Structural determinants of varying innate immune pathway targeting in YopJ bacterial effectors.

Bacterial effector proteins play an essential role in the infection and proliferation of pathogenic bacteria within their hosts through manipulation of immune response pathways. The YopJ family of effectors are a class of acetyltransferases found in both plant and animal pathogens. YopJs from animal pathogens such as *Salmonella enterica, Yersinia pestis,* and *Vibrio parahemeolyticus* target host innate immune pathways such as the JNK, ERK, and, NF-κB pathways. Interestingly, despite their similarity both structurally and functionally, these effectors target different pathways of the innate immune system. For example, the *Salmonella* effector, AvrA, only targets the JNK signaling pathway through acetylation of the mitogen activated receptor kinase kinases (MKK) 4 and 7, while the *Yersinia* effector, YopJ, targets all known innate immune signaling pathways through its ability to target many different kinases involved in these pathways. We present a structural and functional characterization of these effectors against several innate immune related kinases and suggest features that may allow different YopJs to target different MKKs and thus different innate immune signaling pathways.

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