

Case Western Reserve researchers' new pathway discovery published as 'Paper of the Week'

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Case Western Reserve University researchers, from the School of Medicine's Department of Nutrition, discovered two new metabolic pathways by which products of lipid peroxidation and some drugs of abuse, known as 4-hydroxyacids, are metabolized.

The pathways were identified by a combination of metabolomics and mass isotopomer analysis. The findings shed new light on the mechanism of action of the drug of abuse gamma-hydroxybutyrate, also known as "the date rape drug."

The manuscript published in the November 27th issue of the [Journal of Biological Chemistry](#) was named a "Paper of the Week."

"Our finding will lead to studies that will increase the understanding of metabolic disturbances that occur during oxidative stress. The latter is part of the pathology of heart attacks, stroke, diabetes and inflammation," says Guo-Fang Zhang, Ph.D., Research Associate in the Department of Nutrition at Case Western Reserve School of Medicine. "We hope that the upcoming studies will lead to the design of new treatments that minimize the effects of oxidative stress."

"Paving a Catabolic Highway," an editorial about this landmark study concluded, "Overall, this study represents an exemplary prototype for any projects that aim to identify incomplete or unknown metabolic

pathways."

"A combined effort of Case Western Reserve University and the Mt. Sinai Health Care Foundation since 1990 has lead to the building of this department's research program and the conception of this groundbreaking finding," says Henri Brunengraber, M.D., Ph.D., Senior Author, Professor, and Chair of the Department of Nutrition. "We plan to expand this project in close collaboration with Gregory P. Tochtrop, Ph.D., Assistant Professor in the Department of Chemistry. Dr. Tochtrop and his group have synthesized a number of carbon 13-labeled compounds which allowed the unraveling of the steps of the new pathways we discovered".

This work was supported by a RoadMap grant from the National Institutes of Health, a grant from the National Institute of Environment Health Sciences, as well as by a grant from the Cleveland Mt. Sinai Health Care Foundation. The RoadMap grant funded the development of metabolomics at Case Western Reserve, as well as the acquisition of a top-of-the-line mass spectrometer. This instrument allowed this and multiple other studies to be conducted. The RoadMap initiative allowed a quantum jump in the development of metabolic research at the School of Medicine.

Source: Case Western Reserve University ([news](#) : [web](#))

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