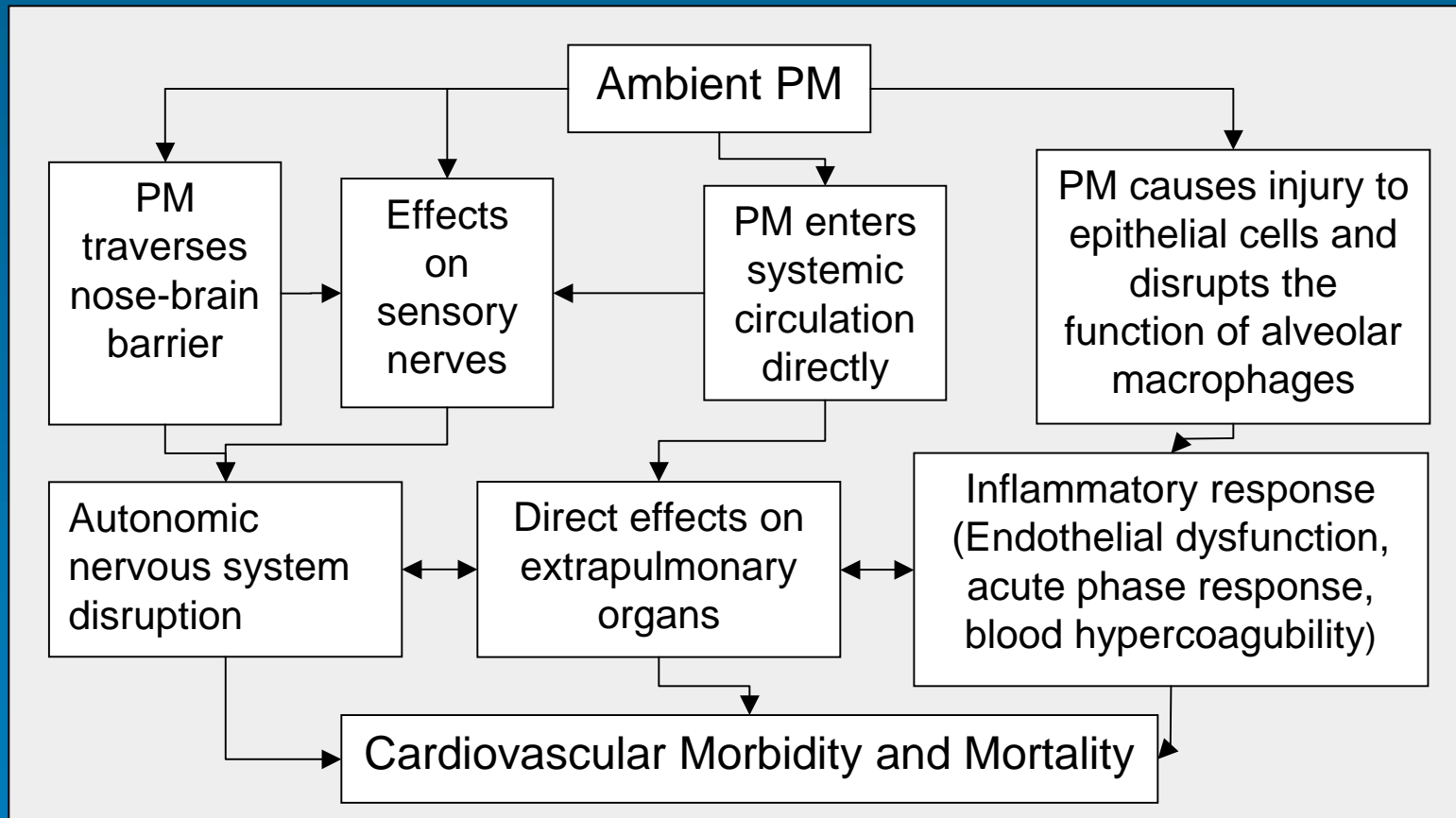


Cardiopulmonary Toxicity of Seattle PM in the Apolipoprotein E Knockout Transgenic Mouse



Mechanism(s)



Electrocardiogram (ECG)

