

Lymphomas tied to metabolic disruption

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Researchers from the School of Medicine at The University of Texas Health Science Center at San Antonio have found evidence that directly links disrupted metabolism (energy production in cells) to a common and often fatal type of lymphoma. The finding was announced Thursday (July 16) in *Nature Communications*.

"The link between metabolism and cancer has been proposed or inferred to exist for a long time, but what is more scarce is evidence for a direct connection—genetic mutations in [metabolic enzymes](#)," said senior author Ricardo C.T. Aguiar, M.D., Ph.D., associate professor of hematology-oncology in the School of Medicine and a faculty scientist with the Cancer Therapy & Research Center (CTRC) at the UT Health Science Center and the South Texas Veterans Health Care System, Audie L. Murphy Division.

"We have discovered a metabolic imbalance that is oncogenic or pro-cancer," Dr. Aguiar said.

The team, which included members of the Health Science Center departments of medicine and biochemistry, investigators from the UT Southwestern Medical Center at Dallas and a group of collaborators from Austria, found that the gene that codes the enzyme D2-hydroxyglutarate dehydrogenase (D2HGDH) is mutated in a subset of cancers called diffuse large B-cell lymphomas. The mutated lymphoma cell displays a deficiency of a metabolite called alpha-ketoglutarate (α -KG), which is needed in steady levels for cells to be healthy.

"When the levels of α -KG are abnormally low, another class of enzymes called dioxygenases don't function properly, resulting in a host of additional disturbances," Dr. Aguiar said.

Dr. Aguiar indicated that α -KG has been recently identified as a critical regulator of aging and stem cell maintenance. "Thus, the implications of our findings are broad and not limited to cancer biology," he said.

More information: *Nature Communications*, July, 2015.
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Provided by University of Texas Health Science Center at San Antonio

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