

## **ALTERATIONS IN SKIN EPIDERMIS IN HIV ASSOCIATED SENSORY NEUROPATHY**

**B.H. Pan**<sup>1,2</sup>, Y. Liu<sup>1</sup>, J. McDonald<sup>1,2</sup>, J. McArthur<sup>1,3,4</sup>, M. Polydefkis<sup>1</sup>

<sup>1</sup>*Department of Neurology, Johns Hopkins University, Baltimore, USA*

<sup>2</sup>*Spinal Cord Injury, Kennedy Krieger Institute, Baltimore, USA*

<sup>3</sup>*Department of Epidemiology, Johns Hopkins University, Baltimore, USA*

<sup>4</sup>*Department of Pathology, Johns Hopkins University, Baltimore, USA*

[span2@jhmi.edu](mailto:span2@jhmi.edu)

Punch skin biopsy developed in recent years has been proved to be a useful technique to diagnosis peripheral neuropathy by assessing small nerve fiber innervation. However, we have relatively little insight into epidermal cells/appendages that serve as the host environment for epidermal nerves and/or specialized sensory complexes. Given this, we investigated several epidermal and subdermal structures in normal healthy subjects and compared with age matched patients diagnosed with HIV associated sensory neuropathy (HIVSN). Merkel cell (MC) is known as the touch sensory complex structure. Distribution of MC in healthy controls showed a scattered pattern with considerable variability. There was a gradient reduction in the density of MC from proximal thigh to distal leg. Compared to normal humans, in patients with HIVSN there is a 35% reduction in the number of MC. In addition, we observed that many cells with dendritic-like processes in the basal epidermis express Tuj1 (class III  $\lambda$ -tubulin, a neuronal marker). Many Tuj1-positive cells were shown in close contact with epidermal axons as revealed by dual immunohistochemistry. They were pyramidal with the process pointing towards epidermal surfaces. The density of these cells was gradually reduced from proximal thigh to distal leg. When compared to healthy controls, patients with HIVSN demonstrated a significant reduction in the number of Tuj1 positive cells ( $p < 0.01$ ). Further characterization of these Tuj1+ cells might help to understand the processes and mechanisms of peripheral neuropathy, which could be potentially used as novel measures to increase the diagnostic yield of skin biopsy.