**Thursday, February 13, 2014**

**CENTRAL NERVOUS SYSTEM RISKS**

**2:10 p.m.   Expo Hall A3**

**Chairs:** Greg Nelson
Jacob Raber

2:10 p.m. Nelson G.   Allen A.   Fike J.   Limoli C.   Raber J.   Rosi S.   Soltesz I.
Spigelman I.   Vlkolinsky R.
*Responses of the Brain to Space-Like Radiation: NSCOR Project Highlights [#3310]*
The NSCOR project investigates the responses of the central nervous system to space-like charged particle exposure.

2:30 p.m. Raber J.   Rosi S.   Zuloaga D.   Jopsom T.   Marzulla T.   Stewart B.   Turker M.   Impey S.
The Relation Between Cognitive Injury, Network Stability, and Epigenetic Change Following Exposure to Space Radiation [#3078]
This project focuses on how changes in hippocampal network stability and DNA methylation contribute to the development of cognitive dysfunction after space irradiation. We observed that space radiation triggers epigenetic changes that regulate structural remodeling of the neuronal architecture.

2:45 p.m. Lucero M. J.   Redfield R. L.   Ito N.   Mukherjee S.   Shih H. S.   Rivera P. D.   Birnbaum S. G.
Chen B. P. C.   Eisch A. J.
*Pattern Separation is Enhanced in HZE-Irradiated Adult Mice [#3294]*
HZE radiation negatively influences hippocampal function. We found that HZE-irradiation had a positive effect on pattern separation, a hippocampal task, in adult mice but a negative effect in young adult mice. Our data suggest an age dependence of the effect of HZE radiation on hippocampal function.

3:00 p.m. Britten R. A.   Davis L. K.   Jewell J.   Miller V.   Lonart G.
*Executive Function in Socially-Mature Rats is Significantly Impaired by Low (<20 cGy) Doses of HZE Particles with LETs of 51–180 keV/um [#3033]*
The ability of socially mature male rats to perform Attentional Set Shifting after exposure to low (<20 cGy) of HZE particles with LETs ranging from 51–180 keV/um has been determined. All HZE beams led to decreased performance, but the dose response varied considerably between the beams.

3:15 p.m. Wyrobek A. J.   Lowe X. R.   Rabin B. M.   Bhatnager S.   Rademaker P.   Northen T.
Witkowska E.   Straume T.   Snijders A.
*Molecular and Cellular Defects in the Choroid Plexus, CSF, and Hippocampus of Animals with Persistent Neurocognitive Deficits After Exposure to HZE Radiation [#3321]*
The choroid plexus, a small cauliflower-like CNS structure that produces CSF and maintains blood-brain homeostasis, shows persistent HZE-induced histological and molecular defects that are associated with long-term neurocognitive dysfunctions.

Effects of Galactic Space Radiation Exposure on Neurionflammatory Pathology and Hippocampal-Dependent Learning and Memory in Wild-Type and Alzheimer’s Disease Transgenic Mice [#3330]

The hippocampus is required for memory formation and is affected in Alzheimer’s disease (AD). We exposed mice to $^{56}$Fe and $^{28}$Si particle irradiation; found microvasculopathy and inflammatory cell infiltration in the brain that may contribute to chronic AD-linked neuropathology and functional sequelae.

3:45 p.m. Grabham P. Guida P. Sharma P.

Effects of Ionizing Radiation on the Human Endothelial Barrier [#3275]

Ionizing photons, low LET charged particles, and HZE particles all affect the endothelial barrier. Photons cause a transient effect on barrier function. Charged particles compromise the barrier over a longer time period with HZE particles being the most potent.