

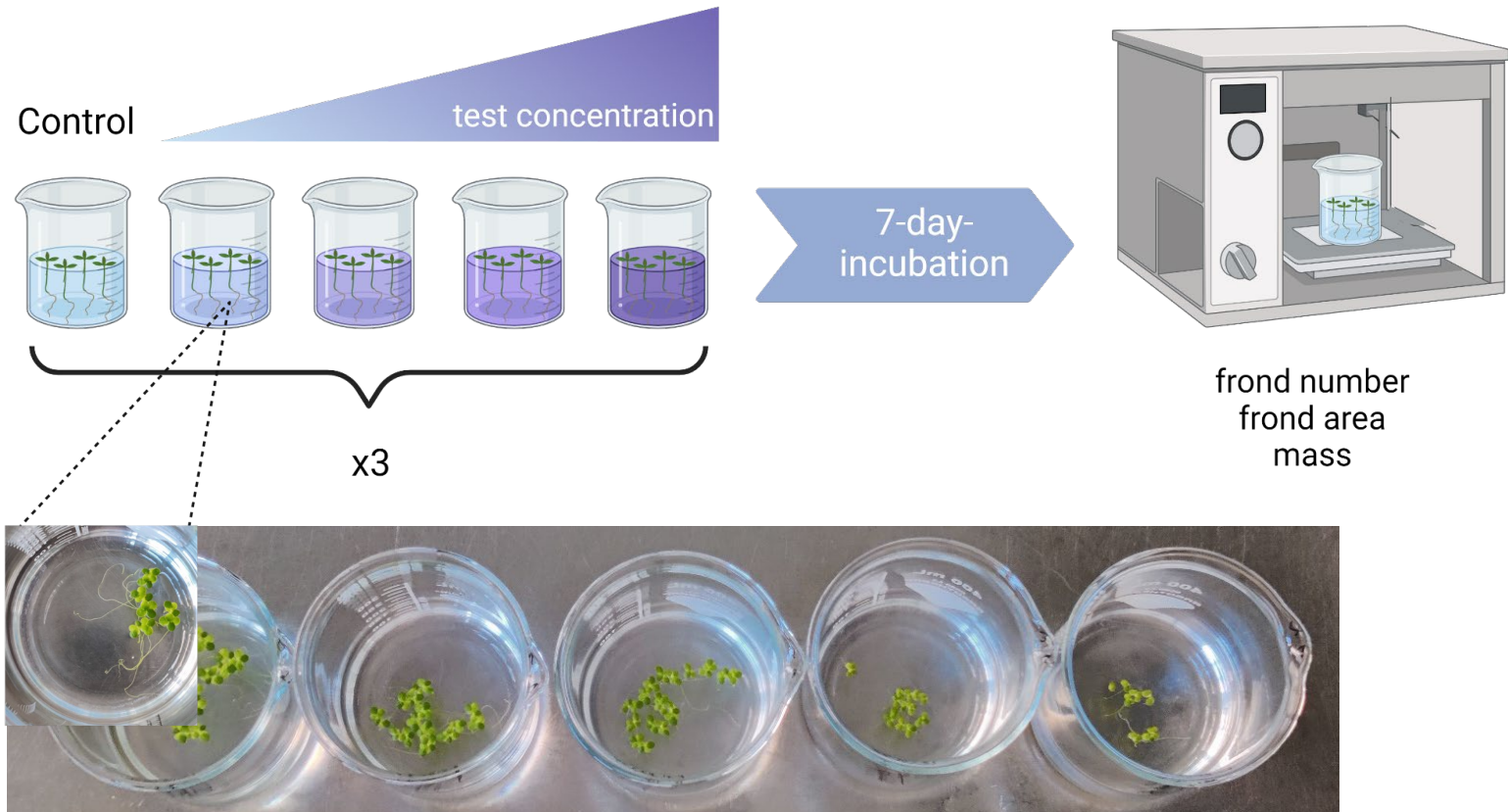
Toxicogenomic Analysis of Ecotoxic Modes of Action in *Lemna minor*

