54. Nuclear Mechanotransduction

1 unit, Philipp Niethammer, November 14, 2025

1) COMPONENTS OF NUCLEAR MECHANOTRANSDUCTION
-The Nuclear Membrane
-Chromatin
-The Nuclear Lamina

2)COMPONENT CONNECTIONS

3)MECHANISMS OF NUCLEAR MECHANOTRANSDUCTION
-The Nuclear Force Sensors
-Experimental Challenges and Strategies
-Mechanosensitive Protein Redistribution
-Mechanosensitive Calcium Release
-Direct Mechanical Control of Gene Transcription

Discussion paper: https://pubmed.ncbi.nlm.nih.gov/33060332/

Lomakin AJ et al., The nucleus acts as a ruler tailoring cell responses to spatial constraints. Science. 2020 Oct 16;370(6514):eaba2894. doi: 10.1126/science.aba2894.

Background reading: https://pubmed.ncbi.nlm.nih.gov/30916994/
Maurer M and Lammerding J. The Driving Force: Nuclear Mechanotransduction in Cellular Function, Fate, and Disease. Annu. Rev. Biomed. Eng. 2019. 21:443–68