Supporting information

A biocompatible cell cryoprotectant based on sulphoxide containing amino acids: mechanism and application

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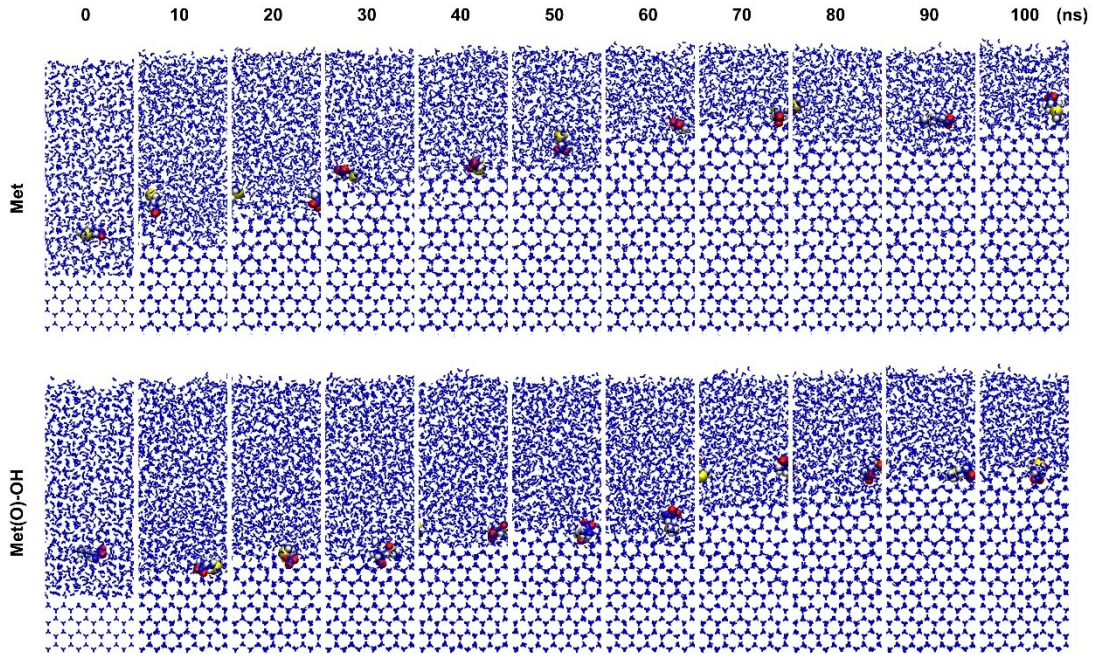

Fig. S1. Snapshots of representative groups of Met and Met(O)-OH-ice-water systems during 0-100 ns, which were randomly selected.

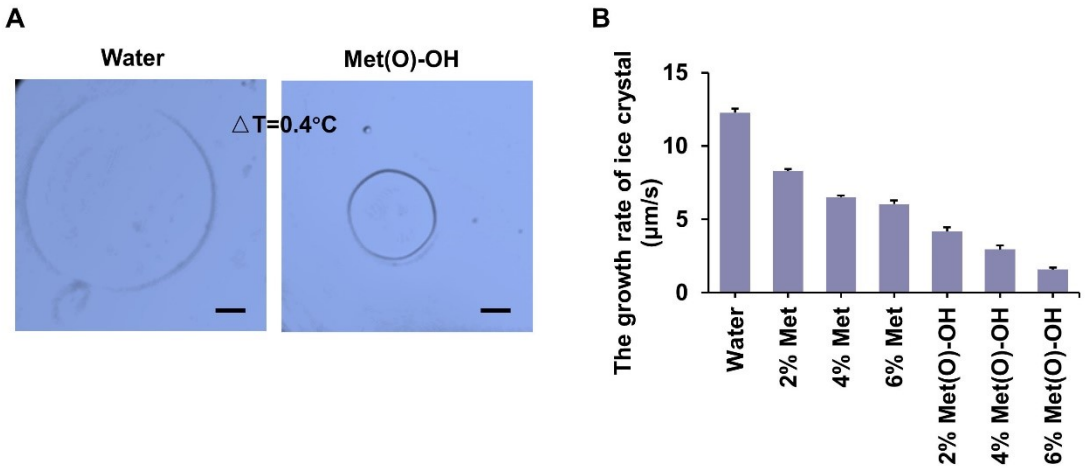

Fig. S2. (A) Optical images of the ice crystal shape and (B) ice growth rates of different Met and Met(O)-OH solutions (△T: temperature below the equilibrium melting temperature).

