e tACS only di ers from tDCS by the fact that sinusoidal currents are given at a speci c frequency in place of continuous and constant currents. tACS directly modulates oscillatory brain activity in such a way that the stimulation frequency can be adapted to the frequency of the speci c targeted oscillation of the brain. Although there is an exponential use of tDCS in di erent conditions, the application of tACS

studies should also try to untangle the mechanisms sustaining long-lasting e ects of transcranial current stimulation, as it might interplay with pathological mechanisms of dementia neurodegeneration with either bene cial or deleterious side e ects [33].

Finally, to move transcranial current stimulation into regular treatment, large-scale randomized and multi-site controlled studies that integrate these techniques into traditional methods such as pharmacological treatment and psycho-cognitive therapy should be conducted. Non-invasive brain stimulation is an awaited complement to the weak therapeutic arsenal of AD. Moreover, future large-scale clinical studies may demonstrate its e ciency in other types of dementia [27,33].

1. He Y, Chen Z, Gong G, Evans A (2009) Neuronal networks in Alzheimer's disease. Neuroscientist 15: 333-350.

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