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Courses » Computational Systems Biology

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Unit 12 - Week 8

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Quiz : Assignment 8

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-09-26, 23:59 IST.

1) Consider the following reactions with gene-protein-reaction relationship:

1 point

R1: $M1 + M2 \rightarrow M3$ Gene A or Gene B
R2: $M3 \rightarrow M4 + M5$ Gene C and Gene A
R3: $M2 \rightarrow M5$ Gene E
R4: $M5 \rightarrow M6$ Gene D

Which of the following statements is/are true in a medium containing M1 and M2, if the metabolite M6 is required for cell survival?

- ☐ Gene A is a single lethal
- ☐ Gene A and Gene D are double lethals
- ☐ Gene A and Gene E are double lethals
- ☐ Gene D is a single lethal

No, the answer is incorrect.

Score: 0

Accepted Answers:

Gene A and Gene E are double lethals

Gene D is a single lethal

2) Which of the following statements about the Fast-SL algorithm is/are true?

1 point

- ☐ Fast-SL performs an LP, where the sum of absolute values of the fluxes carried by reactions in a metabolic network are minimised
- ☐ Fast-SL performs an exhaustive enumeration of every pair of reaction deletions to identify synthetic lethals
- ☐ Fast-SL achieves a speed-up by eliminating reactions, which do not carry a flux in the FBA solution, from the search space
- ☐ Fast-SL uses a mixed-integer linear programming formulation to efficiently evaluate synthetic lethals

No, the answer is incorrect.

Score: 0

Accepted Answers:

Fast-SL performs an LP, where the sum of absolute values of the fluxes carried by reactions in a metabolic network are minimised

Fast-SL achieves a speed-up by eliminating reactions, which do not carry a flux in the FBA solution, from the search space

3) Using the metabolic model of an organism, FSEOF was carried out by enforcing the flux through reaction 5 at every **1 point** step and noting the flux change in reactions 1,2,3 and 4 (shown as different colored bars). The following was observed, for different fractions of maximum flux enforced

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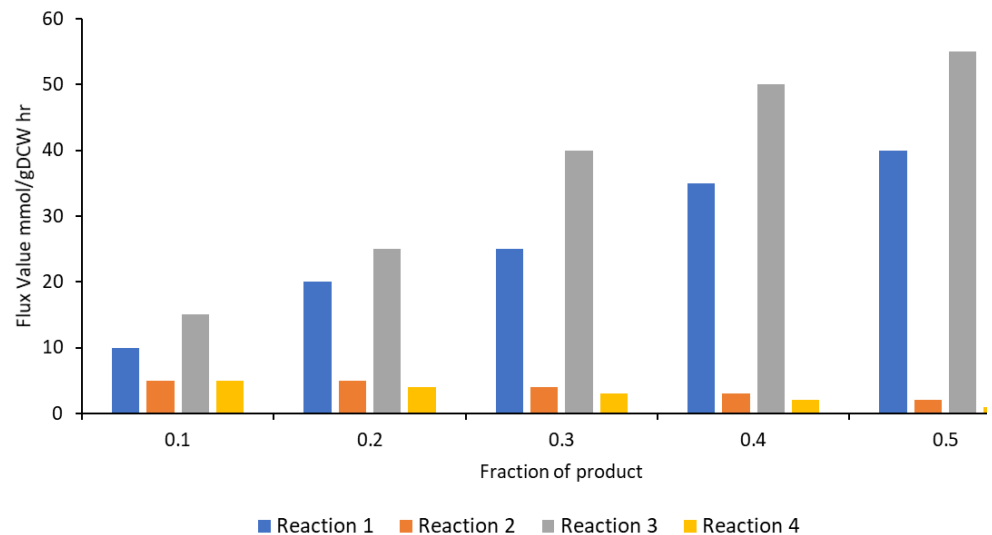
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(labelled from decreasing to increasing fractions as 0.1, 0.2, ..., 0.5):

Which reactions are possible targets for over expression?

- ☐ Reaction 2 and Reaction 4
☐ Reaction 1 and Reaction 3
☐ Reaction 1 and Reaction 2
☐ Reaction 3 and Reaction 2

No, the answer is incorrect.

Score: 0

Accepted Answers:

Reaction 1 and Reaction 3

4) Which one of the following statements about synthetic triple lethals is correct?

1 point

- ☐ Loss of any one gene out of triplet is lethal for the cell
☐ Loss of all three genes at the same time is lethal for the cell
☐ All three genes need to be present for cell survival
☐ All three genes necessarily have the same function

No, the answer is incorrect.

Score: 0

Accepted Answers:

Loss of all three genes at the same time is lethal for the cell

5) For the model given ([iMM904.xml](#) or [iMM904.mat](#)), using COBRA Toolbox, answer the following questions.

What is the growth rate of the model? (Enter values correct to 2 decimal places)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 0.27,0.29

1 point

6) What is the flux through the reaction ICDHym? (Enter values correct to 2 decimal places)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 0.25,0.27

2 points

7) What are the total number of exchange metabolites?

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) 164

2 points

8) Change the uptake rate of glucose (reaction number 70 in the model) to -20 and find the growth rate. (Enter values correct to 2 decimal places) (1 point)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 0.50,0.52

1 point

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