Imaging Modalities and Methods for Enhanced, Label-free Histopathology During Surgery

Tech ID: 31816 / UC Case 2019-580-0

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ABSTRACT

Researchers at the University of California, Davis have developed new techniques capable of producing near real-time tissue analysis with quality and accuracy attributes comparable to traditional Haemotoxylin and Eosin (H&E) histopathology methods.

FULL DESCRIPTION

H&E methods can involve multiple tissue or biopsy preparation steps. Thus, these processes typically require elapsed times that are often incompatible with optimal intra-operative decision-making regarding the amount of tissue to be removed during surgery. Therefore, the field of pathology would be advanced – and positive surgical outcomes with reduced side effects would increase – if histopathological processes with reduced time scales were implemented.

Researchers at the University of California Davis have developed a label-free, spectral, pathology method that can quickly identify regions of diseased tissue *in vivo* without the need for traditional hematoxylin and eosin staining. A multimodal microscope capable of acquiring varied and simultaneous microscopy/spectroscopy images of unstained tissue can survey the tissue structure and architecture, and - by comparing unique tissue signatures provided by the microscope, discriminate between diseased and healthy cells. This method overcomes historical limitations associated with current approaches to intra-operative histopathology.

APPLICATIONS

- Intraoperative pathology

FEATURES/BENEFITS

- Offers a label-free method for near, real-time pathology results
- Reduces average times surgical patients remain under anesthesia
- Increases accuracy of tissue removal during surgery

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,245,866	03/11/2025	2019-580

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- An Optical System for Parallel Acquisition of Raman Spectra from a 2-Dimensional Laser Beam Array

INVENTORS

- Chan, James W.
- Saadai, Payam

OTHER INFORMATION

KEYWORDS

Pathology, Histopathology,

Inter-operative, Label-free

CATEGORIZED AS

- **Imaging**
  - Medical
- **Medical**
  - Diagnostics
  - Imaging
  - Screening

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2019-580-0

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