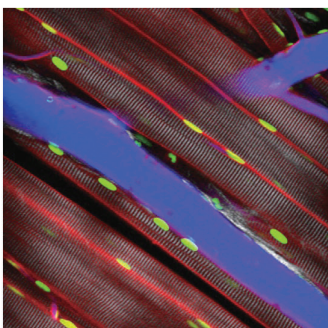
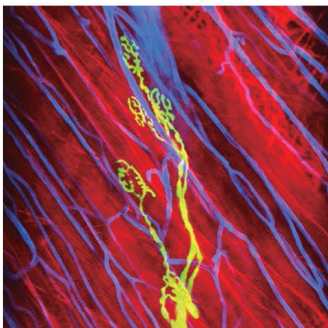
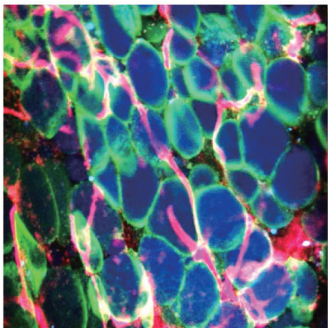
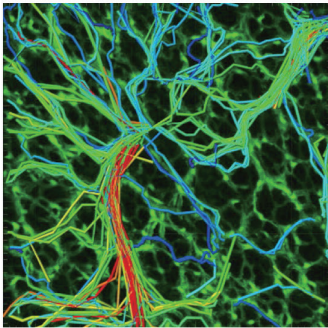
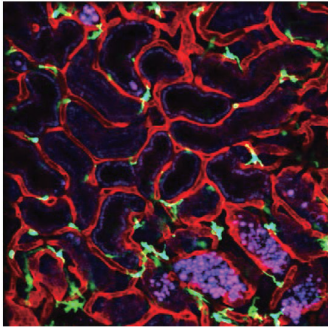
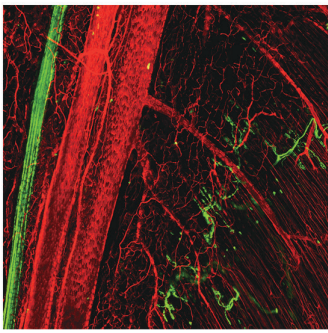




Your Essential Must-Have for High-Quality *In Vivo* Imaging

In Vivo Intravital Microscopy
for Precise Real-time Imaging
at Cellular Level

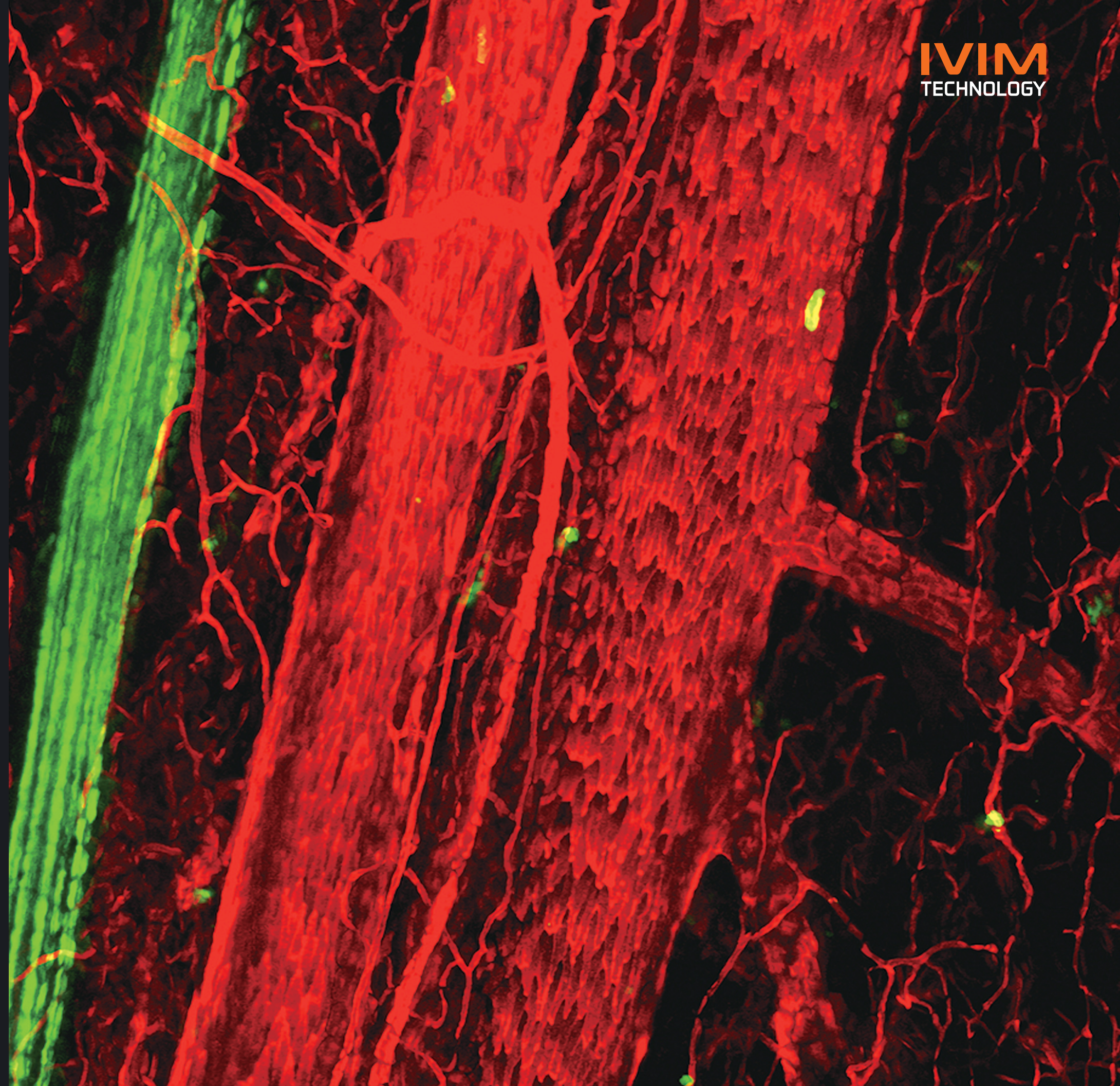


Manufacturer and Service Provider
Intravital Microscopy and *In Vivo* Imaging

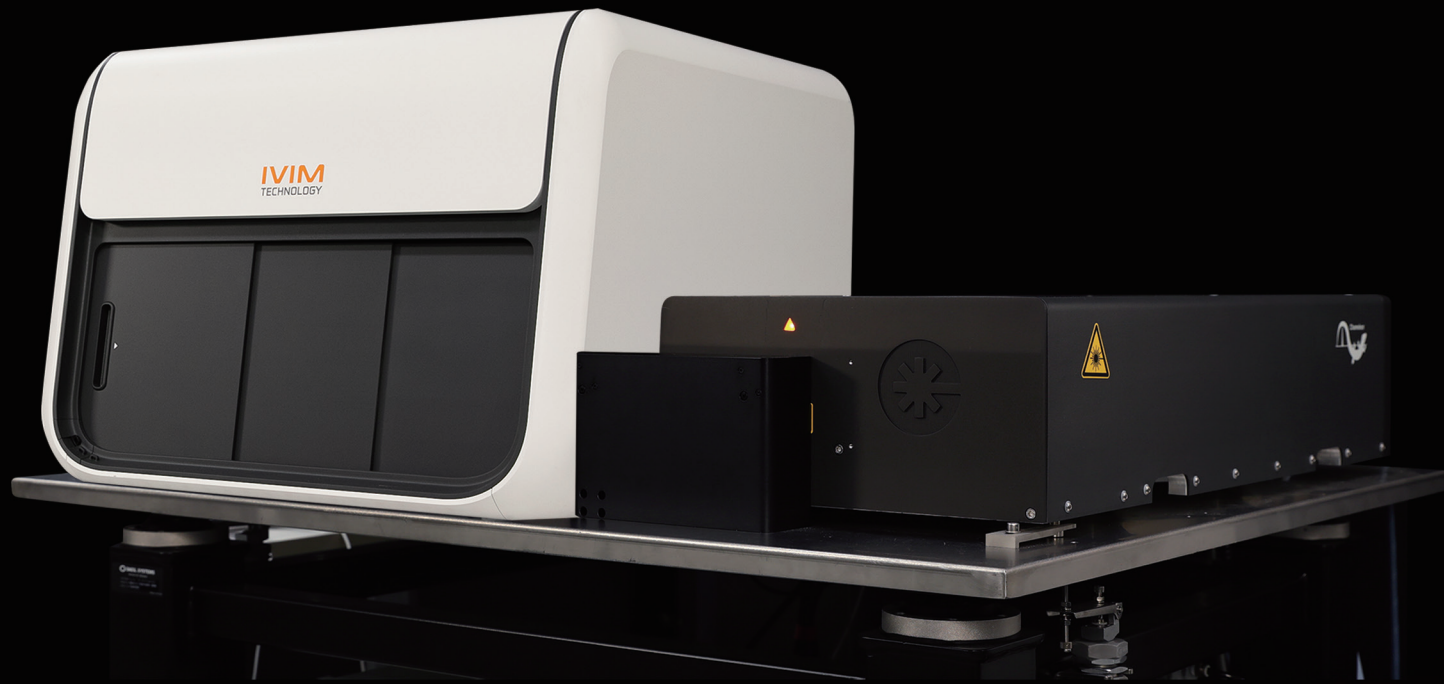
IVIM
TECHNOLOGY

Contents

About IVIM Technology	5p
Products and Services	8p
Our Technology	14p
Key Features	18p
Case Studies	22p
Distributors & Customers	29p



REAL-TIME, HIGH RESOLUTION IN VIVO IMAGING



| About IVIM Technology |

IVIM Technology, established in 2017, is a pioneering leader in the field of *in vivo* intravital microscopy. Our journey began with the introduction of groundbreaking confocal and two-photon microscopes in 2018, setting new standards for *in vivo* imaging of living organisms. By the following year, we advanced our capabilities with the introduction of a smart version featuring a 920nm fs laser, solidifying our position as the world's most advanced and compact intravital two-photon microscope. In the same year, we made significant investments in state-of-the-art animal facilities and established a cutting-edge R&D Center in Daejeon. This strategic expansion has enabled us to further enhance our research and development efforts, driving innovation and excellence in our products and services.

IVIM Technology has rapidly gained global acclaim, serving esteemed researchers from renowned institutions such as Harvard University, Johns Hopkins All Children's Hospital, Sanofi, University of Massachusetts, Seoul National University Hospital, Korea University College of Medicine, Huazhong University of Science and Technology, and Wuhan University, among others.

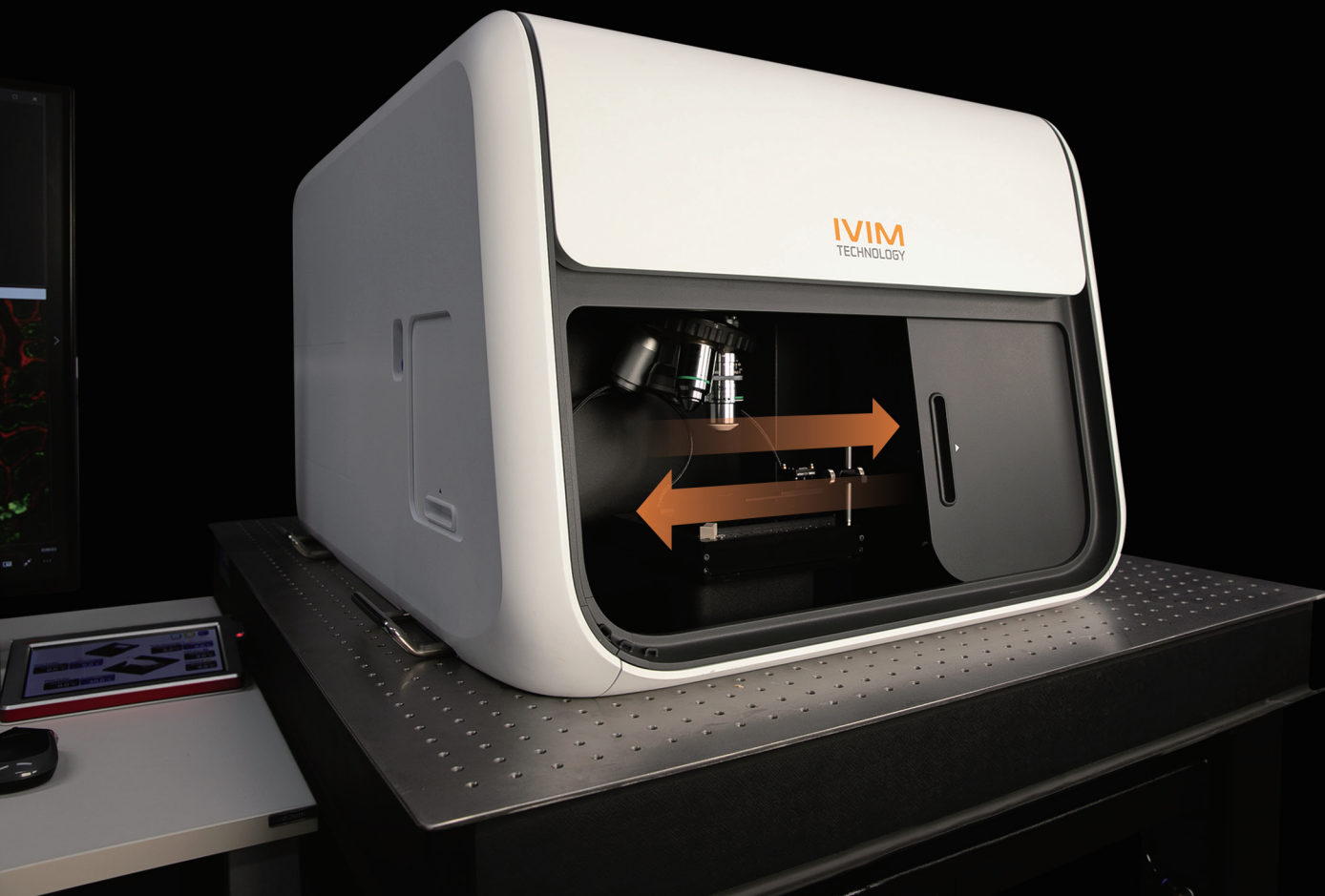
Empowered by our dedicated expert staff, IVIM Technology has recently ventured into providing Contract Research Organization (CRO) services for preclinical *in vivo* imaging. Despite our relatively short time in the preclinical imaging service industry, IVIM Technology has made significant impacts in domestic and foreign markets. In December 2023, IVIM Technology's CRO Service was recognized and listed among the APAC Top 10 Bioanalytical Science Providers by Life Sciences Magazine*. Presently, IVIM Technology offers a comprehensive range of services, including Intravital Microscopy (IVM), onsite/online seminars and workshops, *in vivo* imaging and animal handling surgery training, as well as accessories for intravital imaging and labeled antibodies for specific research needs. Guided by our mission and vision, IVIM Technology is steadfastly moving toward becoming the premier provider of intravital microscopy for the future, focusing on quality and ease of applicability.

