Gene therapy prevents disorders with alcohol exposure in ALDH2 deficiency

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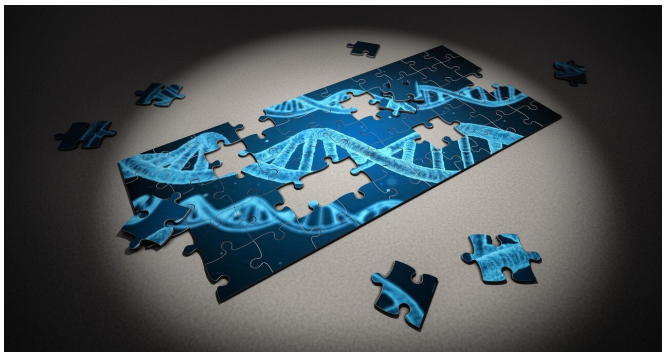

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A new study has shown that gene therapy to treat one of the most common hereditary disorders, aldehyde dehydrogenase type 2 (ALDH2) deficiency, may prevent increased risk for esophageal cancer and osteoporosis associated with chronic alcohol exposure. The study, performed in a mouse model of ALDH2, is published in *Human Gene Therapy*.

Ronald Crystal, Matthew Greenblatt, Katie Stiles, and colleagues from Weill Cornell Medical College, The Rockefeller University, and Hospital for Special Surgery, New York, NY, coauthored the article entitled "Systemic Adeno-Associated Virus-Mediated Gene Therapy Prevents the Multiorgan Disorders Associated with Aldehyde Dehydrogenase 2 Deficiency and Chronic Ethanol Ingestion." The researchers delivered the ALDH2 gene to two mouse models of ALDH2 deficiency using an adeno-associated virus (AAV) vector. Some of the mice were then given ethanol in their drinking water over a 12-week period.

In ALDH2 deficiency, proper ethanol metabolism is not possible, and the systemic accumulation of acetaldehyde causes acute abnormalities as well as chronic disorders including esophageal damage that can lead to the development of esophageal cancer, and abnormalities in bone metabolism that can lead to osteoporosis. Compared to the non-ethanol drinking mice, the mice treated with gene therapy who ingested alcohol did not show signs of either the acute abnormalities or the chronic disorders normally associated with ethanol exposure in ALDH2 deficiency.

"This work by Dr. Crystal and his collaborators points to a new potential therapy for individuals with a particular genetic susceptibility to suffer long-term consequences of excessive drinking," says Editor-in-Chief Terence R. Flotte, MD, Celia and Isaac Haidak Professor of Medical Education and Dean, Provost, and Executive Deputy Chancellor, University of Massachusetts Medical School, Worcester, MA.

More information: Yuki Matsumura et al, Systemic Adeno-Associated Virus-Mediated Gene Therapy Prevents the Multiorgan Disorders Associated with Aldehyde Dehydrogenase 2 Deficiency and Chronic Ethanol Ingestion, *Human Gene Therapy* (2019). DOI: 10.1089/hum.2019.268

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