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Screen the best ionic liquid for keratin dissolution by using COSMO-RS

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Most PDMS used in tissue engineering applications are nonpolar, inert and highly hydrophobic, which lead to the low biocompatibility and interaction responses between implantations and cells.

2.2.3

Structure of keratin and application of keratin in elastomer

Structure of keratin

- Keratin molecules have many inter- and intra-molecular strong bonds and also have no regular repeating units, which lead to it difficult to be dissolved by traditional solvent.
- Keratin has the special amino acid sequence for cell adhesion, which can increase susceptibility to bio-decomposition.
- Keratin can improve the mechanical properties of composites.

Application of keratin in elastomer

It is nevertheless a challenge to identify the best ILs for keratin dissolution;
Experimental measurement of all these systems is not practically feasible;
A rapid and a priori screening method to predict the keratin solubility capacity for ILs is needed

### Study of keratin dissolution in ionic liquids

<table>
<thead>
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<th>Author</th>
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</table>
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**Abstract**

Keratin-based materials (KBM), which are often referred to as “artificial keratin” presents many medical advantages, such as lower costs, better serviceability and better treatment for skin injuries. However, keratin dissolution remains a challenge in keratin-based materials. In this study, we used a novel COSMOR-S simulation method to investigate the keratin dissolution process. We found that 462C was the best ionic liquid for keratin dissolution and had good selectivity compared to other ionic liquids. The results indicated that 462C could selectively dissolve keratin without affecting the protein structure. The study provides a new approach for the development of keratin-based materials with improved properties.

1. Application of keratin in elastomer materials

2. Structures of keratin and keratin models in this study

3. Predict model results

4. Conclusions and Advances

Acknowledgments

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**References**