

Cellular Programs

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Saarland University

Chair of Computational Biology

Assignment 3

Handed out: 28.5.19

Due: 4.6.2019 10:15

Submit your solutions by e-mail with a single PDF attachment to

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Every student should submit his/her own solution. Plagiarism of solutions will be penalized. Don't forget to label your assignment sheet with your name and Matrikelnummer.

Don't exceed specified page lengths by more than 0.25 pages.

Problem 1:

Questions to Paper 5: Topacio, Benjamin R., et al. "Cyclin D-Cdk4, 6 Drives Cell-Cycle Progression via the Retinoblastoma Protein's C-Terminal Helix." *Molecular cell* (2019).

Q1. Explain the logic behind the experiments shown in Figs. 1C - F. Use the following structure:

- a. Experiment X was designed to show Y,
- b. What method was used to show Y,
- c. Summarize the experimental result. (0.5 page in total)

Q2. Describe how phosphorylation of different CDK substrates can be temporally ordered during the cell cycle. (0,25 page max)

Q3. What are - in your opinion - the evolutionary benefits of the "metazoan innovation" described by the authors? (0,25 page max)

Problem 2:

Questions to Paper 6: Slamon, Dennis J., et al. "Phase III randomized study of ribociclib and fulvestrant in hormone receptor-positive, human epidermal growth factor receptor 2-negative advanced breast cancer: MONALEESA-3." *J Clin Oncol* 36.24 (2018): 2465-2472.

Q1.

- a. What did the authors use as an end-point in their analysis?
- b. What method did the authors use to compare Kaplan-Meier curves/estimates?
- c. What do the tick markers on the Kaplan-Meier plot (here triangles/squares on Figure 2) stand for and what do they hint at? (0,5 page max in total)

Q2. Reinterpret Figure 2 of this paper. (0,25 page max)

Q3. Comment critically on the study design/cohort/results interpretation. (0,25 page max)