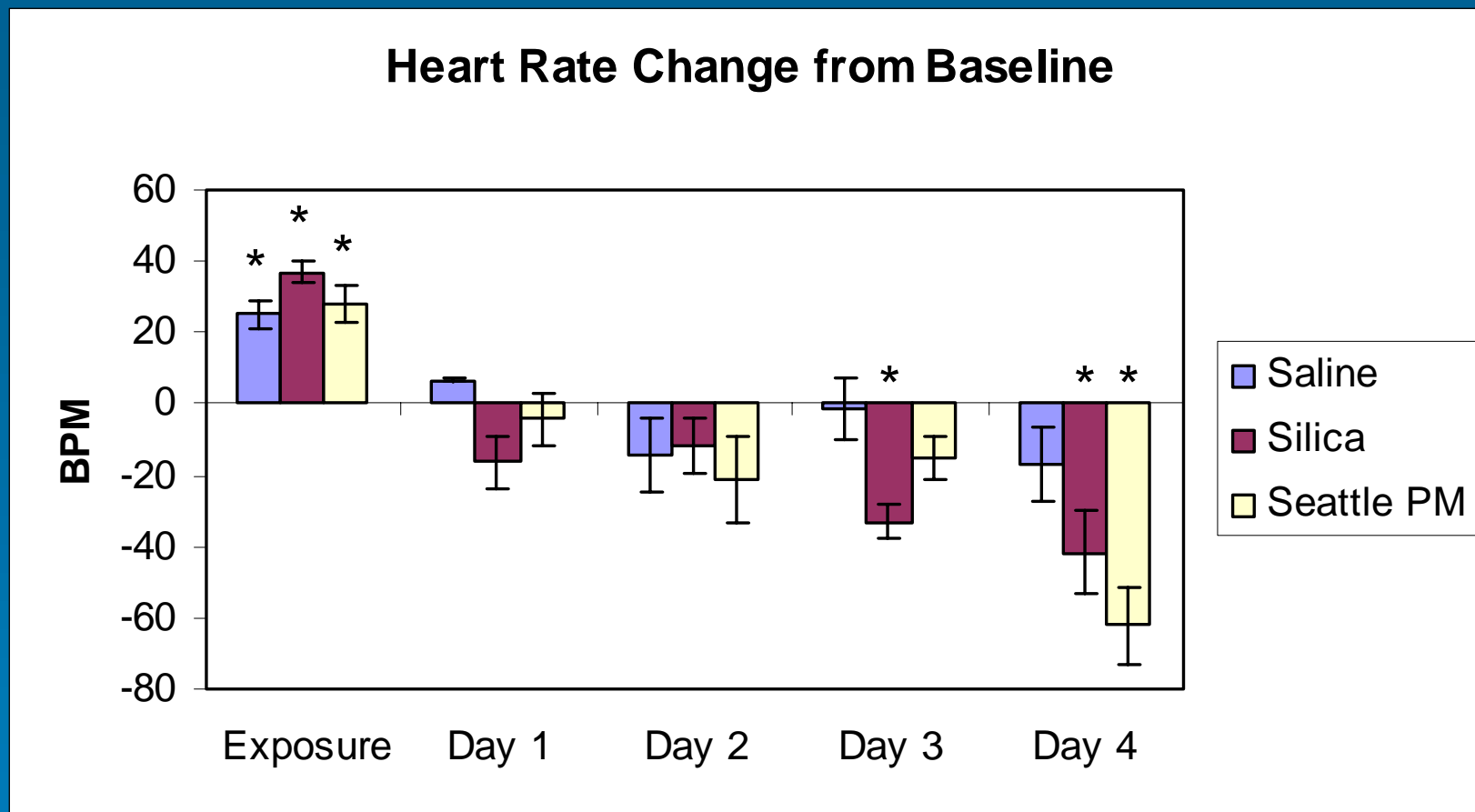
- Mice implanted with telemetry devices to measure ECG
- ECG is measured in untethered, unanaesthetized animals

ECG



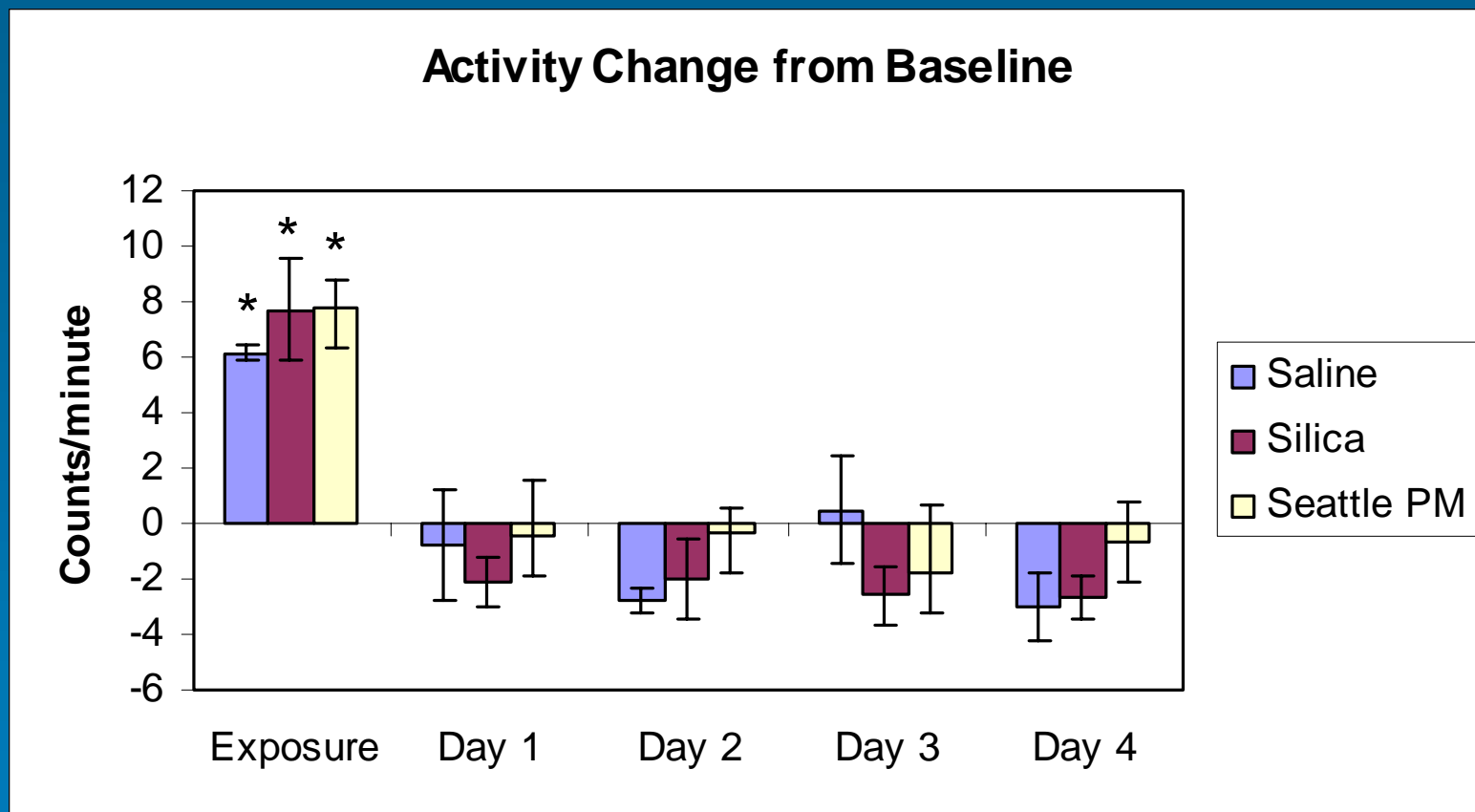
- Heart Rate
- Time Domain Parameters (SDNN, rMSSD)
 - Measure of interbeat interval
- Frequency Domain Parameters (HF, LF, VLF)
 - Measure of variance as it distributes as a function of frequency

