Supplementary Material

**Supplementary Movie 1.** Functional cerebral hemodynamic PACT imaging results of the midbrain corresponding to no external stimulation.

**Supplementary Movie 2.** Functional cerebral hemodynamic PACT imaging results of the midbrain corresponding to left forepaw stimulation.

**Supplementary Movie 3.** Functional cerebral hemodynamic PACT imaging results of the midbrain corresponding to right forepaw stimulation.

**Supplementary Movie 4.** Functional cerebral hemodynamic PACT imaging results of the hindbrain corresponding to no external stimulation.

**Supplementary Movie 5.** Functional cerebral hemodynamic PACT imaging results of the hindbrain corresponding to left forepaw stimulation.

**Supplementary Movie 6.** Functional cerebral hemodynamic PACT imaging results of the hindbrain corresponding to right forepaw stimulation.