IVIM Technology operates globally.



ALL-IN-ONE INTRAVITAL MICROSCOPY SYSTEM

- Simultaneous Multi-Color Imaging
(4 Channels, Capturing 4 Different Colors/Elements Simultaneously)
- Fully Integrated *In Vivo* Maintenance Unit/Animal Stage
(Monitoring & Homeostatic Regulation of Animal Vitality)
- High-Speed Imaging (50 fps – 512 x 512 pixels)
- 4D Animal Motion Compensation (XYZ & Time)
- Cost and time effectiveness, ease of applicability

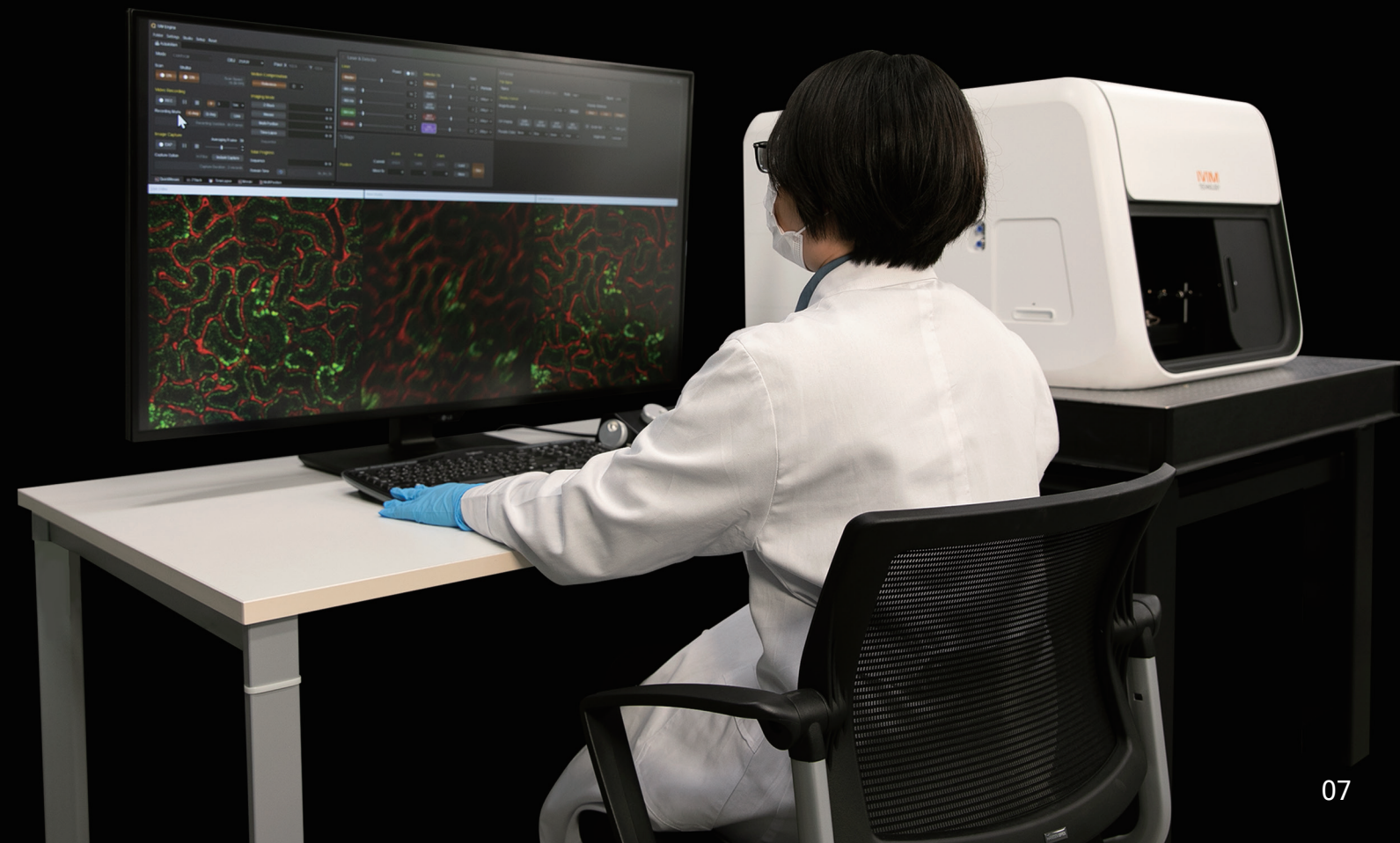


Streamlined Integration

Our system boasts seamless integration of essential components, including the computer, anti-vibration table, microscopy unit, and lasers for the two-photon microscope. This cohesive integration eliminates the need for extensive setup, enabling users to dive into their research or applications immediately. With a compact footprint of less than 6.56 ft³, our All-in-One IVM system maximizes the utilization of limited laboratory or research space, providing efficiency without compromising functionality.

Modular Components

Our system features a modular design, facilitating easy upgrades or customization to meet evolving research requirements. Researchers can effortlessly adapt the system by incorporating updated hardware, software, or features, ensuring its longevity and relevance in dynamic scientific landscapes. This flexibility empowers users to stay at the forefront of innovation and seamlessly integrate advancements into their workflows, ultimately enhancing research capabilities and driving scientific discovery.



Products and Services
One-device, Unlimited Solutions

The "New All-in-One IVM Series" stands as a game-changer addressing the critical need for effective cellular validation, tracking, and mode of action determination in real-time. It not only elevates academic research capabilities by providing cutting-edge tools for cellular exploration but also revolutionizes industrial research by expediting drug development timelines and improving overall success rates in the competitive pharmaceutical landscape.

IVM-C3 (Confocal v. 3)
Tractable, Fast and Gentle

IVM-C3 is a highly integrated system for *in vivo* imaging, offering significantly enhanced detection efficiency, optical resolution, and image contrast compared to conventional fluorescence microscopy. With a 4-wavelength laser and four high-sensitivity confocal detectors, IVM-C3 enables multi-dimensional views of living cells and tissues in 3D or 4D, supporting up to four different colors.

IVM-M3 (Two-Photon v. 3)
Deep Tissue Imaging, High-Resolution, Tunable

IVM-M3 seamlessly combines the flexibility of a traditional converted microscope with the high-resolution imaging capabilities of second-harmonic generation microscopy. Featuring a fully automated tunable fs-pulse NIR laser system, IVM-M3 excels in deep tissue imaging using less-scattering NIR wavelengths. The comprehensive control functionality of the fs-laser system is integrated with the two-photon imaging software, ensuring user convenience with various automation algorithms. Experience advanced imaging with IVM-M3 for your research needs.

IVM-CM3 (Confocal and Two-Photon v. 3)
High Contrast and Resolution, Dual-Mode and Tunable

IVM-CM3 delivers exceptional contrast and resolution with its tunable two-photon laser unit, allowing focus on desired wavelengths ranging from as low as 690 nm to higher up to 1,050 nm, and everything in between. This cutting-edge system seamlessly combines the strengths of both confocal and two-photon microscopy, offering limitless possibilities for three-dimensional imaging of living cells whether near the skin or deep within tumors in small animals. Explore the potential of IVM-CM3 for advanced and versatile imaging in your research.



IVM-MS3 (Two-Photon Smart v. 3)
Compact, Cost-Saving, Hands-Free

IVM-MS3 represents the smart evolution of IVM-M3, an all-in-one two-photon intravital microscopy system meticulously optimized for *in vivo* imaging. This system seamlessly integrates a compact, high-stability, and maintenance-free fs-pulse laser unit into a single box. With the ability to focus on deep tissues at a fixed wavelength of 920nm, IVM-MS3 serves as an exceptional resource for researchers with specific targets, offering optimal functionality within limited resources and budget constraints. Explore the possibilities with IVM-MS3 for efficient and budget-friendly *in vivo* imaging.

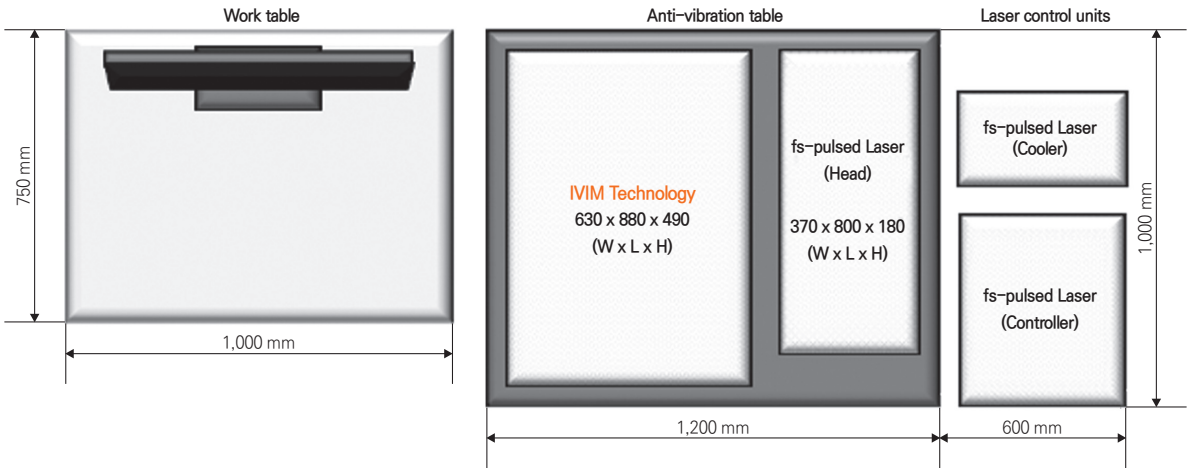
IVM-CMS3 (Confocal and Two-Photon Smart v. 3)
Cost-Effective, Straightforward, Dual-Mode

IVM-CMS3 stands out as the world's most compact and affordable dual-mode intravital confocal and two-photon microscope, offering versatile functionality in a single, streamlined box. Leveraging the confocal laser units from IVM-C3 and the compact two-photon laser unit from IVM-MS3, IVM-CMS3 features a one-switch (one-click) mode changing capability, providing convenient multi-purpose use for intravital functional imaging while optimizing space and minimizing costs. Explore the efficient and cost-saving capabilities of IVM-CMS3 for your diverse imaging needs.