Figure 1A



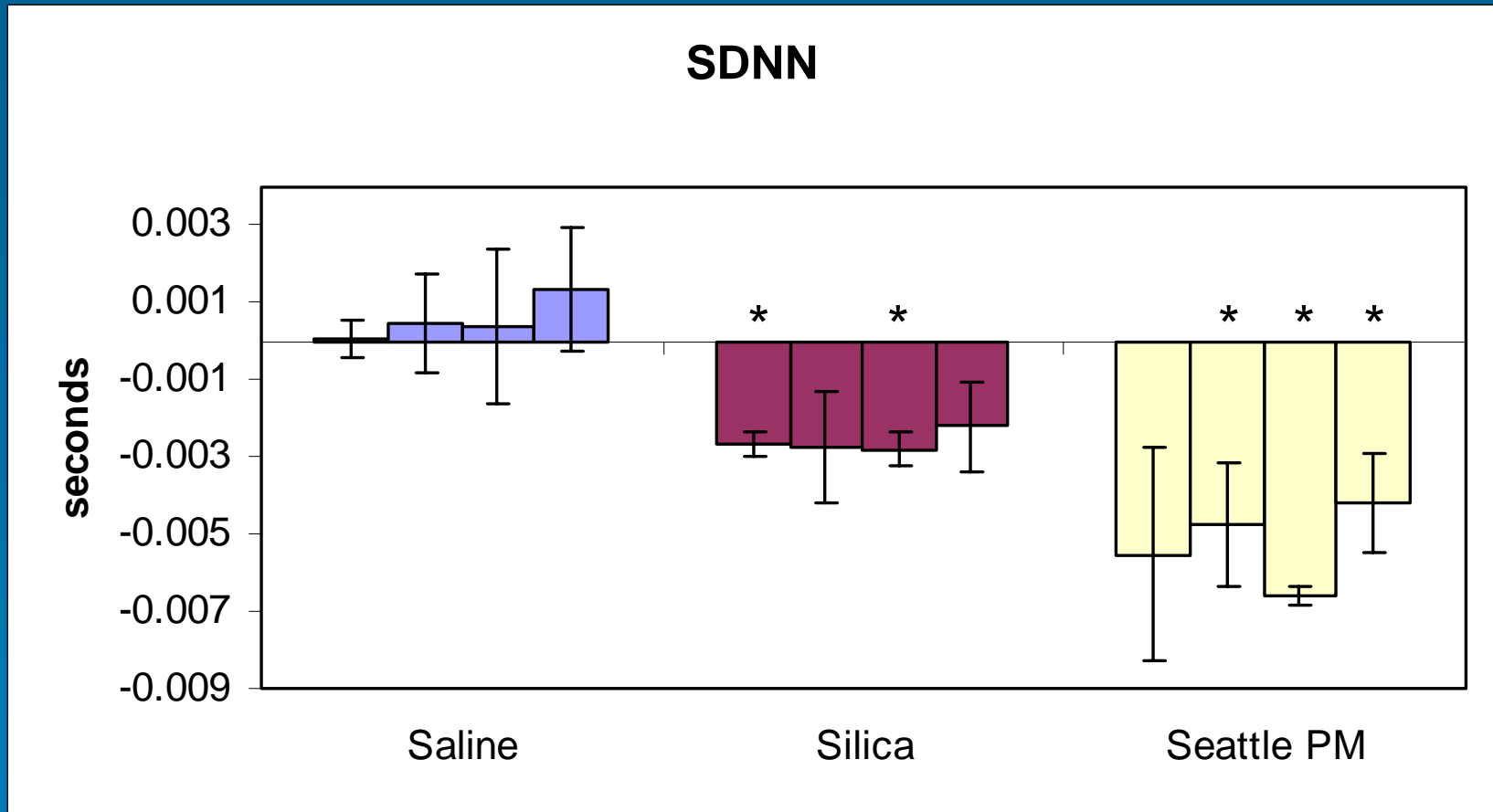
Change in heart rate following exposure to saline, silica or Seattle PM. * $p < 0.05$ compared to baseline values.

