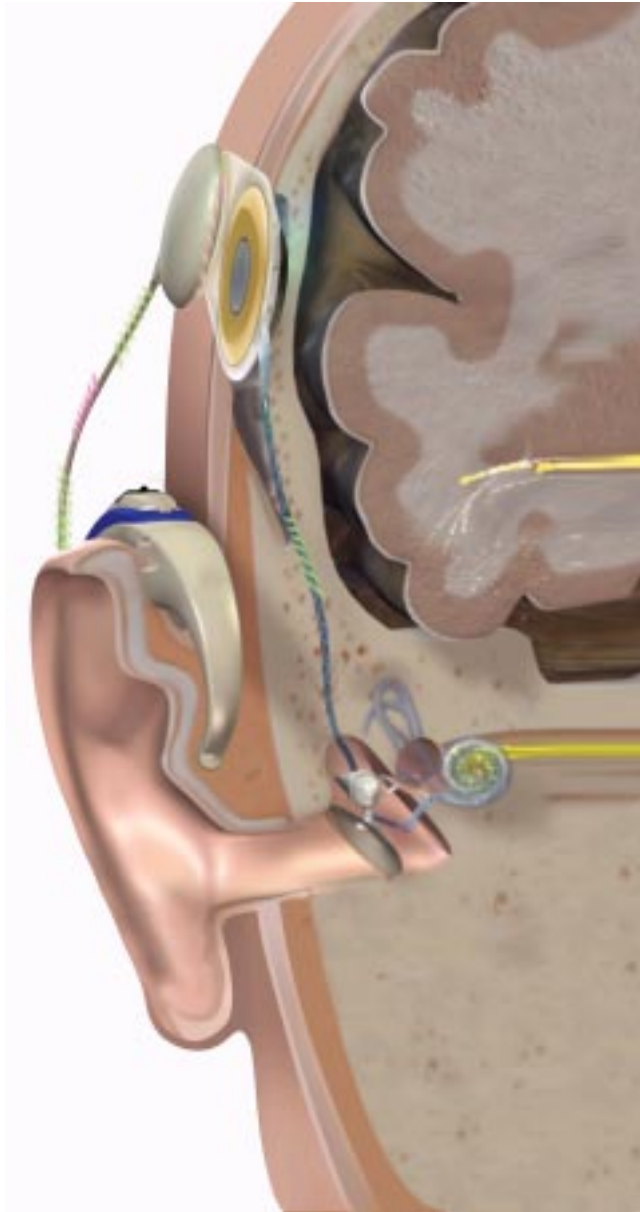
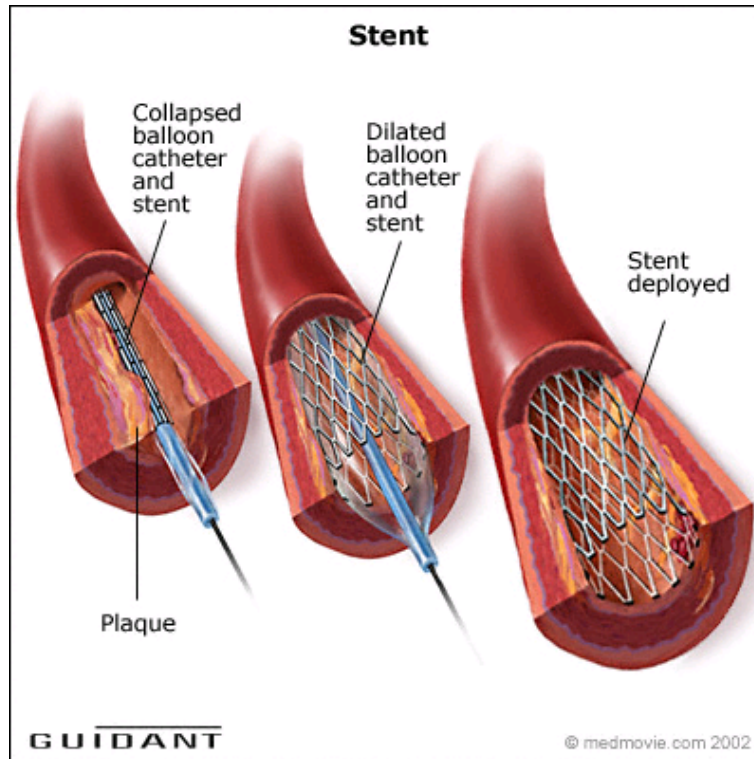