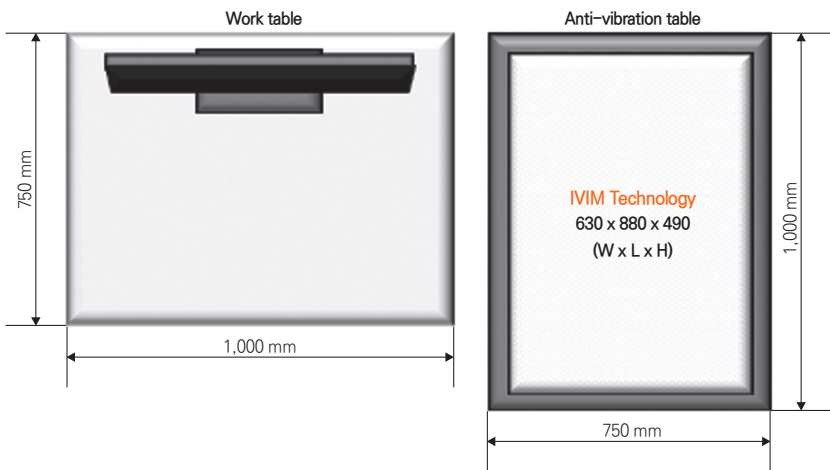
Specifications
The New All-in-One IVM Series (IVM-C3/M3/CM3/MS3/CMS3)

SPECIFICATIONS			C3	M3	CM3	MS3	CMS3
Laser	Confocal Laser Unit	• 405 nm (20mW), 488 nm (20mW), 561 nm (20mW), 640 nm (20mW)	✓		✓		✓
	Tunable Two-photon Laser Unit	• Ti: Sapphire laser • Wavelength: 690-1,050 nm, Pulse width < 75 fs, Rep. rate: 80 MHz • Avg. power > 2.5 W, Dispersion compensation: 0 to -43,000 fs ²		✓	✓		
	Compact Two-photon Laser Unit	• Air cooled fs-fiber laser system with built-in power control • Wavelength: 920 nm, Pulse width < 100 fs, Rep. rate: 80 +/-2 MHz • Avg. power > 1.5 W, Dispersion compensation: 0 to -60,000 fs ²				✓	✓
Fluorescence Detector	Confocal Detector	• Wavelength: 450 - 750 nm (DAPI, CFP, GFP, YFP, RFP, Cy5, Cy5.5, etc.) • 4 Ultra-broadband high SNR PMTs (UV to Near IR, Ultra High Sensitivity, Low Dark Current) • Single master pinhole	✓		✓		✓
	Two-photon Detector	• Wavelength: 450 - 750 nm (DAPI, CFP, GFP, YFP, RFP, Cy5, Cy5.5, etc.) • 4 high quantum efficiency PMTs (UV to Near IR, Ultra High Sensitivity, Low Dark Current) • Emission Filter: Individual filter can be mounted on each of four detectors		✓	✓	✓	✓
Scan Head	Scanner	• Polygonal mirror (Fast axis scanning, Max. 30 kHz) • Galvano scanner (Slow axis scanning, Max. 200 μs/step)					
Imaging Head	Objectives	• Max. 5 objectives are mountable on IVM Engine Software controlled motorized turret (1X – 100X) • Compatible for commercial objectives					
	FOV	• 100 x 100 μm ² - 10 x 10 mm ²					
Image	Pixel Resolution	• Max. 2,048 x 2,048 pixels					
	Imaging Speed	• Standard : 30 fps @ 512 x 512 pixels • (Optional) High Speed: 50 fps @ 512 x 512 pixels					
Animal / Sample Stage	Movable Stage	• Travel Range : 50,000 x 50,000 x 75,000 μm (XYZ) • Micromanipulation (Max. 0.2 μm resolution) • 3-axis independent control with Jog Dial & IVM Engine Software					
	Specimen Holder	• Flexible-design universal <i>in vivo</i> / <i>ex vivo</i> / <i>in vitro</i> specimen holders can be mounted • (Optional) Homeothermic warming system, Holders for window chamber					
	Monitoring Camera	• Real-time live animal / sample monitoring					
Animal Motion Compensation (Tissue stabilization)	LED Light	• Installed inside the machine to assist in the observation of live animals or samples					
	4D <i>In vivo</i> Imaging Motion Compensation	• XY motion compensation: Averaged image acquisition with motion artifact compensation • Z motion compensation: Image-based sample Z position adjustment for long-term intravital microscopic imaging & sample tracking (Feedback-loop automatic stage control) • T motion compensation: Image-based image XY position adjustment for long-term intravital microscopic imaging & sample tracking (Feedback-loop automatic stage control) • Combination of above three compensation for 4D <i>in vivo</i> motion compensation • Controllable by IVM Engine software					
	Live Animal Maintenance Unit	• Body Temp. Monitoring & Feedback Heater Control, including tablet PC • 4CH Rectal Probe, Body Plate Heater, Thermometer Sensor & Cover Glass Heater					
Accessories Add-on	<i>In vivo</i> Imaging Chamber Sets	• Dorsal Skinfold Chamber • Lung Imaging Chamber • Cranial Imaging Window • Abdominal Imaging Window • Pancreas Imaging Window • Mammary Imaging Window • Heart Imaging Chamber • Uterus Imaging Chamber					
	Inhalation Anesthesia System	• Whole Rodent Animal Inhalation Anesthesia System • Anesthesia Mask and Connections for Longitudinal Imaging					
	Antibodies / Dyes	• Fluorescent labeling agents, vascular dyes and conjugated antibodies					
Engine & Studio Software	Image Display	• Independent 4 single channel display (RGBA channel) • Overlay channel display (Selection among RGBA channel)					
	<i>In vivo</i> Imaging Modes	• Mosaic imaging (XY), Z-stack imaging (Z), Time-lapse imaging (T) • Time-lapse imaging at Multi-position (T - M) • Time-lapse & Z-stack imaging (TZ) • Time-lapse & Z-stack imaging at Multi-position (TZ - M)					

IVM-M3/ CM3 Size Information



IVM-C3/ MS3/ CMS3 Size Information



Other IVM Systems
Shaped by Customer Feedback

Customized Systems & Services



IVIM’s Customized Systems and Services enable researchers to adapt their intravital microscopy setup to meet their unique needs. Our systems are designed to seamlessly integrate various apparatuses based on specific research requirements and preferences. Additionally, commercially available water or oil immersion lenses and two-photon lasers can be incorporated to enhance imaging capabilities, ensuring optimal performance under diverse experimental conditions.

IVM-FS (Free Space) System for Middle Animals



The IVM-FS system offers similar functionality to the IVM-CMS3 system, with the primary difference being that it is equipped with a larger stage and modules. This design allows it to accommodate animals larger than mice and rats (over 6 weeks old), such as ferrets and rabbits.

IVM-RC / IVM-RMS (Robotic Confocal / Two-Photon Smart)
Intravital Imaging System for Large Animals

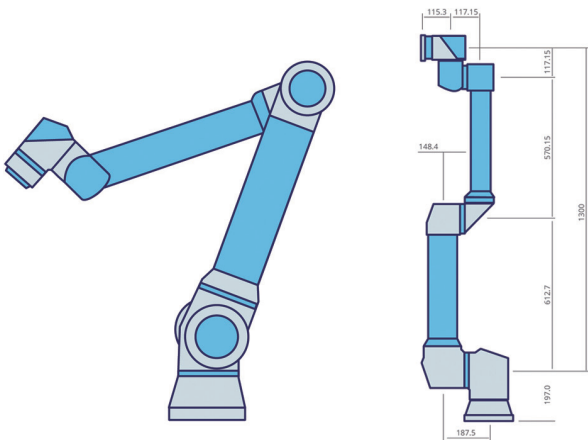
IVM-RC and IVM-RMS accommodate diverse research subjects, including monkeys, rabbits, pigs, ferrets, and more. The precision-engineered 360-degree rotative robotic arm ensures intelligent, unobstructed access to the observation area. Designed for adaptability, the biomicroscope head interfaces directly with the robotic arm.

With an impressive speed of 18 fps at 512 x 512 pixels, and the capability to achieve 1,024 x 1,024 pixels resolution, this imaging system excels in capturing high-quality images for advanced research in neuroscience, dermatology, and ophthalmology. It provides rapid insights into dynamic brain processes, detailed analysis of skin structures, and precise imaging of retinal structures, making it a versatile tool for diverse biological studies.



Model	Key Features
IVM-RC	• Multi-color simultaneous imaging (4 channels, 4 different colors) • High-resolution imaging near the tissue surface • Affordable and simpler to set-up
IVM-RMS	• Multi-color simultaneous imaging (4 channels, 4 different colors) with a deeper tissue penetration • Simple and hands-free turn-key operation of 920 nm NIR fs-laser fixed inside the microscope. • Label-free, non-linear second harmonic generation ability

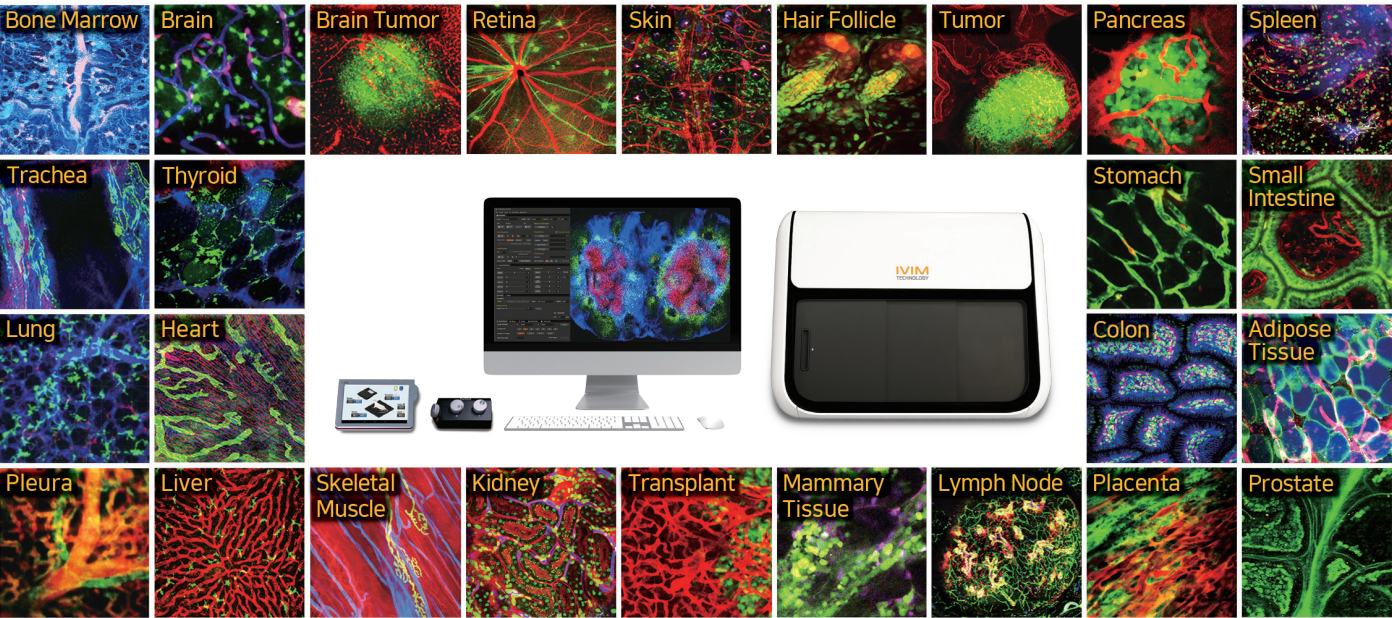
IVM-RCMS Size Information



Our Technology

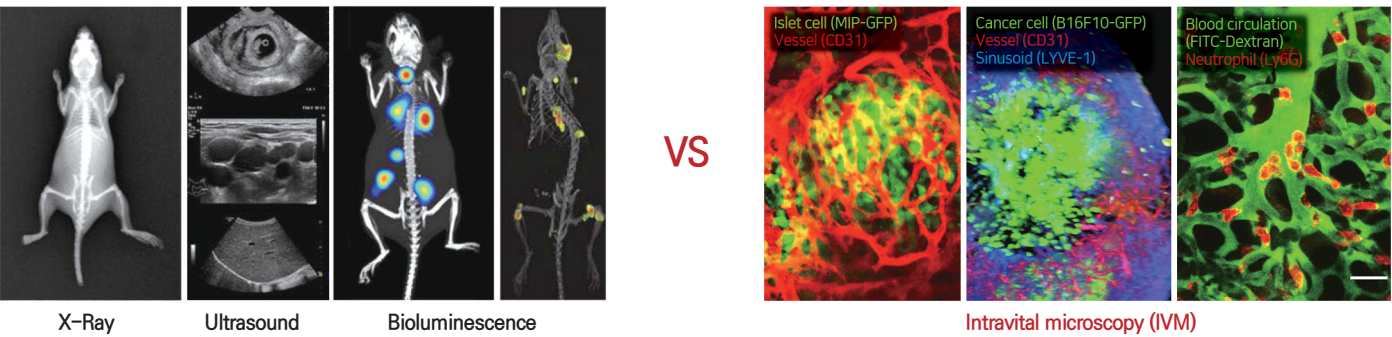
What is Intravital Microscopy (IVM)?

Intravital microscopy is a powerful imaging technique that allows real-time visualization of biological processes within living organisms. Unlike traditional microscopy, which often involves studying fixed or isolated samples, intravital microscopy lets researchers observe dynamic events in their natural physiological context. This technique is commonly employed in preclinical research, including immunology, neuroscience, and cancer research, providing crucial insights into cellular behavior, interactions, and responses within living systems. Intravital microscopy often utilizes advanced optical methods to capture high-resolution images, making it a valuable tool for studying complex biological phenomena *in vivo*.

