生物物理学报(2003) 19(3), 286-290

PDF文档

活体细胞三维图像科学可视化方法的研究

熊俊、李栋栋、瞿安连*、徐涛
华中科技大学生命科学与技术学院生物物理与生物化学研究所

科学可视化是指运用计算机图形学和图像处理技术，将科学计算过程中或者是计算结果的数据转换为图形或图像，在屏幕上显示出来并进行交互式处理的理论技术或方法。介绍了用反卷积荧光显微成像技术获得活体大鼠胰腺β细胞三维图像及对其进行科学可视化的主要过程和两种常用可视化算法，并运用这两种方法对所得到的三维图像进行处理以分析和研究细胞内分泌囊泡的空间分布。结果显示，当仅观察细胞三维图像的二维切片时，三维图像中的某些重要信息会被忽略，而使用科学可视化方法则可以从三维角度直观观察活体细胞内分泌囊泡的空间分布，并且可以观察到分泌囊泡的释放趋势和整体分布，从而为细胞生物学研究提供重要的信息。

Scientific visualization can be used to deal with processing or processed scientific datum and to display them on the screen so as to analyze and process these images interactively by image processing and computer graphics technique. The article concerned in the program of scientific visuliza-tion of three-dimensional images of living rat pancreatic β cells by three-dimensional deconvolution imag-ing microscopy. Two visualization algorithms were studied and used to process the three-dimensional deconvolved images of rat pancreatic β cells in which granules was labeled by acridine orange. Scientific visualization results reveal some missed important information when only the two-dimensional slice images of the whole three-dimensional image were investigated, such as the possible trend of granules' release and the whole space distribution of granules.

关键词