Optical Fibre pH Probe

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Technology description

Market Need

Rapid detection of the tumor during surgery is difficult and a clean margin around the removed tissue, confirming complete removal of the tumor, is typically verified postoperatively with pathology tests. Additional required surgeries, following pathology results of incomplete tumor removal, increases the risk of complications and decreases the patient's quality of life. Testing for margins during surgery reduces the risk of incomplete removal, relieving the health burden of additional surgery and improving patient outcomes.

Technology Description

We have developed a probe that differentiates between tumor and normal tissue by measuring the extracellular pH and preliminary results on human breast cancer and melanoma samples shows a significant difference between tumor and normal tissue. The probe can be used during surgery for immediate feedback on the presence of tumor at the sample margin. Our preliminary data is consistent with literature and shows a significant difference in the probe response between cancer and normal tissue, which has been confirmed by histopathology.

In contrast with techniques currently used, the pH probe is robust, insensitive to external environmental conditions, and offers rapid high resolution results, with measurements taking less than a minute allowing almost real-time detection during surgery. The measurement technique can be almost completely automated to create a very simple user device.

Application area

Published studies have shown a significant difference in the extracellular pH between normal and cancer tissue of the same patient, with cancer tissue having a lower pH, for several different tumor types including glioblastoma and astrocytomas, uterine cancer and melanomas.

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