Cell Biology

ETHANOL-INDUCED CHANGES IN BRAIN MEMBRANE FATTY ACID COMPOSITION AND DECREASED CHICK EMBRYO VIABILITY ARE ATTENUATED BY RESVERATROL.

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Embryonic ethanol (EtOH) exposure promotes increased levels of reactive oxygen species that degrade unsaturated-long-chain membrane fatty acids within embryonic chick brains and is associated with apoptosis and reduced embryo viability. In adults, exposure to resveratrol, a known anti-oxidant found within red wines, is known to partially attenuate EtOH-induced damage. In order to test whether or not resveratrol can attenuate EtOH-induced embryonic damage, fertile chicken eggs were injected daily with EtOH (3.025 mmol / Kg egg) and various concentrations of resveratrol (0 to 29.5 nmol / kg egg) during the first three days of embryonic development. At 11 days of embryonic development (theoretical stage 37), viable embryos were collected, brains isolated, and brain membrane fatty acid composition analyzed. Embryonic EtOH exposure promoted decreased embryo mass, decreased brain mass, and fewer viable embryos at 11 days of development as compared to controls. Embryonic EtOH exposure also promoted reduced levels of unsaturated long-chain membrane fatty acids and increased levels of saturated short-chain membrane fatty acids within developing chick brains. Embryonic exposure to moderate (2.95 nmol / Kg egg) and high (29.5 nmol / Kg egg) levels of resveratrol attenuated EtOH-induced changes in brain membrane fatty acid composition. Likewise, embryonic exposure to moderate and high levels of resveratrol attenuated EtOH-induced reductions in embryo mass, brain mass, and the number of viable embryos increased.