

# PROTEIN - PROTEIN INTERACTION NETWORK OF THE QUORUM SENSING RESPONSE IN *XANTHOMONAS AXONOPODIS* PV. CITRI

Chuck S. Farah

Departamento de Bioquímica, Instituto de Química,  
Universidade de São Paulo

Bacteria use extracellular levels of small diffusible autoinducers to estimate local cell-density (quorum sensing) and to regulate complex physiological processes. The quorum-sensing signal transduction pathway of *Xanthomonas spp* phytopathogens has special features that distinguish it from that of other pathogens. At the top of this pathway sits RpfF, necessary for the production of the unique autoinducer “diffusible signaling factor” (DSF), and the RpfC/RpfG two component signal transduction system necessary for the DSF-dependent production of extracellular pathogenicity factors and cellular dispersion. We used yeast two-hybrid and direct *in vitro* assays in order to identify downstream targets of the RpfCG system. We identified interactions between the HD-GYP domain of RpfG and a set of GGDEF domain-containing proteins coded by the *Xanthomonas axonopodis* pv. citri genome. HD-GYP and GGDEF domains have been shown to possess diguanylate phosphodiesterase and diguanylate cyclase activity, and in this way regulate levels of bis (3'-5') cyclic di-GMP, an important second messenger involved in the regulation of complex bacterial processes including biofilm production, virulence and motility. Other interactions observed include those between RpfC and the only known homolog of “conditioned medium factor”, which is involved in quorum-sensing in *Dictyostelium discoideum* under conditions of nutritional stress, and between RpfCG and NtrBC, a two component system that regulates sigma 54 activity.