

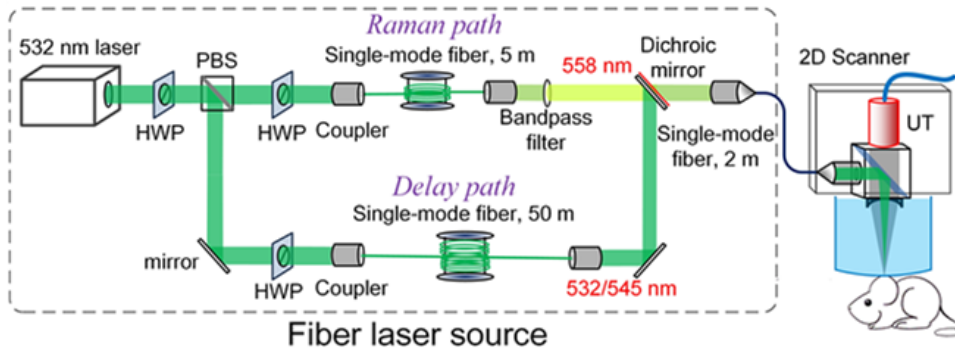
System and Method for Providing Multi-wavelength Laser

Energy & Environment

Health & Wellness

Biomedical and Genetic Engineering

Electricity and Power Electronics



Remarks

Inventions Geneva
Evaluation Days (IGED)
2022 - Gold Medal

IP Status

Patent granted



Opportunity

Photoacoustic imaging is a new biomedical imaging modality based on the use of laser-generated ultrasound, and it is considered as one of the most promising imaging techniques to have emerged in recent years. It is advantageous in a number of aspects. Firstly, it is non-invasive and so is relatively safe to use in in vivo applications. Secondly, by encoding optical absorption into acoustic waves, the spatial resolution and/or penetration depth limitations associated with traditional optical imaging techniques can be overcome. Being able to provide high molecular based contrast and spectral specificity of optical methods, photoacoustic imaging further facilitates visualization of anatomical features not obtainable with other imaging modalities (such as ultrasound). The laser pulse repetition rate of the multiple wavelengths laser is one of the major bottlenecks for fast photoacoustic imaging. Therefore, the multi-wavelength pulsed laser for fast functional photoacoustic imaging is highly demanded in the market.

Technology

The present invention relates to a system and method for providing multi-wavelength laser, and particularly, although not exclusively, to a multi-wavelength pulsed laser source adapted for functional photoacoustic microscopy. A system for providing multi-wavelength laser includes an optical splitter arranged to split light received from a pulsed laser source into at least a first light beam and a second light beam; a first optical regulator arranged to adjust a wavelength of the first light beam and to output the adjusted first light beam; a second optical regulator arranged to introduce a time delay to the second light beam and to output the delayed second light

Technology Readiness
Level (TRL) ?

5

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Develop
Concept

Proof
Concept

Build Value

Follow-on

beam; and an optical combiner arranged to combine the first adjusted light beam and the second delayed light beam, and to output a combined light beam.

Advantages

- The new multi-wavelength pulsed laser is with high pulse repetition rate and high pulse energy.
- The pulse laser is provided in multiple-wavelengths choice.
- The new multi-wavelength pulsed laser is with fast wavelength switching time.

Applications

- The invention has made a novel laser source for fast functional photoacoustic microscopy.
- Combining the new 2-MHz laser source with these fast scanning OR-PAM in the future, high-speed functional photoacoustic images could be achieved.

