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Title: Bioprocess for semi-industrial production of immunomodulator polysaccharide Pleuran by Pleurotus ostreatus in submerged culture

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Abstract: Pleuran, is a polysaccharide belongs to glucan group which made of D-glucose moieties linked with (1 -> 3)- beta and (1 -> 6) -beta glycosidic linkages. The importance of this compound is based on its wide biotherapeutic application as immunomodulator and anticancer polysaccharide. This compound is produced only naturally using specific type of mushroom named Pleurotus ostreatus. Traditionally, this type of mushroom was cultivated using solid state cultivation system in green houses. Nowadays, submerged cultivation is considered as alternative cultivation strategy for mushroom based on its many advantages such as: short cultivation time, high yield, fully controlled cultivation condition, and fewer steps in polysaccharide extraction and purification compared to solid state fermentation. Thus, the present work was focused on the development of pleuran production process in semi-industrial scale using submerged cultivation system. At first, high yield production medium was selected followed by study on the kinetics of cell growth and EPS production in shake flasks. Second, cultivations were conducted in semi-industrial scale using in situ sterilizable 16-L stirred tank bioreactor under controlled and uncontrolled pH conditions. The results showed that bioreactor cultivation under controlled pH condition improved EPS production process and the maximal volumetric and specific pleuran produced in this study were 1.98 g/L and 0.445 g/g, respectively.

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