

E3TALK

March 26

12h00

Room 2.2.14, Ciências ULisboa

Costs and consequences of insect immunity

Insect immune systems frequently rely on antimicrobial peptides as critical antimicrobial effectors. We have explored the consequences of this reliance by examining the interaction between *Drosophila melanogaster* and the ubiquitous broad host range pathogen *Enterococcus faecalis*. Remarkably, we have identified an *Enterococcus* surface protein that is specifically targeted by a *Drosophila* effector peptide; this biochemical interaction is required for immune antimicrobial activity. The identified target is a regulator of cell envelope stress responses that is frequently mutated in strains that acquire antimicrobial resistance in the clinic. Mutations in this target, or in several other stress-response systems that alter its expression, confer near-complete resistance to killing by the *Drosophila* immune response. All of these mutations also alter antimicrobial sensitivity; conversely, selection of *Enterococcus faecalis* with antimicrobials *in vitro* is sufficient to confer strong increases in virulence. We thus demonstrate a new mechanism by which host immunity can select antimicrobial resistance in the absence of antibiotic exposure.



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