

**Thème 5 – Corps humain et santé**  
5-A – Les réflexes et le cerveau

**Prosthetic hand with feeling: re-creating the brain-hand connection**

Use the documents and your knowledge to explain to what extent this new prosthesis is a great hope for disabled people.

**Document 1:**

A new study demonstrates that, with the aid of some artificial sensors and electrodes sunk into a user's arm, a prosthetic hand can be made to detect the need for a firm grasp or a light touch, to make fine distinctions between an object's texture, weight and size, and to respond accordingly with no detectable delay. The prosthetic hand could be directed to open and close at the conscious command of the user. But it could also send back to the user's brain information about the touched object—details, for instance, about its size, weight, texture and density.

The aim of such “real-time bidirectional control,” as the authors of the current study put it, would allow prosthetic hand movements that are more natural, more dexterous and more responsive to a user's needs. Allowing sensory input to temper\* motor commands would someday allow a prosthetic user to employ a different grasp to take an egg than to use a hammer.

In a 36-year-old man who had his injured left arm amputated below the elbow 10 years before, the researchers tested their ability to restore the “user control loop<sup>1</sup>.” Motor commands for a variety of different grasps, as well as for an open hand, made their way down the arm and were detected by sensors on the skin of the subject's stump<sup>2</sup>, then digitized and conveyed to the prosthetic hand. To do so, the researchers implanted a suite of electrodes into two nerves located in the muscles of the subject's upper arm.

February 05, 2014/By *Melissa Healy*, <http://articles.latimes.com>, *Los Angeles Times Website*.

\*temper: to make something less strong, extreme, etc.

- <sup>1</sup> loop: boucle
- <sup>2</sup> stump: moignon.

**Document 2:**

