

Title: Biowaste Transformation to Functional Materials: Structural Properties, Extraction Methods, Applications, and Challenges of Silk Sericin

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Abstract: This review underscores the novelty of silk sericin, often regarded as a byproduct in silk production. Comprising approximately 30% of silk, sericin possesses valuable properties that have been largely overlooked in favor of silk fibroin. This work focuses on innovative extraction methods to convert sericin, typically considered waste, into a valuable resource. By examining these extraction techniques alongside diverse applications, the review aims to enhance the recognition and utilization of silk sericin in research and industry. Various extraction processes where the traditional methods, and some new techniques, are all discussed. In detail, the advantages, limitations, and strategy optimization associated with each extraction method are highlighted. For instance, silk sericin has shown promise as a wound treatment agent, a scaffold for tissue engineering, a carrier for drug delivery, and a biomaterial for regenerative medicine in the field of biomedical science due to its biocompatibility, biodegradability, and nontoxicity. Additionally, it also finds application in the cosmetic industry, where it is used in skincare products due to its moisturizing, antioxidant, and antiaging properties. Eventually, the challenges, limitations, and prospects of silk sericin are intensively discussed. This comprehensive review is expected to serve the growing body of knowledge surrounding silk sericin and foster further research and development of silk sericin-related fields..

Keywords: Silk sericin Extraction methods Biocompatibility Tissue engineering Drug delivery Regenerative medicine Cosmetic applications Biomedical applications

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