

### **Abbreviations used throughout the text**

AD: Alzheimer's disease; AMT: active motor threshold; BBB: brain-blood barrier; CI: cognitively impaired; CIS: clinical isolated syndrome; CNS: central nervous system; CP: cognitively reserved; CS: conditioning stimulation; CSF: cerebrospinal fluid; EDSS: Expanded Disability Status Scale; FDI: first dorsal interosseus; Gd: gadolinium; ICF: intracortical facilitation; ISI: inter-stimulus interval; LICI: long-interval intracortical inhibition; LTP: long-term potentiation; M1: primary motor cortex; MEP: motor evoked potential; MRI: magnetic resonance imaging; MS: multiple sclerosis; PPMS: primary progressive MS; ppTMS: paired-pulse TMS; RMT: resting motor threshold; RRMS: relapsing-remitting MS; SICI: short-interval intracortical inhibition; SICF: short-interval intracortical facilitation; TBS: theta burst stimulation; TMS: transcranial magnetic stimulation; TS: test stimulation