# Chaga Mushroom Extract as an Inhibitor of HNSCC Cell Migration

Dushane, Victoria (School: Sherman Indian High School)

Head and neck squamous cell carcinoma (HNSCC) comprises approximately 90% of all head and neck cancers and represents the sixth most common type of cancer worldwide. Surgery, radiotherapy and chemotherapy have become the standard treatment for HNSCC. These treatments are physically and emotionally debilitating and are selected on the basis of tumor size and spread rather than on the biology of individual tumors. Chaga Mushroom (Inonotus obliquus) is a rot fungus belonging to the hymenochaetaceae family of basidiomycetes. Scientific studies have shown that Chaga mushroom extracts have anti-tumor effects, but despite increased usage and reported beneficial effects, the pharmacological actions of Chaga have not been well documented. Thus, relatively limited scientific evidence for the effectiveness and mechanism of action of Chaga has prevented its incorporation into mainstream medical care, and no reports exist describing its use in head and neck squamous cell carcinoma. In the present study, we describe a novel role for Chaga extract as an inhibitor of proliferation and migration in metastatic UM-SCC-17B HNSCC cells. Cellular proliferation, migration, and E-cadherin cellular signaling profiles were examined in Chaga-treated and untreated HNSCC cells using the CyQUANT proliferation assay, an established in vitro migration assay, and Western-blotting techniques, respectively. Chaga significantly inhibited 24-hour proliferation and migration in HNSCC cells in a dose-dependent manner. Furthermore, Chaga induced E-cadherin expression, a transmembrane glycoprotein of the cell-cell adhesion transmembrane molecule, providing a potential mechanism for the inhibition of migration observed. Present data suggests that Chaga holds promise as a therapeutic agent against HNSCC.

**Awards Won:**