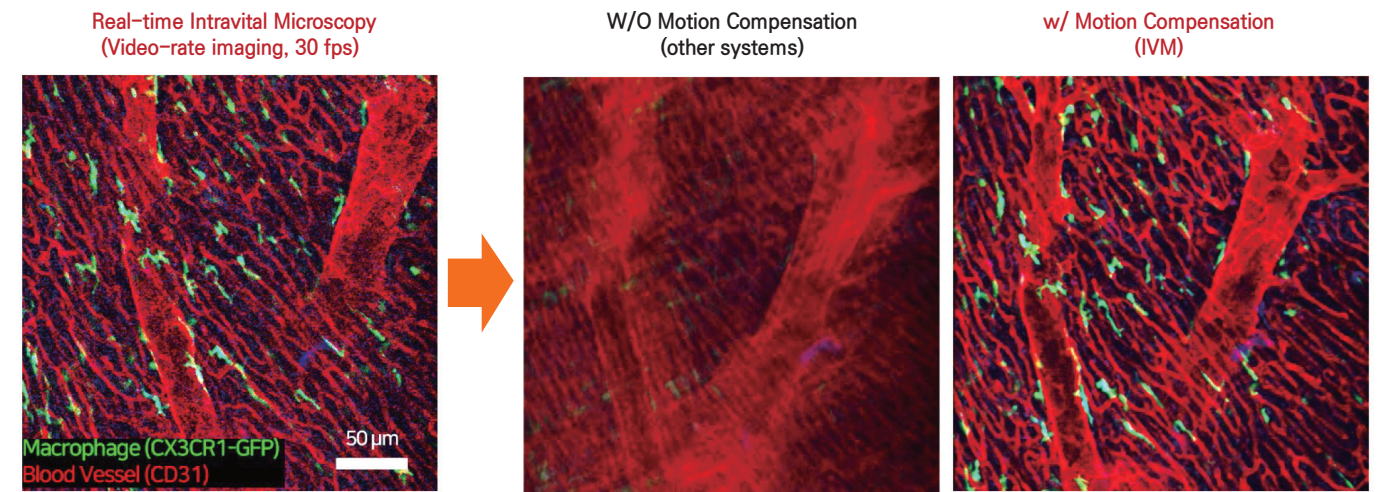


IVIM Technology stands at the forefront of intravital microscopy, offering dynamic 3D imaging capabilities that delve into cellular-level dynamics within the living body. From cell trafficking and cell-cell interactions to probing the intricacies of cell-microenvironment interactions, IVIM's innovative technology provides unprecedented insights into human disease development processes. The company introduces a groundbreaking approach with the world's first All-in-One intravital microscope, compactly packed into a small box yet delivering exceptional imaging performance.

Why Intravital *In Vivo* Imaging is Essential?



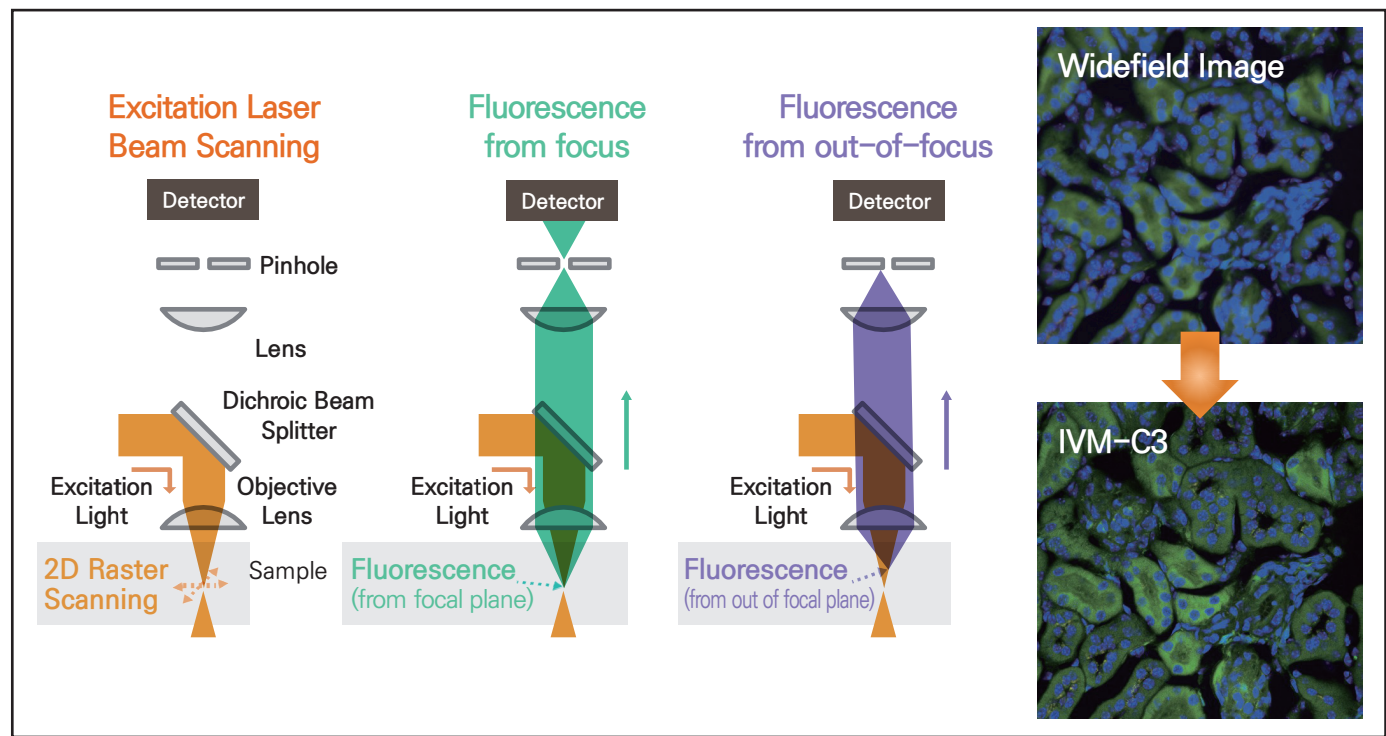
Unlike other imaging modalities such as bioluminescence, PET, CT, or MRI, intravital microscopy provides dynamic insights into biological processes *in vivo*. One of the critical reasons intravital imaging is essential is its ability to capture complex physiological phenomena accurately. For instance, when studying drug responses, immune system interactions, or disease progression, intravital imaging allows researchers to observe these processes within the context of living organisms, providing a more accurate representation of *in vivo* conditions compared to static, *ex vivo* studies.



Moreover, intravital imaging enables researchers to capture live, anesthetized animals, ensuring relevance to clinical scenarios. This aspect is crucial for understanding how interventions or therapies might behave in real-life situations, facilitating the translation of research findings into clinical applications.

What is Confocal Microscopy?

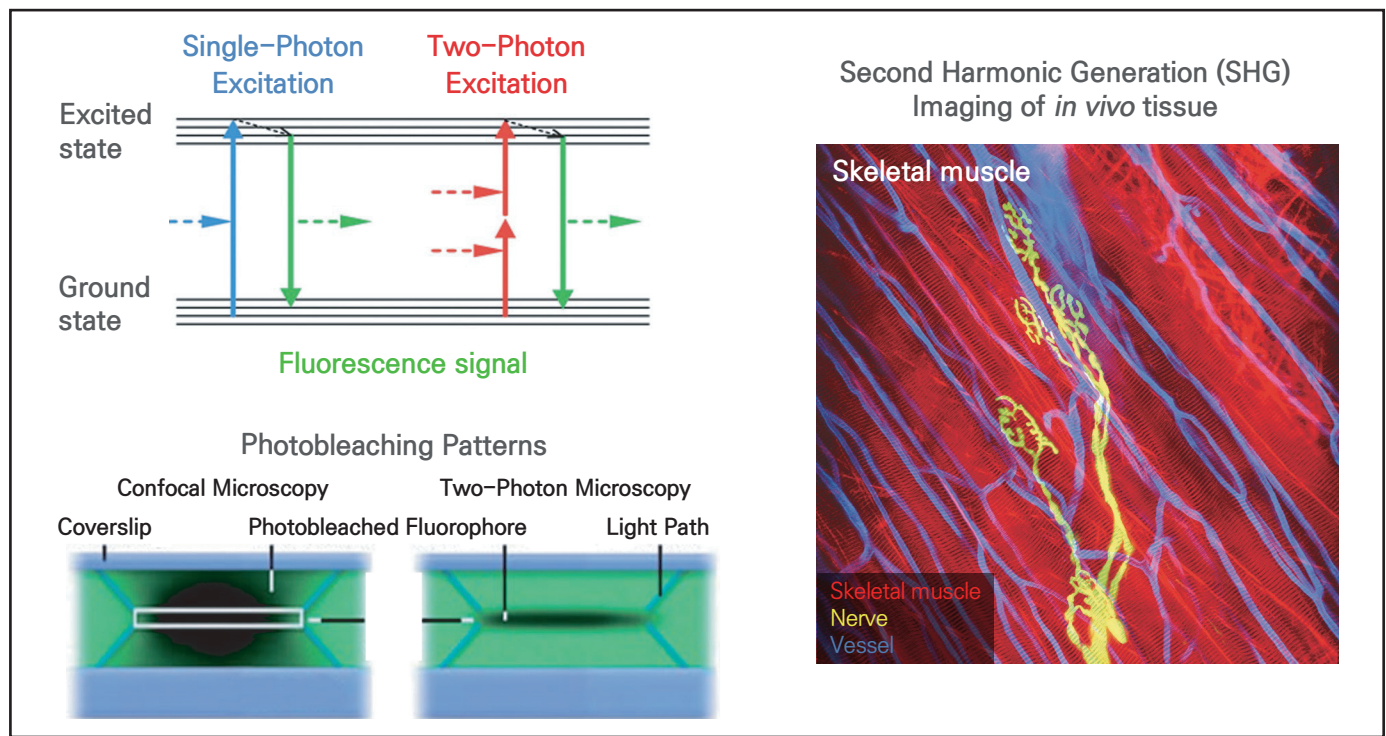
Confocal microscopy presents a powerful approach to *in vivo* imaging across four dimensions (XYZ and time), capturing detailed layer-by-layer insights. This technique utilizes white or laser light and a pinhole mechanism, allowing precise focusing on a specific point while deflecting reflected and scattered light through a second confocal aperture. The scattering of light is influenced by factors such as the size, orientation, and surface characteristics of structures, which impact refractive indices within the system. For instance, rough surfaces scatter light widely, while smooth surfaces do the opposite. This methodology facilitates the visualization of multiple layers by slicing tissues at various focal planes, providing a comprehensive understanding of dynamic biological processes.



Overall, the advantages of confocal microscopy include improved optical sectioning, three-dimensional imaging capabilities, reduced background noise, and enhanced visualization of thick specimens. These features collectively contribute to its widespread use in biological research, allowing for more detailed and accurate analysis compared to conventional fluorescence microscopy.

What is Two-Photon Microscopy?

In a two-photon microscope, the mechanism involves the fluorophore's simultaneous absorption of the photons within a few femtoseconds, leading to fluorophore excitation and subsequent light emission. Two-photon microscopy is particularly valuable for live cell imaging, especially in deeper and thicker tissues, surpassing the capabilities of confocal microscopy. Additionally, its second harmonic generation ability enhances axial and lateral resolution, rivaling confocal microscopy without the need for pinholes. This makes two-photon microscopy a powerful tool for capturing high-quality images in diverse biological contexts.



