

Abstract View

THE CELL-CENTERED DATABASE: AN ONLINE RESOURCE FOR 3D NEURONAL DATA

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We have developed a web-accessible database tailored to high resolution 3D cellular level structural and protein localization data from light and electron microscopy, particularly electron tomography. Electron tomography, the derivation of 3D structure from a series of 2D projections, is providing a wealth of 3D data on biological components ranging from molecules to cells. The Cell Centered Database or CCDB (www.ncmir.ucsd.edu/CCDB) is built on an object-relational framework using Oracle. Each reconstruction is stored with a full set of descriptors, the raw images used to create the reconstruction and derived products such as segmented objects and animations. Data may be registered spatially with a brain atlas using a specially designed spatial mark-up tool, thereby providing a common spatial reference for multiple data sets. Every object segmented from a reconstruction is included as a distinct database entity along with associated measurements allowing the querying of image attributes. The CCDB also contains neuronal tree structures generated using NeuroLucida (MicroBrightfield Inc). Java versions of several of the programs used to create the data are available so that users can view, manipulate or download the data. Data sets are retrieved via the Storage Resource Broker, a management system for transparent access to local and distributed data. The CCDB provides a resource for structural biologists and makes tomographic datasets available to the scientific community at large.

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