

Cellular responses to gravity: extracellular, intracellular and in-between.

[Todd P](#), [Klaus DM](#), [Stodieck LS](#), [Smith JD](#), [Staehein LA](#), [Kacena M](#), [Manfredi B](#), [Bukhari A](#).

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Abstract

Our understanding of gravitational effects (inertial effects in the vicinity of 1 x g) on cells has matured to a stage at which it is possible to define, on the basis of experimental evidence, extracellular effects on small cells and intracellular effects on eukaryotic gravisensing cells. Yet undetermined is the nature of response, if any, of those classes of cells that are not governed solely by extracellular physical events (as are prokaryotes) and are devoid of obvious mechanical devices for sensing inertial forces (such as those possessed by certain plant cells and sensory cells of animals). This "in-between" class of cells needs to be understood on the basis of the combination of intracellular and extracellular gravity-dependent processes that govern experimentally-measurable variables that are relevant to the cell's responses to modified inertial forces. The forces that certain cell types generate or respond to are therefore compared to those imposed by approximately 1 x g in the context of cytoskeletal action and symmetry-breaking pathways.