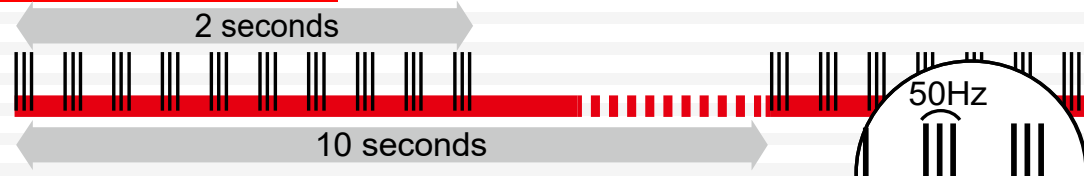


Theta burst stimulation (TBS)

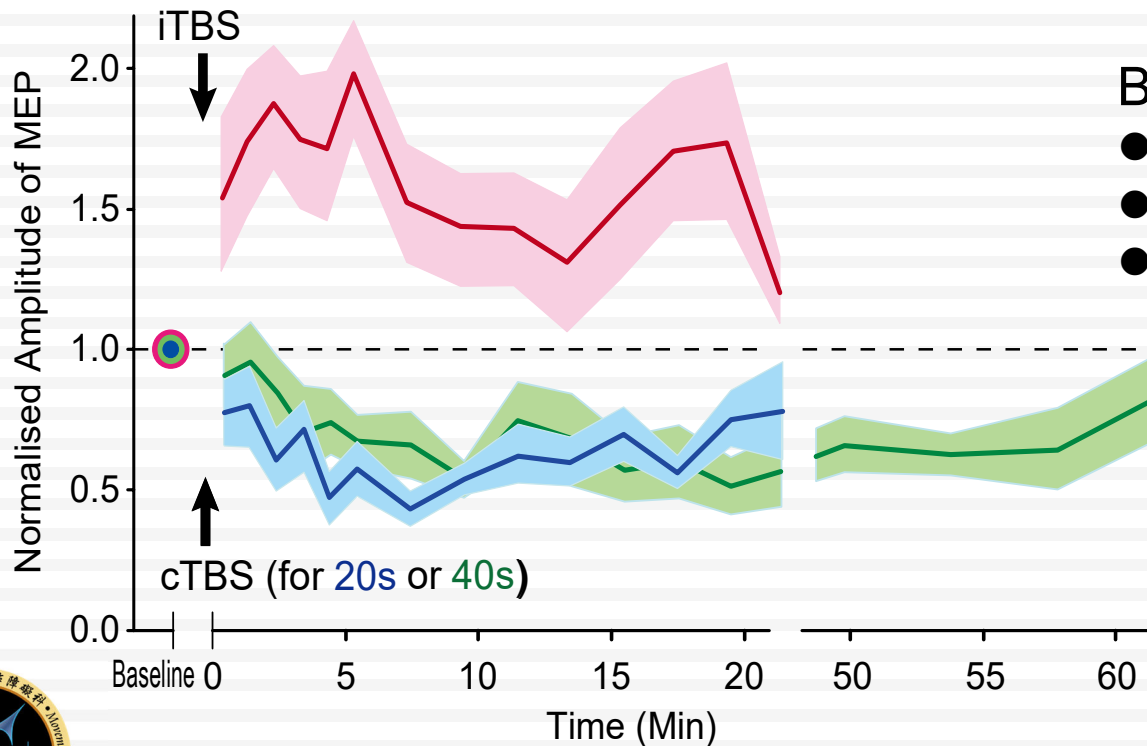
iTBS: Intermittent TBS

10 bursts every 10 s for 20 cycles (190 s)



cTBS: Continuous TBS

100 or 200 bursts continuously (20 or 40 s)



