

Supplementary Methods

Biosignal fluctuation analysis of cerebral perfusion.

We modeled the signal recorded on each probe as the realization X_i of a stationary random variable X at instant i with average μ and standard deviation σ . Let us call X_{i+k} the realization of X at instant $i+k$. We then consider the auto-correlation function $R(k)$ as follows:

$$R(k) = \frac{E[(X_i - \mu)(X_{i+k} - \mu)]}{\sigma^2}$$

We estimated the expectation $E[.]$ in the auto-correlation function by empirical averaging over periods of 120 s. For illustration in Fig. 2, two auto-correlation function $R(k)$ computed following this estimation procedure are plotted as a function of k in seconds between 0 and 120 seconds for the corresponding two probes. The auto-correlation function $R(k)$ is a measure of selfmemory of a random signal between instant i and instant $i+k$. It takes values between 1 if $X_i = X_{i+k}$ and -1 if $X_i = -X_{i+k}$. $R(k)$ is zero if X_i and X_{i+k} are independent. In $R(k)$ the auto-correlation are computed on centered variables $(X_i - \mu)$ and $(X_{i+k} - \mu)$.

intact neurons

penumbral area

ischemic core