Alexandra Loll
17.05.2022

OECD *Lemna sp.* Growth Inhibition Test

Background

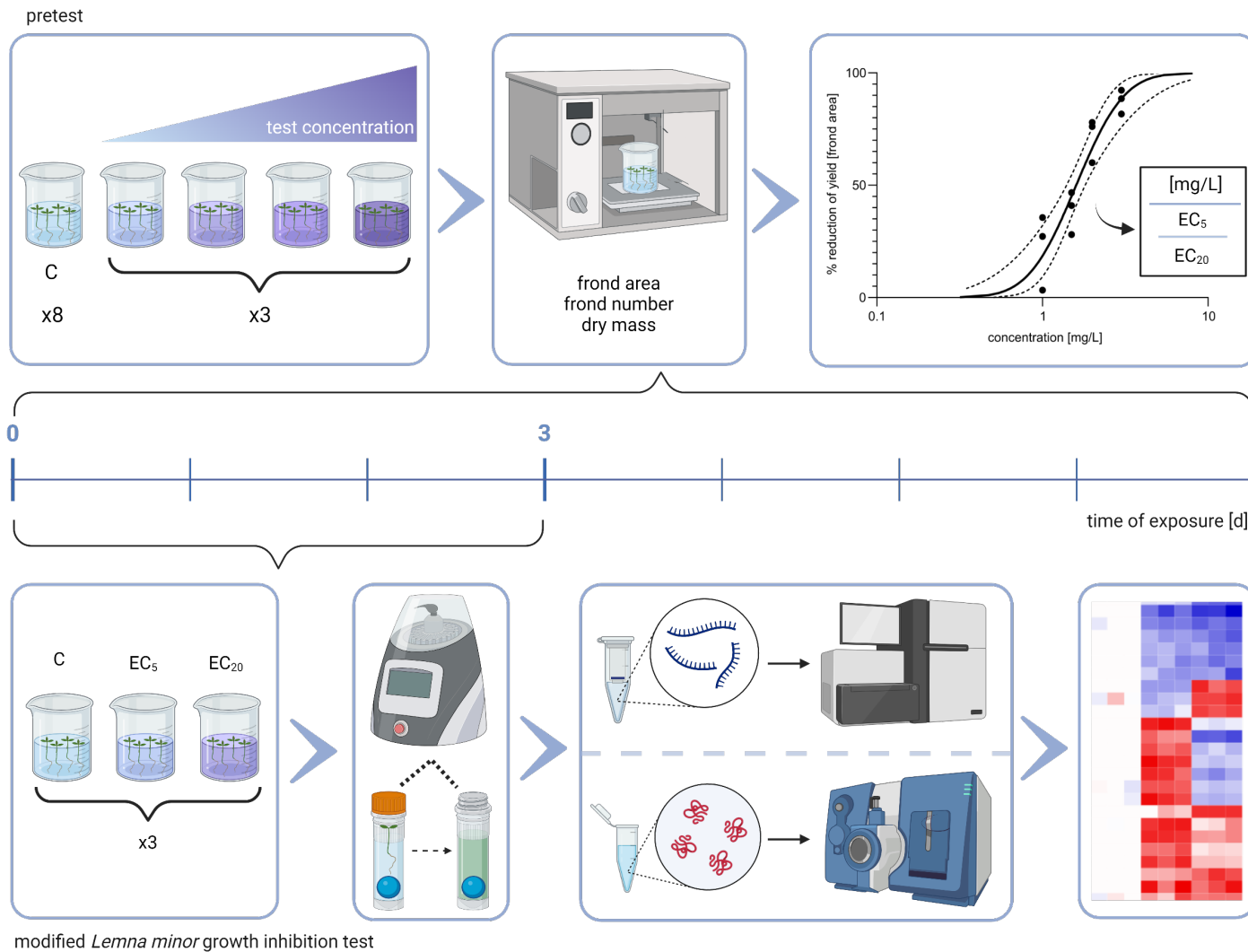
OECD Test Guideline 221



Mode of Action?

Modified version of OECD TG 221

Method



Guiding Questions

1

Gene
expression
changes
observable
after
3 days?

2

Different
signatures for
different test
substances?

