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Ganoderma lucidum polysaccharide inhibits prostate cancer cell migration via the protein arginine methyltransferase 6 signaling pathway

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Abstract

Prostate cancer is one of the most common types of malignant tumor of men worldwide and the incidence and mortality rate is gradually increasing. At present, the molecular mechanisms of growth and migration in human prostate cancer have not been completely elucidated. Studies have demonstrated that Ganoderma lucidum polysaccharides (GLP) can inhibit cancer. Therefore the present study investigated the effect and molecular mechanism of GLP on cell growth and migration of LNCaP human prostate cancer cells. LNCaP cells were transfected with either a protein arginine methyltransferase 6 (PRMT6) overexpression plasmid or PRMT6 small interfering (si)RNA. The cell growth and migration, and the expression of PRMT6 signaling-associated proteins, were investigated following treatment with 5 and 20 µg/ml GLP. The results demonstrated that GLP inhibited cell growth, induced cell cycle arrest, decreased PRMT6, cyclin-dependent kinase 2 (CDK2), focal adhesion kinase (FAK) and steroid receptor coactivator, (SRC) expression, and increased p21 expression in LNCaP cells, as determined by using a Coulter counter, flow cytometry, and reverse transcription-quantitative polymerase chain reaction and western blotting, respectively. Furthermore, GLP significantly inhibited cell migration, as determined by Transwell migration and scratch assays, and altered CDK2, FAK, SRC and p21 expression in LNCaP cells transfected with the PRMT6 overexpression plasmid. By contrast, PRMT6 knockdown by siRNA reduced the effect of GLP on cell migration. These results indicate that GLP was effective in inhibiting cell growth, the cell cycle and cell migration, and the suppressive effect of GLP on cell migration may occur via the PRMT6 signaling pathway. Therefore, it is suggested that GLP may act as a tumor suppressor with applications in the treatment of prostate cancer. The results of the present study provide both the preliminary theoretical and experimental basis for the investigation of GLP as a therapeutic agent.

Figures

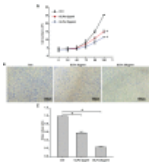

Figure 1. GLP inhibited cell growth of...

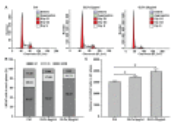

Figure 2. GLP inhibited cell cycle arrest...

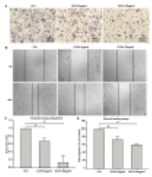

Figure 3. GLP inhibited cell migration in...

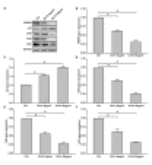

Figure 4. Effect of GLP on the...

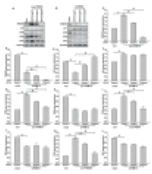

Figure 5. GLP inhibited the PRMT6 signaling...

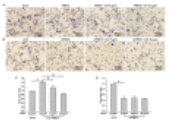

Figure 6. GLP inhibited the migration of...

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