Figure 1B



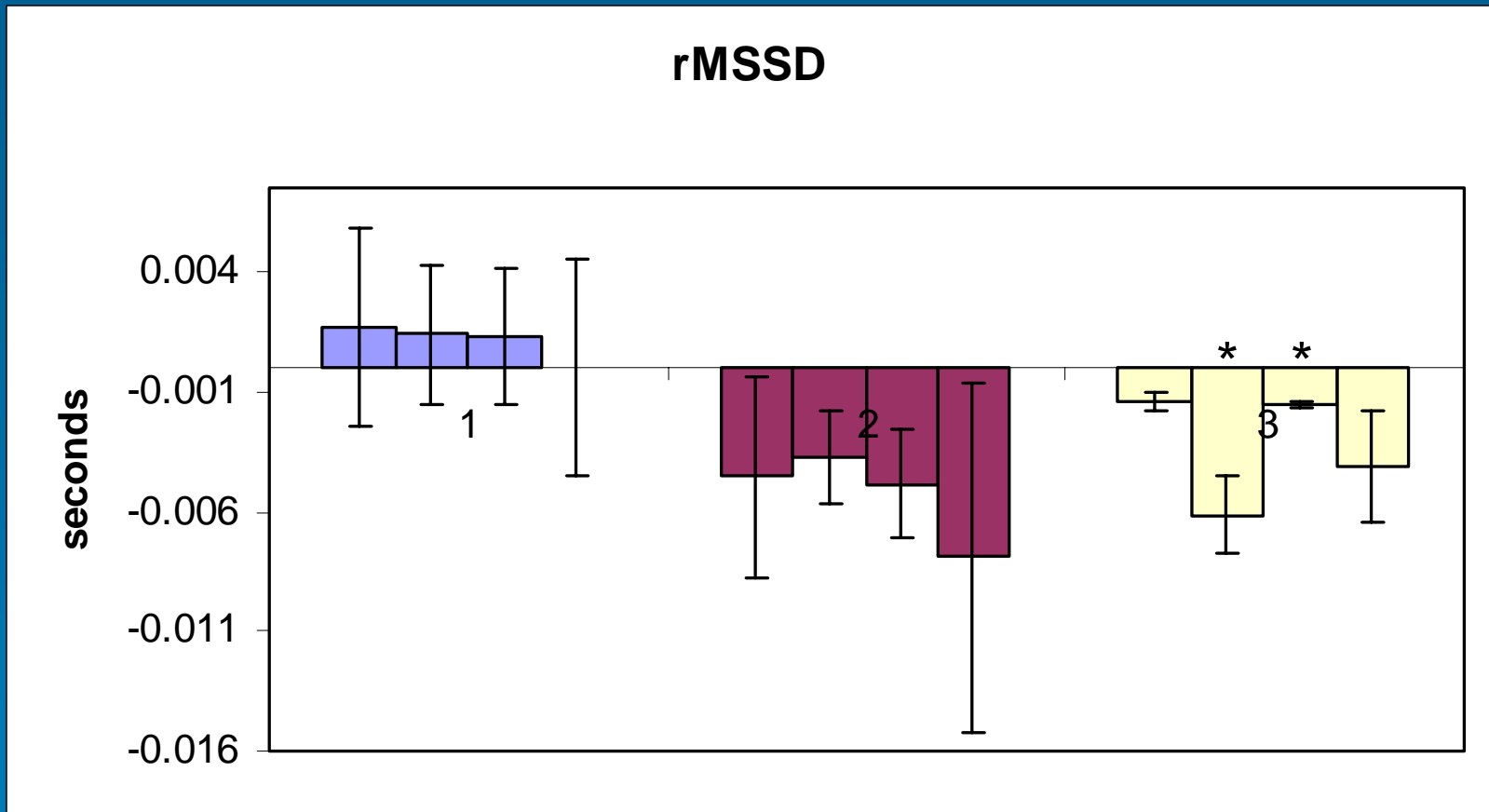
Change in activity following exposure to saline, silica or Seattle PM. * $p < 0.05$ compared to baseline values.

Figure 2A



Change in SDNN following exposure to saline, silica or Seattle PM. * $p < 0.05$ compared to baseline values. Data is shown chronologically for each group, ie Day 1 is on the left ending on day 4 on the right.

Figure 2B



Change in rMSSD following exposure to saline, silica or Seattle PM. * $p < 0.05$ compared to baseline values. Data is shown chronologically for each group, ie Day 1 is on the left ending on day 4 on the right.

