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# Exploration of the growth-virulence trade-off in the plant pathogen *Ralstonia solanacearum* species complex

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*R. solanacearum* is one of the most devastating plant pathogens for agriculture due to its aggressiveness, its wide host spectrum, its vast geographical distribution and its long persistence in the soil. In many countries it infects many important crops (tomato, ginger, potato, bananas, tobacco ...). On potato alone, it is responsible for an estimated \$1 billion US in losses each year world-wide. It can also survive for years in soil, thus preventing the culture of susceptible hosts for long periods of time. When detected, is a source of major constraints for agriculture.

*Ralstonia solanacearum* is now defined as a species complex composed of hundreds different strains and divided in four major phlotypes. Few strains are described as host-specific, but most of them have similar lifecycles and can invade many hosts. Recently, we used a systems biology approach to show the existence of a trade-off between growth and virulence for the strain GMI1000 (Peyraud et al., 2016). Indeed, virulence traits such as excretion of exopolysaccharides or construction of a type III secretion system are costly in terms of energy, carbon and nitrogen, impacting the growth rate. The pathogen has to decide how to invest its resources between growth (hence proliferation) and virulence (thus defense/attack against the plant). This trade-off was experimentally validated by showing that avirulent mutants grows faster than the wild type.

Here, we will present experimental and systems biology results investigating how much this trade-off is conserved among different strains of the *R. solanacearum* species complex. We will show that strains have different trophic preferences and metabolic adaptation, which can be linked to their lifestyle.

Peyraud, R., Cottret, L., Marmiesse, L., Gouzy, J., Genin, S., 2016. A Resource Allocation Trade-Off between Virulence and Proliferation Drives Metabolic Versatility in the Plant Pathogen *Ralstonia solanacearum*. PLoS Pathog. 12, e1005939.  
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