

## **A key pyranose-2-phosphate motif is responsible for both antibiotic import and quorum-sensing regulation in *Agrobacterium tumefaciens***

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We succeeded in understanding how the periplasmic protein AccA from the pathogen *A. tumefaciens* could bind both the plant compound agrocinopine and the antibiotic agrocin 84. Whereas agrocinopine acts as a nutrient and regulatory signal in *A. tumefaciens*, agrocin 84 is lethal once degraded by the enzyme AccF into a toxic moiety. We identified the pyranose-2-phosphate-like moiety (*arabino* for agrocinopine and *gluco* for agrocin 84) shared by these two ligands as the key recognition template for AccA. We hypothesized that agrocin 84 will kill all agrobacteria possessing AccA and AccF and that AccA is a gateway allowing the importation of any compound possessing such a pyranose-2-phosphate motif, and this was confirmed using new synthetic analogs of agrocinopine specifically prepared. Furthermore, among these analogs, arabinose-2-phosphate, resulting from the cleavage of agrocinopine by AccF, was proved, using affinity and in vivo assays, to be the effector of the transcriptional repressor AccR, which controls quorum-sensing and virulence plasmid propagation. Overall, through an interdisciplinary approach, we could identify an original and specific key pyranose-2-phosphate motif that not only allows selective passage of active compounds into the pathogen cells, but also, once these compounds are cleaved, keeps to the matured products their ability to act as signals.

**References** : El Sahili A, Li SZ, Lang J, Virus C, Planamente S, Ahmar M, Guimaraes BG, Aumont-Nicaise M, Vigouroux A, Souler L, Reader J, Queneau Y, Faure D, Moréra S. (2015). A Pyranose-2-Phosphate Motif Is Responsible for Both Antibiotic Import and Quorum-Sensing Regulation in *Agrobacterium tumefaciens*. PLoS Pathogens 11(8):e1005071.