Heart Rate Variability in ApoE^{-/-} Mice Based on Frequency Domain Analysis

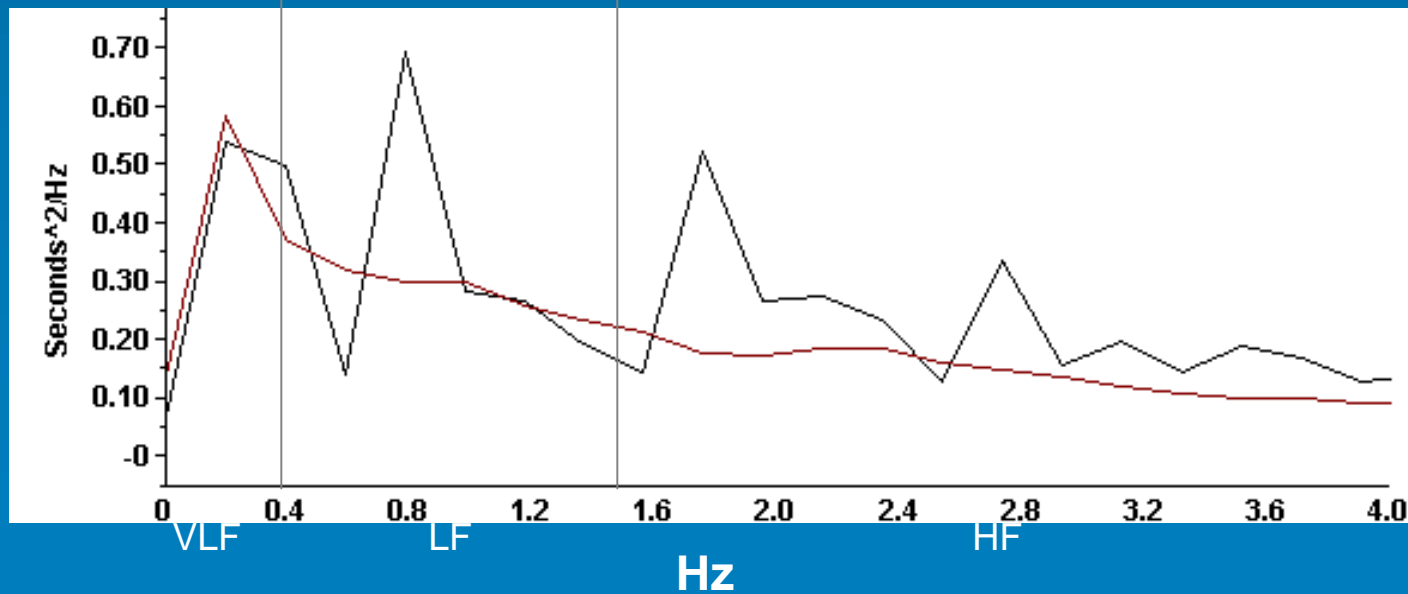
