**Background**

Noise blast, due to high intense pressure waves, not only damages peripheral sensory organs such as the ears and eye, but also induces dramatic central brain damage. Battlefield, sports and road accidents are major events through which the subject can be exposed to a brain trauma. Central brain injury from blast exposure may result from damage to the inner ear or direct damage to blood vessels and axons cause by shear stress from the concussive blast.

Previous studies showed that activated microglia, resident immune cells in the brain, may contribute to neurodegeneration. Prolonged activation of microglia may contribute to or may be indicative of sustained neural degeneration.

**Activate microglia markers**

**Experimental Design**

**Subjects:**
3-4 month old male Sprague-Dawley rats.

6 Noise blasts @ 190 dB

Sacrificed 6 months after noise blast exposure

Obtain 40 micron sections from cochlear nucleus and hippocampus

Brains removed and cryoprotected in 30% sucrose solution

**Immunohistochemistry**

**•** Used to reveal the location of desired CD68 within a brain section

**•** Antibodies are linked to the molecules in order to visualize the location of the protein

**Conclusion**

• Our noise blast exposure induced persistent and heavy CD68 expression in the cochlear nucleus, a region that receives the auditory nerve fibers from the inner ear. These results suggest that noise-induced damage to the inner ear leads to very long term degeneration of auditory nerve fibers in the auditory brainstem.

• The noise blast caused a very modest increase of CD68 in the hippocampus suggesting that our blast had only a minor effect on the hippocampus.

**References**
