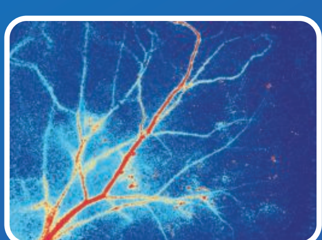
RWD

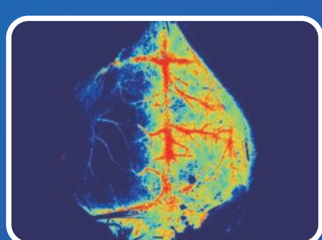
RFLSI III

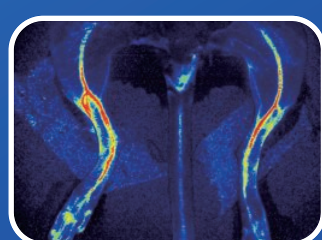
Laser Speckle Imaging System

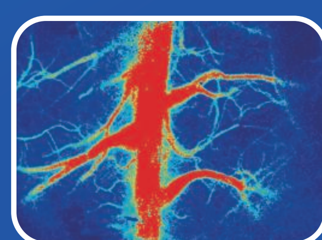
For Pre-Clinical Research about Vascular.

Observe









Laser Speckle Imaging system (RFLSI III)

Laser Speckle Imaging System (RFLSI III) is a blood perfusion imager based on Laser Speckle Contrast Imaging (LSCI) technology. LSCI provides a better means to study the microcirculation that were not possible in the past. It allows visualization of tissue blood perfusion and imaging with high time and spatial resolution. There is no influence on the perfusion, as no contact to the tissue is needed, nor dyes or tracer elements.

What is speckle contrast analysis?

Speckle flow techniques are based on the changes over time of the dynamic speckle pattern generated by motion in the sample. In these techniques, this changing speckle pattern is recorded with a camera that has an integration time in the order of the speckle decorrelation time (i.e., in the millisecond range). Due to the long integration time compared to the typical decorrelation time of the speckle pattern, the speckle pattern will be blurred in the recorded image. The level of blurring is quantified by the speckle contrast[1]

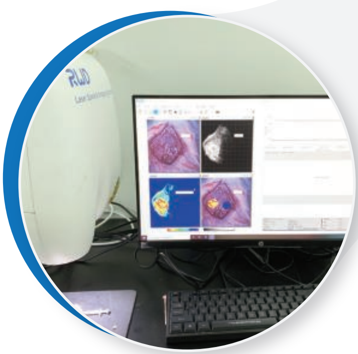
1.Draijer, M., Hondebrink, E., van Leeuwen, T. & Steenbergen, W. Review of laser speckle contrast techniques for visualizing tissue perfusion. Lasers in medical science 24, 639-651, doi:10.1007/s10103-008-0626-3 (2009).

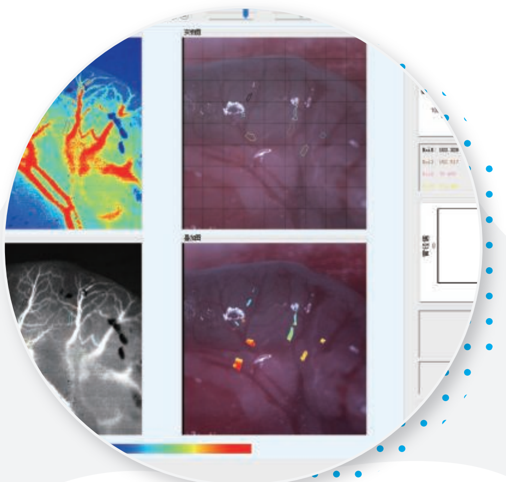
Why Choose the RFLSI III

Quantized Data:

In-vivo data

Quality control standards for ischemia model

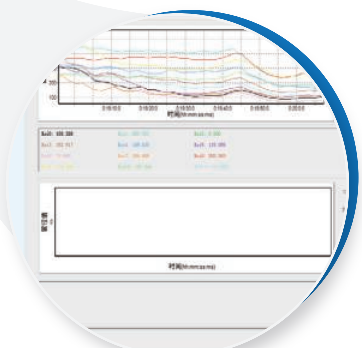




Imaging Data:

4K imaging for the blood vessel

Up to 120 images per second



Real-time Data:

