Biological matters never exist without water. Water in biological system is in a state different from that of bulk water because it interacts with various biomolecules in biological system. We are measuring this unique state of water by Dielectric Spectroscopy and Infrared Spectroscopy to pursue a better state of water for biopreservation.

**The state of water in fish egg and differentiation ability**

Farmed fishes can be provided throughout the year if their hatching can be shifted to their in-spawning season. We try to estimate the differentiation ability of fish egg by measuring the state of water (Water molarity, molecular rotational relaxation time).

**Measurement of slow dynamics of Intracellular water for cryopreservation**

In cryopreservation, an understanding of the dynamics of water molecules in cells is crucial for avoiding the fatal freezing injuries. We measure the picosecond orientational dynamics of intracellular water by dielectric spectroscopy, with the aim of contributing the development of optimized cryopreservation protocols.