

## **14b Effect of Nutrient Fluxes on Osteoblast Culture Survival**

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Exercise has long been known to elicit positive bone remodeling response. The mechanism is thought to involve small, periodic fluxes in nutrient and hormonal levels in the surrounding interstitial fluid, and mechanical strains which affect the adherence and shape of the cellular cytoskeleton during exercise. However it is exceedingly difficult to confirm this mechanism directly in living organisms, since the amount of interstitial fluid is too small to provide an accurate understanding of the situation. In vitro tests have shown that fluid shear does stimulate a metabolic response in osteoblast cell cultures, and here we evaluate the effect of nutrient fluxes in the absence of shear strain. This information is used to develop a model which describes the change in osteoblast cell proliferation in culture as a function of nutrient flux, and consequential metabolic up or down regulation.