

生物鲁棒性的研究进展

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生物鲁棒性是指在受到外部扰动或内部参数摄动等不确定因素干扰时，生物系统保持其结构和功能稳定的一种特性。目前已经发现生物鲁棒性普遍存在于生物系统整体、器官、细胞、分子等各种层次，如细菌趋化、细胞周期、细胞信号通讯、基因突变、生物发育、基因网络等等。产生生物鲁棒性的作用机制主要是生物系统的反馈、冗余、模块和结构稳定等。稳定鲁棒性和品质鲁棒性是生物鲁棒性研究的两个重要命题，数学模型是生物鲁棒性研究的重要手段。认识生物鲁棒性对癌症、AIDS、糖尿病等疾病的发生、发展和治疗有重要意义。文章从上述几个方面综述了生物鲁棒性的研究进展。

Progress of biological robustness

Biological robustness is a system property to keep a stability of live-body structure and function as uncertainty factor from external and internal variety disturbs it. Up to now, it is known robustness always arises in whole, organ, cell and molecule, for example, bacterial chemotaxis, cell cycle, intercellular communication, gene mutation, development, gene network, and so on. In the organism, using feedback control, redundancy, modularity and structure stability attains robustness. Stability robustness and character robustness are two important issues in the research, and mathematics model is a method for biological robustness. The knowledge of biological robustness signifies to illness's generation, development and therapy, such as cancer, AIDS and diabetes. This paper reviews biological robustness progress recently.

关键词

生物鲁棒性(Biological Robustness); 稳定性(Stability); 鲁棒度(Degree of Robustness(DOR))