

Optical Spectroscopy for the Detection of Ischemic Tissue Injury

Tech ID: 11320 / UC Case 2004-313-0

ABSTRACT

Approach in optical spectroscopy for the detection of ischemic tissue injury

FULL DESCRIPTION

Several novel and distinct approaches to detect and quantify ischemic tissue damage have been developed by researchers at the University of California, Davis and the Lawrence Livermore National Laboratory (LLNL). Currently, physical examination and tissue biopsy remain the principal means of determining the viability of tissue that may be suffering from inadequate blood supply. Although symptoms of ischemic tissue damage are clinically relatively easily identified once they have occurred, significant problems prevent the detection of these symptoms in time to prevent permanent damage:

- ▶ Clinically apparent signs do not present themselves until a significant amount of tissue has been destroyed;
- ▶ Damage to internal organs requires extremely invasive examination procedures; and,
- ▶ Current detection methods are incapable of exactly locating the affected tissue.

There is a substantial need to develop means of detecting and quantifying ischemic tissue damage in its early stages, before it is clinically apparent and before irreversible damage has occurred.

This UC Davis and LLNL invention provides novel optical spectroscopy methods to quantify ischemic tissue and organ injury. These methods are non-invasive, non-traumatic, portable, and can make measurements in a matter of seconds. In addition, these methods can be realized through fiber optic probes, making it possible to take measurements of target organs deep within a patient's body.

APPLICATIONS

- ▶ Quantify ischemic tissue and organ injury
- ▶ Solid organ and tissue transplantation
- ▶ Civilian and battlefield trauma
- ▶ Ischemic bowel, cerebrovascular and cardiovascular disease
- ▶ Diabetic tissue injury

FEATURES/BENEFITS

- ▶ Optical spectroscopy methods
- ▶ Fiber optic probes
- ▶ Able to target organs deep within a patient
- ▶ Non-invasive
- ▶ Non-traumatic
- ▶ Portable
- ▶ Measurements in a matter of seconds

RELATED MATERIALS

- ▶ [Raman RN, Pivetti CD, Matthews DL, Troppmann C and Demos SG. 2008. Quantification of in vivo autofluorescence dynamics during renal ischemia and reperfusion under 355 nm excitation. Opt Express. 16\(7\):4930-44.](#)

PATENT STATUS

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OTHER INFORMATION

KEYWORDS

optical spectroscopy,
ischemic tissue injury,
clinical diagnostic, non-
invasive, portable

CATEGORIZED AS

- ▶ **Medical**
 - ▶ Diagnostics
- ▶ **Optics and Photonics**
 - ▶ All Optics and Photonics

RELATED CASES

2004-313-0

Country	Type	Number	Dated	Case
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