Abstract **454**, Date **1:00 pm, Sunday, February 20, 2005 (24 hours)**
Session **: D7: Auditory Nerve**

TEM Analysis of Innervation Patterns on Hair Cells in Normal Canary and a Canary with Progressive, Genetic, Inner Ear Abnormality (Belgian Waterslager Canary)

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Belgian Waterslager canaries (BWS) show a rapid, progressive, genetic inner ear abnormality, that results in minimal changes in the number of auditory nerve fibers (Gleich et al 2001) and cells in the first order cochlear nuclei (Kubke et al 2002) in adults. However, no studies have analyzed changes at the level of the adult hair cell synapse. Since many more hair cells are lost (~30%) than neural fibers (~12%) it has been suggested that the remaining adult BWS hair cells may have a greater afferent synaptic density than normal.

In the current study we use serial TEM sections from a position 80% of length from the basal tip of the basilar papilla (BP) to quantify synaptic density in non-BWS and BWS canary. At this position 14-16 hair cells are seen across the width of the non-BWS, BP. Preliminary results from serial reconstruction of 6 hair cells along the neural edge in non-BWS canary show at least two patterns of afferent innervation: 2 hair cells with 5- afferent synapses and an occasional single efferent synapse, and 4 hair cells with 1-2 large afferent synapses and no efferent synapses. These preliminary results suggest a synaptic density for neural hair cells in the apical region of the non-BWS, BP which may be similar to the synaptic density reported for neural hair cells in the apical region of barn owl BP (Fischer 1994).

Preliminary observations of TEM serial sections in BWS reveal only 6-8 hair cells across the width of the BP. Reconstruction of hair cells on the neural edge in BWS will be used to quantify synaptic density for comparison with patterns seen in non-BWS. These results offer the first direct measurements of synaptic density on apical hair cells in normal and genetically abnormal canary inner ear and provide a first step toward understanding the synaptic consequences of hair cell loss and regeneration in a bird with progressive, genetic inner ear abnormality. (Supported by NIDCD R01DC00132 to RJD and BMR)