



# Flux balance analysis of continuous cultivation for investigating the lipogenesis metabolism in *Rhodotorula toruloides*

Bachelor thesis

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*Rhodotorula toruloides* lipogeneesi uurimine, kasutades  
metaboolsete voogude analüüsi

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# Declaration

Hereby I declare that I have compiled the paper independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously been presented for grading.

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The paper conforms to requirements in force.

Supervisor: name

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Permitted to the defence. Chairman of the Defence Committee: Name

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## Abstract

## Annotatsioon

## Abbreviations

# Introduction

[1] [2]



# 1. Theoretical background

## 1.1. *Rhodotorula toruloides*

General physiological characteristics

## 1.2. Overview of cellular growth laws

## 1.3. Genome-scale metabolic modeling

Flux balance analysis

## 1.4. Overview of microbial cultivation methods

## 2. Aims of the thesis

### 3. Materials and methods

#### 3.1. Criteria for selecting experimental data

#### 3.2. Biomass integration to the model

#### 3.3. Flux balance analysis and sampling of the solution space

## 4. Results

## 5. Conclusion

## Summary

## Acknowledgements

## References

- [1] L. M. Blank, L. Kuepfer, and U. Sauer, *Genome Biology*, vol. 6, no. 6, R49, 2005, ISSN: 1465-6906. DOI: 10.1186/gb-2005-6-6-r49.
- [2] M. Chen, T. Xie, H. Li, Y. Zhuang, J. Xia, and J. Nielsen, “Yeast increases glycolytic flux to support higher growth rates accompanied by decreased metabolite regulation and lower protein phosphorylation,” *Proceedings of the National Academy of Sciences*, vol. 120, no. 25, Jun. 2023, ISSN: 1091-6490. DOI: 10.1073/pnas.2302779120.



## Supplementary