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Dynamics of phenotypic reversibility of bacterial cells with oscillating hydrostatic pressure SUDIP NEPAL, Univ of Arkansas-Fayetteville, PRADEEP KUMAR, Department of Physics, Univ of Arkansas-Fayetteville — Bacterial cells encounter and respond to physiochemical fluctuations. The response depends on the extent and type of the stresses applied. The response of bacterial cells to the **fluctuating stress** is relatively unknown. Here, we have studied the response of wild type Escherichia coli (E. *coli*) under fluctuating hydrostatic pressures ranging from 1 atm to 500 atm. High pressure acts as a stress to E. *coli* since these bacteria are adapted to grow optimally at atmospheric pressure. Cell division of E. *coli* is inhibited at high pressures resulting in increase in the length of the cells. Cell-length is reversible in nature and bacterial cells revert back to normal size on a time scale that is proportional to the strength and time of continuous pressure applied upon relaxing the high pressure condition. We have studied the dynamics of cellular reversibility of E. *coli* under the conditions in which continuous pressure is applied and subsequently relaxed over different time scales. We have quantified the dynamics of cellular reversibility with different relaxation times. Furthermore, we propose a model to describe the reversibility of the bacterial cell with the relaxation time. Our theoretical model fits well to the experimental data. We further

Sudip Nepal
Univ of Arkansas-Fayetteville

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