3

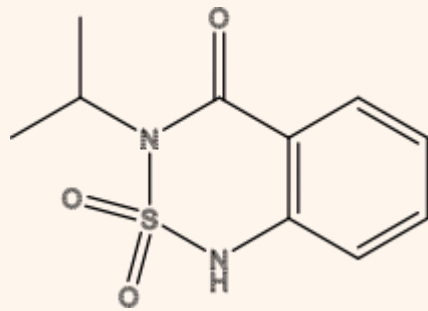
Mode of
Action?

Test Substances

Background

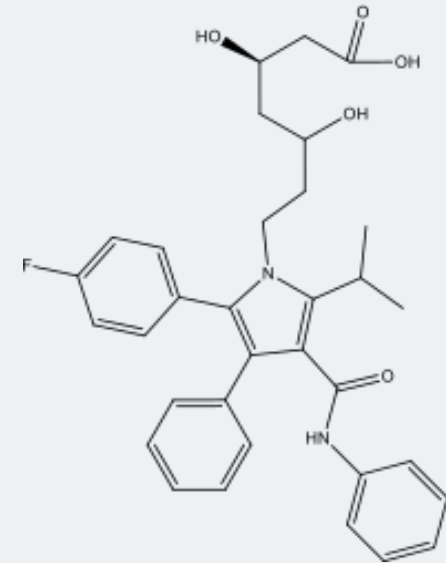
Bentazon

- ❖ Herbicide
- ❖ Inhibition of photosynthesis
- ❖ HMG-CoA reductase (HMGR) inhibition



Atorvastatin

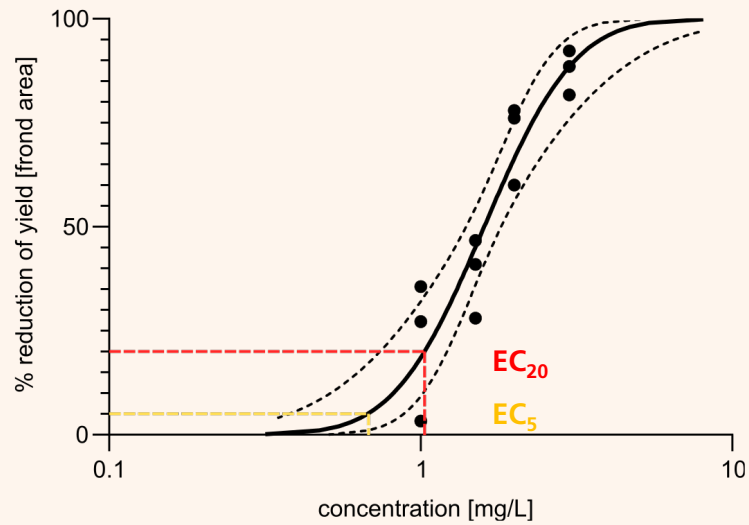
- ❖ Pharmaceutical
 - ❖ HMGR inhibition
- known in plants