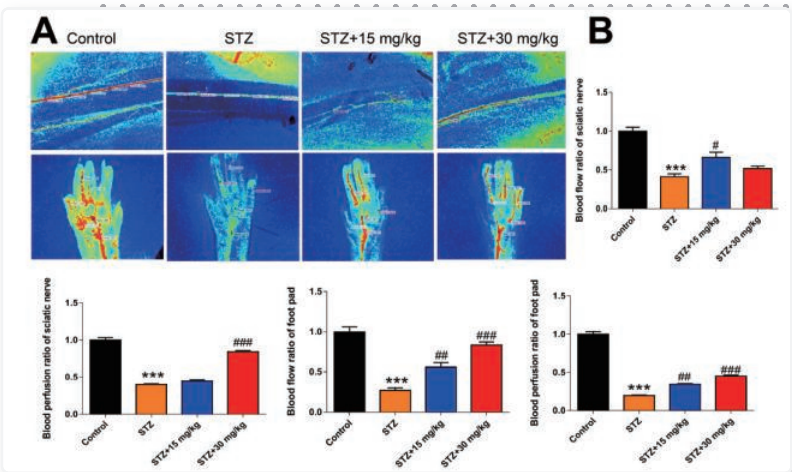
You can get the reperfusion data during ischemia model

It is especially suitable for physiological vascular related research

Case study

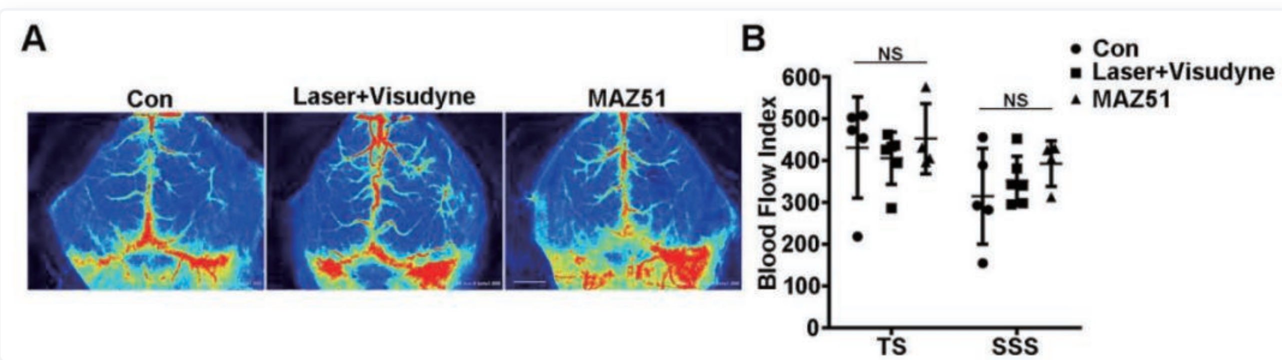
DW14006 as a direct AMPK activator ameliorates diabetic peripheral neuropathy in mice

After anesthesia with isoflurane (RWD, China), the real-time regional velocity and distribution of blood flow and **perfused blood vessel** of sciatic nerve and **foot pads** were detected by Laser Speckle Contrast Imaging/LSCI (RFLSI Pro, RWD, China). Blood perfusion areas of sciatic nerve and foot pads were analyzed by Image J.



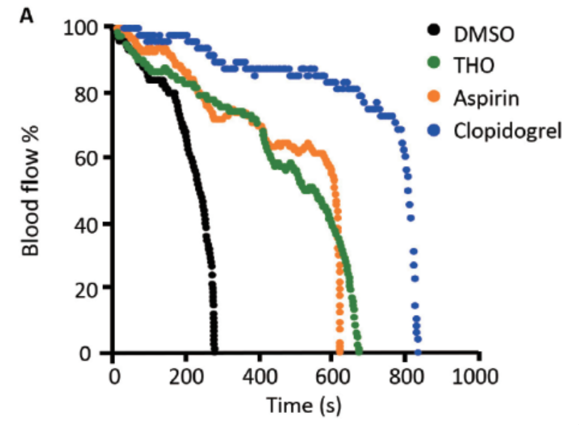
Meningeal lymphatics clear erythrocytes that arise from subarachnoid hemorrhage

