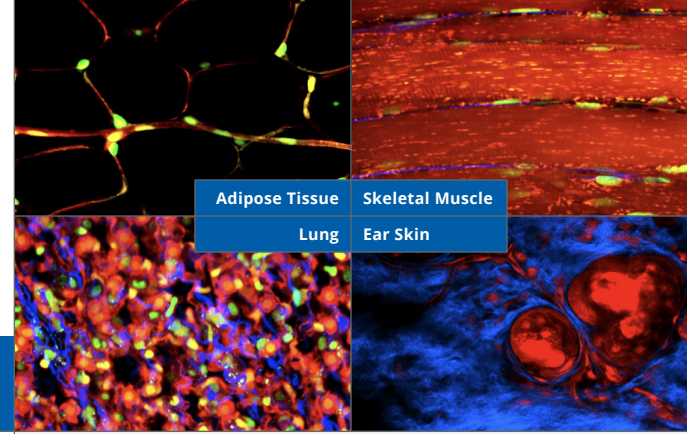


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Axon Laser Lights the Way to Intravital Two-Photon Imaging

The Challenge

The clinical use of multiphoton imaging on live cells could enable real-time in vivo biopsies, to develop faster identification and treatment of diseases. One of the key steps in the process is to develop compact, low cost and easy to use system. To this end, IVIM Technology (Daejeon, South Korea) committed to develop the world's most compact, cost-effective, fs-laser module integrated two-photon microscope system for intravital imaging of live cells. Specifically, the goal was to deliver a system that is suitable for non-expert users with superb imaging quality with minimal invasion on living organ of the animal. A key challenge for IVIM was getting a laser with all the features and performance they required, having compact size affordable price.

The Solution

The newly launched IVIM-MS2 is an All-in-One Intravital Two-Photon Microscopy System, incorporating a Coherent Axon 920-TPC laser. Dr. Pilhan Kim, CEO of IVIM Technology and Professor of Korea Advanced Institute of Science and Technology (KAIST), explained, "This microscope can explore complex dynamic behaviors of numerous cells inside a living body. It serves as next-generation core technology to elucidate unknown pathophysiology of various human diseases and hopefully discover new cures for them." He noted that prior to its development, users must be skillful to get the needed images on various organs with conventional two-photon systems, which were very challenged.

Dr. Kim stated that IVIM selected Axon 920-TPC for several reasons. Its AOM integrated compact size, rugged build with air cooling, and maintenance-free operation made it the ideal laser for their IVIM-MS2. He added, "The air-cooled, AOM integrated design allowing IVIM to use a much simpler, less costly optical design with much higher reliability for high up-time operation" The total power control, or TPC, allowing fast power change; the adjustable pre-compensation can tune the pulse width at sample. The laser enabled them to develop the all-in-one revolutionary two-photon, high resolution in-vivo 3D fast imaging systems.

The Result

Using the new all-in-one intravital microscopy systems, researchers can now observe highly dynamic molecular and cellular processes such as gene expression, protein activity, cell trafficking, cell-to-cell interactions in unprecedentedly high resolution, inside a live body.

Intravital Images from Two-Photon IVM-MS2

- Optimized for in-vivo imaging of 3D cellular-level dynamics in various target tissues
- Ultra-high speed in-vivo imaging up to 100 fps @ 512 x 512 pixels
- 4-color simultaneous two-photon imaging, capable of simultaneous detection of fluorescence & label-free non-linear multi-harmonic generation (SHG) imaging

"Small size of the Axon920-TPC enabled us to make the world smallest Two-Photon Microscopy, IVM-MS systems by fully integrating the fs-laser in a single box. It greatly helps customer to fit the system in their limited lab spaces."

— Dr. Pilhan Kim, CEO
IVIM Technology Inc. Daejeon, South Korea