Range Finder Tests

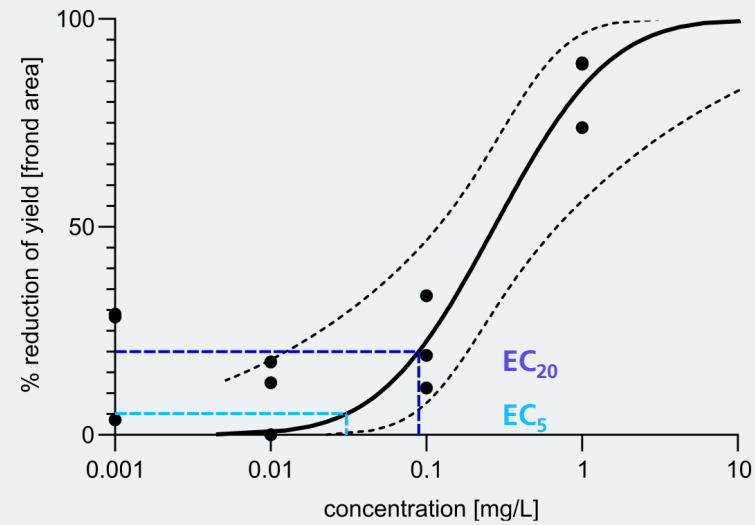
Results pre test

Bentazon

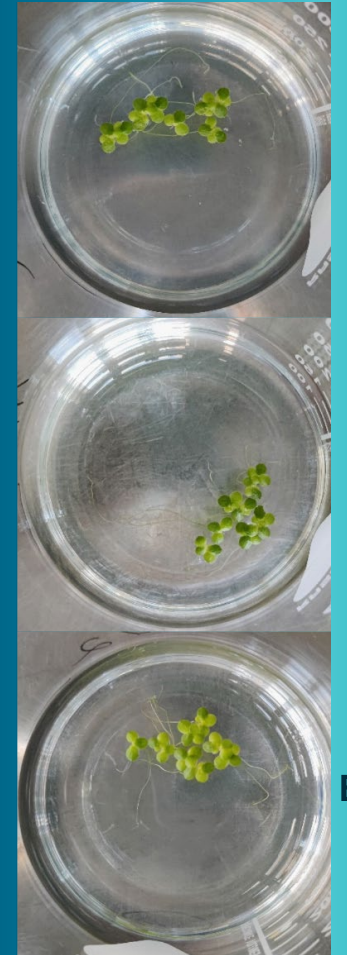


❖ micromolar range

Atorvastatin



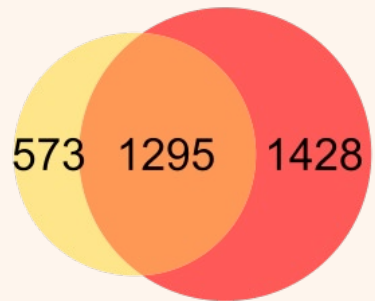
❖ nanomolar range



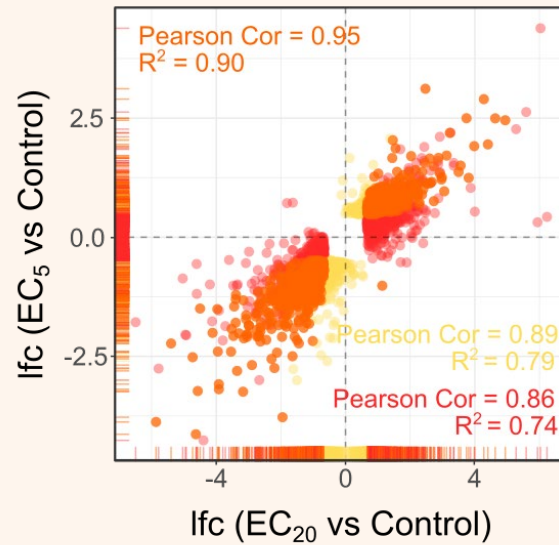
