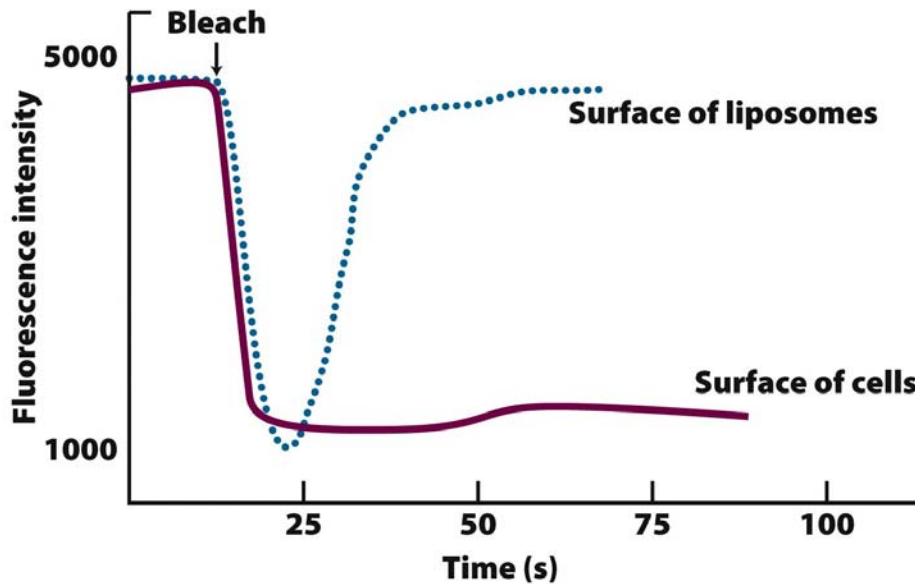


生命科學系 100 學年度生物醫學碩士班招生 細胞生物學 考題

1. Trypsin-EDTA is widely used to dissociate cultured cells. Please explain the mechanism. (6 points)
2. Cytoskeletons are actively involved in cell cycle progression. Please explain their roles in mitosis. (12 points)
3. Compare the roles of Arp2/3 complex and cofilin. (8 points)
4. What is the master transcription regulator of the immune system in mammals? Explain the mechanism to regulate the activity of the transcription factor. (8 points)
5. Describe the pathway of activation of CREB transcription factor following ligand-binding to Gs protein-coupled receptors. (8 points)
6. Describe the roles of clathrin coat and SNARE complex. (8 points)
7. Please compare the major differences between P-, V- and F- class ATP pump. (5%)
8. What is ABC transporter? Where can it be found and its role in cellular transport as well as in cancer? (5%)

9. The behavior of a transmembrane protein (XR) is being investigated. Cells expressing GFP (green fluorescent protein)-XR or artificial lipid vesicles (liposomes) containing GFP-XR are subjected to fluorescence recovery after photobleaching (FRAP). The intensity of the fluorescence of a small spot on the surface of the cells or on the surface of the liposomes is measured and shown in the below figure.



Analyze the Data 10-1
Molecular Cell Biology, Sixth Edition
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Please answer the following questions:

a. What is FRAP experiment? (5%)

b. Please explain for the different behavior of GFP-XR in liposomes and plasma membrane a cell? (5%)

10. Please describe how a membrane potential is maintained by means of ATP-powered pump and ion-channel? (10%)

11. Please describe how mammalian cells control the progression of cell cycle from G₀ to S? (10%)

12. What is oncogene and tumor suppressor gene? How does it relate to cancer? (10%)