

國立中山大學九十學年度博士班招生考試試題

科目：生物學【海生所】

共 一 頁 第 一 頁

每題 25%，答案前標明題號

1. Proteins constitute a large percentage of cell and carry out many different cell functions. It is therefore not surprising that protein synthesis is central to cell growth, differentiation, and reproduction. Do you know how cells regulate their protein synthesis, assembly and degradation?
2. Describe expected trends in responses of stressed ecosystems, from the aspects of energetics, nutrient cycling and community dynamics.
3. 假設太空人在六光年外的星球上發現了很多大約十公分長的生物，你知道太空船上配備了所有的研究設備，但除此之外對該星球及生物一無所知。請提出一構想讓太空人去執行，但又有機會在眾多研究計畫中脫穎而出的。
4. 水生生物演化進入陸生環境，以及陸生生物演化進入水生環境，其生理上各需要什麼適應？

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1. During the past three years, two areas of research in biosciences have quickly evolved into new technology systems: (1) the DNA microarrays or DNA chips, and (2) bioinformatic analysis for functional genomics. Thus, NSC of Taiwan, ROC, initiates a project: the general objective of this program is to employ a single, straightforward and powerful molecular biology approach of hybridizing the labeled cDNAs synthesized from the target and reference/control fish tissue mRNA with Atlantic salmon (*Salmo salar* L.) and other functionally relevant fish tissue cDNA microarrays. This initiative of a programmatic research project is aimed at establishing a comprehensive and integrated fish functional genomics program with 7 concentric and prioritized subprojects, which are assembled with a strong and cohesive interest of the existing research expertise and skills of the involved Principal Investigators (P.I.)/Professors of National Sun Yat-sen University in Taiwan. With specific and complementary experimental designs, we attempt to address the gene regulation and signal transduction pathway activities involved in targeted fish as a response to specific sets of abiotic or biotic stresses and developing the DNA chip in assaying the stress responses in salmon. If you are a PI, try to have a proposal in getting this NSC grant. Please, write down your proposal.
2. What are the major processes that contribute to determining the species richness and diversity in a community?
3. 假設深海潛艇在八千公尺水深發現了很多大約十公分長的不知名且不知門的生物，你知道那海域並非深海湧泉區，但除此之外對該生物一無所知。請提出一研究構想有機會在眾多相同對象研究計畫中脫穎而出的。
4. 水生生物演化進入陸生環境，以及陸生生物演化進入水生環境，其生理上各需要什麼適應？