Transcriptomic

Results shortened test

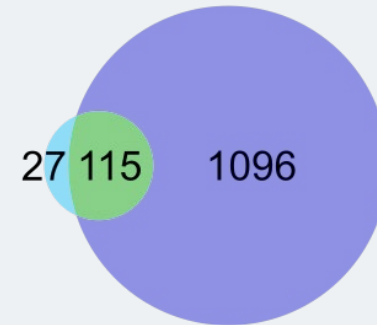
Bentazon



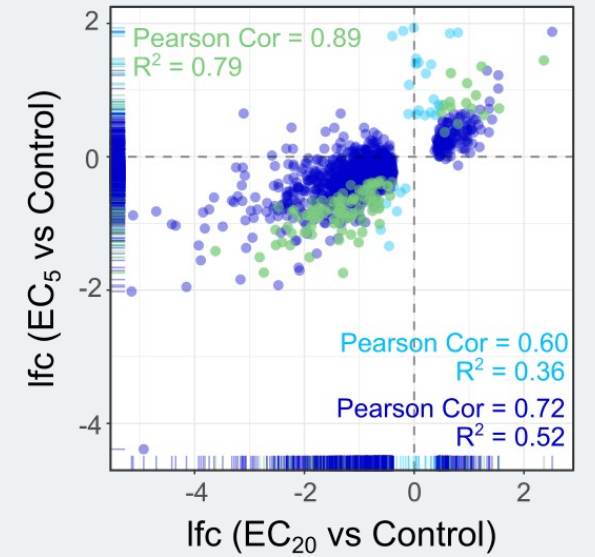
■ DEG in EC₅ ■ DEG in EC₂₀



Atorvastatin

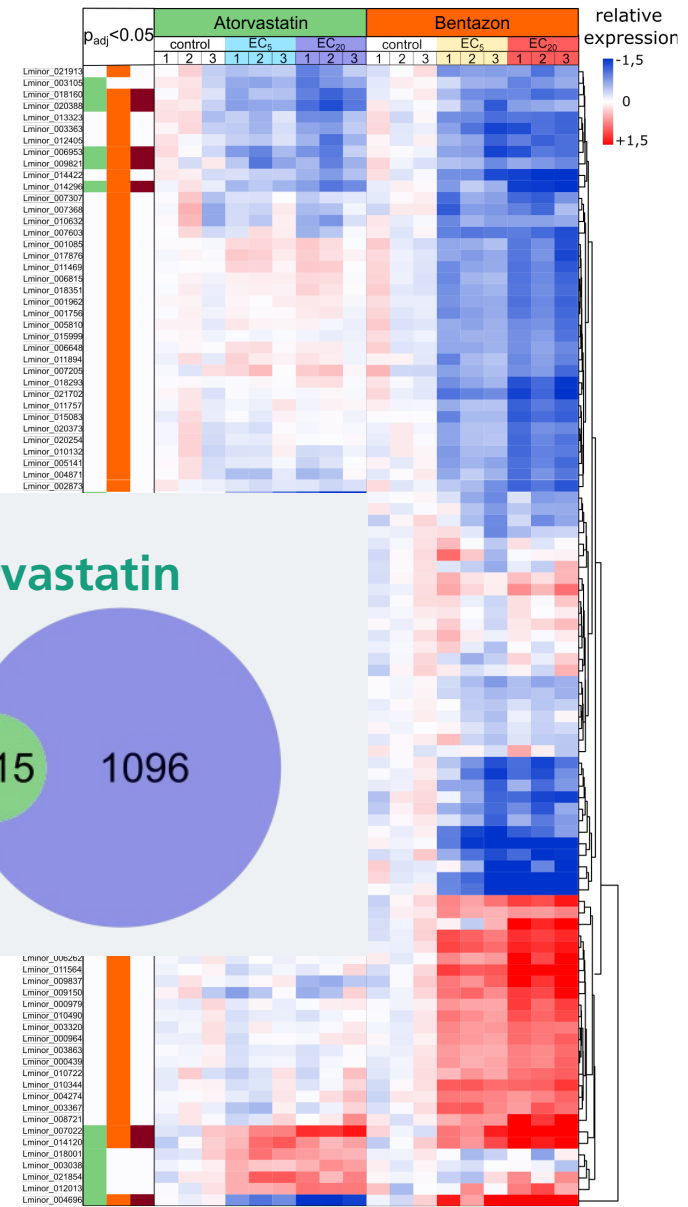
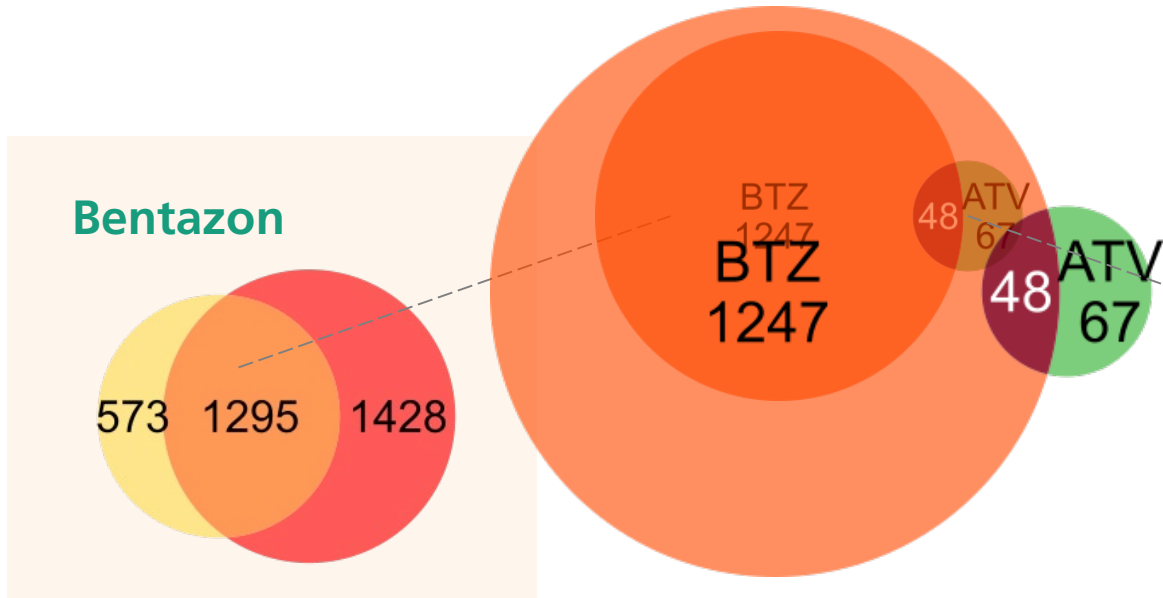


