Better antifreezes to preserve donor organs for transplantation

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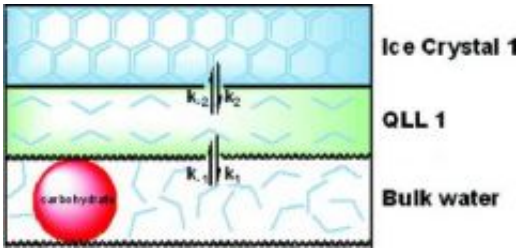

Chemists have developed a method to better preserve organs for transplantation. Image: American Chemical Society

Chemists in Canada have developed a new approach for producing more effective medical antifreeze fluids for preserving kidneys, hearts, and other organs donated for transplantation. These next-generation antifreezes can decrease damage to organs caused by ice crystals, and thus prolong the time a donated organ will remain viable prior to transplantation. This could increase the number of available organs for potential recipients. Their study is scheduled for the current issue of the *Journal of the American Chemical Society*.

Robert N. Ben and colleagues note that the growth of ice crystals is a major cause of damage to cells, tissues and organs during cryopreservation, which leaves them unusable for transplantation. To address this challenge, the researchers developed synthetic antifreeze materials, called C-linked antifreeze glycoprotein analogues (C-AFGP).

These proteins contain a sugar coating and have custom-tailored antifreeze activity.

Now the scientists describe the development of "hydration index" that can be used to more reliably predict how prospective antifreeze materials will behave. Their index provides a clearer picture of how water molecules interact with the sugar component (as well as native AFGP) and affect their chemical behavior. This is a key to understanding their ability to resist the formation of ice crystals when chilled.

Article: "Hydration Index – A Better Parameter for Explaining Small Molecule Hydration in Inhibition of Ice Recrystallization", pubs.acs.org/stoken/presspac/p … ll/10.1021/ja806284x

Source: ACS

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