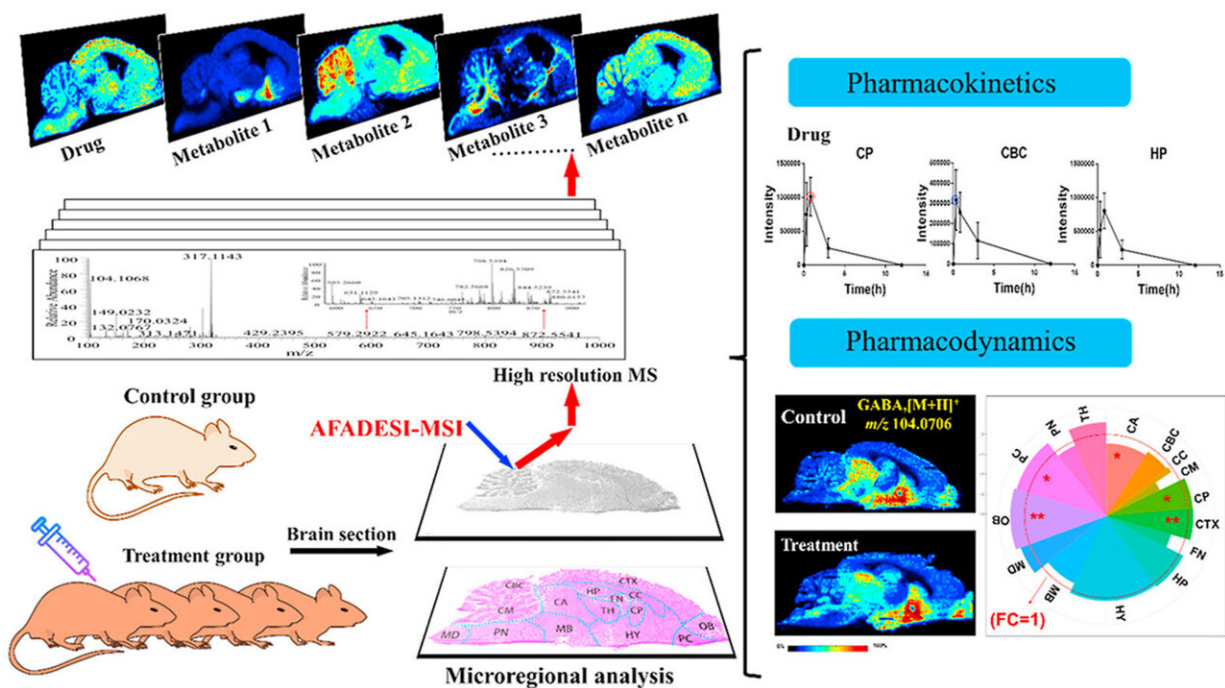


Method to characterize pharmacokinetics and pharmacodynamics in the brain microregions

September 5 2022



Graphical abstract: An effective temporo-spatial pharmacometabolomics method based on mass spectrometry imaging has been proposed for pharmacokinetic and pharmacodynamic characterization of brain microregions to elucidate the molecular mechanism of central nervous system (CNS) drugs. Credit: *Acta Pharmaceutica Sinica B* (2022). DOI: 10.1016/j.apsb.2022.03.018

The brain is the most advanced organ with various complex structural

and functional microregions. It is often challenging to understand what and where the molecular events would occur for a given drug treatment in the brain.

The authors of this article propose a temporo-spatial pharmacometabolomics method based on ambient mass spectrometry imaging and applied it to evaluate the microregional effect of olanzapine (OLZ) on brain tissue and demonstrate its effectiveness in characterizing the microregional pharmacokinetics and pharmacodynamics of OLZ for improved understanding of the molecular mechanism of drugs acting on the microregions of the brain.

The method accurately and simultaneously illustrated the levels dynamics and microregional distribution of various substances, including exogenous drugs and its [metabolites](#), as well as endogenous functional metabolites from complicated [brain tissue](#). The targeted imaging analysis of the prototype drug and its metabolites presented the [absorption](#), distribution, metabolism, and excretion characteristics of the drug itself. Moreover, the endogenous functional metabolites were identified along with the associated therapeutic and adverse effects of the drug, which can reflect the pharmacodynamics effect on the microregional [brain](#).

This method is significant in elucidating and understanding the molecular mechanism of central nervous system drugs at the temporo and spatial metabolic level of system biology.

The research was published in *Acta Pharmaceutica Sinica B*.

More information: Dan Liu et al, A temporo-spatial pharmacometabolomics method to characterize pharmacokinetics and pharmacodynamics in the brain microregions by using ambient mass spectrometry imaging, *Acta Pharmaceutica Sinica B* (2022). [DOI: 10.1016/j.apsb.2022.03.018](https://doi.org/10.1016/j.apsb.2022.03.018)

Provided by Compuscript Ltd

Citation: Method to characterize pharmacokinetics and pharmacodynamics in the brain microregions (2022, September 5) retrieved 15 May 2024 from

<https://medicalxpress.com/news/2022-09-method-characterize-pharmacokinetics-pharmacodynamics-brain.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.