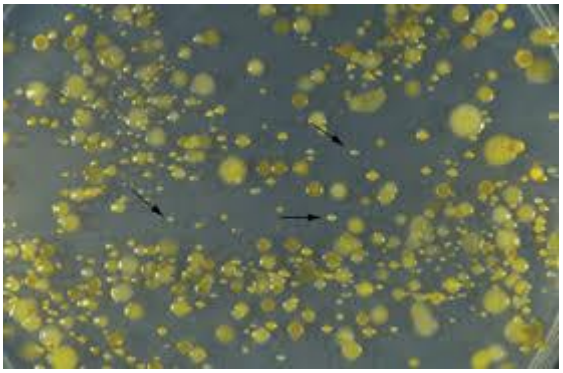
# Understanding the role of chemotaxis in entry, colonization and disease caused by rice pathogen *Xanthomonas oryzae* pv. *oryzae* in India

Researcher at DBT's Centre for DNA Fingerprinting and Diagnostics (CDFD), Uppal, discovered that phyllosphere, *Xanthomonas oryzae* pv. *oryzae* (Xoo), utilises flagellar mediated directional movement (chemotaxis) to enter the xylem vessels through hydathodes. In natural high humid habitat of rice host plant, early morning due to high root pressure xylem sap exudes and creates a gradient of various amino acids and sugars at phyllosphere. This gradient of chemotactic signals is sensed by Xoo chemotaxis system (MCP, CheW2, CheA2, Che Y1, CheR2, CheB2) and bacteria direct itself towards the hydathodes by flagellar movement and invades xylem vessels as deletion of either of these chemosensory signalling protein coding genes disrupts chemotactic movement towards these metabolites and failed to cause bacterial leaf blight disease by natural mode of infection (epiphytic infection).



*Xanthomonas* is a hemibiotrophic group of bacterial plant pathogen whose members cause devastating loss worldwide by causing a variety of diseases in economically important crops such as rice, citrus, cabbage and pepper. Infection cycle of *Xanthomonas* can be divided into the epiphytic stage and the endophytic stage. The epiphytic stage initiates once the bacteria are introduced into the aerial tissues of a new host, usually leaf or fruit tissue and continues until the entrance into the host tissue via the plant natural openings (hydathodes) and wounds. Most *Xanthomonas* spp. harbour motility-associated apparatuses like flagella and type IV pili and motility of these bacteria *in vitro* was reported to be mostly attributed to flagella. However, it was yet to be shown if flagella directly play a role in endophytic fitness or plant surface motility.

Source: https://www.ncbi.nlm.nih.gov/pubmed/30011125