

## Bioactive Potential of Fungal Polysaccharides in Lipopolysaccharide-Stimulated BV-2 Cells through MAPK Signaling Pathways

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**SUMMARY.** In this study, it was aimed to investigate some biological activities and antiinflammatory potential of polysaccharides isolated from three wild mushroom species in LPS-activated BV-2 cells. Monosaccharide units of fungal polysaccharides were identified by High Pressure Liquid Chromatography. The productions of TNF- $\alpha$ , IL-6 were determined by ELISA. The expressions of iNOS and COX-2 were measured by RT-PCR analysis. The activations of signalling molecules were detected by Western blotting using phosphorylation specific antibodies. The results of monosaccharide analysis in HPLC showed that polysaccharides of studied three mushrooms composed of mainly glucose and fructose. Our results indicated that three polysaccharides have significantly inhibited the inflammation by reducing p38 and ERK1/2 phosphorylation, IL-6 and TNF- $\alpha$  production, COX-2 and iNOS mRNA expression in LPS induced microglial cell BV-2 line without any cytotoxicity. These findings suggest that fungal polysaccharides, specially *T. claveryi* exhibit an anti-inflammatory activity that might contribute to the prevention of inflammatory diseases.

**RESUMEN.** En este estudio se propone investigar algunas actividades biológicas y el potencial antiinflamatorio de los polisacáridos aislados de tres especies de hongos silvestres en células BV-2 activadas con LPS. Los monosacáridos integrantes de los polisacáridos de hongos fueron identificados por cromatografía líquida de alta presión. Las producciones de TNF- $\alpha$  e IL-6 se determinaron por ELISA. Las expresiones de iNOS y COX-2 se midieron por análisis de RT-PCR. La activación de moléculas de señalización se detectó por transferencia Western utilizando anticuerpos de fosforilación específicos. Los resultados del análisis de monosacáridos en HPLC mostraron que los polisacáridos de los tres hongos estudiados se componen principalmente de glucosa y fructosa. Nuestros resultados indicaron que los tres tipos de polisacáridos inhibieron significativamente la inflamación mediante la reducción de la fosforilación de p38 y ERK1/2, la producción de IL-6 y la expresión de TNF- $\alpha$ , COX-2 e iNOS mRNA en la línea de células microgliales BV-2, sin mostrar citotoxicidad. Estos hallazgos sugieren que los polisacáridos de hongos, especialmente los de *T. claveryi*, exhiben una actividad anti-inflamatoria que podría contribuir a la prevención de enfermedades inflamatorias.

**KEY WORDS:** BV-2 cells, fungal polysaccharides, inflammation, LPS.

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