To verify whether meningeal lymphatic vessels serve as the route for the drainage of erythrocytes from the CSF into the CLNs, we ablated meningeal lymphatic vessels by injecting Visudyne into the cisterna magna and photoconverted it by laser light. After 7 days of ablation, **use the laser speckle to observe the lymphatic coverage of the transverse sinus and the superior sagittal sinus were notably lower**



DW14006 as a direct AMPK activator ameliorates diabetic peripheral neuropathy in mice

C57BL/6J mice (male, 7-8 weeks old) were anesthetized by isoflurane inhalation with anesthesia respirator (R540IP, RWD Life Science) 2 hours after oral gavage of 100 mg/kg candidate compounds. Carotid arterial thrombosis was induced with a filter paper-disc (d = 2 mm) soaked with 10% $FeCl_3$ and **the blood flow was monitored by laser-speckle blood flow imaging system** (RFLSI Pro, RWD Life Science).



Arterial Supercharging Is More Beneficial to Flap Survival Due to Quadruple Dilation of Venules

Three days after flap harvest, observed from the laser speckle images, the vascular network in the skin bridge between the iliolumbar and sacrococcygeal perforasomes in the ILA group underwent extensive dilation (Fig. 4). On day 3, the perfusion value of the vascular network had an increase of 2.89 ± 0.77 over that obtained immediately after surgery in the ILA group, whereas an increase of only 0.79 ± 0.47 could be obtained in the ILV group, resulting in significant difference between the two groups(P ¼ 0.018; Table 3). The histology showed that the average venous diameter was 203 ± 15 mm in the ILA group, which was significantly larger than 91 ± 12 mm in the ILV group ($P < 0.001$); the average arterial diameter was 88 ± 13 mm in the ILV group, which was also significantly larger than 67 ± 9 mm in the ILA group ($P < 0.001$; Fig. 5).

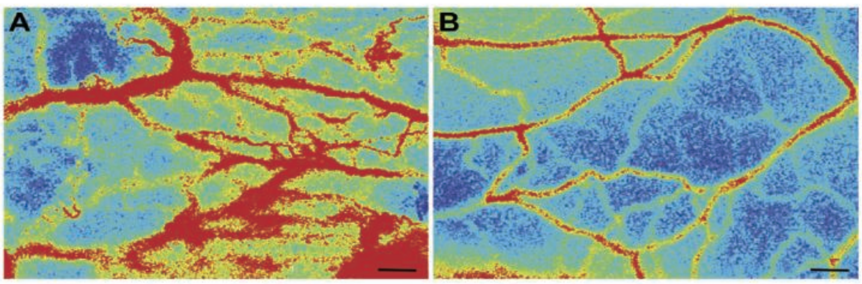


Fig. 4 — Laser speckle images of the vascular network in the skin bridge between the iliolumbar and sacrococcygeal perforasomes. More extensive dilation of the vascular network could be observed in image A with preservation of the iliolumbar perforating artery (ILA group) than in image B with preservation of the iliolumbar vein (ILV group). (Color version of figure is available online.)

Table 1 – Diameter change in vessels of the choke zone between the iliolumbar and posterior intercostal perforasomes.			
Diameter	Venule (mm)	Vein (mm)	Artery (mm)
Immediately after surgery	0.05 ± 0.01	0.15 ± 0.01	0.05 ± 0.02
1 d after surgery	0.10 ± 0.02	0.15 ± 0.02	0.07 ± 0.02
2 d after surgery	0.16 ± 0.04	0.17 ± 0.01	0.08 ± 0.03
3 d after surgery	0.18 ± 0.06	0.20 ± 0.04	0.09 ± 0.02

Parameter

Model	RFLSI III
Brand	RWD
Scope of monitoring	0-5000 PU
Image acquisition speed	Up to 120 FPS
Image size	<90 × 90mm
Camera	Dual CMOS(Color)
Zoom range	12× optical zoom with auto-focus
Monitor camera	5.0 million(2048 × 2048)
Image camera	5.0 million(2048 × 2048)
Monitoring Laser	785 nm
Laser power	110mW
Indicator laser	660 nm
Region of interest(ROI)	On-line & Off-line analysis
ROI shape	Square, circle, polygon
Vascular diameter	On-line & Off-line analysis
Data	Imagine, Video Blood Perfusion

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