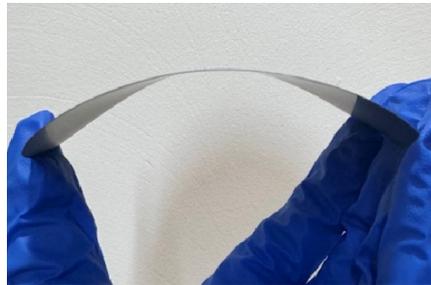


# Supplement

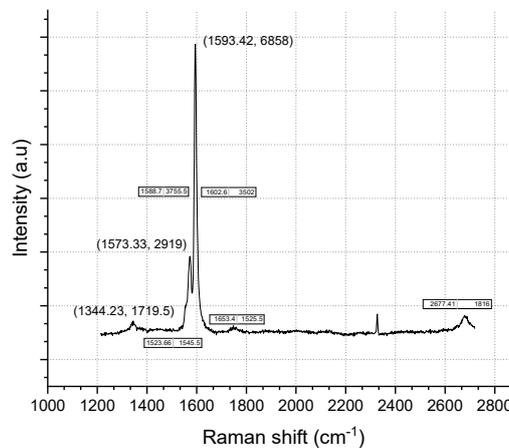
Title: Magnetically compatible Brain Electrodes Array based on Sin-gle-walled Carbon Nanotubes for Long-term Implantation

## Supplement Text S1

Too soft substrate would cause SWCNTs to break, so Si sheet with a thickness of 100  $\mu\text{m}$  was chosen. The base of this experiment is 100  $\mu\text{m}$  thickness flexible silicon wafer-coated  $\text{SiO}_2$  with a thickness of 300 nm. Si has a Young's modulus of 168.9 GPa and is flexible at 100  $\mu\text{m}$ . The Young's modulus of parylene is  $2.9 \pm 0.2$  GPa. The bending degree of a 4 inch silicon wafer with a thickness of 100  $\mu\text{m}$  (coated with SWCNTs) is shown in the figure below:



