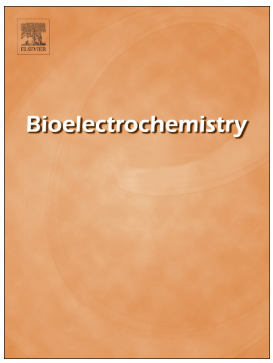

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Medium's conductivity and stage of growth as crucial parameters for efficient hydrocarbon extraction by electric field from colonial micro-algae

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Abstract

The green algae *Botryococcus braunii* produces a high amount of extracellular hydrocarbon, making it a promising algae in the field of bio-fuels production. As it mainly produces squalene like hydrocarbons, cosmetic industries are also interested in its milking. Pulsed electric fields (PEF) are an innovative method allowing oil extraction from micro-algae.

In common algae accumulating hydrocarbon inside cytoplasm (*Chlorella vulgaris*, *Nannochloropsis sp*, etc), electric fields can destroy cell membranes, allowing the release of hydrocarbon. However, for *B.braunii*, hydrocarbons adhere to the cell wall outside of cells as a matrix. In a previous article we reported that electric fields can unstick cells from a matrix, allowing hydrocarbon harvesting.

In this work, we deeper investigated this phenomenon of cell hatching by following 2 parameters: the conductivity of the medium and the cultivation duration of the culture. Cell hatching is accurately evaluated by both microscopic and macroscopic observations.

For high conductivity and a short time of cultivation, almost no effect is observed even after up to 1000 PEF pulses are submitted to the cells. While lower conductivity and a longer cultivation period allow strong cell hatching after 200 PEF pulses are applied to the cells.