

Conference Abstract

# P.17 Reduced Isometric Contractility and Isobaric Compliance of the *ex vivo* Thoracic Aorta of Hypertensive APP23<sup>+/-</sup> overexpressing Mice due to Serum Corticosterone Levels

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Keywords

Dementia  
stress  
vascular disease

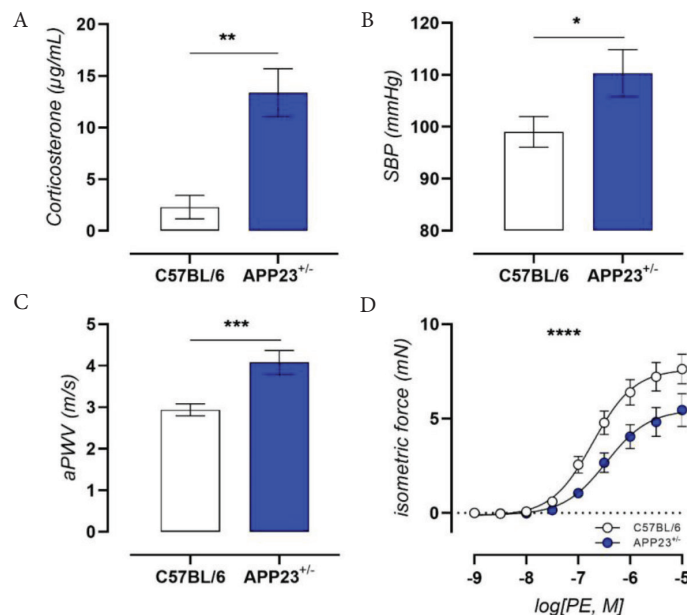
ABSTRACT

**Objective:** Alzheimer’s disease (AD) is characterized by noticeable neuropsychiatric symptoms and cognitive decline [1]. In addition, cardiovascular disease (CVD) is a known etiological hallmark of AD pathogenesis [2]. Recent epidemiological evidence suggests an interplay between arterial stiffness (AS) and AD [3]. Therefore, we aimed for an in-depth vascular characterization of the APP23<sup>+/-</sup> overexpressing AD mouse model (APP23<sup>+/-</sup>).

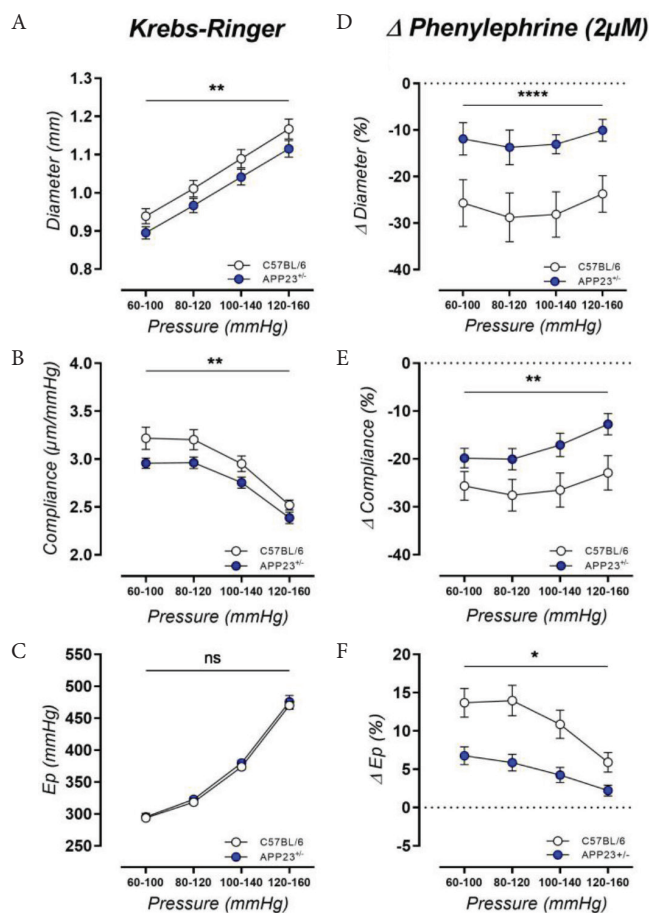
**Methods:** Blood pressure (BP, CODA) and aortic pulse wave velocity (aPWV, VEVO2100) were measured *in vivo*, whereas isometric vascular reactivity (organ chambers), isobaric AS (Peterson modulus (Ep)) and compliance (Rodent Oscillatory Tension Set-up for Arterial Compliance) were determined *ex vivo* in thoracic aorta segments of APP23<sup>+/-</sup> mice (male, *n* = 10) vs. C57BL/6 mice (male, *n* = 18) at the age of 6 months. Corticosterone levels were analysed on blood serum by means of ELISA. The data are given as mean ± SEM.

**Results:** APP23<sup>+/-</sup> mice showed elevated corticosterone levels (Figure 1A) associated with increased peripheral systolic BP (Figure 1B) and aPWV *in vivo* (Figure 1C), and decreased isometric adrenoreceptor-dependent contractions *ex vivo* upon phenylephrine stimulation (Figure 1D). *Ex vivo* isobaric AS measurements at baseline disclosed a smaller aortic diameter of APP23<sup>+/-</sup> mice (Figure 2A) resulting in reduced compliance (Figure 2B), with no Ep differences (Figure 2C). Upon phenylephrine treatment, a smaller effect on aortic constriction (Figure 2D), compliance (Figure 2E) and Ep (Figure 2F) was observed for APP23<sup>+/-</sup> animals, corresponding to reduced isometric contractions (Figure 1D).

**Conclusion:** APP23<sup>+/-</sup> mice have increased corticosterone levels leading to increased BP, aPWV and reduced isometric contractility, resulting in decreased isobaric compliance, but with unchanged arterial wall biomechanics.



**Figure 1** Significantly increased serum corticosterone levels (A), systolic blood pressure (SBP) (B), abdominal pulse wave velocity (aPWV) (C) and decreased isometric force (D) upon phenylephrine contraction in 6 months old APP23<sup>+/-</sup> vs. C57BL/6 mice.



**Figure 2** Significant smaller aortic diameter (A) and compliance (B) in baseline Krebs-Ringer solution for APP23<sup>+/-</sup> mice vs. C57BL/6 mice, without differences in Ep (C). Limited aortic constriction (D), compliance (E) and Ep (F) upon phenylephrine (2 µM) stimulation for APP23<sup>+/-</sup> mice vs. C57BL/6 mice.

## REFERENCES

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