

Resting-state EEG can predict sertraline treatment outcomes

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A latent-space machine learning algorithm tailored for resting-state

electroencephalography (rsEEG) can predict treatment outcomes with sertraline in depression, according to a study published online Feb. 10 in *Nature Biotechnology*.

Wei Wu, Ph.D., from South China University of Technology in Guangzhou, and colleagues designed a latent-space [machine learning](#) algorithm tailored for rsEEG and applied it to data from an antidepressant treatment prediction study in depression to identify treatment-responsive neurobiological phenotype.

The researchers found that symptom change was predicted in a manner that was specific for sertraline versus placebo and generalizable across study sites and EEG equipment. The sertraline-predictive EEG signature generalized to a second depression sample; reduced EEG-predicted symptom improvement was seen using the sertraline-defined model for historically treatment-resistant patients compared with those showing partial response. In a third independent data set, two properties of the predictive signature were examined: convergent validation and neurobiological significance. In this sample, the rsEEG-derived outcome predictions indexed prefrontal neural responsivity, as measured by concurrent transcranial magnetic stimulation (TMS). The smaller the rsEEG-predicted symptom improvement with sertraline, the better the response to TMS treatment over the right dorsolateral prefrontal cortex with concurrent psychotherapy in a fourth depression treatment data set.

"These findings ground in individual-level neurobiology a treatment-responsive phenotype obscured within the broader clinical diagnosis of depression and its associated biological heterogeneity, and lay a path towards machine learning-driven personalized approaches to treatment in [depression](#)," the authors write.

Several authors disclosed financial ties to the biopharmaceutical industry.

More information: [Abstract/Full Text \(subscription or payment may be required\)](#)

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