Figure 3: a) Schematic diagram of lumped two-compartment model, where it is assumed that contrast is well-mixed within each compartment at any instant. Blood with tracer or contrast can flow at a rate $F$ into a compartment with volume fraction $v_1$ and exit on the venous side. The second compartment with volume $v_2$, could represent the interstitial space, and the exchange of contrast between the two compartments is controlled by a parameter $PS$, representing the permeability surface area product for trans-capillary transport of contrast. b) The lumped two compartment system can represented by a system of coupled linear differential equations (see appendix A). A solution for a unit impulse of contrast at $t=0$, and assuming that there is no contrast in the two two compartments before this arterial input was calculated for $F=0.88$ ml/min/g and $PS=0.3$ ml/min/g, assuming $v_1 = 0.06$ ml/g and $v_2=0.18$ ml/g. The red line represents the contrast concentration that would be detected per unit voxel volume, and which is calculated as volume-fraction-weighted sum of contributions from the vascular space (solid gray line) and the interstitial space (dashed gray line).