

Abstract Submitted  
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**New insights into the bacterial cell wall peptidoglycan architecture** JOHN DUTCHER, AHMED TOUHAMI, University of Guelph, MANFRED JERICHO, Dalhousie University — The molecular architecture of the bacterial cell wall peptidoglycan (sacculi) is among the most challenging, yet still unsolved, structural problems in biochemistry. Two models have been proposed: the planar model, in which the glycan strands lie in the plane of the cell surface, and the scaffold model, in which the glycan strands lie perpendicular to the cell surface. We have used atomic force microscopy (AFM) to investigate the molecular structure of this unique biopolymer in the rod-shaped bacterium *Bacillus subtilis* at high resolution. AFM images recorded in air on single sacculi revealed a porous regular network with 25-50 nm-wide peptidoglycan fibers and a 5-25 nm pore size. Interestingly, the new bacterial pole showed a regular structure with the same fiber sizes but with the fibers running in a direction that is almost perpendicular to that observed away from the pole. This finding combined with our previous data on live hydrated bacteria (1) provides new insights into the three-dimensional architecture of the peptidoglycan of Gram-positive bacteria. 1- A. Touhami, M. H. Jericho, and T. J. Beveridge, *J. Bacteriol.*, 2004 186: 3286-3295.

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