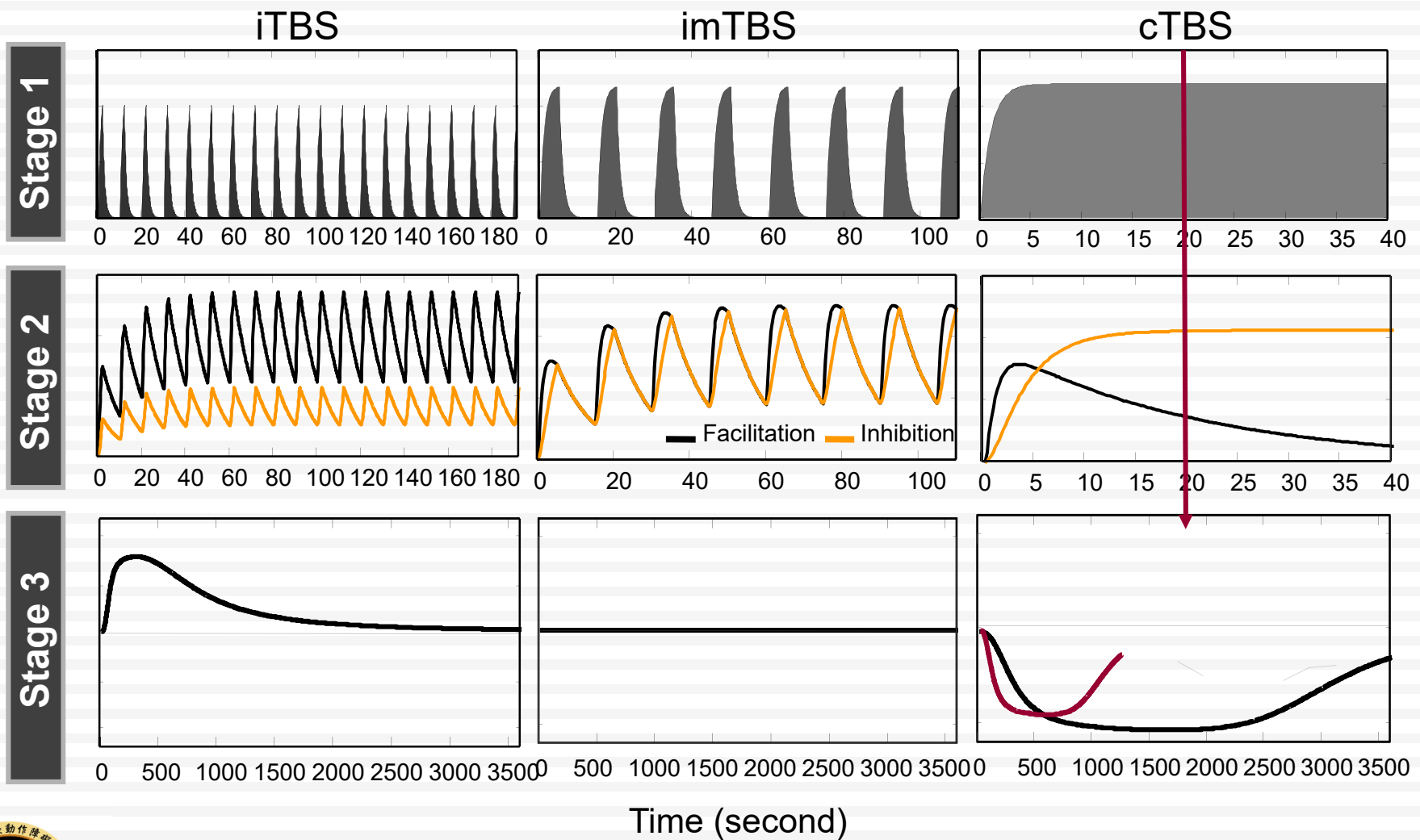
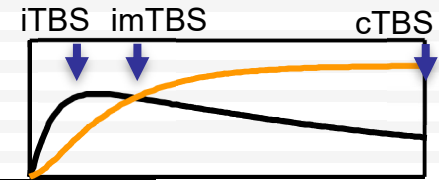
Benefits:

- Shorter stimulation time
- Lower intensity
- Only requires one machine

- Huang et al., Neuron 2005
- Huang et al., In: Advances in Biological Psychiatry 23 2007
- Huang et al., In: The rTMS in the treatment & rehab of CNS diseases 2009
- Huang et al., In: Encyclopedia of Movement Disorders 2010
- Suppa & Huang et al., Brain Stim 2015



