deacetylation degree. Additionally, peptides described as angiogenic, Pep-12, QK, among others, were synthesized by solid-phase peptide synthesis, in an automated system, and characterized by HPLC and ESI-MS. Then, chitosan was functionalized with the bioactive peptides, through carbodiimide chemistry (EDC/NHS coupling), with peptide grafting being supported by FTIR and NMR results. The angiogenic potential of peptides, the conjugates and derived biomaterials will be further studied by assessing the effect over endothelial cells or on vascularization using a CAM assay, evaluating the influence of different size chain of the peptides.