Perfusion quantification by deconvolution

tissue function

$c_t(t)$ (mM) vs t (s)

$= CBF$

arterial input function (AIF)

$c_a(t)$ (mM) vs t (s)

$\otimes$ $r(t)$

tissue response

$r(t)$ vs t (s)
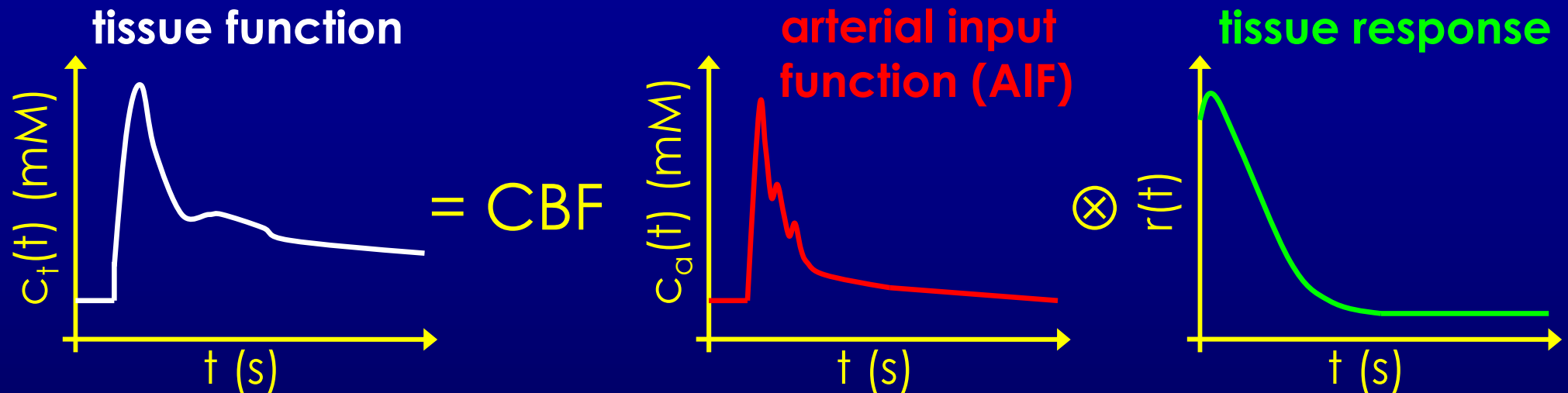
$$c_t(t) = CBF \cdot c_a(t) \otimes r(t) = CBF \cdot \int_0^t c_a(t') \, r(t-t') \, dt'$$

$$MTT = \int r(t)\,dt \qquad\qquad CBV = CBF \cdot MTT$$

L. Østergaard, Magnetic Resonance in Medicine 1996

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