



INSTITUTE FOR CELLULAR ENGINEERING

Modeling Aggregation Dynamics in *Taxus cuspidata* Cultures

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- Many pharmaceuticals are plant-derived but cannot be harvested in the amounts necessary to meet the demands of society. Plant cell culture has shown promise as an alternative production technique to this low-yielding natural extraction. Most natural products that we wish to produce in plant cell culture are secondary metabolites, or defensive molecules that are not necessary for normal growth.



The filters pictured on the left were used to separate suspension cell cultures, seen on the right, by size. From data collected, aggregation dynamics, total growth, and sucrose consumption dynamics curves were created.

- In our lab we grow *Taxus* spp. cells that produce Taxol®, an anti-cancer agent and secondary metabolite. The cells grow as aggregates, or clumps of cells of varying sizes, that may affect the production of the secondary metabolite. Therefore, by understanding aggregation dynamics and how they affect the production of Taxol®, we can determine the culture conditions that yield the highest amount of product. The culture conditions that optimize Taxol® production will likely optimize the production of secondary metabolites in other plant cell cultures as well.