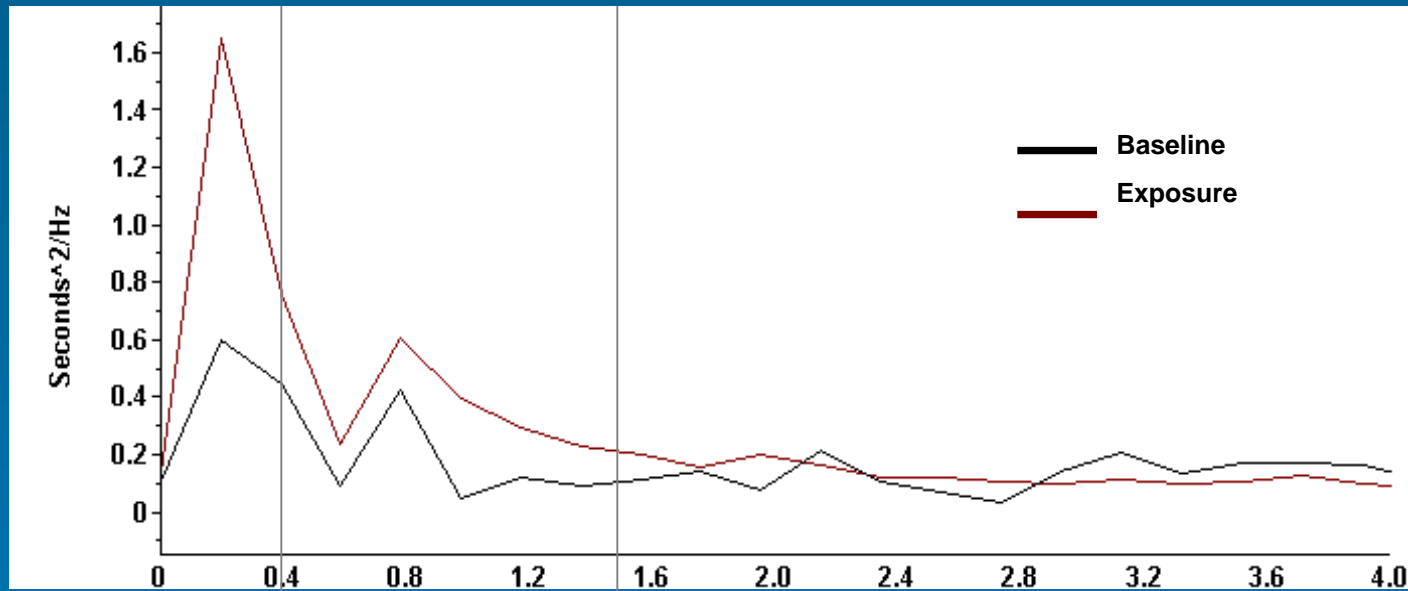
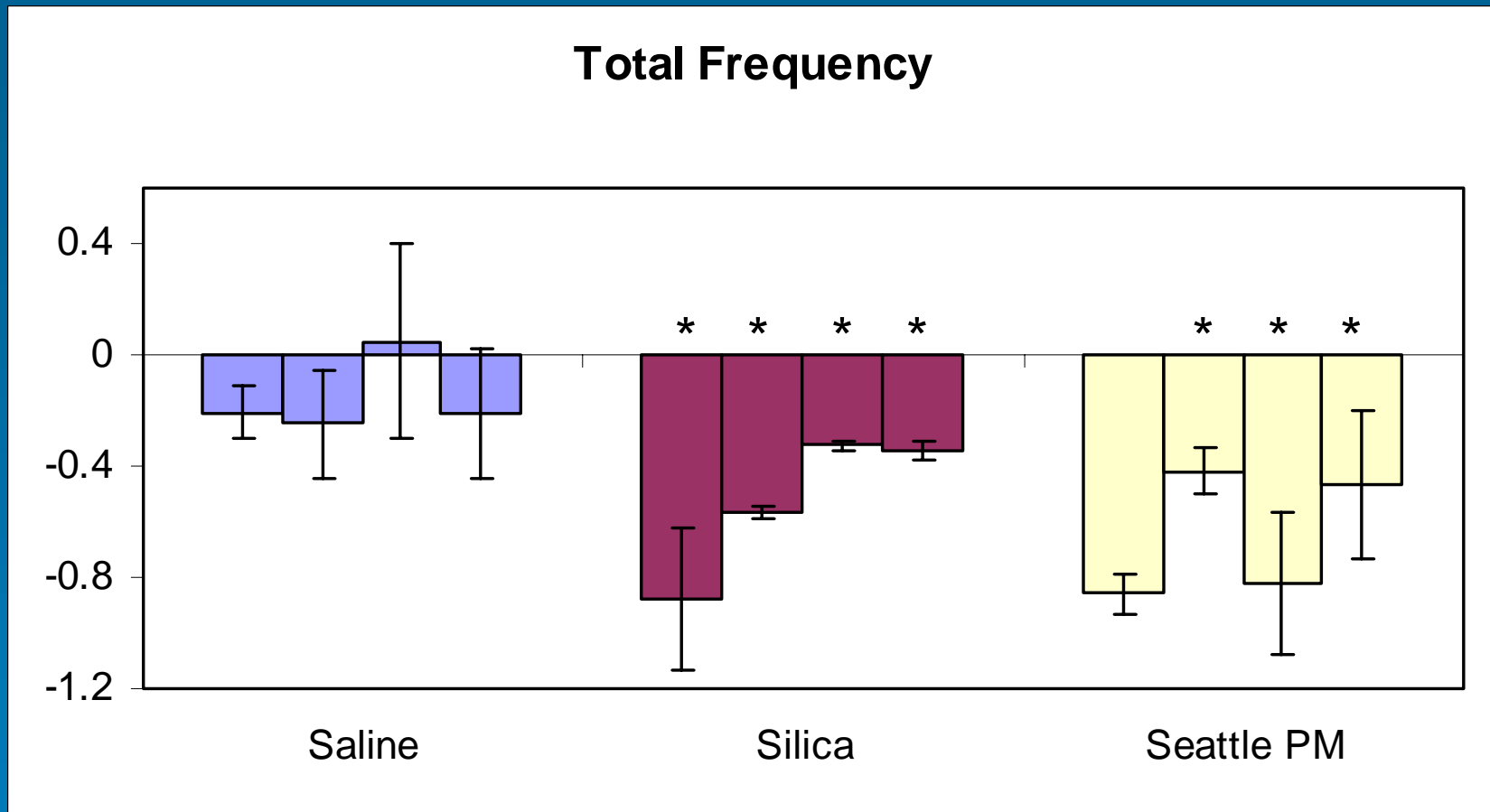
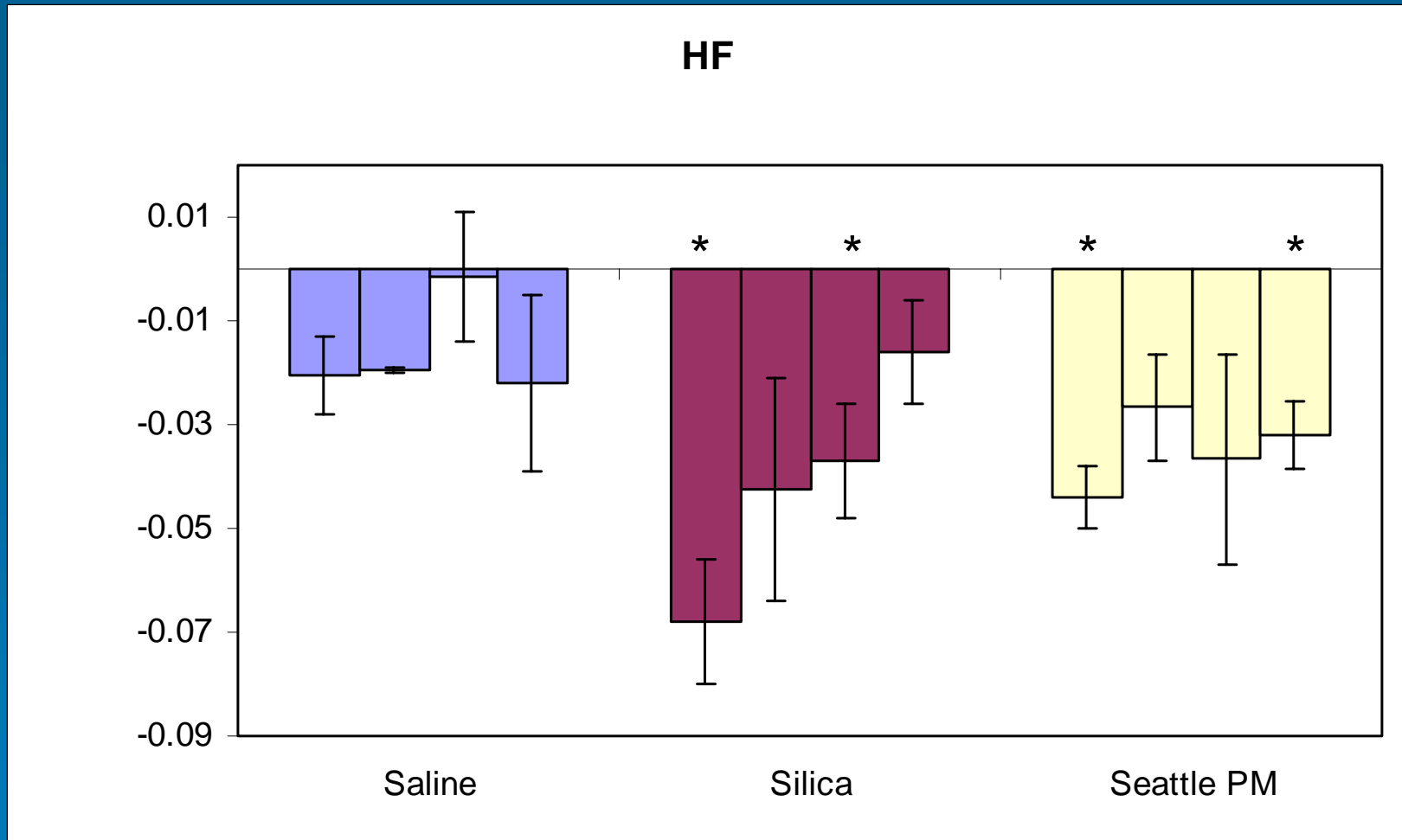


