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# Physiological role of the mycobacterial pup proteasome

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## Abstract

Pupylation,the conjugation of a prokaryotic ubiquitin-like protein (Pup) to polypeptide targets,marks proteinsfor proteasomaldegradation.The Pup-proteasome system(PPS) was initially identified in*Mycobacterium tuberculosis*, where it was shown to be essential for full virulence of this pathogen. Later, thestrict conservation of PPS genes inactinobacterial and nitrospiral species, most of which are non-pathogenic, suggested a fundamental role for this proteolyticpathway in bacterial physiology. To better understand the physiological roles of PPS components in *M. tuberculosis* and related species, we focused our efforts on *Mycobacterium smegmatis*, a model mycobacterial organism. We report that the PPS is essential for prolonged survival of *M. smegmatis*at stationary phase. Accordingly, analysis ofpupylation dynamics during growth revealed increased levels of pupylated proteins and increased expressionpupylation-associated genes during stationary phase. Integration of our results with previously published data suggests that the demonstrated importance of the Pup-proteasome system for *M. smegmatis*persistence at stationary phase is also relevant for *M. tuberculosis*, as well as for other actinobacterial species.

## Biography

EyalGur has completed his Ph.D. at the age of 31 years from Tel Aviv University and postdoctoral studies from Massacusetts Institute of Technology. He is now a principal investigator at Ben-Gurion University of the Negev, working on intracellular protein degradation in bacteria.