Unit 12 - Week 8

Assignment 8

The due date for submitting this assignment has passed. **Due on 2018-09-26, 23:59 IST.**
As per our records you have not submitted this assignment.

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

R1: M1 + M2 -> M3 Gene A or Gene B
R2: M3 -> M4 + M5 Gene C and Gene A
R3: M2 -> M5 Gene E
R4: M5 -> 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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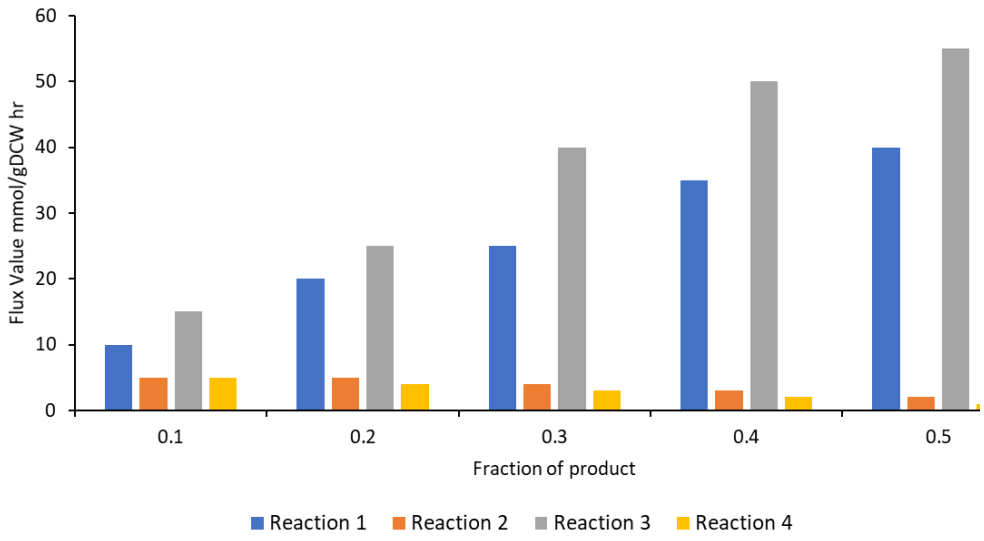

(labelled from decreasing to increasing fractions as 0.1,0. 2, …, 0.5):

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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