**Confocal Microscopy**

CCR is active in visualization of confocal microscopy data. Several projects include the analysis of (1) oral epithelial cells, (2) dental microtubules, and (3) Caenorhabditis elegans worms. Confocal microscopy data consists of a stack of images comprising slices of the subject being studied, and is similar in format to that of CCR's medical visualization projects. The interest is to extract features common to multiple slices and present them in a coherent, intuitive fashion.

In the case of the oral epithelial cells, the researchers were interested in observing the interaction of bacteria as they attack the cell. The visualization procedure consisted of segmenting a single cell from the multiple ones present in a scan. Next, appropriate contour levels were chosen to extract surfaces for both the cell wall and the bacteria. The cells were stained prior to scanning such that the information of interest was more prominent in the slices. With this application, the researchers were able to see groups of bacteria inside of the cell. The resolution of the original scans was not high enough to differentiate individual bacteria. The goal of this project is to be able to develop new treatments for infections.

The image shown above is the confocal image of an oral epithelial cell. The orange objects within the cell are groups of bacteria. Please view the associated video to see an animation of the cell.