

Cryo-electron microscopy of vitreous sections (CEMOVIS): Cell nucleus and other structures.

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Biological specimens must be stained and dehydrated in order to be observed by conventional electron microscopy. These limitations have been overcome with cryo-em of thin vitrified film that makes it possible to observe sub-micrometric particles in their fully hydrated native state [1]. Cryo-em of vitreous sections (CEMOVIS) extends these advantages to bulky specimens [2, 3]. Recently much better results have been obtained as a result of improved control of vitrification through high pressure freezing and better control of the cutting process. With CEMOVIS it is now possible to observe for the first time the ultrastructure of cells and tissues in their native state at a resolution approaching 2 nm. In most cases, what is seen differs from what is known from conventional electron microscopy and it is seen with more details.

We will demonstrate this claim with results obtained from bacteria, cultured cells and tissues, focusing on condensed DNA and nuclear structures.

References

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