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## Terpenoids and terpenoid indole alkaloids in *Catharanthus roseus* cell suspension cultures

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### Citation

Saiman, M. Z. (2014, November 20). *Terpenoids and terpenoid indole alkaloids in Catharanthus roseus cell suspension cultures*. Retrieved from <https://hdl.handle.net/1887/29812>

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**Issue Date:** 2014-11-20

# STELLINGEN

Behorende bij het proefschrift

## **Terpenoids and terpenoid indole alkaloids in *Catharanthus roseus* cell suspension cultures**

1. Quantitative metabolite profiling of *C. roseus* cell lines is required for the selection of strains for studies of the regulation of biosynthetic pathways and thus build a platform for metabolic engineering. (This thesis)
2. To increase the level of the terpenoid precursor for TIA production one could aim at channeling the C5 units produced by the MEP pathway from the carotenoid to the iridoid pathway. (This thesis)
3. Feeding of *C. roseus* cells with geraniol in combination with jasmonate elicitation leads to higher levels of loganic acid and strictosidine, but not in higher levels of other downstream alkaloids, which means that there might be a limiting step in the flux of strictosidine to the downstream TIA. (This thesis)
4. Comprehensive metabolomic analysis is necessary to reveal the full effect of a genetic modification as transcript analysis only shows the accomplishment of the gene expression. (This thesis)
5. In a synthetic biology approach to improve the production of secondary metabolites, an inducible rather than a constitutive down-regulation of competing pathways should be used to avoid blocking of essential pathways for cellular growth.
6. The best choice of a heterologous host for the production of a certain compound is a matter of balancing advantages, disadvantages, and challenges associated with engineering potential host organisms as well as engineering the native plant. Li and Pfeifer (2014) Curr Opin Plant Biol 19: 8–13
7. Understanding the biosynthetic machinery requires also knowledge about compartmentation and the logistics (transport and presence of precursors, products, co-factors, and energy) of the plant cell factory.
8. No matter how successful the chemical compound is produced in a plant or a heterologous host, the costs of the large-scale production process is the most important aspect for industrial application.
9. Misuse of the journal impact factor is when it is extended to an automatic measure of the impact of an individual paper and its quality.
10. Universities should be more concerned how to contribute more to the society than how to chase for a high world ranking.
11. Experimental outcomes are the results that you see, not what you wish to see.
12. In this world, the trouble starts when and where there are no respect and tolerance.

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20 November 2014**