Confocal Microscopy

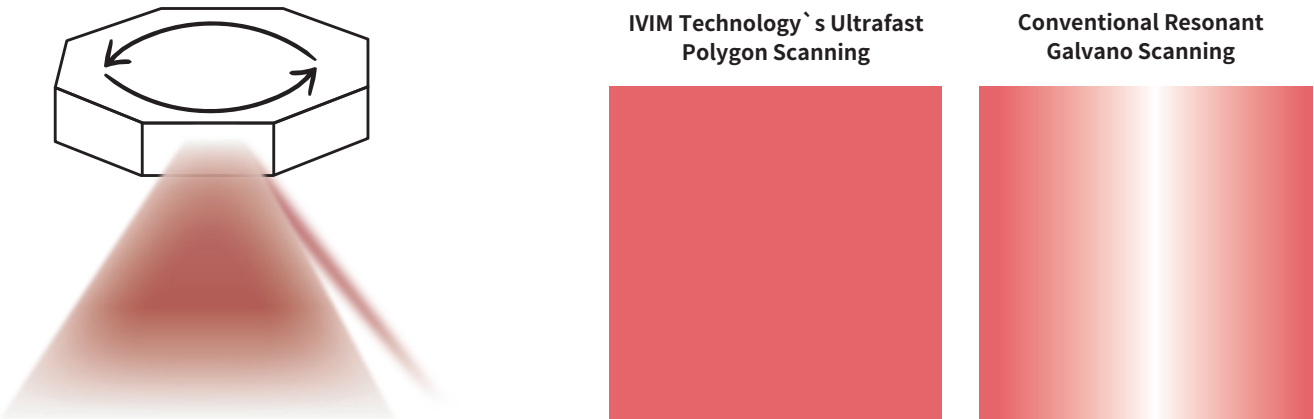
- Single-photon excitation
- Point scanning + Pinhole.
- Optical sectioning: Fluorescence signal from out-of-focus is blocked.
- Imaging Depth: 100–200 μm
- Continuous-wave solid-state laser with flexible choice of wavelength at the range from ultraviolet (UV) and visible (VIS) to near-infrared (NIR)
- Descanned confocal detector
- Easy & efficient, multi-color 3D intravital imaging

Two-Photon Microscopy

- Two-photon excitation
- Point scanning + No Pinhole
- Optical sectioning: Fluorescence signal is intrinsically generated only at the focus.
- Imaging Depth: 250–1,000 μm
- Femto-second pulsed laser tunable at near-infrared (NIR) wavelength range
- Non-descanned detector (NDD)
- Deeper-tissue 3D intravital imaging

Key Features of All-in-One IVM Systems

01 Ultrafast Laser-beam Scanning with Uniform Illumination

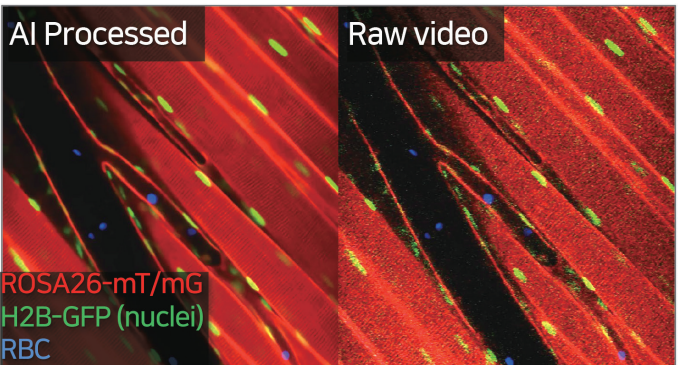


IVIM Technology's All-in-One intravital microscopy system is equipped with an ultrafast rotating polygonal mirror scanner, enabling ultra-high-speed *in vivo* imaging at a maximum of 50 frames per second (fps) with a resolution of 512 x 512 pixels. This system achieves uniform excitation illumination over the entire imaging field of view (FOV), ranging from 100x100 μm^2 to 10x10 mm^2 .

Key features include:

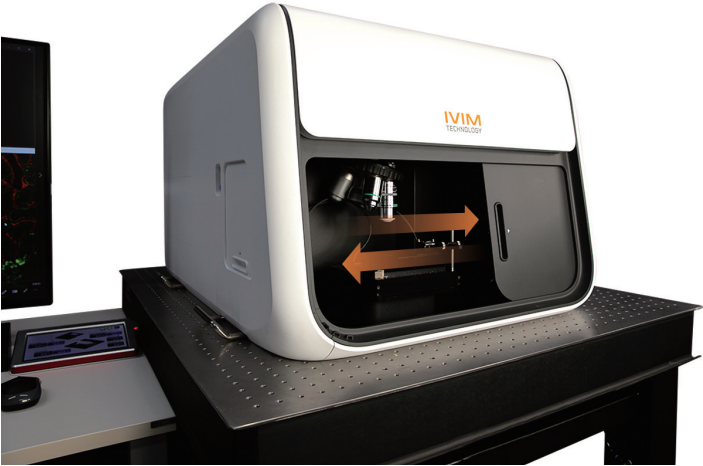
- Enables ultra-high speed *in vivo* imaging (Max. 50 fps @ 512 x 512 pixels)
- Achieves uniform excitation illumination over entire imaging field of view (FOV)
- Provides the best signal to noise ratio (SNR) across the entire FOV.

02 AI processing (noise-cancelling) of *In Vivo* Video-rate Imaging Data



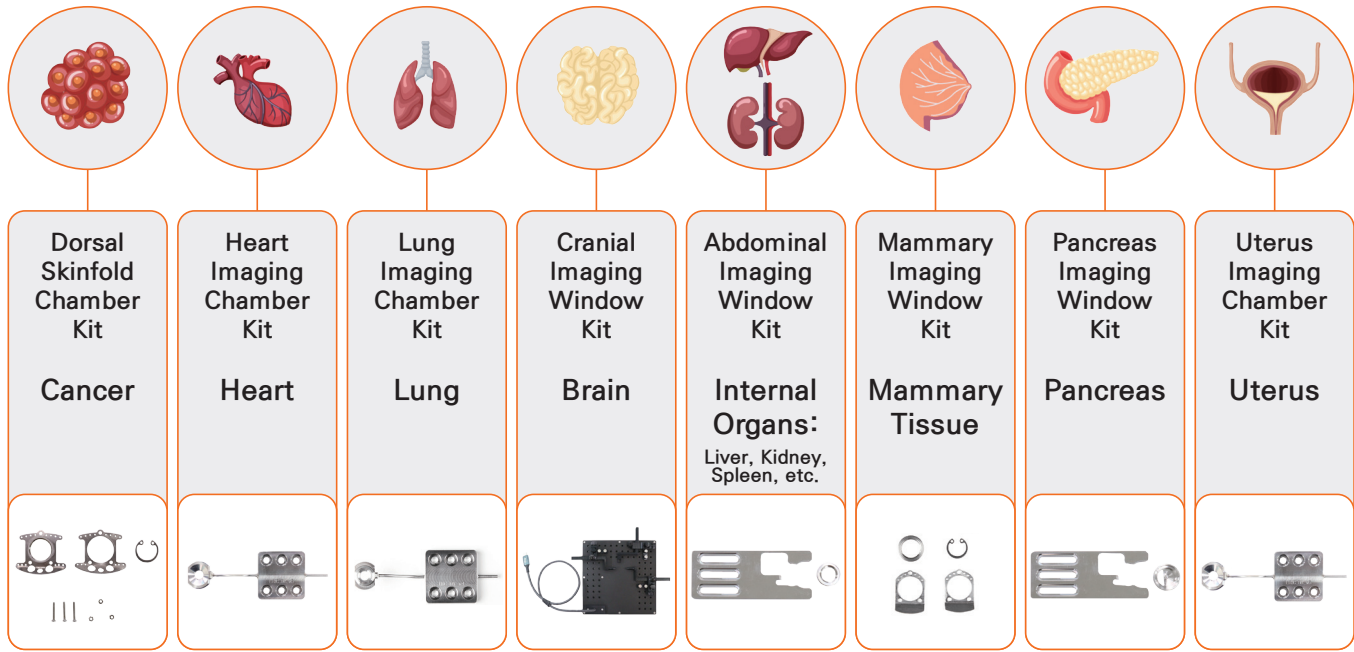
To obtain cell-to-cell interaction and dynamics information *in vivo*, high-speed scanning is essential. However, increasing imaging speed reduces SNR, which interferes with fluorescence signal detection because the SNR reduction is indistinguishable from noise. Fortunately, when analyzing the image series acquired at ultra-high speed one by one, the true fluorescence signal appears the same in the front, back, and nearby images of the image series. If it is noise, it is present in Time1 but not in Time2. IVIM's AI noise-cancelling feature solves this problem by leveraging this information to distinguish and eliminate noise, ensuring clearer and more accurate fluorescence signal detection.

03 Ergonomic Design, Reduced Space



- Ergonomic design integrated all the essential features necessary for hands-free imaging in high speed and resolution.
- Apparatus for heating, anesthesia, window chamber observation, and longtime inspection to keep the physiological conditions of the animal stable in the best possible way
- Smallest footprint (Confocal & Two-photon) (< 40 x 40 x 20 inches/100 x 100 x 50 cm)

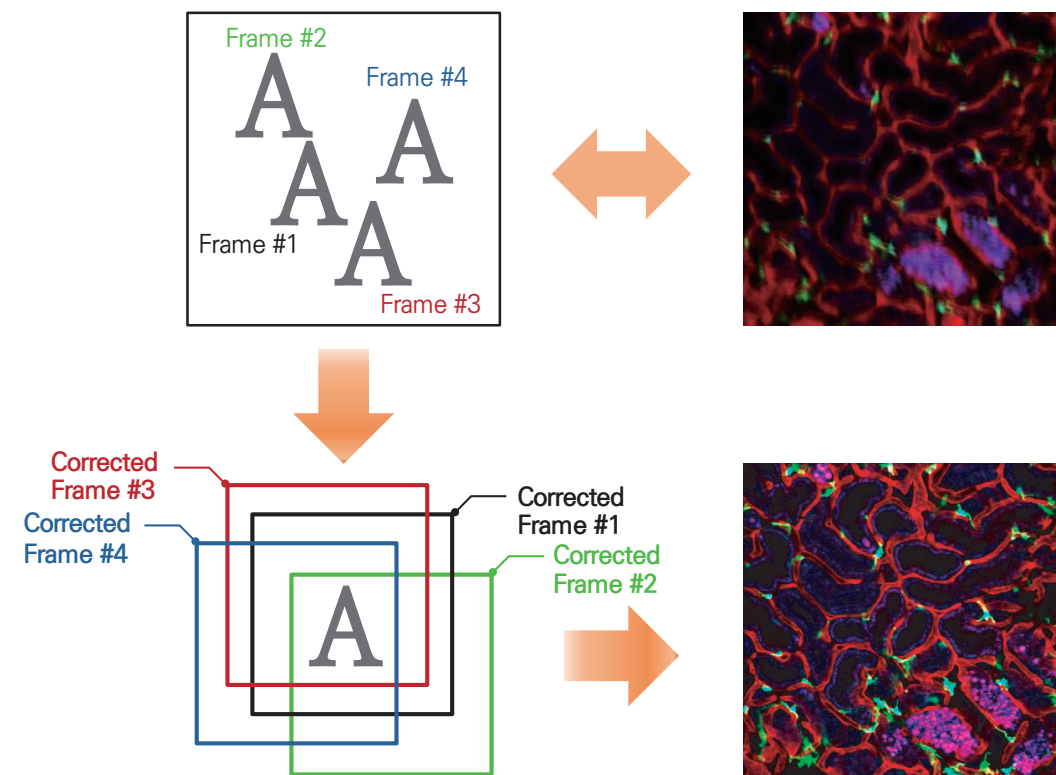
04 *In Vivo* Imaging Apparatus for Longitudinal Imaging



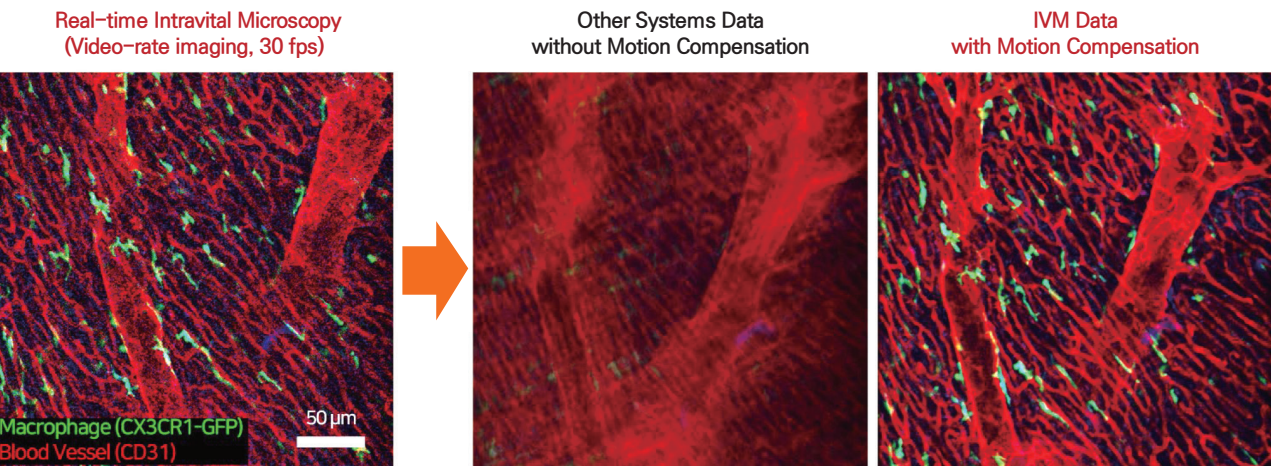
IVIM Technology offers intravital *in vivo* imaging apparatus for long-term imaging of various organs such as heart, lung, brain, abdominal organs, mammary tissue, pancreas and uterus in living mice. Our systems allow continuous imaging sessions for several weeks post-exposure, minimizing the need for sacrificing animals after each session and promoting ethical research practices.

