Embryos and larvae of marine invertebrates are the focus of research in George von Dassow’s lab, and the main modes of investigation are video (time-lapse, real-time, or high-speed) and confocal microscopy using fluorescent probes in living cells. Possible internship projects might involve starfish or barnacle eggs and embryos or planktonic larvae of various species. Some examples: 1) We discovered that some invertebrate larvae make a living in the plankton as predators, taking down and consuming animal prey that often exceeds their own size. This mode of larval life has not been widely recognized previously, yet may be quite widespread among marine invertebrates. One of several candidates that need further study is the actinotroch larva of phoronids (an obscure but phylogenetically-significant group of suspension feeding tube worms). These beautiful, graceful larvae have a well-known means for capturing unicellular algae using a whorl of ciliated tentacles, but they can also “gulp” and swallow large objects, including other animals. Can you catch them doing it on video? Can they actually grow and develop on a carnivorous diet? And if so, do they do it in nature? 2) Starfish oocytes and embryos are naturally "excitable" – their surfaces propagate subtle waves of contractile protein assembly as they prepare for and complete cell division – and we can amplify these waves into dramatic patterns by injecting them with one of the key cell division regulators. We hypothesize that excitability is an adaptive trait which helps these unusually large cells to divide in a hurry. If we can dial excitability up and down slightly, does it change the rate or the accuracy of cell division? Other possible projects might include: looking for excitable behavior in other invertebrate eggs; characterizing development of feather-like appendages in barnacle larvae; or visualizing calcium signaling in embryos and larvae as they build their swimming organs.