**Supplementary material**

The main procedures of “curved lead” implantation are dividing into three parts: (1) Identify the location of the subthalamic nucleus (STN), the pedunculopontine nucleus (PPN) and the wire insertion pathway based on *The Rat Brain in Stereotaxic Coordinates of Paxinos and Watson*.[1] (2) Make an auxiliary device consist of a lead carrier and a lead channel, which was detailly described in our previous work. [2,3] First, the related implantation parameters of the wire insertion pathway were calculated based on the automated algorithm in Excel.[2,3] Second, make a lead carrier by cutting metal capillaries into half circles. Third, make a lead channel on the carrier to restrain the movements of the curved lead. Fourth, glue the auxiliary device to stereotaxic apparatus. (3) Implant curved lead. First, adjust the auxiliary device to suitable position which is parallel with the horizontal platform of the stereotaxic apparatus. Second, adjust the operation arm of the stereotaxic apparatus to make the “lead channel” forms the “deflection angle” (calculated by inputting the coordinates of the two targets into the automated Excel algorithm). Third, fix the rat on the stereotaxic apparatus and keep the bregma and lambda on a same horizontal plane. Fourth, adjust the position of lead channel to make it overlap with the wire insertion pathway. Fifth, based on the calculated point of entry, a hole in the skull of each rat was drilled by a small drill, and then the curved lead was implanted with a calculated length along the lead channel.

**Reference**

1.Paxinos G, Watson C. The rat brain in stereotaxic coordinates. 6th ed. Elsevier Academic Press 2007, Amsterdam.

2.Ding CY, Yu LH, Lin YX, Chen F, Wang WX, Lin ZY, et al. A novel stereotaxic system for implanting a curved lead to two intracranial targets with high accuracy. J Neurosci Methods 2017;291:190–197. doi: 10.1016/j.jneumeth.2017.08.017.

3.Ding CY, Yu LH, Lin YX, Chen F, Lin ZY, Kang DZ. The "curved lead pathway" method to enable a single lead to reach any two intracranial targets. Sci Rep 2017;7:40533. doi: 10.1038/srep40533.