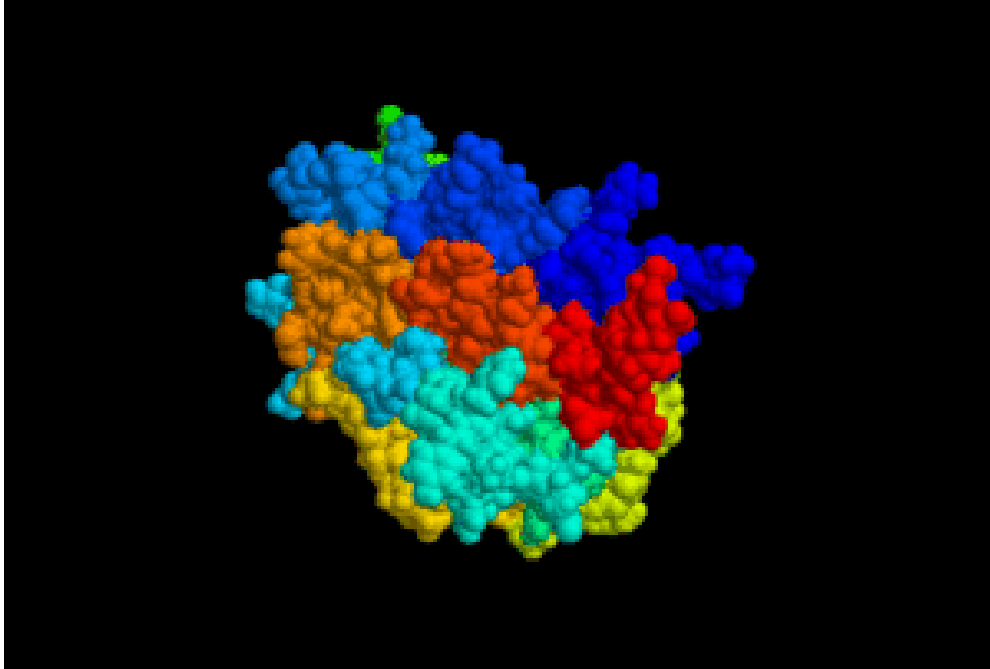
There is a great medical need for a material that works like a muscle. So far no synthetic material has come close but we keep working on it. In the first arm wrestling competition between a synthetic-muscle arm and a human, the human won easily. The second human-robot arm wrestling contest will be soon. See the website at Jet Propulsion Lab: <http://ndeaa.jpl.nasa.gov/nasa-nde/lommas/eap>.



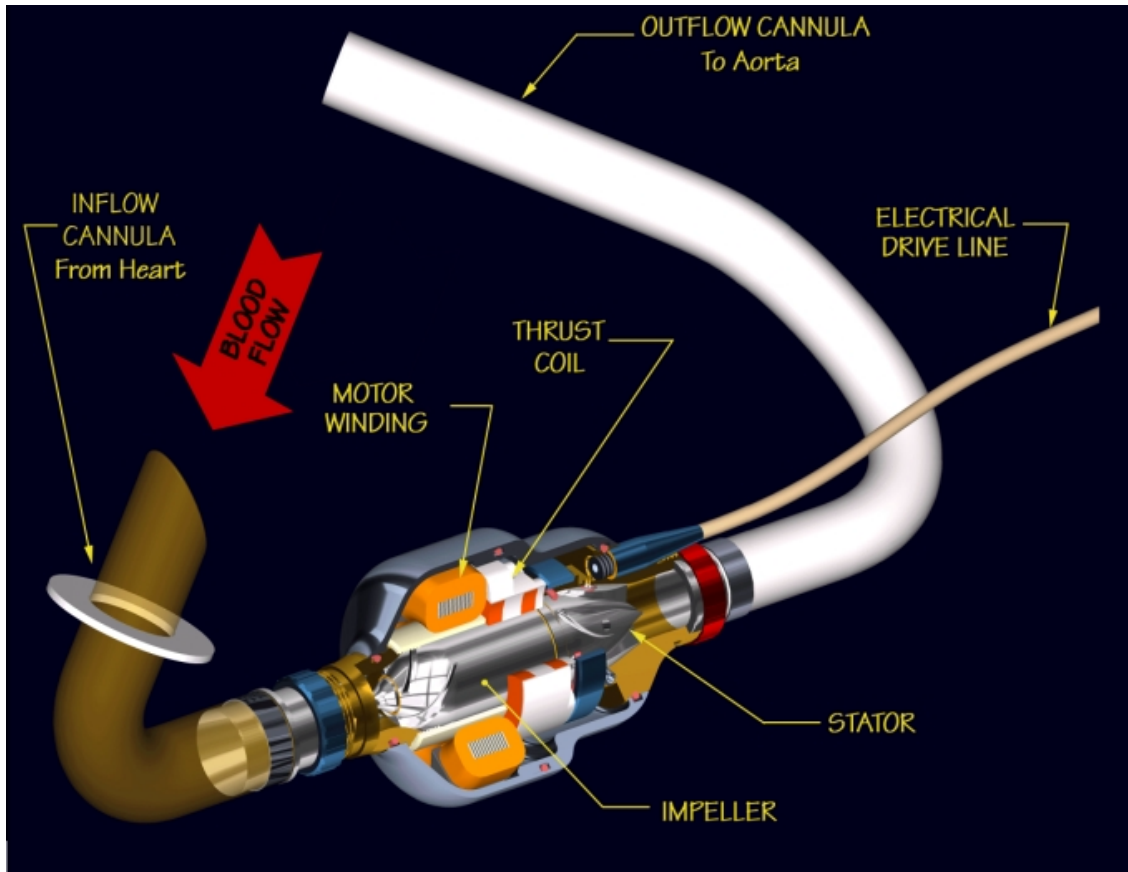
There is one good example of electronics and the nervous system working well together. This implanted “silicon cochlea” can cure deafness in many people born without the proper bone structure in their ear. A transmitter on the ear couples to an implanted chip that stimulates nerve hairs in the inner ear. See [www.bionicear.com](http://www.bionicear.com). A big current challenge is to make a “silicon retina” to give some sight to people whose retina is damaged or destroyed.



This stent, made by Guidant re-opens an artery that has been closed by atherosclerosis and restores circulation to the heart or brain. Newer stents release drugs to further reduce the tendency of fatty tissue to regrow and reblock the artery.



A model of Erythropoietin, which helps to assemble hemoglobin into red blood cells. This is an example of a new family of large protein drugs produced by biotechnology, as opposed to the more conventional small-molecule drugs. If we can overcome problems with making these drugs in quantity and getting them into the patient, we can expect a new era in treatment of many inherited diseases.



Launchpoint Technologies design for an artificial heart. The present pumped versions cause considerable blood damage and so can only be used for a limited time. The low availability of hearts for transplant means we badly need a good artificial heart system.