

Biochemistry Cumulative Examination

April 7, 2016

25 points for each question; 100 points total.

1. (1) What does CRISPR stand for?

(2) Briefly explain the three key stages of CRISPR-based immunity, how it is established and used.

2. Discuss the similarities and differences of CRISPR systems compared with (1) gene knock-out and (2) RNA interferences.

3. Describe how Type II CRISPR-Cas9 system works.

4. Initially, it was thought that the CRISPR system targets RNA, but was later found to target DNA. Describe the experimental design by Sontheimer that proved this point or suggest your own strategy that can address this question.