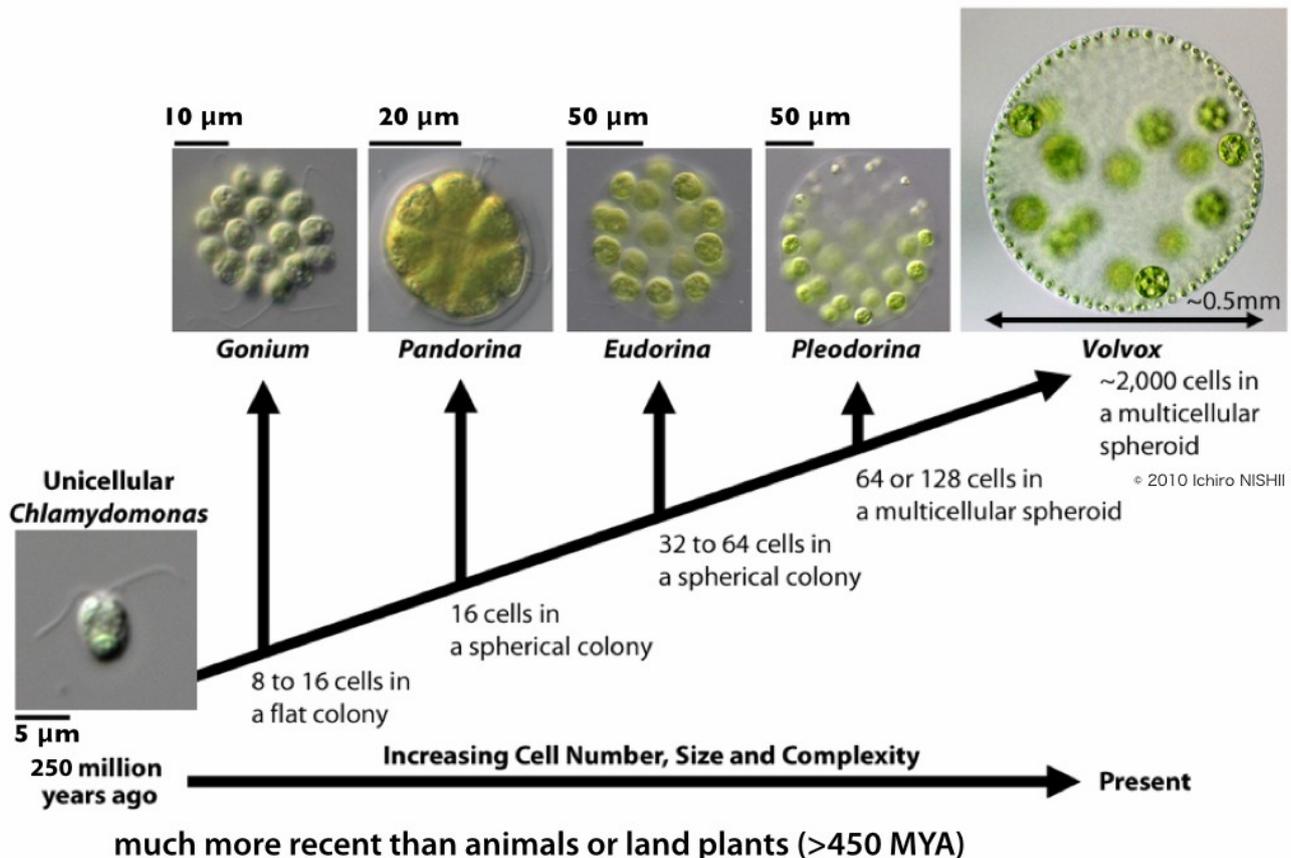


Studies on evolution of developmental complexities in volvocine algae

Ichiro NISHII [Biological Sciences Course]



Evolution of colonial and multicellular volvocine algae

From these series of volvocine algal species, we could see trace of unicellular to multicellular evolution. Not only the cell number but also they increase developmental complexity, such as formation of spherical colony (from *Pandorina*), larger structure of ECM (from *Eudorina*), division of labor (from *Pleodorina*).

Volvox carteri is one of the simplest multicellular organisms, which has served as a good model system for understanding multicellular evolution from unicellular ones. This green alga consists of more than two thousand of cells but only two cell types; many small cells are somatic cells that form a spherical colony and ~16 large cells inside the colony are gonidia that will develop as young colonies in the later stage. *Chlamydomonas reinhardtii* is a closely related unicellular alga sharing a common ancestor with *V. carteri* ~250 MYA. In volvocine algae related to *Volvox* and *Chlamydomonas*, there are series of colonial species with different number of cells. They show more developmental complexity such as morphogenesis, germ-soma differentiation, larger colonial size and oogamy as they have more cells. We are now studying on molecular bases of this multicellular transition of these organisms using genome information, genetic analysis and cell biology.

Keywords : Green algae, Volvox, Chlamydomonas, Morphogenesis, Differentiation