

French Student at Atomic Energy Commission to Research Surface Plasmon Resonance

Craig Richard is a bioengineering senior who spent the summer at the French Alternative Energies and Atomic Energy Commission to research Surface Plasmon Resonance's sensitivity and improve its functions for better and mostly functional work.

Surface Plasmon Resonance is a technique used to examine molecular interactions. It's quite versatile, as it does generic research and studies things like food quality, disease biomarker detection, defense, etc.

Richard spent the summer in Grenoble, France, at the Institute for Nanosciences and Cryogenics. He used a DNA biochip for his research, observing the interactions among its sequences.

The results of his work were not long in coming: Craig was lucky to change the reflectivity of that sequences and tried to increase their response. Richard and his colleagues had introduced gold nano-objects for that, and it wasn't anything totally new for him because he also worked on developing a DNA-based cancer treatment. The young scientist did it by trying to attach a certain molecule to a DNA sequence found in cancer that would change the strand and, therefore, treat a disease.

What is the principle of its work?

If the research appears to be successful, Richard and his colleagues could create a drug that would make cancer cells inactive. Cells would no longer produce the signals to survive and grow, and they would no longer produce the proteins. Such a drug would make a cancer DNA sequence "die".

Craig has developed two products to help people deal with some senses problems: an electronic tongue and an electronic nose. Both devices were born in the lab of LSU (Louisiana State University) where Richard worked on a daily basis.

- **The electronic tongue** works for people who can't differentiate tastes. It sees the difference between wine, coffee, and milk; plus, it is able to track the age of products. For example, it understands the difference between one-day-old and three-day-old milk.
- **The electronic nose** is for people with anosmia, which means inability to differentiate smells. It will help them "feel" the smell of gas, for example, or it will alert about some unpleasant odors around.

Richard confesses he always dreamt about helping people. Having been introduced to bioengineering in high school, Craig decided to continue working in this field, entered LSU, and did his project through their biotechnology lab. He continues working in that laboratory today, and he participated in the LA-STEM program that influenced his development as a bioengineer, too.

Sharing his impressions on working at French Alternative Energies and Atomic Energy Commission this summer, Craig says it was an interesting and useful experience though it wasn't easy to get accustomed to the new surroundings.

"People live at a slower pace there," he admits. "But it was cool to meet so many English-speaking people who shared my interest in the science. Here at the U.S., you don't always get that chance walking down the streets."