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Abstracttitel:	2D IMAGING OF OXYGEN SATURATION DURING INTRAVITAL MICROSCOPY.

To investigate the distribution of oxygen in the pulmonary microcirculation *in vivo,* we developed a murine model of pulmonary intravital microscopy combined with multispectral imaging of hemoglobin saturation (SO_2).
A circular window (D 7-10µm) was surgically excised from the right thoracic wall for microscopic access to the surface of the upper right lobe of the lung. Mice were ventilated at 60 breath/min and images were acquired during the expiratory plateau phases. Stacks of images at preselected wavelength ranges and exposure times were analyzed with a dedicated software (SO_2 Analysis Program, SOAP) to obtain 2D SO_2 images of the observed area. On SO_2 images, arterioles, venules and capillaries could be distinguished clearly. High resolution SO2 mapping the pulmonary micro-circulation in *vivo* during intravital microscopy presented SO2 values increase already in precapillary arterioles and reach maximum values within 100ms after the blood enters the capillary bed. This 2D imaging of oxygen saturation provides a powerful tool to study efficiency and heterogeneiety of oxygenation under physiological and pathological conditions.