TBS model explains the effects

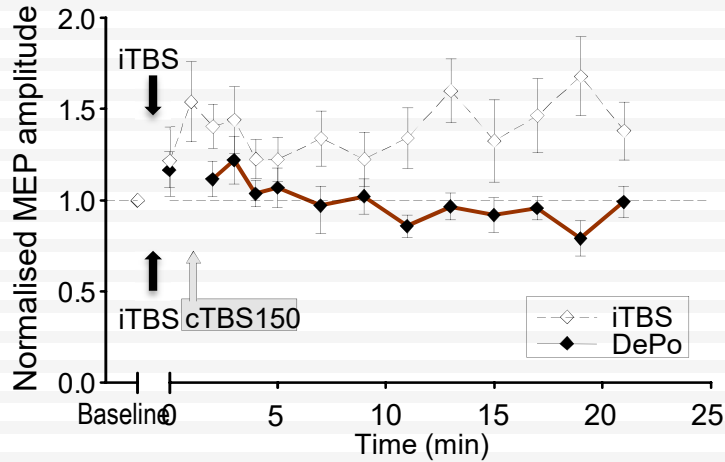


(Huang et al. Clin Neurophysiol. 2010)

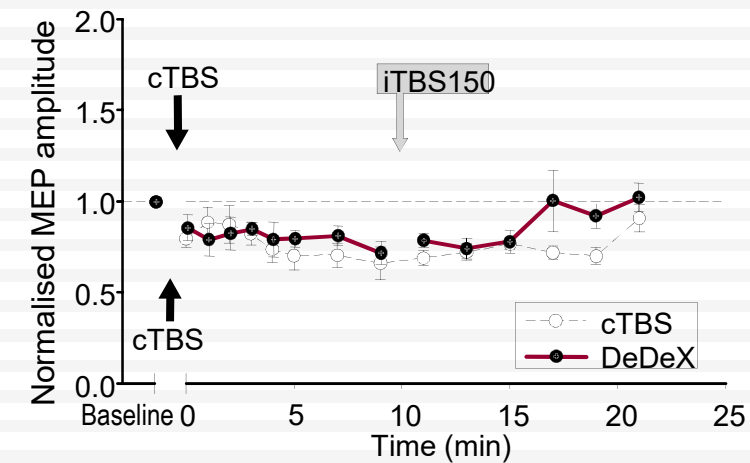
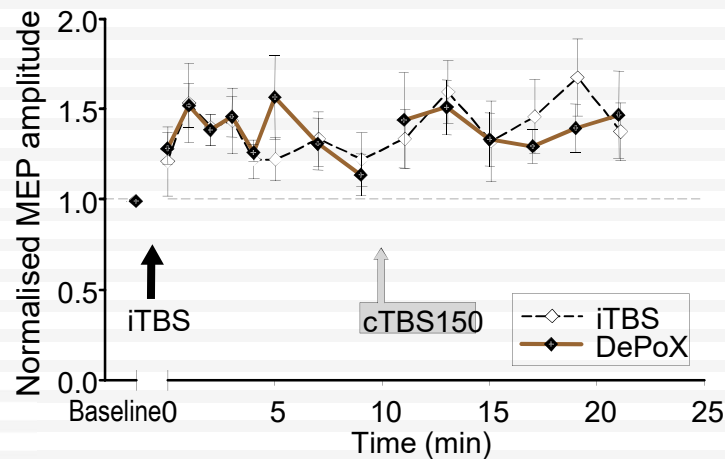
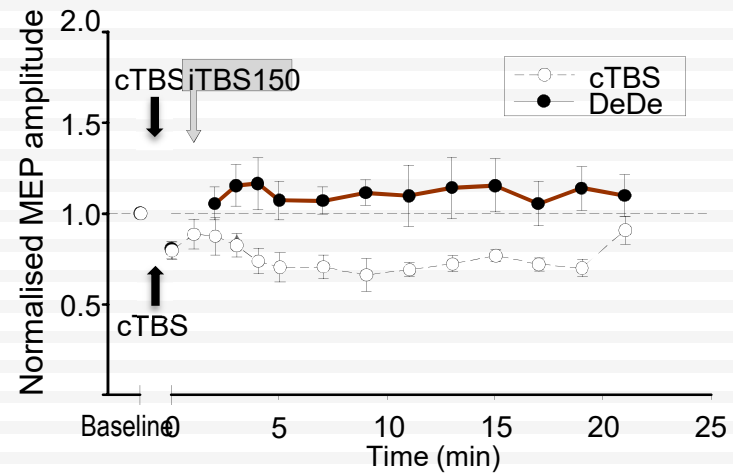


