

## Water-Based Chitosan Solution

An eco-friendly method for dissolving chitosan

VCU researchers have developed a simple green method for the dissolution of chitosan into water. Chitosan is the second most abundant and renewable polymer in nature. It has a low toxicity, is biocompatible, and is biodegradable. These features make chitosan an ideal biomaterial to be used in the food, cosmetic, and pharmaceutical industries. However, processing chitosan for its various applications is difficult as it is not innately soluble in water. The current dissolution process for chitosan requires the use of acidic solutions, which are not environmentally friendly and limit chitosan's use in the biomedical field. The method developed by our researchers makes the dissolution process environmentally friendly and enables for a broader use of chitosan in the biomedical field.

### The technology

This method is capable of producing a plain water-based chitosan pseudo-solution. Chitosan is first processed with an ionic liquid (IL) until it has been dissolved. The chitosan-IL solution is then submersed in an excess amount of plain water where it begins the solvent exchange process. Once this process is complete and the pseudo-solution has formed, the ionic liquid can then be recycled for further use. Different molecular weights of chitosan can be used in this process, enabling a broader range of applications. This pseudo-solution could be used for a wide variety of biomedical applications, including drug encapsulation, 3D printed, food packaging, and cosmetics.

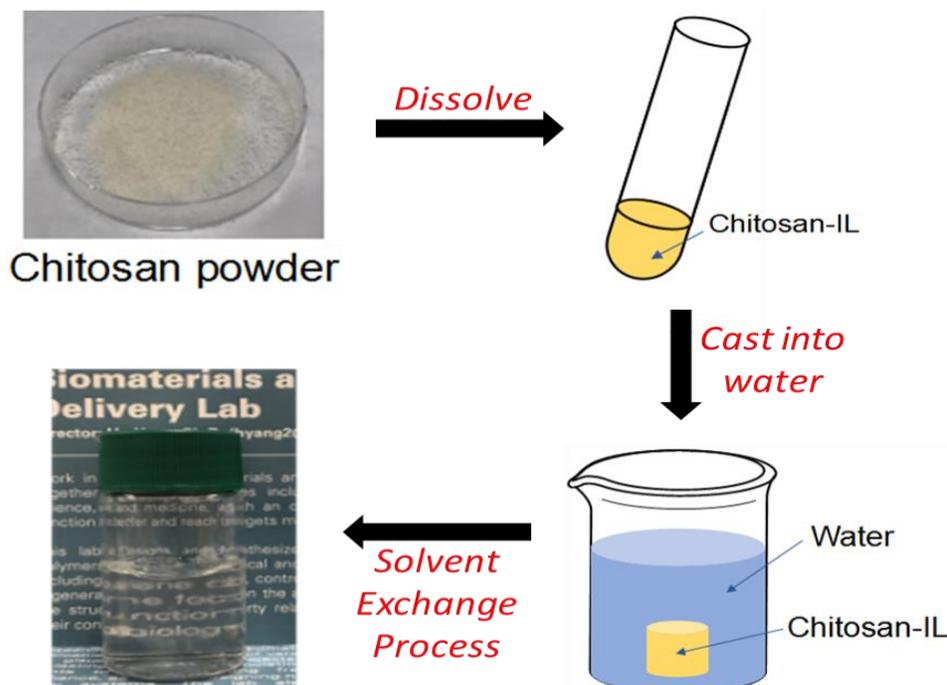


Figure 1. Process for developing the pseudo solution of chitosan.

### Benefits

- » Quicker cell attachment
- » Better biocompatibility
- » Long shelf life ~1 month
- » Environmentally friendly
- » Recyclable materials

### Applications

- » Drug Delivery
- » Wound Healing
- » 3D printing
- » Food packaging
- » Antimicrobial textiles
- » Wastewater treatment

#### Patent status:

Patent pending: U.S. and foreign rights are available.

#### License status:

This technology is available for licensing to industry for further development and commercialization.

#### Category:

Biomedical

#### VCU Tech #:

18-120

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