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Reversible and irreversible deformations of bacterial cell walls ARIEL AMIR, Harvard University, FARINAZ BABAEIPOUR, Harvard University, UCSD, DAVID NELSON, Harvard University, SUCKJOON JUN, Harvard University, UCSD — Bacterial cell walls determine their shape and hold their large internal pressure. In spite of their biological importance, a full understanding of their structure and mechanics is lacking. Here, we shed new light on the nature of the deformations of bacterial cell walls by showing, theoretically and experimentally, that these can be either elastically (reversibly) or plastically (irreversibly) deformed, depending on the timescales involved. Our data suggests that irreversible bending of the cell wall arises due to an asymmetric insertion of new material, responding to the mechanical stresses.

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