■ DEG in EC₅ ■ DEG in EC₂₀



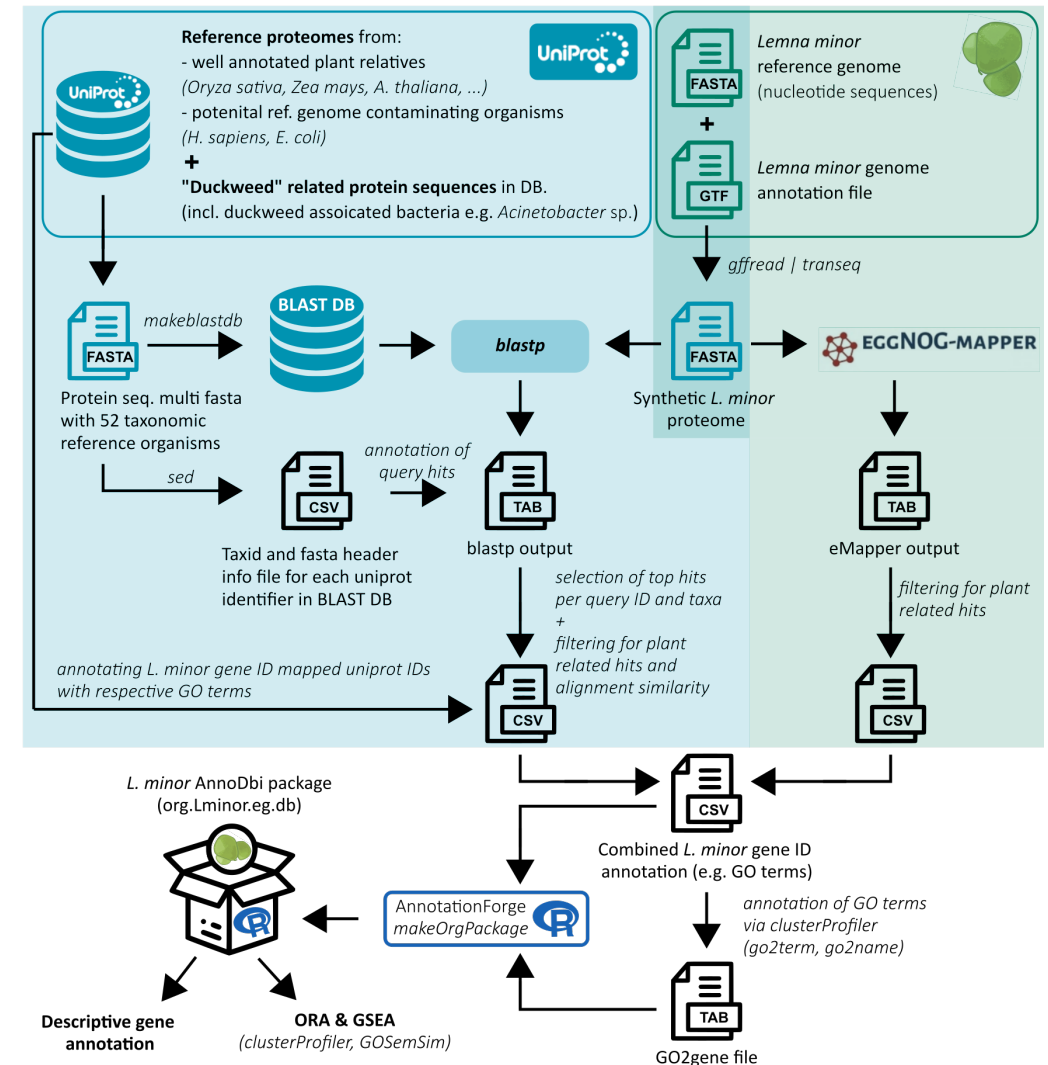
