

综述评论

生物力学与基因-献给周培源教授诞辰100周年

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 生物界包罗万象, 其中有力的作用, 所以有生物力学. 自Galileo, Harvey, Borelli, Hooke, Euler, Young等创始以来, 生物力学阐明了鸟飞鱼游, 人体运动, 血液循环, 人工脏器等, 对人类社会, 有所贡献. 生物力学的基础是质点力学, 传统地用连续体力学的概念来简化. 但近年做生物组织在应力的作用下改造的问题, 引起了必须更改传统连续体力学的几个公理的问题. 我们将仔细讨论这些公理, 然后指出新公理存在的理由, 是由于基因在细胞里的日常工作. 基因不单主宰遗传, 变异; 并且忙着控制日常生活. 不过, 现在仅见其端倪. 详细的情形, 要等将来来阐发了.

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分类号

BIOMECHANICS AND GENE ACTIVITIES ----- CELEBRATING THE CENTENNIAL OF PROFESSOR CHOU PEIYUAN

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Abstract

All biological phenomena involving force and motion are in the realm of biomechanics. Mechanics people, from Galileo on to today, have used the principles of conservation of mass, momentum, and energy to make contributions to human well being. They have added to the scientific understanding of locomotion, circulation, respiration, renal and nervous functions, and artificial internal organs. In recent years, many people, working on tissue engineering, arteriosclerosis, and other health problems, have to focus on the problem of finding out how do living tissues change or remodel themselves under stress. They found that some of the classical conservation laws do not apply, and there is a problem of introducing new axioms to biomechanics. The purpose of the present paper is to discuss these new axioms, then go on to point out that the basic reason for these new axioms is the activity of the genes in our cells. Some of our genes work daily to control our lives. Their functions are not limited to genetics and mutation. This points to a new lead to new thoughts. A new science is waiting to be developed.

Key words [Axioms of continuum mechanics](#) [Axioms of biomechanics](#) [Tissue remodeling](#)
[Mechanical properties remodeling](#) [Zero-stress state remodeling](#) [Axioms remodeling](#) [Remodeling due to gene action](#) [Gene mechanics](#)

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