Figure 3A



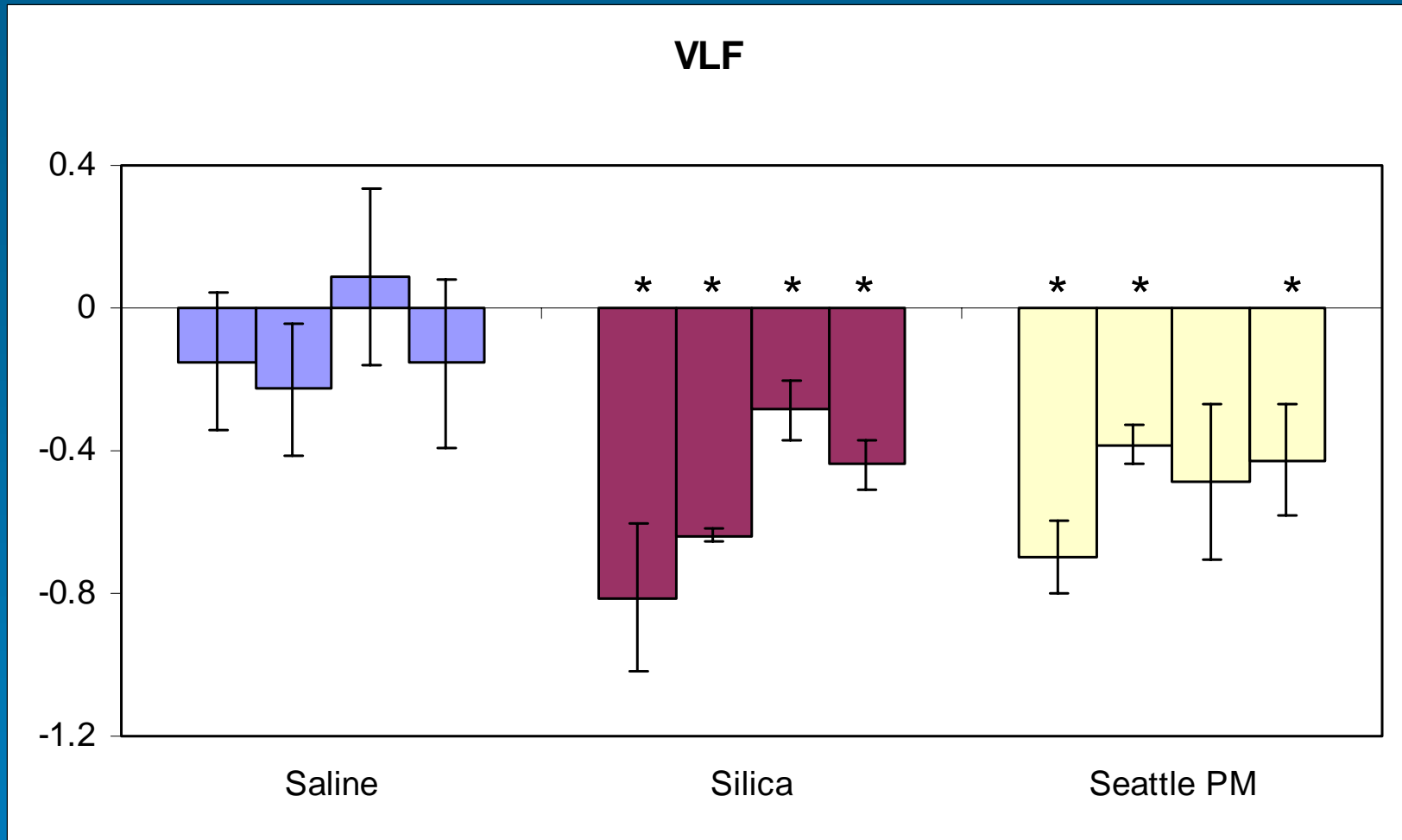
Change in total frequency following exposure to saline, silica or Seattle PM. * $p < 0.05$ compared to baseline values. Data is shown chronologically for each group, ie Day 1 is on the left ending on day 4 on the right.

Figure 3B



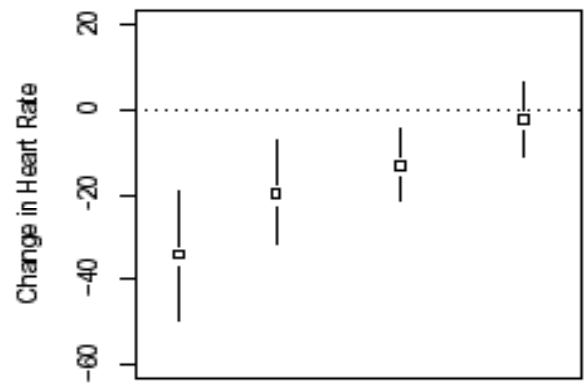
Change in high frequency following exposure to saline, silica or Seattle PM. * $p < 0.05$ compared to baseline values. Data is shown chronologically for each group, ie Day 1 is on the left ending on day 4 on the right.

