

## SCA 60

XENON AND THE INFLAMMATORY RESPONSE TO  
CARDIOPULMONARY BYPASS IN THE RAT<sup>1</sup>Clark J, <sup>2</sup>Ma D, <sup>1</sup>Homi H, <sup>3</sup>Maze M, <sup>1</sup>Grocott H<sup>1</sup>Duke University Medical Center, Durham, NC, USA; <sup>2</sup>Imperial College of Science, Technology and Medicine, London, UK;<sup>3</sup>Imperial College of Medicine, London, UK

**Background:** Xenon, an anesthetic gas acting via antagonism of the N-methyl-D aspartate (NMDA) receptor, has been demonstrated to have neuroprotective properties in several settings of brain injury, including experimental cardiopulmonary bypass (CPB) (1,2). NMDA-related pathways are responsible for excitotoxic neuronal injury after cerebral ischemia, but have also been demonstrated to play a role in mediating inflammatory processes (3). The purpose of this study was to investigate the effect of xenon on the inflammatory response to CPB in the rat.

**Methods:** Rats were randomized into four groups (n = 9-12 per group): i) SHAM rats were cannulated but did not undergo CPB; ii) CPB rats were subjected to 60 min of CPB using a membrane oxygenator receiving a gas mixture of 30% O<sub>2</sub> 65% N<sub>2</sub> and 5% CO<sub>2</sub>; iii) MK801 rats received the NMDA receptor antagonist, MK801 (0.15 mg/kg, i.v.) 15 min prior to 60 min of CPB with the same gas mixture; and iv) XENON rats underwent 60 min of CPB using an oxygenator receiving 30% O<sub>2</sub>, 60% xenon, 5% N<sub>2</sub> and 5% CO<sub>2</sub>. The inflammatory response was compared among groups by analyzing serum samples obtained at baseline, after 45 min of bypass, and 120 min after the completion of bypass, for the cytokines, IL-6 and IL-10.

**Results:** All of the CPB groups demonstrated post-CPB elevations in both cytokines compared to the SHAM operated group (IL-6, P=0.001, Figure 1; IL-10, P=0.02, Figure 2). However, there were no differences in cytokine levels at any time point among the CPB, MK801 or XENON groups (IL-6, P=0.23-0.53; IL-10, P=0.11-0.54).

**Conclusion:** These data indicate NMDA antagonism via xenon or MK801 does not alter the inflammatory response to CPB in rats. These findings are consistent with a previous report by Bedi et al.

(4) where xenon demonstrated no effect in an isolated ex vivo CPB model. We speculate that the previously demonstrated neuroprotective effect of xenon during cardiopulmonary bypass is likely independent of any inflammatory modulating effect.

**References:**

1. Ma D. et al. *Anesthesiology* 2003;98:690-8.
2. Wilhelm S. et al. *Anesthesiology* 2002;96:1485-91.
3. Jander S. et al. *J Neuroimmunol* 2000;109:181-7.
4. Bedi A. et al. *Br J Anaesth* 2002;89:546-50.

Figure 1

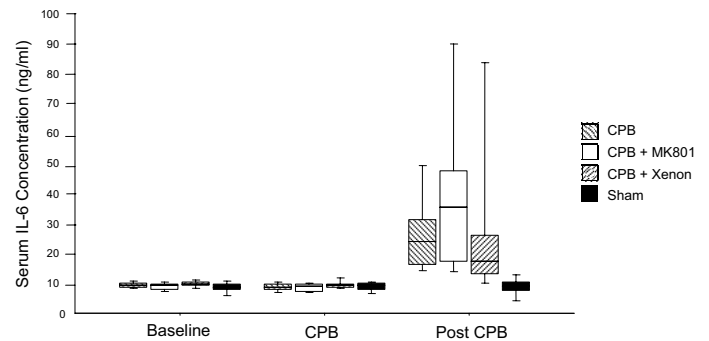


Figure 2

