

Exam 2

Required Essay Questions

This is an open book, open-notes exam.

Answer any **three (3)**—no extra credit for more) of the following in the form of a short essay. Use evidence from the readings to support your answers.

Write your answers in a .doc, .docx, or pdf file and upload to Canvas. No need to copy in the questions, but do **include the question numbers**, so we know which ones you meant to answer.

1. What was Lysenko's approach to plant breeding, and how did it clash with Vavilov's and with mainstream genetics? What was its political appeal in the Soviet Union? And what was Stalin's calculation in supporting Lysenko and persecuting the mainstream geneticists? (In other words, what would he have seen as the risks and benefits of this move)?
2. What is new in Muller's 1935 *Out of the Night*, compared to what we saw from him in 1932? Consider especially his ideas about reproductive technologies. What does he want to use such technology for? How does he expect them to change attitudes to love, marriage, and eugenics?
3. Muller's ideal of a mechanistic, non-teleological understanding of life steered him toward a view of evolution that required "heritable variations" (i.e., mutations) to occur in particular ways. At the beginning of his 1946 Nobel Lecture, for example, what does he say is required of the mutation process in order for natural selection to work in a non-teleological way? What kinds of variations does he want to rule out? And how does his conception of radiation-induced mutation fulfill the requirement?
4. What were the principal features of the Structurist approach in 1940s/1950s molecular biology? What did Watson and Crick see as the limitations of both the approach and its practitioners. And how did this affect their interactions with Rosalind Franklin?
5. In Muller's 1955 article on "The Genetic Damage Produced by Radiation," what are the main sources of radiation that he is worried about? How and by whom are the risks being denied? And what solution does he want—is he for or against taking the risks and developing bombs and/or peaceful uses of atomic energy, or what does it depend on?