**Jon Schoorlemmer**. Invited speaker at Advanced biomedical science session:

Title: *In vitro stem cell models for neurodegenerative disease.*

Keywords: Stem cell models, neuron, oligodendrocyte, Multiple Sclerosis, Human endogenous retroviruses, neuroinflammation, Interferonβ.

Abstract.

I will present the interest of our research group in the generation of *in vitro* models for neurodegenerative disease. Oligodendrocytes and neurons can be used to analyze pathophysiological mechanisms that are hardly accessible *in vivo*. Multiple sclerosis (MS) is a chronic inflammatory and degenerative disease of the central nervous system (CNS) of unknown etiology. Endogenous retrovirus (ERV) are carried in the human germline, probably as a result of ancestral retroviral infections, and HERVs comprise approximately 8% of the genome. Their expression is repressed under physiological conditions in most tissues, but its activity has been associated with tumorigenesis, and with diseases of the CNS such as sporadic Amyotrophic Lateral Sclerosis (ALS) and Multiple Sclerosis (MS). Toll-like receptors (TLRs) detect viral proteins or nucleic acids and mediate an antiviral response that includes Interferonβ (IFNβ) induction. We considered the possibility that overexpression of HERV-W may induce an inflammatory response within the CNS. We therefore investigated whether dsRNA transcribed from HERV *loci* is capable of triggering an immune response in stem cell-derived neural precursor cells. We show that Lentivirus-mediated HERV-W overexpression induced expression of INFβ, possibly through TLR3. Finally, I will briefly overview future approaches to improve the utility of models and better understand neuroinflammation.