

Bioimaging Cume

March 1, 2018

100 points

Study Reference: K.E. Dean, A.E. Palmer Advances in fluorescence labeling strategies for dynamic cellular imaging (2014) Nat. Chem. Biol. 10:512-523.

- 1) (25) The study reference provided for this exam described recent advances in fluorescent labeling strategies for live cell imaging. Many references were made to fluorescent species that could be particularly useful for "FRET." Explain what FRET is by using a Jablonski (energy) diagram and also note the necessary conditions for FRET to occur.

- 2) (25) Genetically encoded fluorescent proteins (FPs) have been engineered to improve their properties for fluorescence imaging. What are these properties? I.e., explain what makes one FP better than another.

- 3) (25) Certain FPs have been engineered to have unusual photophysical properties that can be exploited for specialized forms of fluorescence microscopy. Describe two (2) non-standard photophysical properties that have been observed and the corresponding application that they are useful for.

- 4) (25) Describe three techniques for labeling and imaging RNA sequences.