



A possible role of a cerebral energy gene in alcoholism

A.F. Ribeiro¹, D. Correia², R. Boerngen-Lacerda² and A.L. Brunialti-Godard¹

¹Departamento de Biologia Geral, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brasil

²Departamento de Farmacologia, Universidade Federal do Paraná, Curitiba, PR, Brasil

Correspondence author: A.L. Brunialti-Godard

E-mail: brunialt@ufmg.br

Genet. Mol. Res. 11 (1): 404-411 (2012)

Received March 17, 2011

Accepted December 2, 2011

Published February 17, 2012

DOI <http://dx.doi.org/10.4238/2012.February.17.2>

ABSTRACT. We examined a possible relationship between genes responsible for energy metabolism of the brain and addictive behavior in an animal model. We used non-inbred, Swiss mice exposed to a three-bottle free-choice model [water, 5% (v/v) ethanol, and 10% (v/v) ethanol] over a 16-week period, consisting of four phases: acquisition, withdrawal, reexposure, and quinine-adulteration. The mice were then behaviorally classified into three groups: loss-of-control-drinker (preference for ethanol and high levels of consumption during all phases, N = 6), heavy-drinker (preference for ethanol and high levels of consumption during acquisition and reduction during quinine-adulteration, N = 7), and light-drinker (preference for water during all phases, N = 10). Another group only received tap water (ethanol-naive control mice, N = 9). Further analysis using quantitative real-time PCR showed that in mice behaviorally classified as loss-of-control-drinkers, there was a significant inverse correlation between transcript levels of the *Hadh* gene and those of other energy metabolism genes in the nucleus of the amygdala, suggesting that this pathway may contribute to ethanol consumption in these mice.

We conclude that cerebral energy metabolism is involved with ethanol addiction, meriting further study.

Key words: Animal model; Brain; Energy metabolism; Ethanol; Extended amygdala