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On the response of *Escherichia coli* to high rates of deformation BRIANNA FITZMAURICE, JONATHAN PAINTER, GARETH APPLEBY-THOMAS, DAVID WOOD, Cranfield Defence and Security, Cranfield University, Shrivenham, Swindon, SN6 8LA, United Kingdom, RACHAEL HAZAEL, PAUL MCMILLAN, Department of Chemistry, University College London, 20 Gordon Street, London WC1H 0AJ, United Kingdom — While a large body of work exists on the low strain-rate loading of biological systems such as bacteria, there is a paucity of information on the response of such organisms at high rates of deformation. Here, the response of a readily accessible strain of bacteria, *Escherichia coli* (*E. coli*), has been examined under shock loading conditions. Although previous studies have shown greatly reduced growth in shock conditions up to several GPa, relationships between loading conditions and bacterial response have yet to be fully elucidated. A more rigorous investigation into the 1D shock loading response of *E. coli* has been carried out here, leading to a more comprehensive view of its behaviour when exposed to high pressures. Comparison has been drawn to provide insight into the importance of the nature of the loading regime to the survival of these biological systems.

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