Key Features of All-in-One IVM Systems

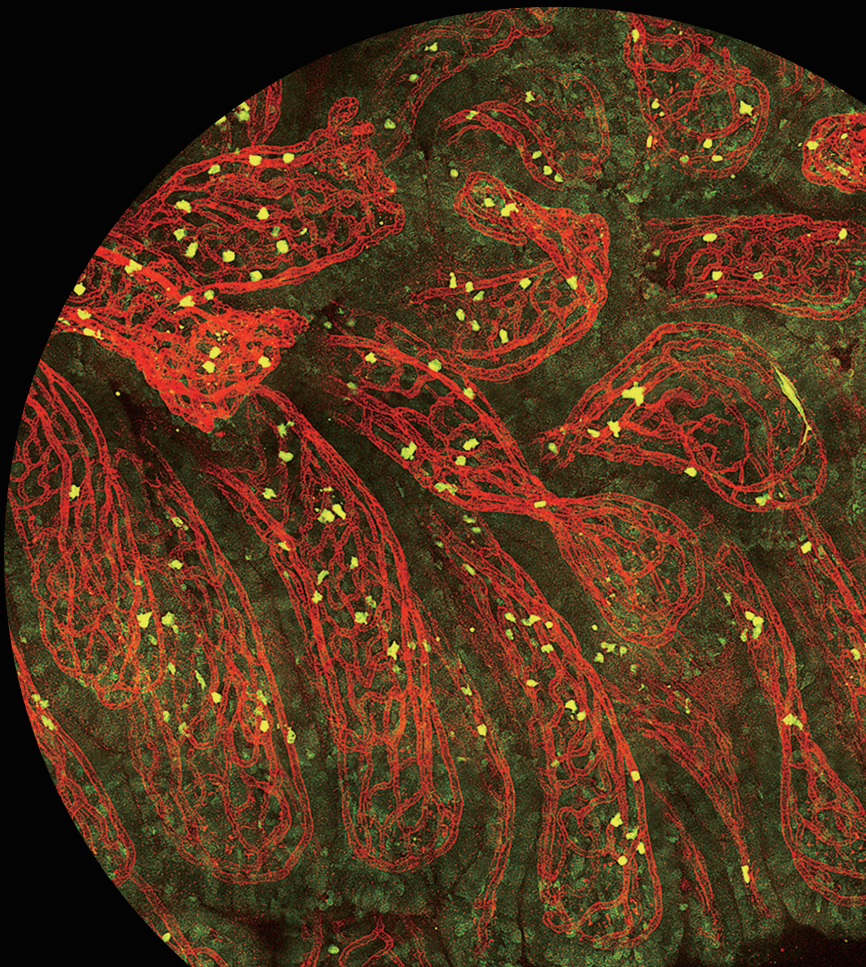
05 4D Integrated Motion Artifact Compensation



The All-in-One IVM systems provides automatic, hassle-free, and highly precise motion compensation. It ensures smooth imaging even in the presence of movement. Utilizing GPU-assisted parallel computing, it delivers immediate acquisition of motion-compensated imaging results. We have enhanced our imaging algorithms specifically to compensate for animal motion, ensuring high precision and reliability in imaging outcomes.

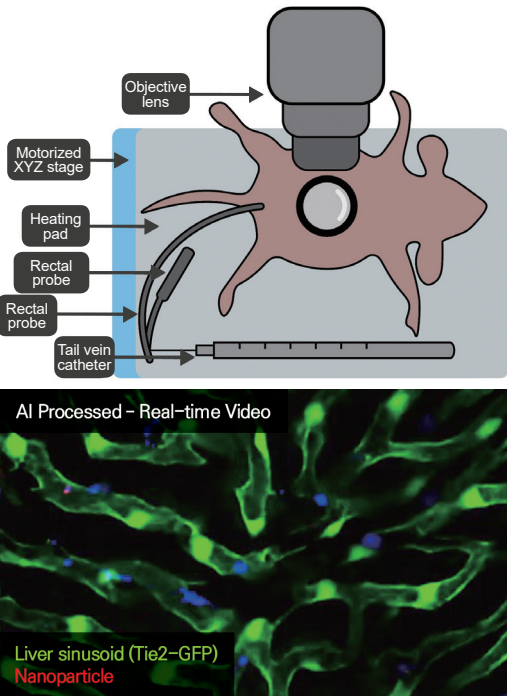


In Vivo Intravital Imaging Applications and Case Studies



IVM Applications: Case Studies

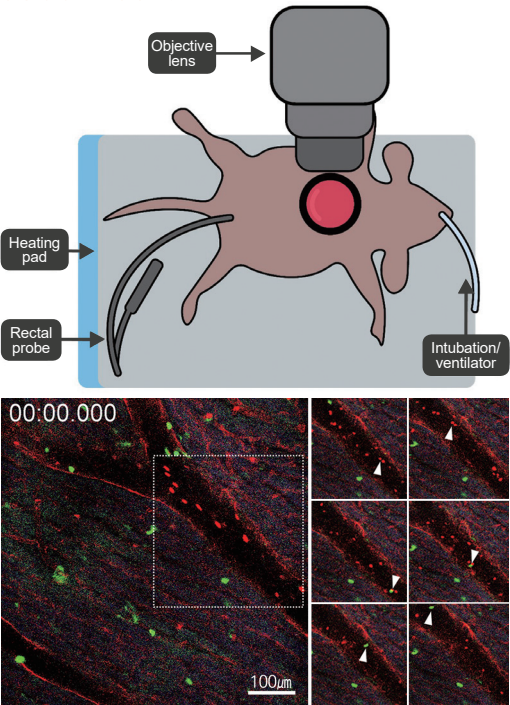
In Vivo Monitoring of Nanoparticle Delivery and Accumulation in Live Mouse Liver



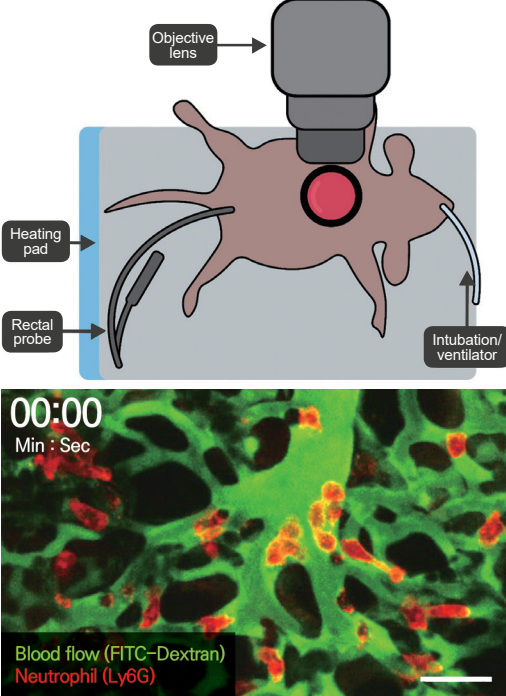
In this study, methodology involves a minimally invasive approach, involving a slight incision of the abdominal skin to access the liver tissue, allowing for precise examination of drug delivery. The presented research examples demonstrate the successful application of this approach, showcasing the delivery of red nanoparticles to the hepatic sinusoids and their subsequent accumulation at specific sites within the liver sinusoids, all captured in real-time video footage.

Cellular-level Circulation Cell In Vivo Imaging in Live Mouse Heart

Leveraging the intravital heart imaging window system, we successfully acquired real-time video rate recordings and conducted image analysis of the dynamic behavior of circulating LysM+ immune cells and flowing red blood cells (RBCs) within the microvasculature of the left ventricle in a live mouse model's heart. The dynamics of adoptively transferred DiD-labelled erythrocytes were tracked at a sub-second frame rate (15 frames·s⁻¹), allowing for the derivation of micro-velocity in the arterioles and venules of cardiac tissue. Sequentially, the rolling and circulating dynamics of neutrophils resident in cardiac tissue arteries were captured.



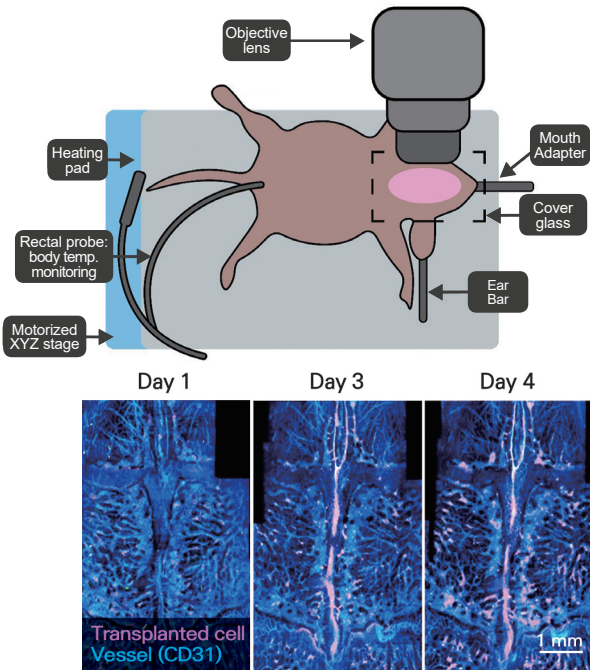
In Vivo Microcirculation Imaging in Live Mouse Lung



In this method, a negative pressure is applied between the window chamber and the exposed lung tissue through a vacuum-based tissue motion stabilizer, facilitating the stable attachment of the lung tissue to the coverslip. This unique approach ensures a secure and motion-free environment, enabling us to acquire high-resolution microscopic images that showcase the dynamic behavior of neutrophils within the pulmonary vasculature of live mouse models. This suction-based system not only provides exceptional stability but also allows for precise observation of cellular dynamics in real-time, offering valuable insights into the intricate processes occurring within the pulmonary microenvironment.

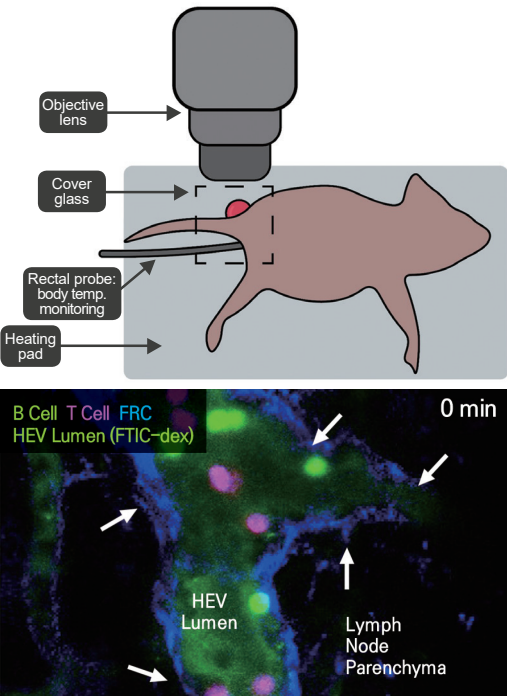
In Vivo Bone Marrow Transplantation Imaging in Live Mouse Brain

In this study, we conducted a comprehensive longitudinal examination of calvarial bone marrow at the cellular level following Bone Marrow Transplantation (BMT) *in vivo*. To enhance our understanding, we employed a double-transgenic mouse model (H2B-GFP/ β -actin-DsRed) as donors, enabling a subcellular-level visualization of nuclear-cytoplasmic dynamics in the transplanted bone marrow cells. This innovative approach facilitated a direct and dynamic *in vivo* monitoring of the distribution and proliferation of transplanted bone marrow cells.



IVM Applications: Case Studies

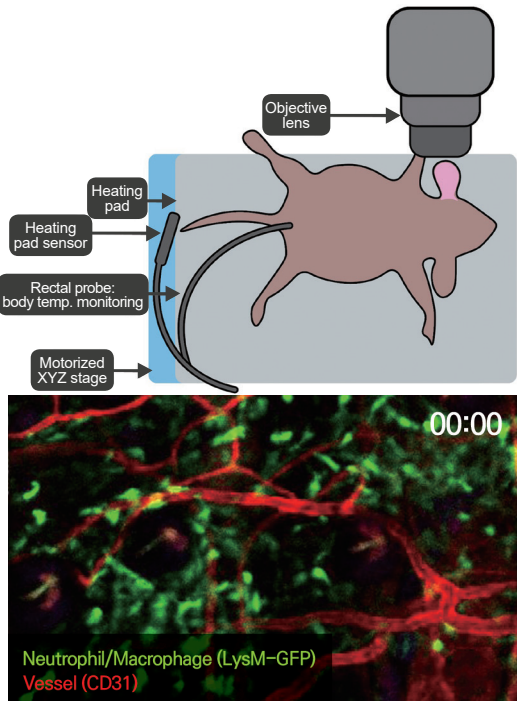
In Vivo Cell Trafficking Imaging in Live Mouse Lymph Node



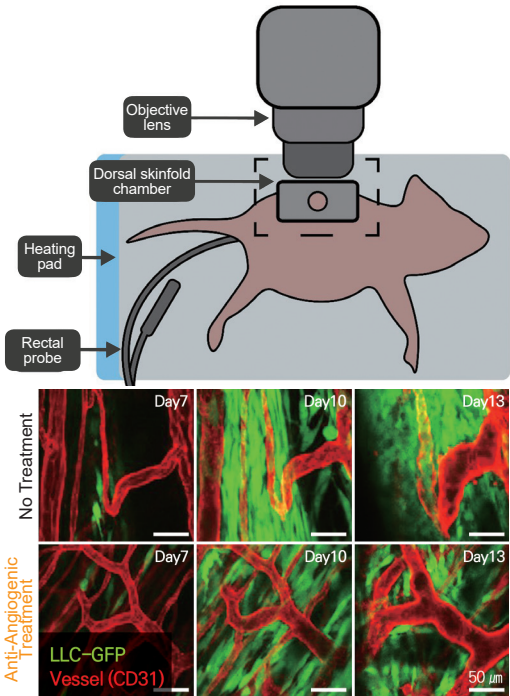
IVIM's up-to-date *in vivo* surgery techniques enable the direct observation of cell trafficking and interactions within living organisms, providing a real-time view of individual cells in various organs. For instance, in this study, IVIM allows for the live observation of the popliteal lymph node in an anesthetized mouse, offering a unique opportunity to monitor events such as the extravasation of T cells and B cells in the lymph node's high endothelial venule (HEV), as illustrated in the accompanying image. The study showcases the unparalleled utility of IVIM in unraveling dynamic cellular processes within living organisms, marking a substantial leap forward in our understanding of *in vivo* cellular behavior.

