



## Application of high electric field pulses for plant cell disintegration

Tulakorn Manakhajornvej<sup>1\*</sup>, Mohammad Naghi Eshtiaghi<sup>2</sup> and Nuttawan Yoswathana<sup>3</sup>

<sup>1,2,3</sup>*Department of Chemical Engineering, Faculty of Engineering,  
Mahidol University, Thailand*

\*e-mail: tulakorn.man@student.mahidol.ac.th

High Electric Field Pulses (HELP) is a non-thermal cell disintegration method for extraction of intracellular compounds. The aim of this study is to investigate the effect of HELP process parameters on cell disintegration of plant cell materials and also evaluated the prediction model for sugar cane HELP treatment using Response Surface Methodology (RSM). At 9 kV/cm and 60 pulses up to 70% cell disintegration of sugar cane was observed. Similarly, cell disintegration of coconut meat using HELP at 4 kV/cm, 60 pulses was achieved. Comparison between heat and HELP cell disintegration clearly indicated that it is possible to treated plant cell with similar or higher disintegration degree at very shorter time (about 1 min) compare to thermal method (15 min). In addition, the energy consumption for HELP treated sample was distinct lower (3 kJ/kg) than thermal treatment (200 kJ/kg).

**Keywords:** High Electric Field Pulses (HELP), cell disintegration, energy consumption, non-thermal process