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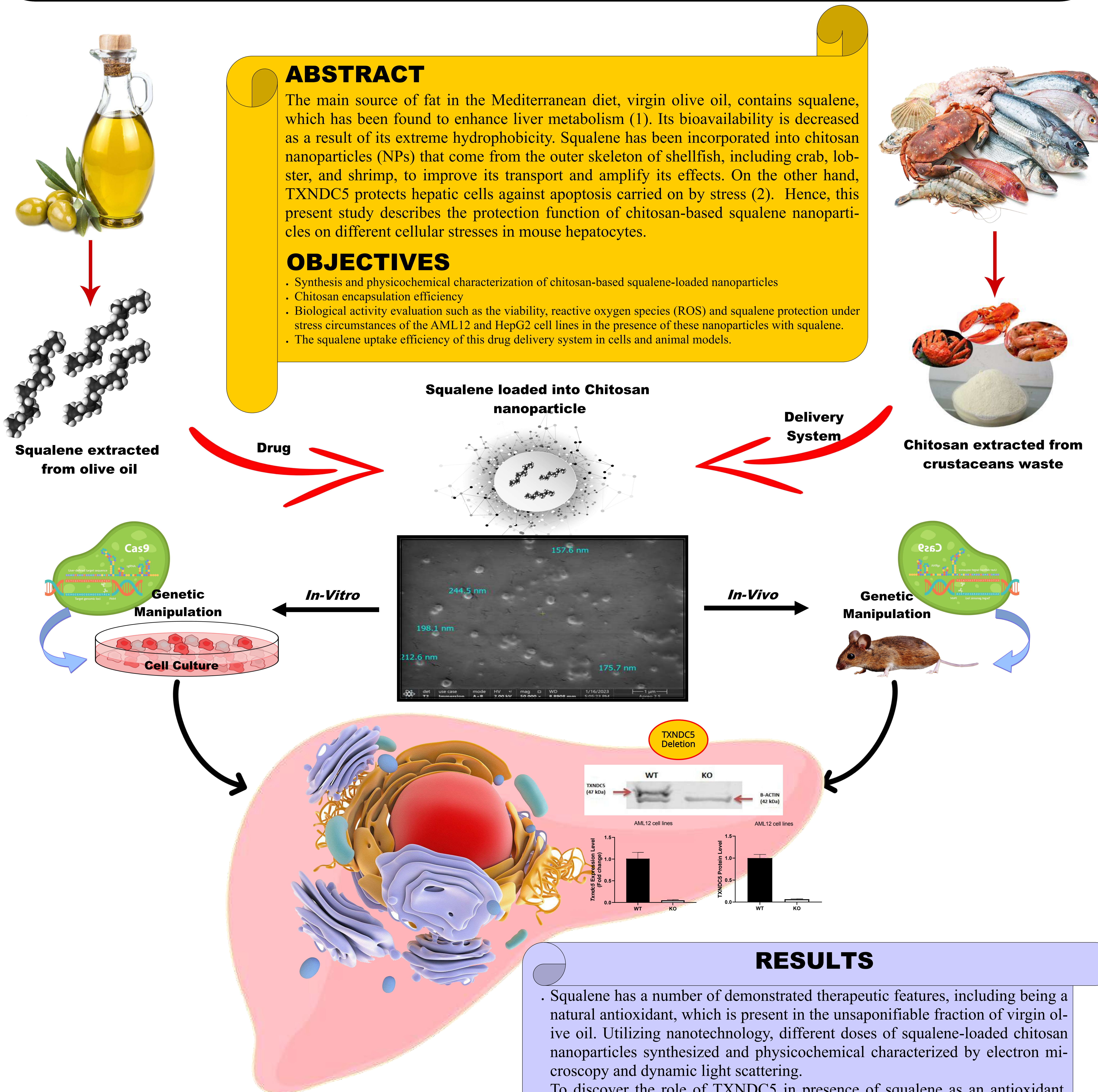
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## ABSTRACT

The main source of fat in the Mediterranean diet, virgin olive oil, contains squalene, which has been found to enhance liver metabolism (1). Its bioavailability is decreased as a result of its extreme hydrophobicity. Squalene has been incorporated into chitosan nanoparticles (NPs) that come from the outer skeleton of shellfish, including crab, lobster, and shrimp, to improve its transport and amplify its effects. On the other hand, TXNDC5 protects hepatic cells against apoptosis carried on by stress (2). Hence, this present study describes the protection function of chitosan-based squalene nanoparticles on different cellular stresses in mouse hepatocytes.

## OBJECTIVES

- Synthesis and physicochemical characterization of chitosan-based squalene-loaded nanoparticles
- Chitosan encapsulation efficiency
- Biological activity evaluation such as the viability, reactive oxygen species (ROS) and squalene protection under stress circumstances of the AML12 and HepG2 cell lines in the presence of these nanoparticles with squalene.
- The squalene uptake efficiency of this drug delivery system in cells and animal models.



## CONCLUSION

Molecular mechanisms of squalene action in non-alcoholic fatty liver disease using chitosan nanoparticles as a drug delivery system and its impact on human health will be specified in this project.

## RESULTS

- Squalene has a number of demonstrated therapeutic features, including being a natural antioxidant, which is present in the unsaponifiable fraction of virgin olive oil. Utilizing nanotechnology, different doses of squalene-loaded chitosan nanoparticles synthesized and physicochemical characterized by electron microscopy and dynamic light scattering.
- To discover the role of TXNDC5 in presence of squalene as an antioxidant, TXNDC5-deficient cell lines and mouse models were generated by CRISPR/cas9 technology.
- The efficacy of several squalene-chitosan nanoparticles concentrations on the morphology of cells and cellular uptake of squalene will detect, as foreseeable results.
- The biological activities of liver cells will assess under stressful circumstances.
- Based on our research, TXNDC5's role will be exposed in liver metabolic in the presence of squalene-chitosan nanoparticles.
- The expression patterns of different genes involved in liver metabolism will be evaluated.

## REFERENCES

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