In Vivo Immune Cell Trafficking Imaging in Live Mouse Skin

A novel approach was employed where endothelial cells were labeled *in vivo* through the intravenous injection of an anti-CD31 antibody conjugated with a far-red fluorophore. This technique facilitated the observation of skin vessels in live mice. We harnessed the unique genetic makeup of LysM-GFP mice, where the endogenous expression of green fluorescence protein (GFP) occurs in neutrophils and macrophages. State-of-the-art IVIM seamlessly conducted time-lapse imaging, enabling dynamic analysis of live animal skin. Notably, this study allowed us to monitor the motility changes of neutrophils following THz-irradiation, capturing these events in real-time video. IVIM played a pivotal role in unraveling the intricate dynamics of cellular behavior, emphasizing its indispensable role in advancing our understanding of biological processes within the *in vivo* context.



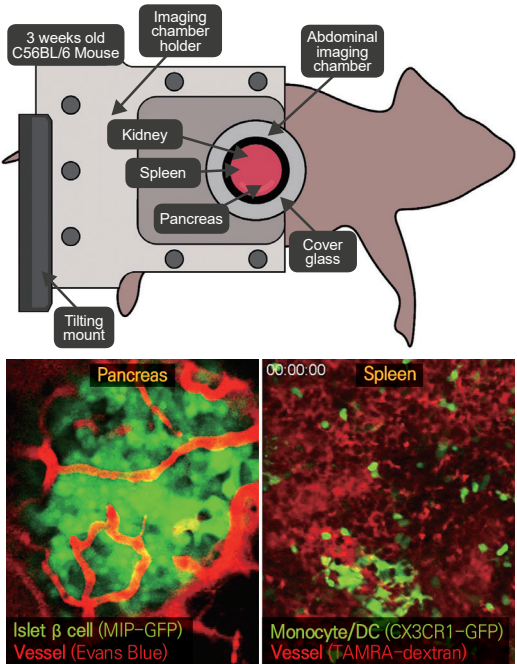
Longitudinal In Vivo Cancer Xenograft Imaging in Live Mouse



A Dorsal Skinfold Chamber (DSC) is used for non-invasive analyses of quantitative assessments of dynamic processes in the preclinical models. By optimizing the chamber, implantation, and imaging process, it is possible to observe the same spot in one single animal for up to several months. DSC was utilized over time for *in vivo* analysis of tumor development for longitudinal cancer xenograft imaging in one mouse model. For a tumor model, tumor cells were implanted first, and the tumor development on the site was observed. Through IVIM, vessel morphology is observed, and *in vivo*, the efficacy of an anti-angiogenic drug can be assessed.

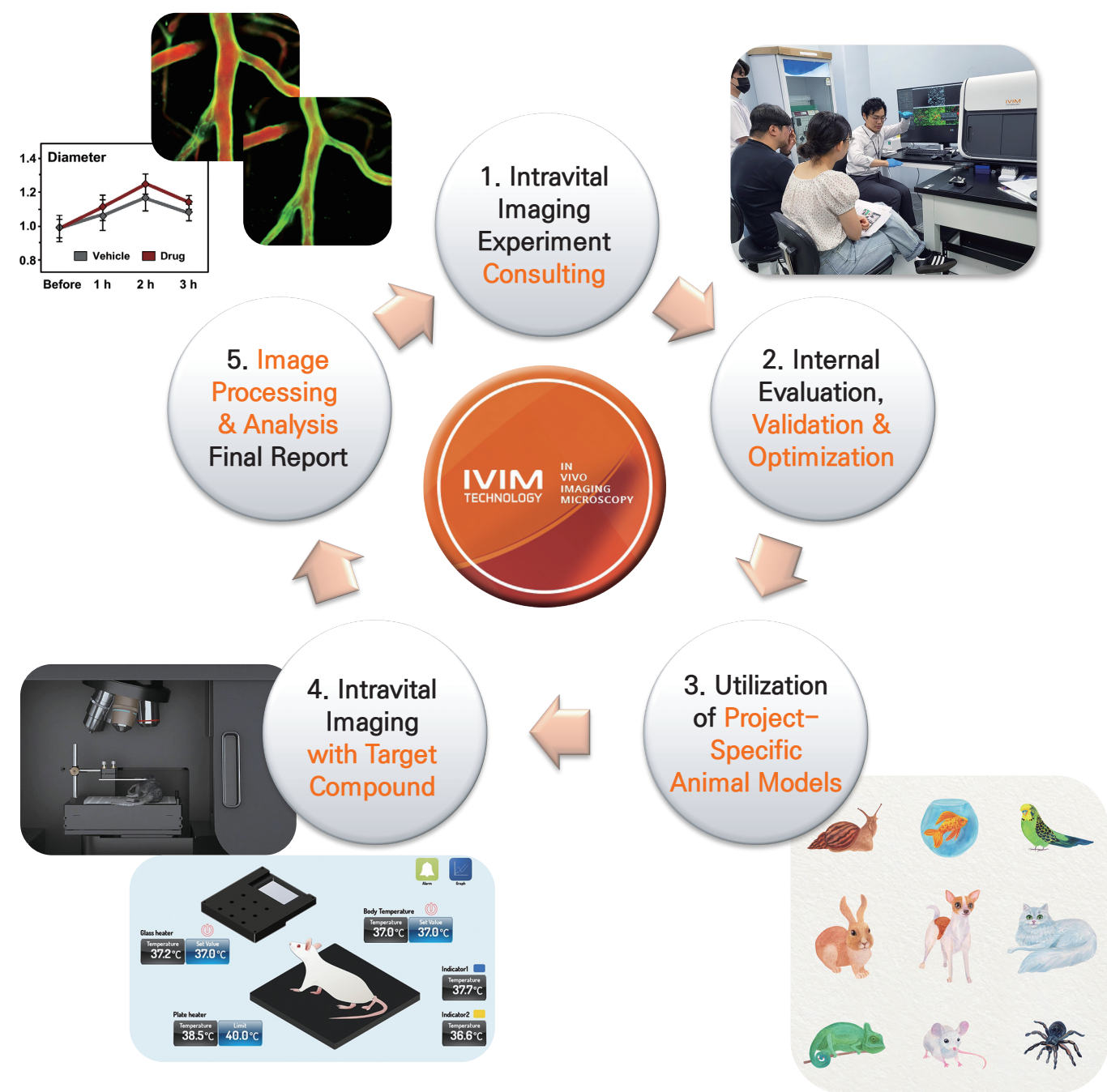
Longitudinal In Vivo Abdominal Imaging in Live Mouse

Longitudinal abdominal imaging using intravital *in vivo* microscopy offers a crucial advantage in studying dynamic processes in organs like the pancreas, spleen, or kidney. MIP-GFP and CX3CR1-GFP mice, expressing GFP in pancreatic beta-cells and immune cells, respectively, enable precise observations. This real-time imaging allows continuous tracking of pancreatic beta-cell activity and immune cell dynamics over time, providing valuable insights into physiological processes and potential interventions for metabolic disorders and immune responses.

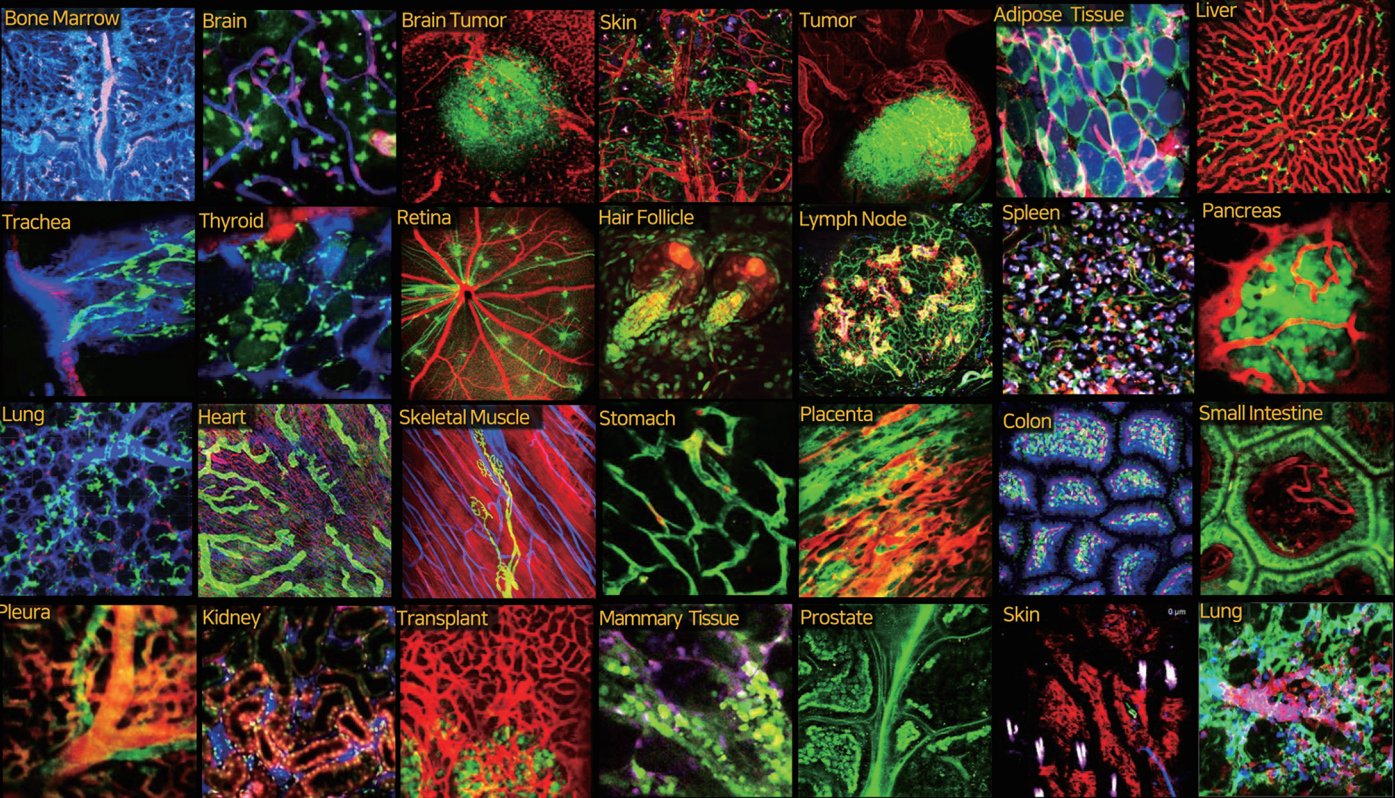


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- I. Park, et. al., *European Respiratory Journal*, 53:1800736 (2019)
- I. Park, et. al., *Biomedical Optics Express*, 9(5):2383-2393 (2018)
- S. Han, et. al., *Science Translational Medicine*, 8(335):335ra55 (2016)

Liver

- Quan Y, et al., *Journal for ImmunoTherapy of Cancer*:11:e007080. (2023)
- J. Moon, et. al., *Med Laser*, 10(1):1-6 (2021)
- J. Moon, et. al., *Biomed Optics Express*, 11(9):5132-5146 (2020)
- B. Oh, et. al., *Diabetes*, 67(3):473-485 (2018)
- Y. Hwang, et. al., *Biomed Optics Express*, 8(10):4706-4716 (2017)

Lymph Node

- S. Jeong, et. al., *J Control Release*, 335(10):86-102 (2021)

Spleen

- H. Choi, et. al., *Science Advances*, 6(15):eaa6980 (2020)

Eye / Retina

- J. Jeon, et. al., *Trans. Vis. Sci. Tech.*, 10(4):31 (2021)
- H. Kim, et. al., *Trans. Vis. Sci. Tech.*, 9(6):20 (2020)
- J. Kim, et. al. *Science Advances*, 5(2):eaa6732 (2019)
- S. Ogura, et. al., *JCI Insight*, 2(3):e90905 (2017)

Skin

- M. Shin, et. al. *ACS Appl Mater Interfaces*. Apr 19:15(15):18653-18662 (2023)
- K. Kim, et. al. *Adv. Funct. Mater.* 31:2103413 (2021)
- H. Kwak, et al. *Vaccine*, 37(36):5191-5202 (2019)
- J. Ahn, et. al. *Biomedical Optics Express*, 9(8):3974-3982 (2018)
- J.Y. Kim, et. al., *ACS Nano*, 12(7):6904-6916 (2018) - S. B. Kim, et. al., *J. Cell Biology*, 216(7):2201 (2017)

