Steve Meyer
Great Adventures in Evolution
Chris Jensen

Project Summary

My project, an illustration depicting a white blooded icefish surrounded by hemoglobin filled red blooded vertebrates frozen in ice, demonstrates the icefish's ability to survive in the constant freezing temperatures of the ocean surrounding Antarctica in a comical way. Before Antarctica separated from South America its surrounding waters were warmer and inhabited with sharks, rays, and other red blooded fish (the species I decided to demonstrate ill-suited for the now freezing climate). As the planets surface shifted and Antarctica and South America became separate, changes in ocean currents restricted warmer waters and created and open evolutionary niche with limited predation and competition for the icefish's ancestors to evolve into the "bloodless" fish we find today.

This "Antarctic Convergence" is another example of how geological changes lead to changes in species, especially in such an extreme case. Darwin got at these concepts well before the discovery of such bizarre creatures like the icefish. One of the big name opposers to Darwinian theory, and many other evolutionary breakthroughs, was the creationist Rudolf Virchow. For this reason I decided to use him as an example of a red blood vertebrate ill suited for life in freezing waters. This gag puts Virchow face to face with a species that literally (and in my illustration metaphorically) secretes undeniable evolutionary evidence.

In my image, the stringy icefish feces swirls into the form of a double helix bringing attention to the importance of genetic research involved with the icefish. When the Antifreeze glycoprotiens, responsible for absorbing and lowering temperatures at which hazardous small ice crystals (found in arctic water) can form and grow inside the icefish's white bloodstream were isolated at a genetic level, a link to a red blooded ancestor was found. Its gene sequence resembled Trypsinogen an ancient digestive enzyme found in red blooded fish. When a chimeric gene encoding both AFGP's and Trypsinogen was found it was clear that the former evolved from the latter. It also marked the discovery of evolution at a genetic level. It also marked the discovery of the molecular fossil (trypsinogen, myoglobin, and hemoglobin in the case of the icefish). This demonstrated how natural selection is not only a "progressive process." Natural selection acts only in the moment and cannot preserve what is no longer used. The same can be said for the icefish's digestive system in my illustration.