

FORCES ACTING IN LIVING CELLS

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In living organisms occur many physical processes. We limit ourselves to the problems of cellular scale. Recent progress in the molecular and cell biology challenges physics to describe molecular interactions between cells and their fragments. First reasonings were phenomenological, due to simplicity reasons, and nowadays biophysical and biochemical studies also use frequently thermodynamics. However, the physical measure of interaction is force and there is nothing else more clear and precise in description of interaction, if only classical physics is applicable.

In most cases the weight and size of the molecular structure involved in the cellular phenomena justify applicability of classical physics and even the Newtonian dynamics. We support the role of forces by some examples like: self-assembly, liquid lyotropic crystals, ordered fluids, lipid and living membranes, membrane transport, molecular penetrations and deformations, surface interactions between cells (like in cell fusion) and force generation by biomolecular engines.