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## Food Waste Valorization from Olive Oil Production Chains: New Applications in Regenerative Medicine

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## INTRODUCTION

Olive oil by-products are often discarded as waste, despite being rich in bioactive compounds. Reusing them for medical applications supports regenerative medicine, especially osteoarthritis treatment. One key compound, hydroxytyrosol, is a powerful antioxidant and anti-inflammatory that supports cartilage regeneration but has poor stability and bioavailability. To overcome these limitations, Hyt@tgel has been developed. It is an innovative drug delivery system, consisting of chitosan nanoparticles embedded in a thermosensitive hydrogel, which changes from liquid to gel at body temperature, allowing the targeted and prolonged release of Hyt into damaged joints.



Hyt@tgel offers an innovative and eco-friendly osteoarthritis treatment, integrating agriculture, biotechnology, and healthcare to enhance patient benefits and reduce environmental impact. Repurposing agri-food by-products represents a crucial step toward a more sustainable future. By promoting a more efficient circular economy, this approach minimizes waste and maximizes the use of natural resources, paving the way for a healthier planet and a more sustainable healthcare system.

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