Brain

- E. Lee, et. al., *Exp Mol Med* 55, 470-484 (2023)
- H. Choi, et. al., *pharmaceutics*, 14(3), 672 (2022)
- Y. Kim, et. al., *Front Cell Dev Biol*, 8:613733 (2020)
- J. Ha, et. al., *Front Mol Biosci*, 24(7):596366 (2020)
- J. Lee, et. al., *Biomed Optics Express*, 11(8):4835-4847 (2020)

Bone Marrow

- S. Ahn, et. al., *FASEB BioAdvances*, 00: 1- 13 (2022)
- S. Ahn, et. al., *PLoS ONE*, 12(11):e0187660 (2017)

Pancreas

- I. Park, et. al., *Diabetes & Metabolism Journal*, 44:193-198 (2020)

Kidney

- S. Kim, et. al., *Kidney International* ,100(3), 570-584 (2021)
- E.M. Lee, et. al., *Islets*, 10(1):25-39 (2018)

Thyroid gland

- J. Y. Jang, et. al., *EMBO Molecular Medicine*, 9:750 (2017)

Bladder

- H. Yu, et. al., *Biomaterials*, 280:121277 (2022)

Tumor Model

- J. Kim, et. al., *Molecular Oncology*, 16(2):466-484 (2022)
- J. Xu, et. al., *Small*, 14(50):1803601 (2018)

Real-time Intravital *In Vivo* Imaging

Microcirculation / Blood Cell Flow

- J. Jeon, et. al., *Trans. Vis. Sci. Tech.*, 10(4):31 (2021)
- I. Park, et. al., *European Respiratory Journal*, 53:1800736 (2019)
- I. Park, et. al., *Biomedical Optics Express*, 9(5):2383-2393 (2018)
- Y. Hwang, et. al., *Biomed Optics Express*, 8(10):4706 (2017)
- J. Y. Jang, et. al., *EMBO Molecular Medicine*, 9:750 (2017)
- S. Han, et. al., *Science Translational Medicine*, 8(335):335ra55 (2016)
- K. Kim, et. al., *Scientific Report*, 6:33804 (2016)
- K. Choe, et. al., *Journal of Clinical Investigation*, 125(11) :4042 (2015)
- H. Seo, et.al., *Biomed Optics Express*, 6(6):2158 (2015)
- J. W. Choi, et. al, *Cancer Research*, 75(21):4474 (2015)
- J. Ahn, et. al., *Biomed Optics Express*, 6(10):3963 (2015)
- A. L. van de Ven, et. al., *J. of Controlled Release*, 158(1):148 (2012)

Drug Delivery / Efficacy Monitoring

- G. Zhao, et al. *ACS Appl Mater Interfaces*.15 (26), 31273-31284 (2023)
- H. Choi, et. al., *pharmaceutics*, 14(3), 672 (2022)
- S. Kim, et. al., *Kidney International* ,100(3), 570-584 (2021)
- H. Choi, et. al., *Science Advances*, 6(15):eaa6980 (2020)
- I. Park, et. al., *European Respiratory Journal*, 53:1800736 (2019)

Cell Delivery / Transplantation

- B. Oh, et. al., *Diabetes*, 67(3):473-485 (2018)
- E.M. Lee, et. al., *Islets*, 10(1):25-39 (2018)

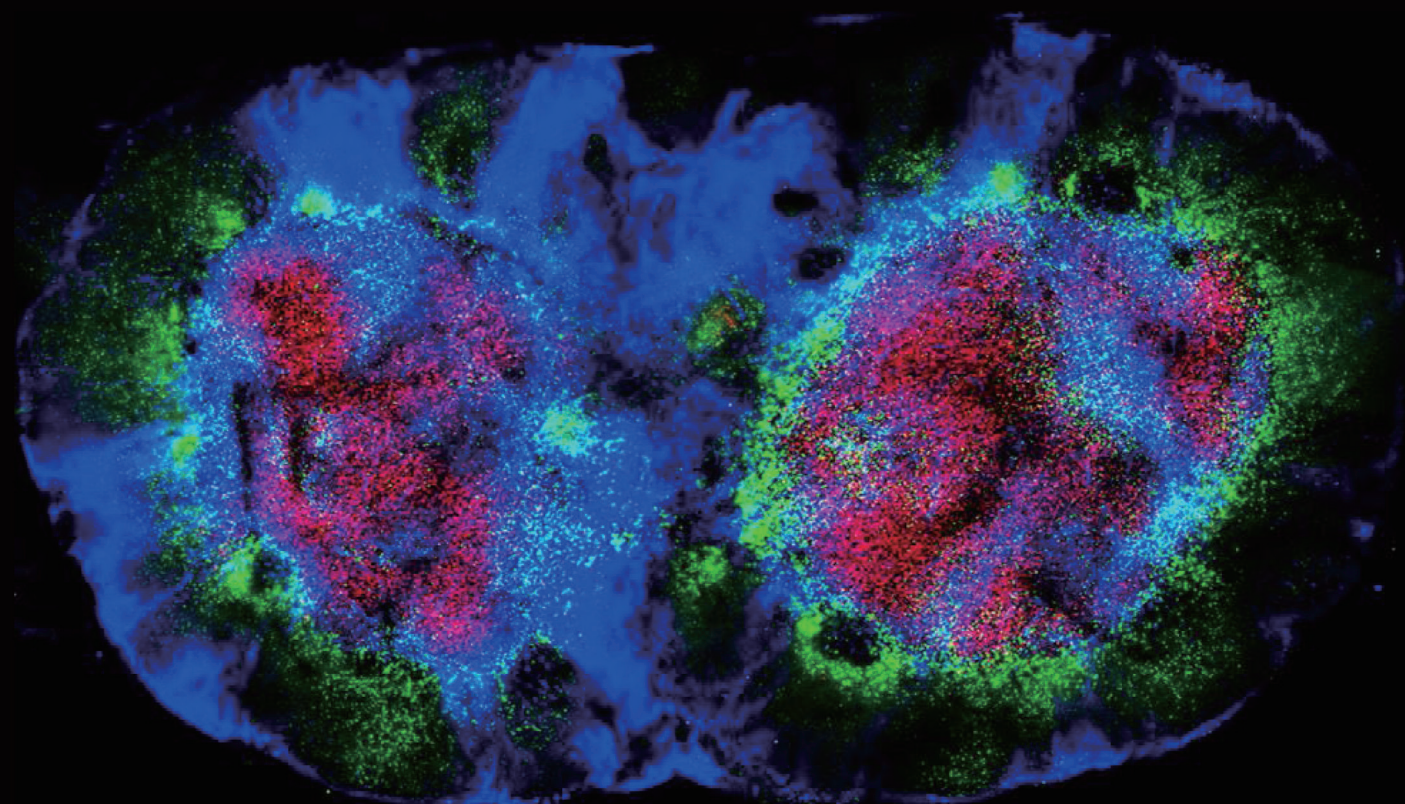
Endomicroscopy

- J. Ahn, et. al., *Biomed Optics Express*, 10(6):2719 (2019)
- Y. Kim, et. al., *Scientific Reports*, 9:3560 (2019)
- J. Ahn, et. al., *Biomed Optics Express*, 6(10):3963 (2015)
- K. Jung, et. al., *Circulation Res.*, 112(6):891 (2013)
- J. K. Kim, et. al., *Nature Protocols*, 7(8): 1456 (2012)
- P. Kim, et. al., *Nature Methods*, 7(4):303 (2010)
- Z. Fan, et. al., *Nature Medicine*, 16(6):718 (2010)

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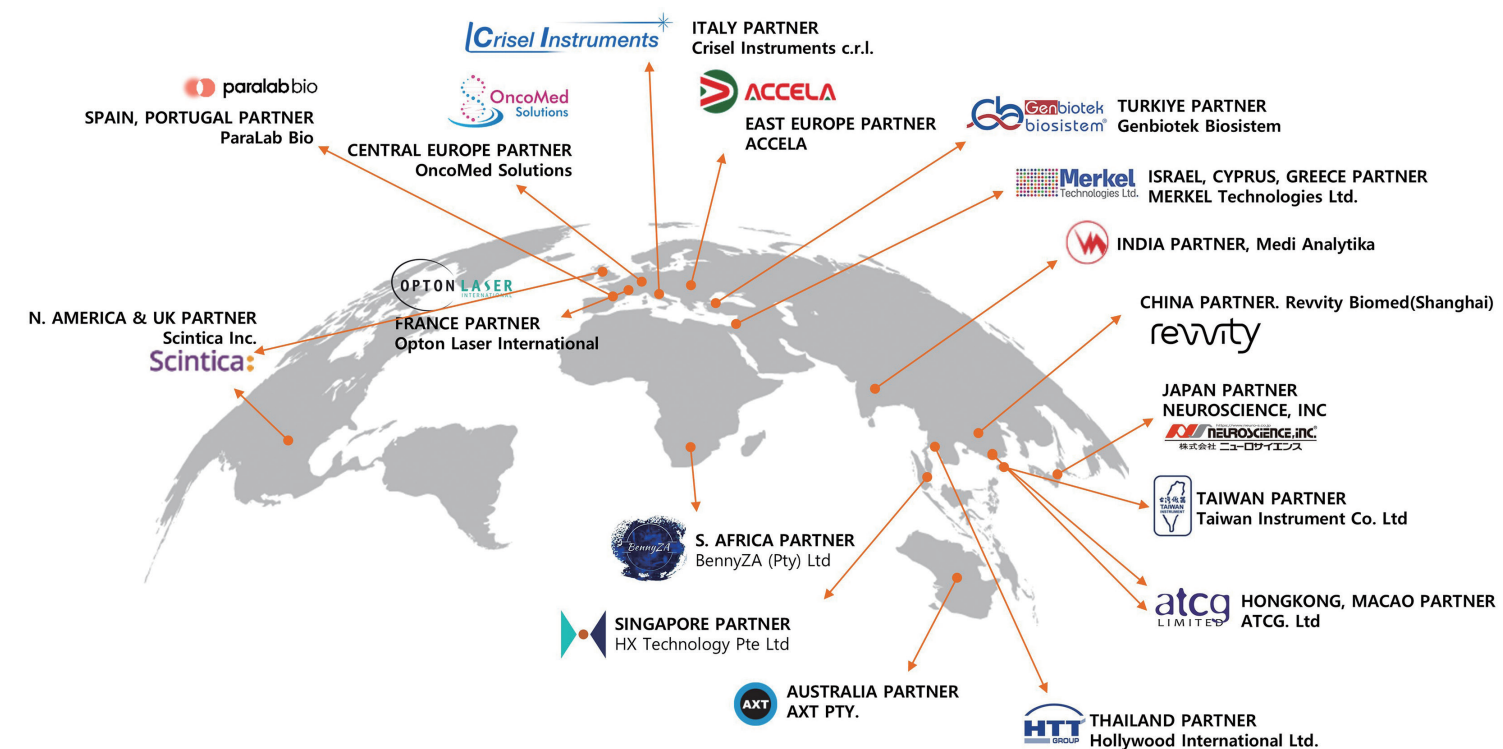
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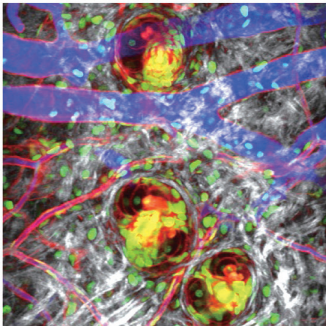
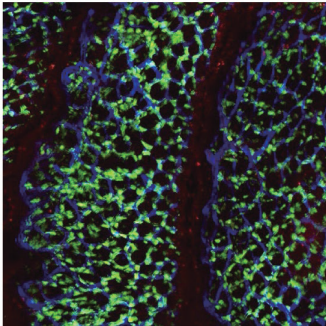
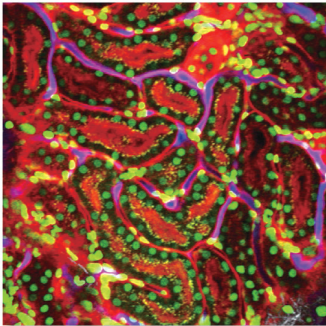
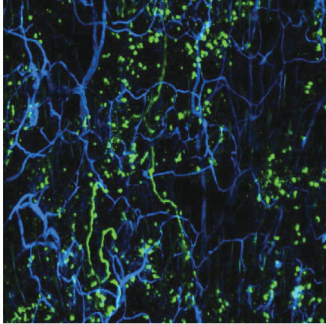
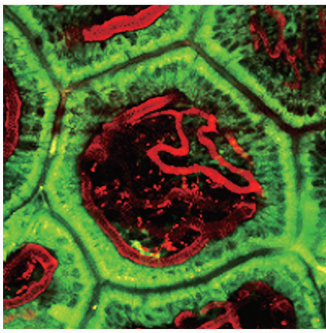
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