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Erasmus Mundus Euro photonics
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Cerebral blood flow evolution in MBL-KO mice after reperfusion following temporal ischemia

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Stroke is a non static disease
Reperfusion could generate injury

- Reperfusion
- Inflammation
- I/R Injury
- Immune system
- Complement system

- Pro-inflammatory
- Pro-coagulatory
Mannose-Binding Lectin

previous results

**Humans**
Stroke patients with MBL-low genotypes have 11 times better outcome than MBL-sufficient genotypes

**Animal Models**
MBL deficiency is beneficial in experimental brain ischemia.

Infarct volume in MBL knock-out (KO) mice is smaller at 48 hours following ischemia compared to wild type (WT) mice.

*Cervera et al, PLoS ONE, 2010*
Infarct volume size is smaller in MBL-KO than in WT mice

Cervera et al, PLoS ONE, 2010
Laser Speckle Flowmetry
Moving particles create dynamic speckle patterns

Speckle pattern on a CCD
Exposure time 1 – 10 ms
**Increased blood flow areas, more blurred**

Laser speckle statistics allows quantifying flow

\[ K_s = \frac{\sigma_s}{\langle I \rangle} \]

\( \sigma_s \rightarrow \) Spatial standard deviation of speckle intensity

\( 0 \leq K \leq 1 \)

Speckle contrast is related to flow

\[
K = \sqrt{\beta \left( \frac{\tau_c}{T} + \frac{\tau_c^2}{2T^2} \left[ \exp\left(-\frac{2T}{\tau_c}\right) - 1 \right] \right)}
\]

- \( \beta \): Instrument parameter
- \( T \): Exposure time
- \( \tau_c \): Inversely proportional to a measure of the speed and # of moving scattering particles

\[ \tau_c \propto \frac{1}{BF} \]

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