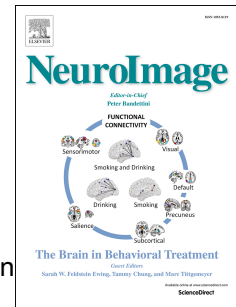


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Contributions of dopaminergic and non-dopaminergic neurons to VTA-stimulation induced neurovascular responses in brain reward circuits

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Abstract

Mapping the activity of the human mesolimbic dopamine system by BOLD-fMRI is a tempting approach to non-invasively study the action of the brain reward system during different experimental conditions. However, the contribution of dopamine release to the BOLD signal is disputed. To assign the actual contribution of dopaminergic and non-dopaminergic VTA neurons to the formation of BOLD responses in target regions of the mesolimbic system, we used two optogenetic approaches in rats. We either activated VTA dopaminergic neurons selectively, or dopaminergic and mainly glutamatergic projecting neurons together. We further used electrical stimulation to non-selectively activate neurons in the VTA. All three stimulation conditions effectively activated the mesolimbic dopaminergic system and triggered dopamine releases into the NAcc as measured by *in vivo* fast-scan cyclic voltammetry. Furthermore, both optogenetic stimulation paradigms led to indistinguishable self-stimulation behavior. In contrast to

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