

ABSTRACT

BIOMIMETIC ICE-INHIBITING MATERIAL AND CRYOPRESERVATION
SOLUTION COMPRISING SAME

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The present invention relates to a biomimetic ice growth inhibition material, which is prepared by constructing a library for structures of compound molecules, with the compound molecules comprising a hydrophilic group and an ice-philic group, by evaluating the spreading performance of each compound molecule at an ice-water interface by adopting molecular dynamics simulation (MD simulation), and by screening the compound molecules with the desired affinities for ice and water. The present invention firstly provides the mechanism of the affinities of the ice growth inhibition material for ice and water, introduces MD simulation into the molecular structure design of the ice growth inhibition material, evaluates the affinities of the designed ice growth inhibition material for ice and water through MD simulation, predicts the ice growth inhibition performance of the ice growth inhibition material, and can realize the optimization of the structure. The biomimetic ice growth inhibition material designed and screened by the method disclosed herein has good capability of inhibiting the growth of ice crystals, and can achieve a good cryopreservation effect on reagents even without adding DMSO.

20 (Fig. 1)