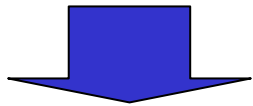
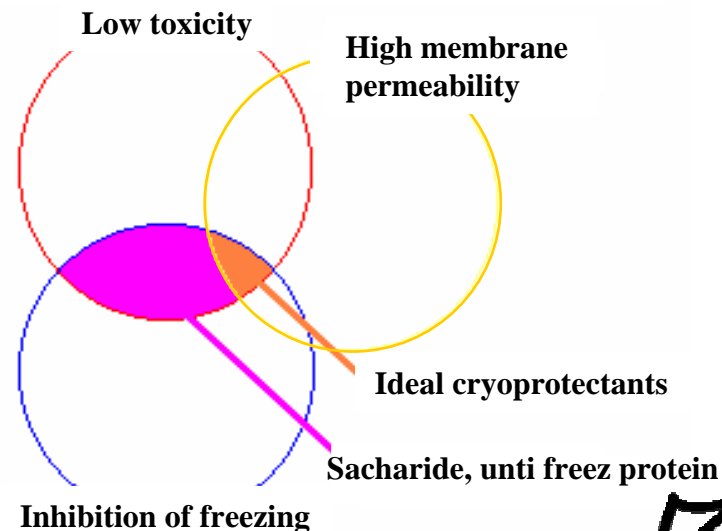


# Cryopreservation of living cells

In cryopreservation, intracellular ice formation (IIF) of free water is deleterious for living cells. Nontoxic saccharide, especially disaccharide trehalose, is expected to be nearly ideal cryo- and lyoprotective material. In this study, we estimate the requirement of intra- and extracellular saccharide to inhibit intracellular ice formation. In addition, how the inhibition-effect differs among saccharide is studied experimentally.



## Characters required for cryoprotectants

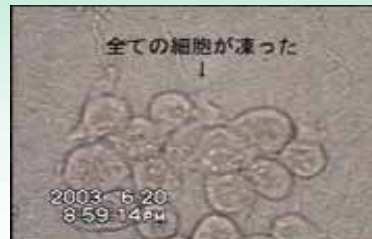


## Extracellular saccharide inhibits IIF

Solution without saccharide



↓ -90 / min.

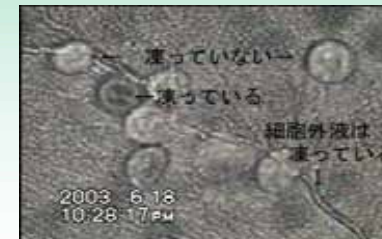


Intracellular freezing ratio  
100 %

Solution including saccharide



↓ -90 / min.



Intracellular freezing ratio  
4 %

How intracellular saccharide works on freezing ?

