

Synthesis mechanism of bio-cellulose by cell-free system

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Microbial cellulose produced by bacteria has received massive attention in various fields because of its unique structural features. However, its production through microbial cells encounters several limitations due to the shortcomings associated with microbial growth and negative strain formation. To overcome these limitations, currently the interest is shifting towards the cell-free system development. The most familiar form of microbial cellulose is a pellicle. Since microbial cellulose grows in the higher oxygen tension, the formation of the cellulose pellicle occurs on the air-media interface of a static cultured growth media. The pellicle grows downward since cells that are entrapped into the pellicle become inactive or die due to lack of oxygen. To the best of our knowledge, production of bio-cellulose by cell-free system shows a new synthesis mechanism which is unknown well until now and much different from formation of microbial cellulose.