

# Integrating cellular and tissue dynamics with cell fate decisions through computational modeling

Heldring, M.M.

## Citation

Heldring, M. M. (2023, December 12). *Integrating cellular and tissue dynamics with cell fate decisions through computational modeling*. Retrieved from https://hdl.handle.net/1887/3666239

Version:	Publisher's Version
License:	Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden
Downloaded from:	https://hdl.handle.net/1887/3666239

**Note:** To cite this publication please use the final published version (if applicable).

## Stellingen

### behorende bij het proefschrift

### Integrating cellular and tissue dynamics with cell fate decisions through computational modeling

- 1. Differences among individuals in cellular stress responses can be explained by mimicking biochemical reaction rates by varying the parameters of an ODE model for intracellular protein dynamics (this thesis).
- 2. DNA damage-induced expression dynamics of p53, MDM2, p21 and BTG2 are specific to the type of DNA damage, but are not sufficient to fully explain cell fate determination (this thesis).
- 3. GREB1 and PR are essential regulators of cell cycle progression and can be used to predict MCF7 cell cycle progression (this thesis).
- 4. Cell fate is determined by a complex interplay between extracellular signals, intracellular protein dynamics and cell microenvironment (this thesis).
- 5. Details and assumptions can make or break a mathematical model and therefore require solid justification (Bodner et al., 2021. *PLOS Computational Biology*).
- 6. Modeling forces one to formulate an answer to questions that would be obscured or seem of little importance with solely experimental research (Eddy et al., 2015. *Trends in Cell Biology*).
- 7. Environmental pollution with artificial estrogen disruptive chemicals poses a risk for fetal development and human health, and their production and use should be carefully reconsidered (Zheng et al., 2023. *International Journal of Hygiene and Environmental Health*).
- 8. High-throughput *in vitro* methods in combination with computational modeling approaches are essential to speed up and improve the efficacy of preclinical testing and could ultimately render animal testing obsolete (Van Norman, 2020. *JACC: Basic to Translational Science*).
- 9. Mitigating climate change and preventing ecological collapse will save more lives than the development of novel drugs.
- 10. A doctorate augments the effectivity of work and actions to keep our planet habitable.

Muriel M. Heldring Leiden, 12-12-2023