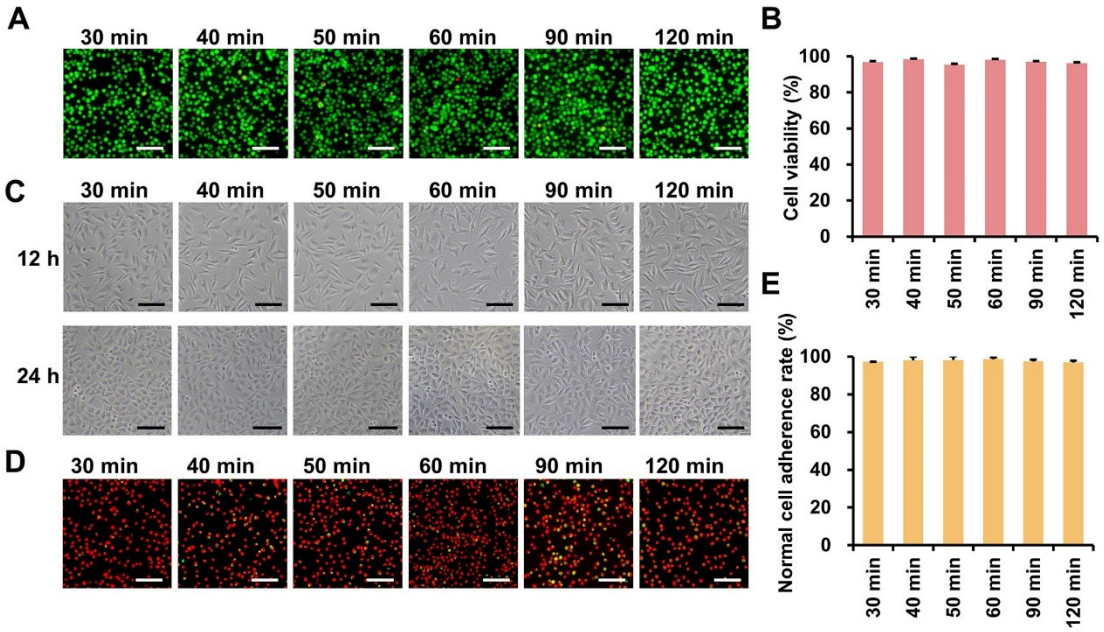

Fig. S3. Cytotoxicity evaluation of 2% Met. (A) Fluorescence images of the live/dead assay, (B) cell viability, (C) phase contrast images, (D) fluorescence images of the live/dead assay of L929 cells cryopreserved with the ultrarapid freezing protocol, and (E) normal L929 cell adherence rate after exposure in 2% Met for 30, 40, 50, 60, 90, and 120 min. Green, live cells; Red, dead cells. Scale bar = 100 μm. Value = mean ± standard deviation, n ≥ 3.

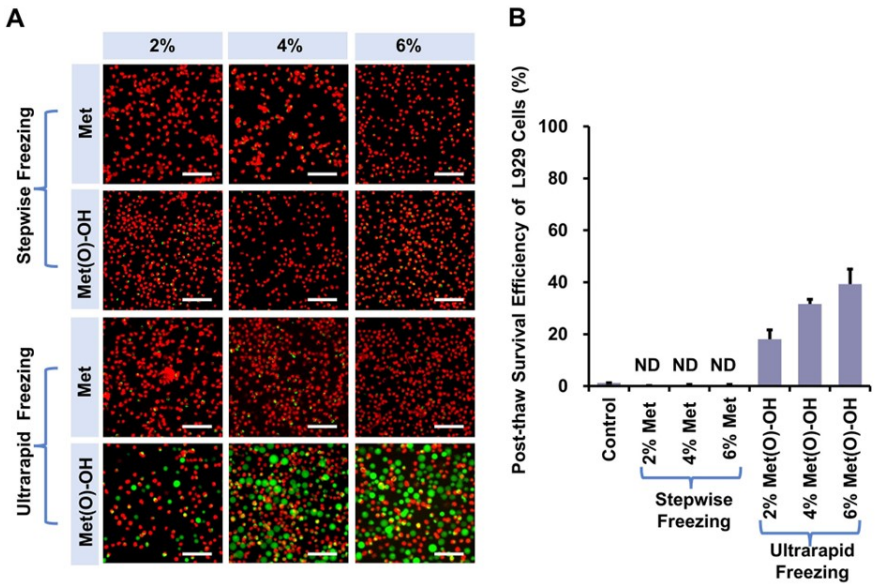

Fig. S4. Cell cryopreservation using Met and Met(O)-OH. (A) Fluorescence images of the live/dead staning images of L929 cells after post-thaw. (B) Post-thaw survival efficiency of L929 cells using stepwise freezing protocol and ultrarapid freezing protocol. Green: live cells. Red: dead cells. ND: not detected. Value = mean ± standard deviation, $n \geq 3$.

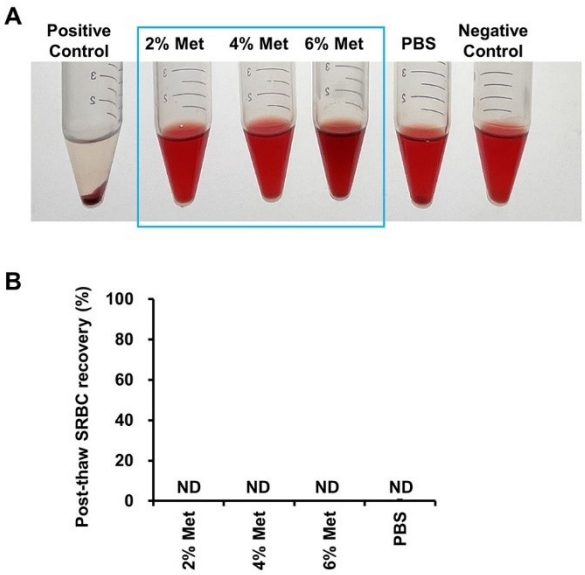

Fig. S5. The SRBC cryopreservation using Met with ultrarapid freezing. (A) Photos of SRBC hemolysis after cryopreservation with different concentrations of 2% Met, 4% Met, and 6% Met. PBS (0% hemolysis, 100% SRBC survival) as positive control and H2O (100% hemolysis, 0% SRBC survival) as negative control. (B) Post-thaw cryopreservation efficiency of SRBC after cryopreservation with different concentrations of 2-6% Met. ND: not detected.