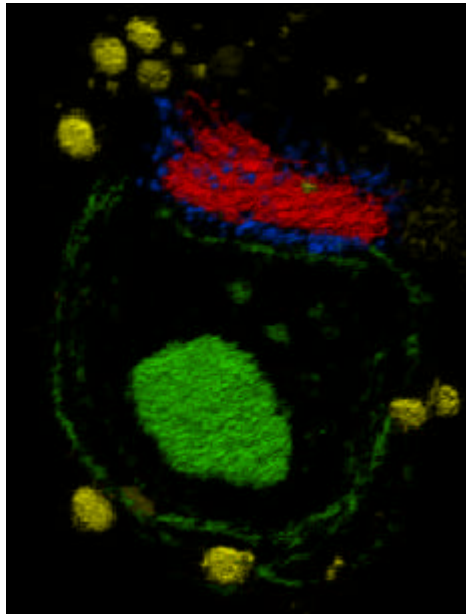




Golgi Biogenesis in *Toxoplasma gondii*



Single plane view showing a single Golgi within a *T. gondii* cell. Golgi - red, nucleus - green, ER to Golgi transport vesicles - blue, remainder of cell - yellow.

Drs Sheff, Pelletier, He, Roper, Pypaert and Warren are researchers in the Department of Cell Biology at Yale University School of Medicine. Together with workers at a number of US Universities, they have recently been working on the mechanism by which new Golgi grow during the cell cycle.

The parasite *Toxoplasma gondii* was the model organism for this work. Initial results showed that in the *T. gondii* cell cycle, the Golgi grows by a process of lateral extension of the cisternae, followed by medial fission, then the Golgi were incorporated into each of the two nascent daughter cells that form by endodyogeny within the mother cell.

In order to examine the ultrastructural details, Dr Sheff and his co-workers used **Volocity** to create 3D renderings of the cell cycle. Electron micrographs were captured from serial thin sections through the samples. These were scanned to create digital images, processed and aligned and each organelle highlighted and extracted by hand into a separate channel. The extracted channels were then presented to **Volocity** and rendered to create 3D volumes. The 3D renderings from **Volocity** confirmed the presence of two Golgi structures in a single nascent daughter cell. The study as a whole indicates that the Golgi is an autonomously replicating organelle.

Using **Volocity** to render electron micrographs is an example of both the versatility and power of this software: when scanned each layer in the stack was approximately 6MB of data and a stack comprised 38 layers, yet was rendered using a standard desktop computer.