

W0002

Structure Of Tracheal Cytotoxin In Complex With A Heterodimeric Pattern-Recognition Receptor. Chung-I Chang,^{1,2} Yogarany Chelliah,^{1,2} Dominika Borek,² Dominique Mengin-Lecreulx,³ Johann Deisenhofer^{1,2}, ¹Howard Hughes Medical Institute and ²Dept. of Biochemistry, Univ. of Texas Southwestern Medical Center at Dallas, 6001 Forest Park Rd, Dallas, TX 75390, USA, ³Inst. de Biochimie et Biophysique Moléculaire et Cellulaire, Centre National de la Recherche Scientifique, Univ. de Paris-Sud, 91405 Orsay, France.

Tracheal cytotoxin (TCT), a naturally occurring fragment of Gram-negative peptidoglycan, is a potent elicitor of innate immune responses in *Drosophila*. It induces the heterodimerization of its recognition receptors, the peptidoglycan recognition proteins (PGRPs) LCa and LCx, which activates the immune deficiency (Imd) pathway. The crystal structure at 2.1 Å resolution of TCT complexed with the ectodomains of PGRP-LCa and PGRP-LCx shows that TCT is bound to and presented by the LCx ectodomain for recognition by the LCa ectodomain; the latter lacks a canonical peptidoglycan-docking groove conserved in other PGRPs. The interface revealed in atomic detail between TCT and the receptor complex highlights the importance of the anhydro-containing disaccharide in bridging the two ectodomains together and the critical role of diaminopimelic acid (DAP) as the specificity determinant for PGRP interaction.