

Identification of a peptide containing polysaccharide secreted by *Hericiium erinaceus* with cell cytotoxic effects on U87MG glioblastoma cells

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In the United States, the five-year survival rate of glioblastoma is 6.8%. Current therapies include surgical removal of tumor tissues followed by radiation and chemotherapy. Development of alternative therapies with reduced side effects and increased efficacy will be required to improve glioblastoma patient's survival rates. *Hericiium erinaceus*, also known as Lion's Mane, has been used in Chinese traditional medicine for millennia to treat weak immune system function, gastric ulcers, and for general nutrition. Additionally, studies on *H. erinaceus* extractions taken orally have suggested an increase in cognitive ability and improved memory. *H. erinaceus* has been shown to produce Erinacine A, which stimulates nerve growth factor in neurons. Given the dramatic impact on nervous tissues, the authors investigated whether *H. erinaceus* secretes compounds which can reduce cell viability in a glioblastoma cell model. Optimal culture of *H. erinaceus* mushroom mycelia was achieved on potato dextrose yeast peptone agar (PDYPA) plates. Secretions were collected after 4-6 weeks of growth. *H. erinaceus* secretions were analyzed with fast protein liquid chromatography (FPLC). A peptide containing polysaccharide was identified at approximately 100 KDa. The glioblastoma cell line U87MG was chosen to determine effects of *H. erinaceus* secretions on cell viability. Cell viability assays suggest that secretions from *H. erinaceus* reduce U-87 MG cell viability by 32%. To better understand the effects of *H. erinaceus* secretions on non-tumorigenic cells, MCF10A cells were also subjected to *H. erinaceus* secretions in a viability assay. MCF10A cell viability was unchanged or improved following *H. erinaceus* secretion exposure. Future studies will focus on further characterization of secreted compounds from *H. erinaceus* and animal model studies.