Figure 3C

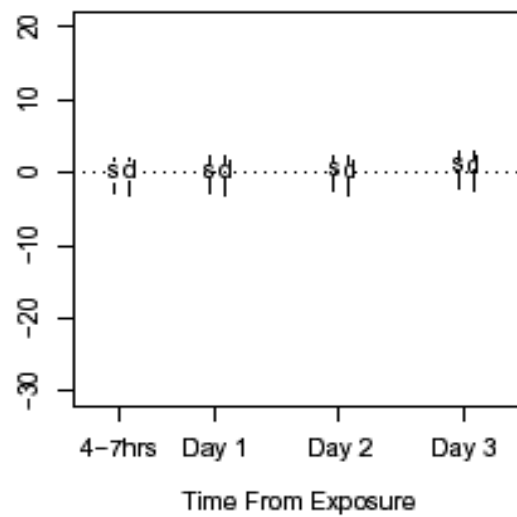
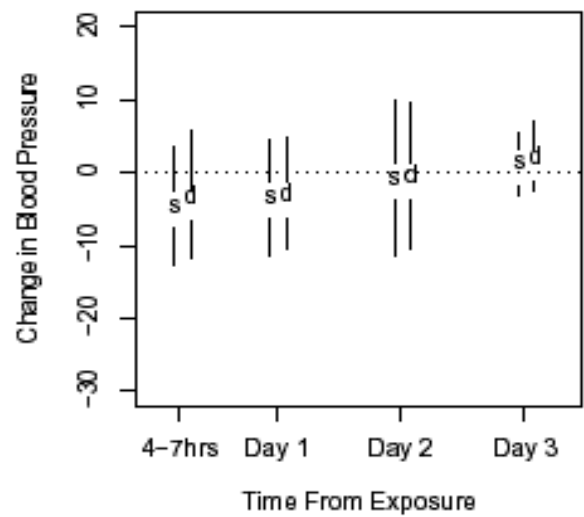
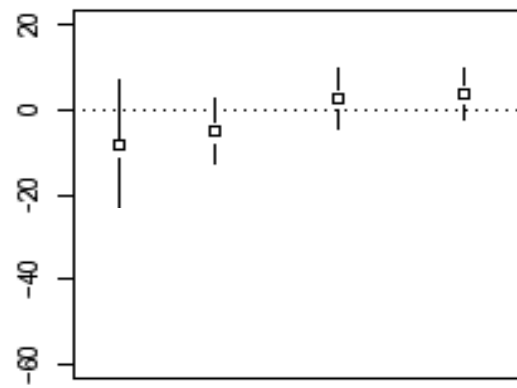


Change in very low frequency following exposure to saline, silica or Seattle PM.
* $p < 0.05$ compared to baseline values. Data is shown chronologically for each group, ie Day 1 is on the left ending on day 4 on the right.

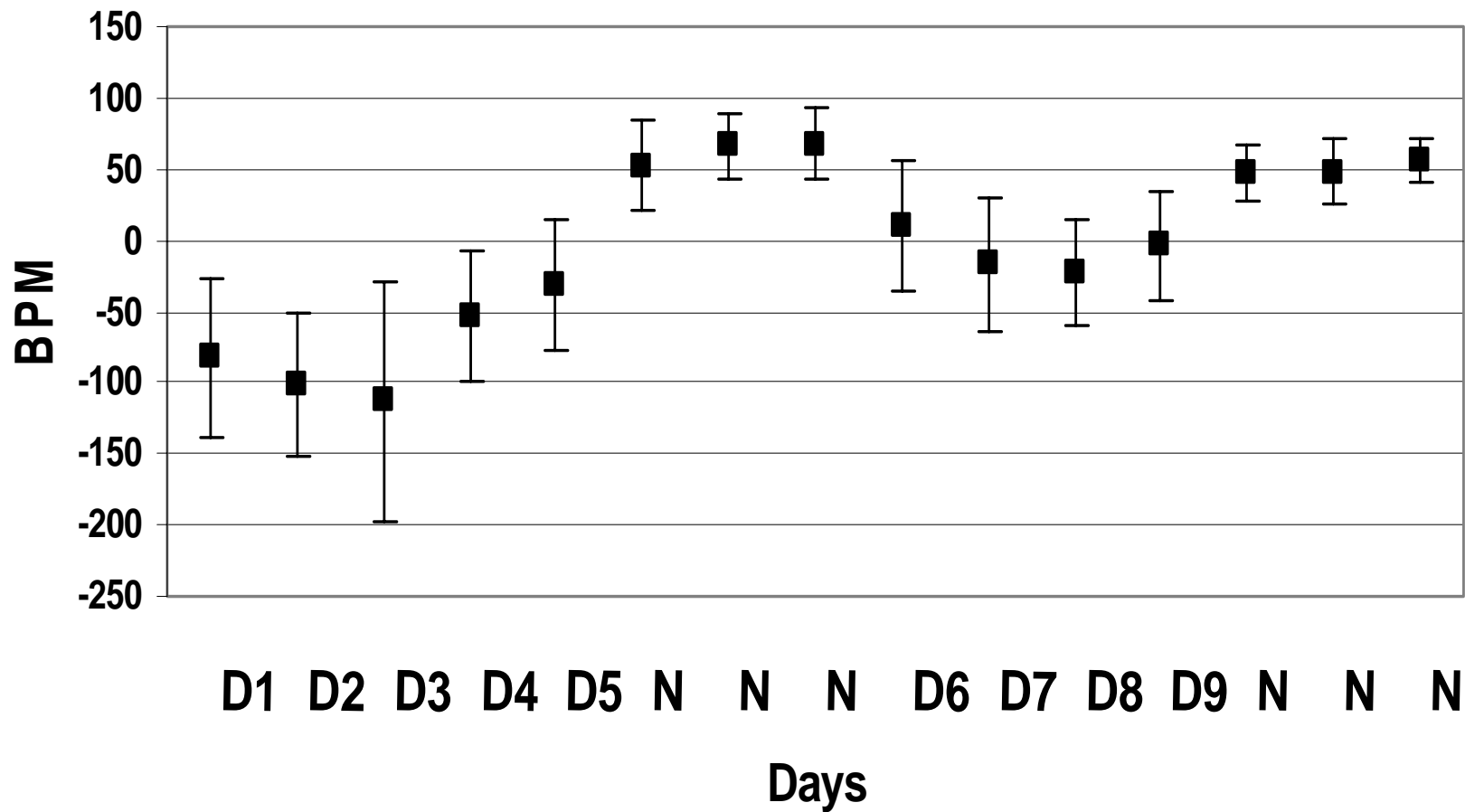
Washington, DC PM



St Louis PM



Heart Rate - Change from Baseline, 2 hr average



Conclusions

- Exposure to particulates
 - decreased heart rate
 - decreased heart rate variability (HRV)
- Frequency domain analyses suggest effects mediated via the autonomic nervous system

Thank you to...

- Lisa Corey
- Coralie Baker

- Funding:

EPA #R-827355-01-0

NIEHS #P30 ES07033