Reversal of plasticity in humans

Depotentialtion



De-depression

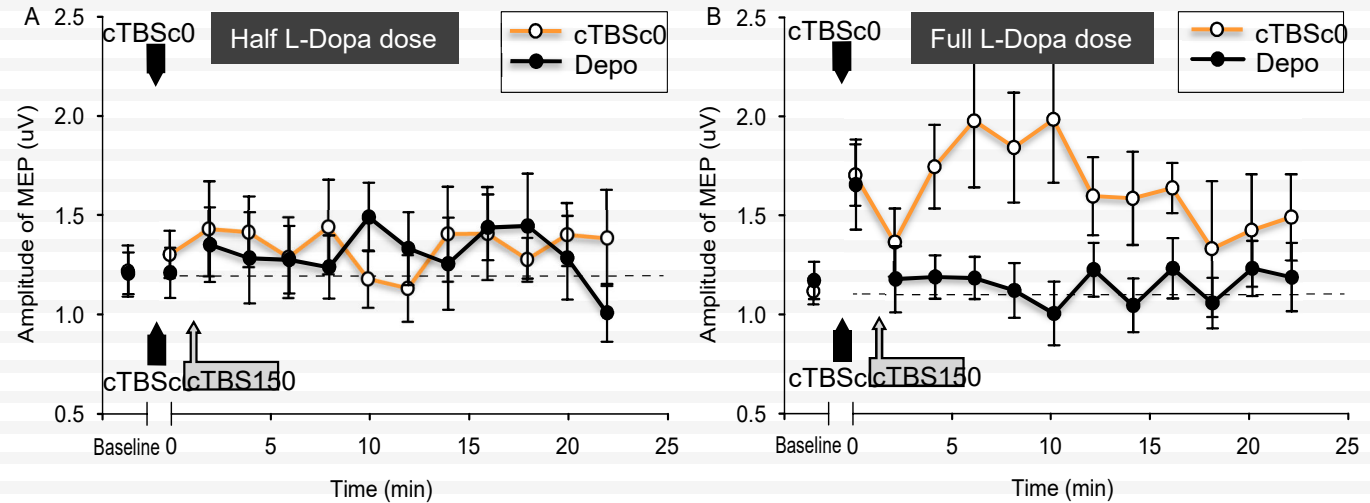


(Huang et al., J Physiol 2010)

Aberrant motor plasticity in PD patients

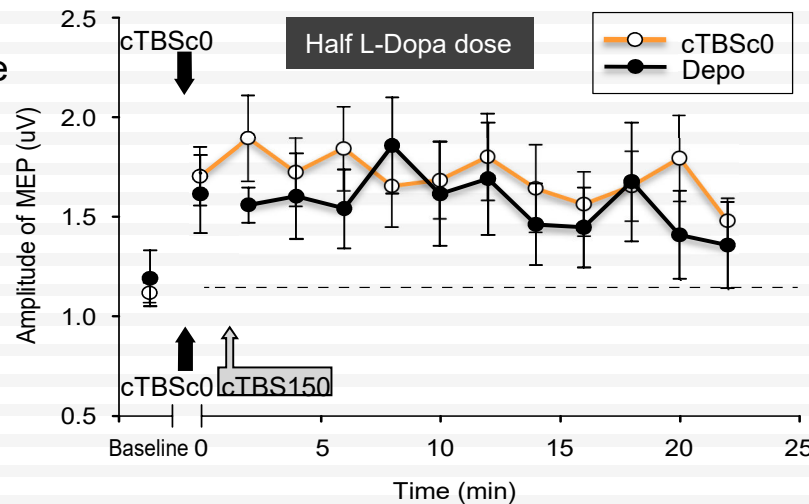
Non-LID PD:

