COX isoforms in aortic endothelial cells from young adult and mature adult mice

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In the endothelium of the aorta there are athero-prone (high probability/HP) or athero-protected (low
probability/LP) regions, dictated by the type of flow they experience. We have previously shown that
cyclo-oxygenase (COX)-1 predominates in the endothelium of both areas in young adult mice (3
months). Debate continues regarding the levels of COX-1 versus COX-2 expression in the vasculature.
Vascular function and enzyme expression changes as animals age. Thus, in the current study we have
compared levels of COX-1 and COX-2 expression in HP and LP regions of aortic arch in tissue from
young adult (3 month) and mature adult (12 month) C57Bl6 mice. We have also measured COX activity
(as 5x10⁻⁵M A23187-stimulated prostacyclin release, 30 minutes; measured by RIA of its breakdown
product, 6-ketoPGF₁α) in aorta from 3, 6 and 12 month colony wild type (C57Bl6) versus COX-1
knockout (COX-1⁻⁻) mice.

Figure 1: Wild Type 3 mo
Figure 2: COX activity in aorta from 3, 6 and 12 month old wild type and COX-
1⁻⁻. Data is mean ± S.E.M for n=4-7. Within group analysis was performed using two-way ANOVA
followed by Bonferroni post-test. Significant differences were assumed were P>0.05 and denoted by*.

Our results demonstrate that while both COX-1 and COX-2 are present in the endothelium of healthy
young and mature mice, COX-1 immunoreactivity and activity predominates in all age groups tested.