

Sunday, July 8, 2012
POSTER SESSION: CNS
7:00 p.m. Ambassador Ballroom

Guilarte T. R. Kleiman N. J. Dziedzic J. M.

[Translocator Protein 18 kDa \(TSPO\), a Potential In-Vivo Biomarker of Space Radiation Induced CNS Injury](#) [#8102]

Translocator Protein 18 kDa (TSPO) is an early, sensitive and predictive biomarker of brain injury, neuro-inflammation, and neurodegeneration that can be quantitatively measured in the living human brain using non-invasive techniques.

Mao X. W. Gridley D. S.

[Role of NADPH Oxidase in Low-Dose Radiation-Induced Neurovascular Remodeling in Mouse Hippocampus](#) [#8049]

The purpose of this study is to investigate whether the superoxide-producing enzyme NADPH oxidase is involved in alterations of neurovascular remodeling induced by low-dose proton radiation.

Marty V. Minassian N. Cohen T. Nelson G. Spigelman I.

[Radiation-Induced Alterations in Synaptic Transmission of Dentate Granule Neurons Depend on the Dose and Species of Charged Particles](#) [#8100]

Using whole-cell patch clamp recording, excitatory and inhibitory neurotransmission of hippocampal dentate granule neurons was examined in male C57BL/6 mice at three months after they were irradiated with protons, silicon, or iron-charged particles.

Moncaster J. A. Wojnarowicz M. Sarangi S. Minaeva O. Blakely E. A. Goldstein L. E.

[Effects of Space Radiation on Hippocampal-Dependent Learning and Neuropathology in Wild-Type and Alzheimer's Disease Transgenic Mice](#) [#8119]

It is unknown how space radiation causes cognitive impairments and by what mechanism(s) radiation exposure might predispose individuals to develop Alzheimer's disease. We are investigating this issue.

Raber J. Allen A. Baure J. Habdank-Kolaczowski J. Davis M. J. Olsen R. Yeiser L. Rosi S. Fike J. R.

[Charged Particle Radiation, Reactive Oxygen Species, and CNS Function](#) [#8057]

Low-dose whole-body space irradiation causes hippocampus-dependent cognitive changes and changes in neurogenesis in the dentate gyrus but there does not seem to be a simple relationship between radiation-induced changes in cognition and neurogenesis.

Rabin B. M. Gomes S. Shukitt-Hale B. Heroux N. Bonilla J. Carrihill-Knoll K. L.

[Reliability of the Disruptive Effects of Exposure to Protons on Neurocognitive Performance](#) [#8001]

Although exposures to protons reliably produced deficits in cognitive performance, there were differences in the effectiveness with which protons produce a decrement in performance between two separate runs.

Rudbeck E. Vlkolinsky R.

[Functional Effects of Proton Radiation on Synaptic Transmission and Plasticity in the Hippocampus of APP/PSEN1 Transgenic Mice](#) [#8084]

We describe effect of proton radiation on synaptic plasticity in the hippocampal neurons of APP/PSEN1 transgenic mice. We used *in vitro* electrophysiology to test if radiation aggravates decrements associated with Alzheimer's type neurodegeneration.

Shih H.-Y. Rivera P. D. LeBlanc J. A. Cole M. G. Amaral W. Z. Eisch A. J. Chen B. P. C.

[Fractionated and Non-Fractionated High-LET ⁵⁶Fe HZE Particle Radiation Cause Similar Long-Term Deficits in Adult Hippocampal Neurogenesis](#) [#8069]

We find that fractionated vs. non-fractionated delivery of 1.0 Gy of ⁵⁶Fe particles are equally detrimental to hippocampal neurogenesis in mice. Thus, past work with non-fractionated delivery is useful for predicting the CNS risk of space radiation.

Sokolova I. Obenaus A. Nelson G. Vlkolinsky R.

[*Radiation-Induced Suppression of LTP is Associated with Altered Intrinsic Membrane Properties in Hippocampal CA1 Neurons*](#) [#8106]

1 Gy radiation with H⁺ reduced hippocampal neuron excitability and suppressed LTP in the CA1 area of the hippocampus. At the cellular level, these changes were associated with altered intrinsic membrane properties of the CA1 pyramidal neurons.

Sureshkumar M. A. Chaudhary P. C. Dhawan J. A. Biegon A. Naidu M.

[*Fractionated Ionizing Radiation Skews Differentiation of Glial/Oligodendrocyte Progenitor Cells and Induces Cognitive Defects*](#) [#8041]

We find significant induction of DNA repair enzyme apurinic endonuclease-1 and inhibition of glial progenitor cell differentiation, with dose fractionation. Our rat spinal cord study indicates demyelination and significant cognitive defects nine months post exposure.

Vlkolinsky R. Campbell-Beachler M. Sokolova I. Obenaus A. Nelson G. A.

[*Functional Effects of Proton, Silicon and Iron Radiation on Synaptic Excitability in the Mouse Hippocampus*](#) [#8114]

This study compares functional effects of low doses of proton, silicon, and iron radiation on synaptic excitability and plasticity in three major neuronal fields of the mouse hippocampus.