**Glucose uptake activity of *Ganoderma lucidum* QRS 5120 in L6 myotube cell**

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**Abstract**

The increasing prevalence of diabetes mellitus alongside the advancements in industry and technology underscores the urgency to eliminate this disease. *Ganoderma lucidum*, renowned for its anti-diabetic, anti-microbial, and anti-inflammatory properties, is widely utilized as a therapeutic medication. The aim of this study was to investigate the glucose uptake activity of exopolysaccharides (EPS) derived from the identified Malaysian *Ganoderma lucidum* strain QRS 5120 on the L6 myoblast cell line. To achieve this, Ganoderma pellets were cultured using a bioreactor, and EPS were extracted from the pellet for testing its glucose uptake activity. EPS production peak at day 12 (83 g/L) of the cultivation. The extracted EPS underwent a sulfation process to enhance compound solubility and flexibility. This was confirmed by Fourier-transform infrared spectroscopy (FTIR), where sulfation resulted in a sharp vibrational stretch at 1622 cm⁻¹, while unsulfated EPS exhibited a medium stretch at 1632 cm⁻¹. The glucose uptake activity assay revealed that a significantly lower concentration of residual glucose was observed at 500 μg/L (0.43 mg/mL) and 200 μg/L (0.45 mg/mL) when compared to the control group, indicating that EPS has a stimulatory effect on glucose uptake activity in L6 myotube cell lines. Consequently, from this preliminary study, it was shown that the EPS derived from the Malaysian strain *Ganoderma lucidum* QRS 5120 exhibits glucose uptake activity in skeletal muscle cells.

**Keywords:** *Ganoderma lucidum*, glucose uptake, residual glucose, exopolysaccharides, sulfation