Biocompatible Cell Encapsulation by Polyphenol Originated from Plant

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Cell Encapsulation is a technology that seeks biological and chemical applications by coating live cells with artificial capsule. Through the artificial capsule, not only it is possible that scientists can add various chemical properties to cells, but also we can control the biological properties of cells. Recently, with the development of polyphenol coating technology, it has been used many times for the coating of living cells. The cell encapsulation by polyphenol features that it can easily be coated on the cells but it is to difficult to coat cells in a bio-compatible environment where cell's viability can be maintained high. Therefore, we researched to use pyrogallol, the polyphenol originated from plants, in cell encapsulation in order to encapsule the cells(yeast in our research) in more safe conditions for them. As a result, we found the optimal pyrogallol concentration and coating time safe for cells which in over 90% of yeasts could survive after the encapsulation. And we observed the artificial capsule formed on the cell’s surface by many experimental ways. Also, we could control the time of cell division by pyrogallol encapsulation. Furthermore, the encapsulation by pyrogallol could protect yeasts from an agglutination reaction against E. coli and protect yeasts in a vacuum condition(low-pressure). Finally, we conclude that the pyrogallol is the bio-compatible material for the cell encapsulation with various functions.

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