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Universiteit Leiden



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Title: High-throughput profiling of small molecules using mass spectrometry

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Stellingen (propositions)

1. In metabolomics, sample pretreatment procedures should not only be automated, reproducible and include external calibration using reference compounds, but should also be standardized to be able to compare studies between laboratories. (Chapter 2)
2. By using proper sample pretreatment and analytical procedures, the analytical performance of direct infusion mass spectrometry can be comparable with platforms using a separation method hyphenated to mass spectrometry. (Chapter 1 and 2)
3. Elektrokinetic sample pretreatment techniques are very promising for selective analysis using mass spectrometry. (Chapter 4)
4. Whole zebrafish embryo lysis cannot be used for correctly monitoring the uptake of certain drugs. (Chapter 6)
5. Concepts of engineering can improve the understanding of biological networks (Alon 2003, *Science* 301(5641), p. 1866-1867). An engineer can more easily comprehend the concepts of biology than vice versa.
6. Understanding the dynamics during loss of allostasis or (sudden) systemic changes in a biological system is crucial to understand its underlying biological processes. (Ramautar et al. 2013, *Curr. Op. In Chem. Bio.* 17(5), p. 841-6). Characterizing a biological network is analogous to characterizing an electrical or mechanical 'black box' for example in choosing the proper challenge test or 'impulse'.
7. In-depth phenotyping of a biological system, such as metabolomics, will be key for breakthroughs in biomedical and pharmacological research towards the development of personalized medicine (van der Greef et al. 2006, *Pharmacogenomics* 7(7), p. 1087-94). However, one of the major challenges in metabolomics is the biological interpretation.
8. The zebrafish is a powerful model for the study of human disease (Dooley and Zon 2000, *Curr. Op. in Gen. and Dev.* 10(3), p.252-256). Metabolomics can add more translational power to the zebrafish model.

9. Het drukken van een proefschrift past niet meer in het huidige digitale tijdperk.
10. Met de opkomst van het internet zijn kunstrecensenten overbodig geworden.
11. Massa spectrometrie is nog geen 'spectrometrie voor de massa'.