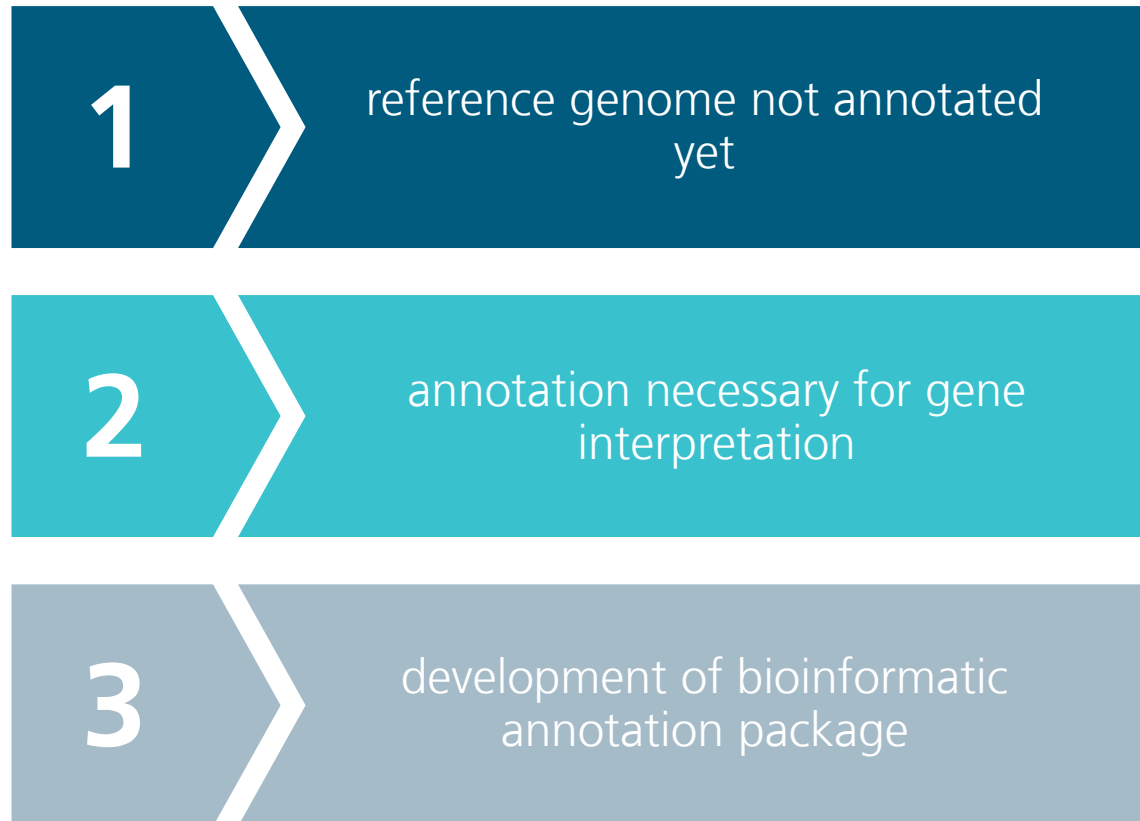
Comparison of both substances