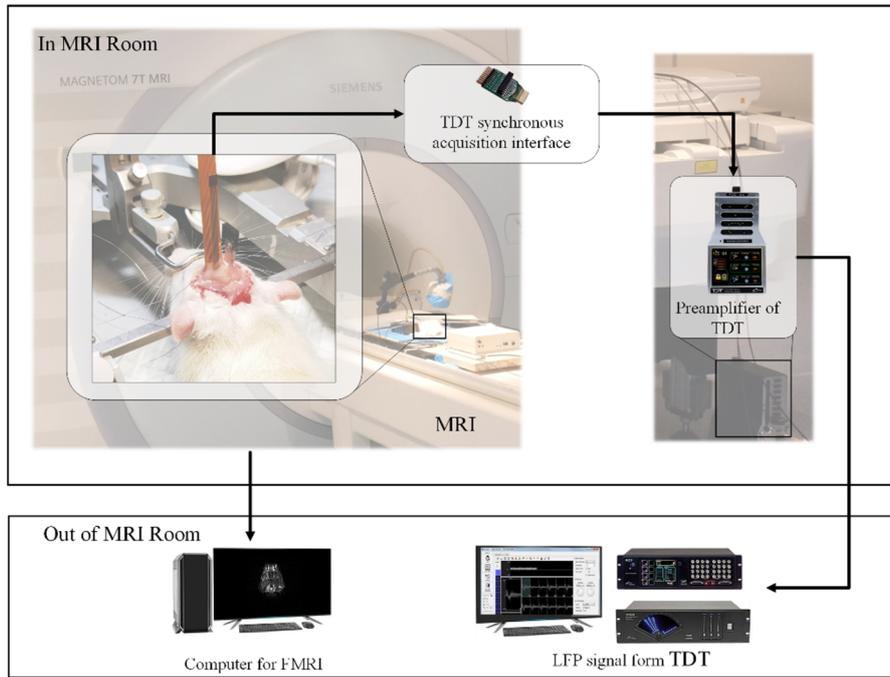
Silicon wafer bending picture



Raman shift of SWCNTs after bending

## Supplement Text S2

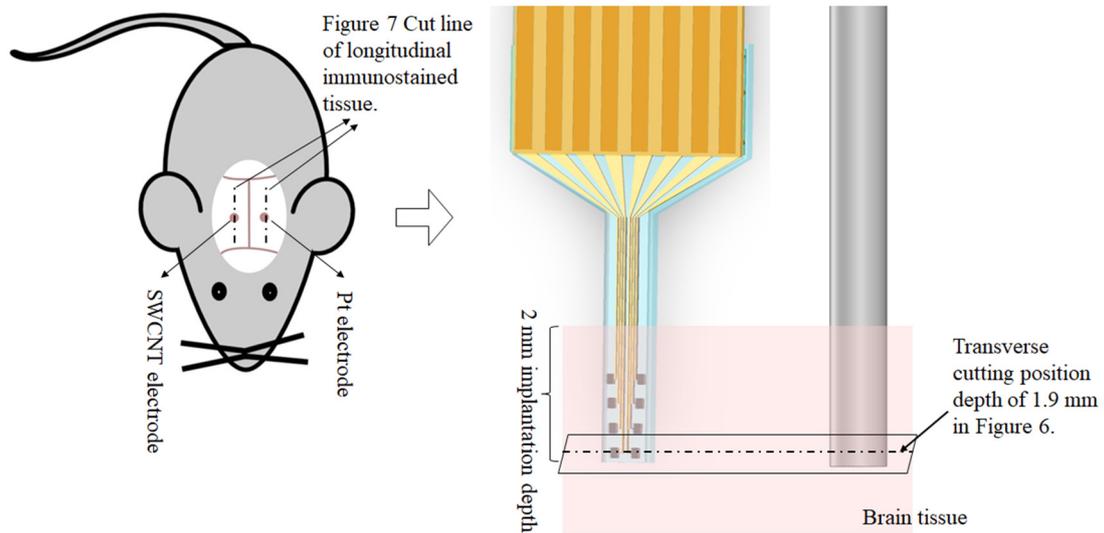
After the electrode is implanted in the brain, it is transferred to the omnetics interface through the adapter provided by TDT to the nuclear magnetic indoor amplifier of TDT, and the signal is amplified through the amplifier and then transmitted out of the nuclear magnetic outdoor to the signal acquisition system. At the same time, 7T nuclear magnetic scans were taken to image the heads of mice.



schematic diagram of simultaneous acquisition of fMRI and LFP signals

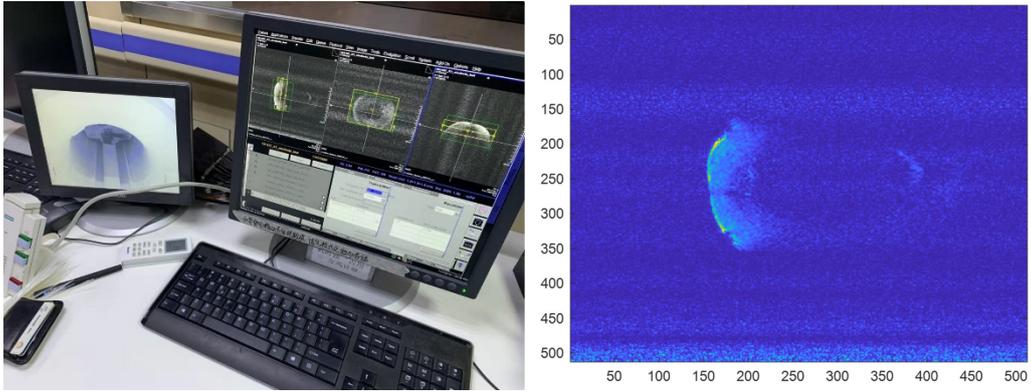
## Supplement Figure S1

The implantation sites of swcnt electrode and Pt electrode as a contrast electrode in mice.



Implantation diagram for immune response

## Supplement Figure S2



fMRI image of melon