

**Vitamin E status and metabolism in adult and aged aryl hydrocarbon receptor null mice.** M. G. Traber, D. J. Mustacich, L. C. Sullivan, S. W. Leonard, A. Ahern-Rindell, N. Kerkvliet, *J. Nutr. Biochem.*, **21**, 1193-1199 (2010).

The aryl hydrocarbon receptor (AhR) is involved in regulation of mechanisms for detoxification of xenobiotics, as well as vitamin A metabolism. Vitamin E is a fat-soluble nutrient whose metabolism is initialized via the cytochrome P450 system. Thus, AhR absence could alter hepatic regulation of  $\alpha$ -tocopherol metabolism. To test this hypothesis, we assessed vitamin E status in adult (2-5 m) and old (21-22 m), wild-type and AhR-null mice. Plasma  $\alpha$ -tocopherol concentrations in AhR-null mice ( $2.3 \pm 1.2$   $\mu\text{mol/L}$ ,  $n=19$ ) were lower than those of wild-type mice ( $3.2 \pm 1.2$ ,  $n=17$ ,  $P=.0131$ ); those in old mice ( $3.2 \pm 1.2$ ,  $n=20$ ) were higher than those of adults ( $2.2 \pm 1.0$ ,  $n=16$ ,  $P=.0075$ ). Hepatic  $\alpha$ -tocopherol concentrations were not different between genotypes, but were nearly double in old ( $32 \pm 8$   $\text{nmol/g}$ ,  $n=20$ ) as compared with adult mice ( $17 \pm 2$ ,  $n=16$ ,  $P<.0001$ ). Hepatic Cyp3a concentrations in AhR-null mice were greater than those in wild-type mice ( $P=.0011$ ). Genotype ( $P=.0047$ ), sex ( $P<.0001$ ) and age ( $P<.0001$ ) were significant modifiers of liver  $\alpha$ -tocopherol metabolite ( $\alpha$ -CEHC) concentrations. In general, Cyp3a concentrations correlated with hepatic  $\alpha$ -tocopherol ( $r=0.3957$ ,  $P<.05$ ) and  $\alpha$ -CEHC ( $r=0.4260$ ,  $P<.05$ ) concentrations. Since there were no significant genotype differences in the hepatic  $\alpha$ - or  $\gamma$ -tocopherol concentrations, AhR-null mice did not have dramatically altered vitamin E metabolism. Since they did have higher hepatic  $\alpha$ -CEHC concentrations, these data suggest metabolism was up-regulated in the AhR-null mice in order to maintain the hepatic tocopherol concentrations similar to those of wild-type mice.