Results shortened test



Functional Annotation

Results shortened test



Overrepresentation Analysis - ORA

Results shortened test

Bentazon

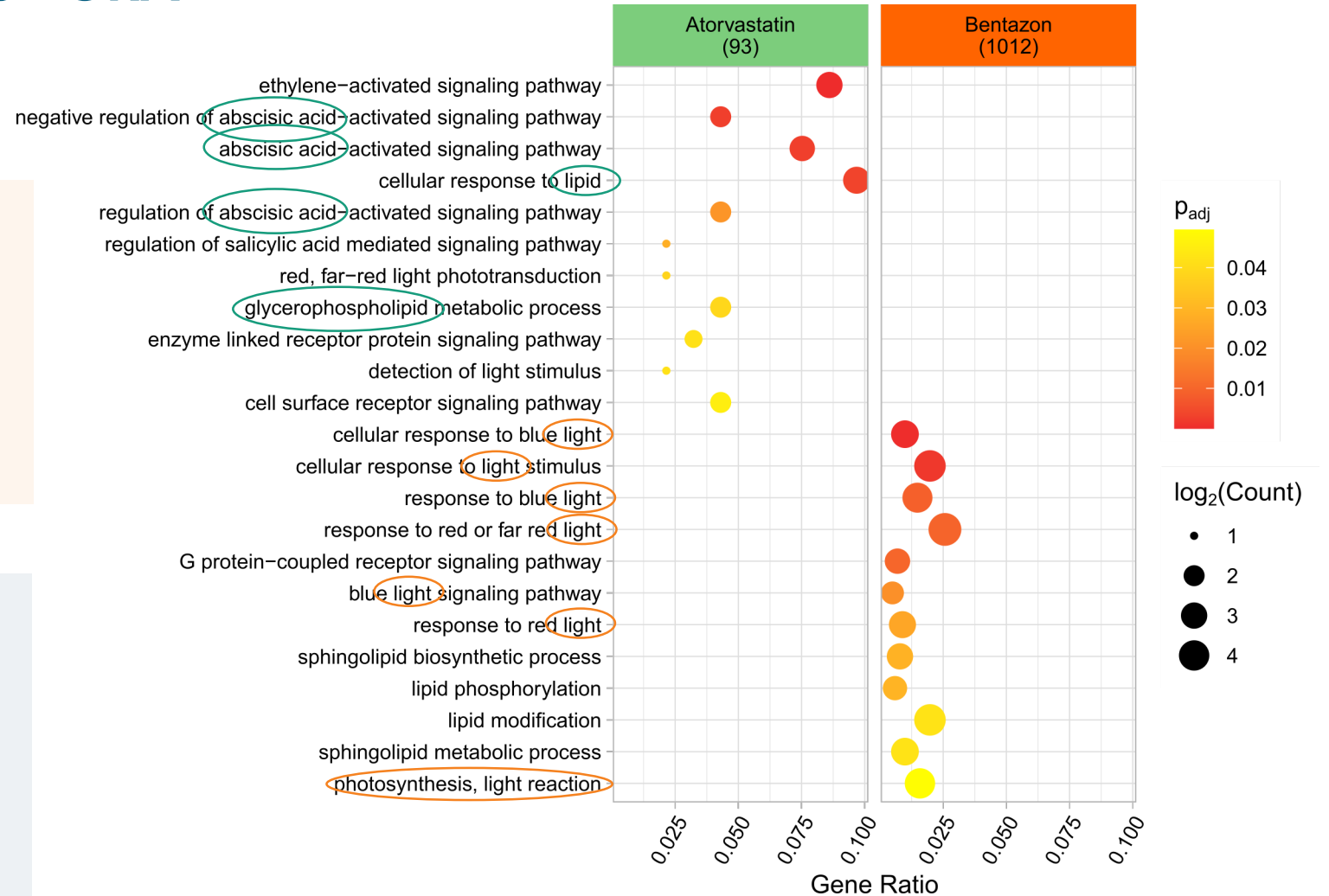
❖ Photosynthesis inhibition

→ Light related biological processes

Atorvastatin

❖ HMGR inhibition

→ Lipid and abscisic acid (ABA) related biological processes



Guiding Questions and answers

1

Gene
expression
changes
observable
after
3 days?



establishment of
shortened ecotoxicity
test with *Lemna minor*
with output on
molecular level

Guiding Questions and answers

2

**Different
signatures for
different test
substances?**



observation of different
gene expression changes
after exposure to different
substances

Guiding Questions and answers

3

Mode of
Action?



development of
functional annotation
package enabled
interpretation of gene
function

Thank you for your
attention!

Contact

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