Biopsy-Implantable Chemical Sensor for Monitoring and Adjusting Cancer Treatments

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In the battle against cancer (which kills nearly 8 million people worldwide each year) doctors use powerful weapons from their arsenal myriads, including various forms of Chemotherapy and Radiation. What they lack, however, is good reconnaissance — a reliable way to obtain real-time data about how well a particular therapy is working for any given patient. That's why, a tiny biochemical sensor that is implanted in the cancerous tissue will be made; the sensor then wirelessly sends chemical measurements to an external "reader" device, allowing doctors to better monitor a patient's progress and switch therapies accordingly. This device boosts treatments' efficacy while reducing patients' exposure to serious side effects. Design requirements are critical for the success of any project. And so, accuracy of the device and material cost are considered the main design requirements of our project. A simple prototype has been crafted in order to test the mechanism of our idea. Dissolved Oxygen (DO) and pH levels are measured, and a simulation has been made in order to mimic the environment of the tumor. In conclusion, our smart device offers an opportunity to accurately monitor the state of the cancerous tissues with a quite low cost.

Awards Won: