

Supplementary Information

Near-Infrared Laser Mediated Modulation of Ice Crystallization by Two-Dimensional Nanosheets Enables High-Survival Recovery of Biological Cells from Cryogenic Temperatures

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Table S1. Hydrodynamic size, zeta potential (ZP), and polydispersion index (PDI) of GO and MoS₂ NSs for Deionized water (DI), Phosphate buffered saline (PBS), and cell culture medium (Dulbecco's Modified Eagle's medium, DMEM). Mean ± SD, n=3.

Sample	Parameter (Unit)	DI	PBS	DMEM
GO	Hydrodynamic Size (nm)	750 ± 52	970 ± 464	1045 ± 1543
	ZP (mV)	-9.8 ± 1	-14.2 ± 2.1	-14.5 ± 1.1
	PDI	0.489	0.442	0.545
MoS ₂	Hydrodynamic Size (nm)	363 ± 35	819 ± 47	1103 ± 803
	ZP (mV)	-5.65 ± 0.5	-11.03 ± 0.7	-15.8 ± 0.2
	PDI	0.354	0.347	0.795

Figure S1. Raman spectrum of GO NSs. The NSs suspensions in CPA were rewarmed from $-196\text{ }^{\circ}\text{C}$ with laser irradiation for different time: **A.** $t = 0\text{ s}$, **B.** $t = 10\text{ s}$, **C.** $t = 60\text{ s}$ and **D.** $t = 120\text{ s}$. Laser power density: 5000 mW/cm^2 .

