Fig. S1. Measurement of the heart rate obtained from the motion ghost caused by periodic pulsed motion of the haemolymph in the vessel by T_{1w}-MRI. (A–D) Preliminary experiments were conducted using the internal carotid artery (ICA) of the mouse. (A) Coronal image of the left side of the head of the mouse with motion artifact compensation. The position of the ICA is shown by an arrow head. (B-C) Coronal image without motion artifact compensation. The periodic motion ghost was measured at T_R 0.1 s (B) and 0.15 s (C). Arrows show the position of the ghost along the phase direction of the image. (D) The interval of the motion ghost (Δ) and the estimated heart rate (ω beats s^{-1}) were obtained from the following equation:

$$\omega = 2\pi \, \Delta \, / \, (T_R \, N_p)$$

where N_p is number of phase encodings. The Δ values of the ICA increased linearly when T_R was increased from 75 ms to 250 ms. The observed heart rate, 5.3 ± 0.2 beats s^{-1}, was in agreement with the heart rate obtained by electrocardiography (300 beats min^{-1}). (E) Transverse image of the branchial vessel of *M. galloprovincialis.* The position of a branchial vessel and its ghosts are shown by an arrow head and arrows, respectively. From Δ (8 pixels), N_p (256) and TR (0.15 s), the heart rate was calculated as 1.3 beats s^{-1}.

Movie 1. An Intragate MR movie of the cardiac cycle with a transverse image at 1 mm posterior to the AV valve. Four cardiac cycles at 10 frames/beat are shown.

Movie 2. An Intragate MR movie of the cardiac cycle with a transverse image at the position of the AV valve. Four cardiac cycles at 10 frames/beat are shown.