Mechanotransduction in Cellular Function

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Abstract. Mechanotransduction refers to the process by which cells convert mechanical stimuli into biochemical signals. This article examines the role of mechanotransduction in cellular function, including its impact on cell shape, motility, and differentiation, and explores its implications in disease contexts.

Keywords: Mechanotransduction, Cellular Function, Biochemical Signals, Cell Motility, Disease Implications

Introduction

Mechanotransduction is a critical process that enables cells to sense and respond to mechanical stimuli from their environment. This conversion of mechanical forces into biochemical signals influences various cellular functions, including changes in cell shape, motility, and differentiation. It is increasingly recognized that mechanotransduction plays a pivotal role in development and homeostasis, as well as in the progression of diseases such as cancer and fibrosis. Understanding the underlying mechanisms of mechanotransduction offers insights into how cells interact with their physical environment and may lead to novel therapeutic strategies.

References

1. SharmaV. K.BasuS.ChakrabortyS. (2015). RNAi mediated broad-spectrum transgenic resistance in Nicotiana benthamiana to chilli-infecting begomoviruses. Plant Cell Rep.34 (8), 1389–1399. doi: 10.1007/s00299-015-1795-8

2. Kumar, R. V., Sharma, V. K., Chattopadhyay, B., & Chakraborty, S. (2012). An improved plant regeneration and Agrobacterium-mediated transformation of red pepper (Capsicum annuum L.). Physiology and Molecular Biology of Plants, 18(4), 357-364.
3. Sharma, V., Zheng, W., Huang, J., & Cook, D. E. (2020). CRISPR-Cas RNA targeting using transient Cas13a expression in Nicotiana benthamiana. In RNA Abundance Analysis: Methods and Protocols (pp. 1-18). New York, NY: Springer US.
4. Kumar, R., & Shukurova, Z. Y. (2018). Wild silk moths' conservation status in India. Proc of the GRI of ANAS, 7(1), 122-129.
5. Shukurova, Z. Y., & Shukurlu, Y. H. (2024). Retraction Note: Non-mulberry silkworm Saturnia Pyri (Denis & Schiffermüller, 1775) and a new perspective source of biomaterials.
6. Nikolla, M., Mulliri, J., Ribaj, A., & Tema, A. (2023). Measuring the Efficiency of Public Transport Lines in Albania using DEA Model. WSEAS Transactions on Environment and Development, 19, 300-308.