- Reduced plasticity
- Normal depotentiation



LID PD

- Abnormal depotentiation
- Hypersensitive to dopamine

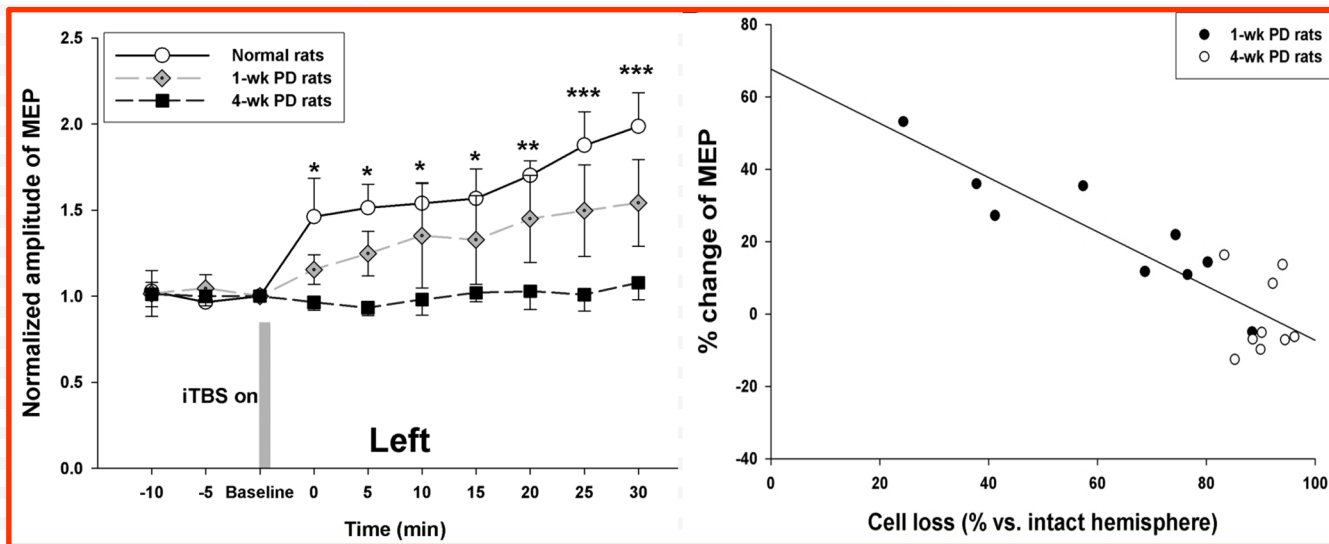
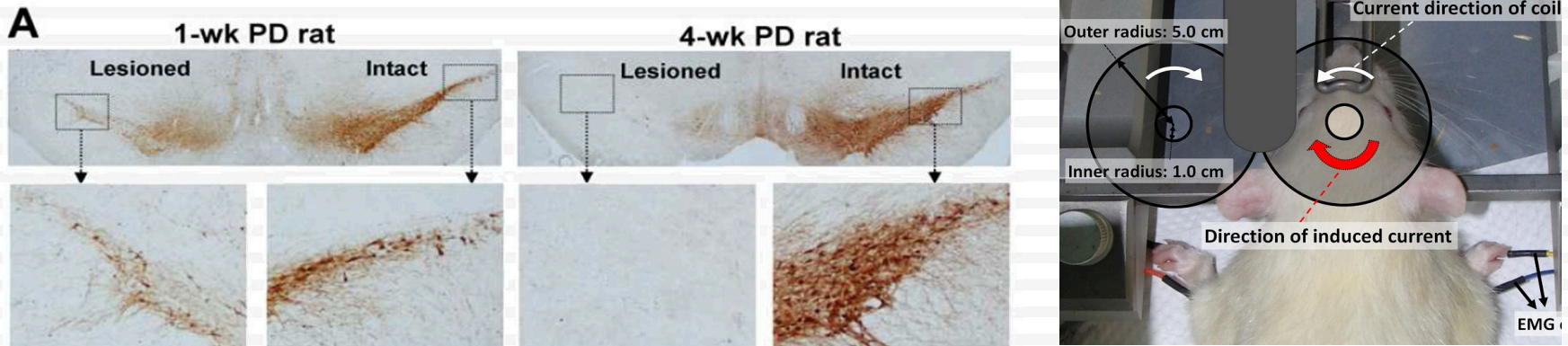


(Huang et al., Brain, 2011)



TBS-induced plasticity vs. dopamine

The amount of TBS-induced motor plasticity correlates to the amount of functional dopamine cell in the substantia nigra.



(Hsieh & Huang et al., Cereb Cortex 2015)

