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## Colloque IVB : Signalisation et réaction cellulaire


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## Veni, senti, vici : Evolution of Quorum Sensing in Gram(+) bacteria


Gram(+) bacteria use a wealth of extracellular signalling peptides, so-called autoinducers, to regulate gene expression according to population densities. These "quorum sensing" systems, which control vital processes such as virulence, sporulation and gene transfer, are prime targets for novel antibiotics. Based on our X-ray analysis of PlcR, the major virulence regulator of the Bacillus cereus group, we show that fundamentally different processes in different bacterial classes are regulated by essentially the same autoinducer recognition mechanism. In the case of PlcR, we indicate how this structural framework is employed to regulate virulence. Corroborated by a phylogenetic analysis, our data further suggest that all those quorum sensors that bind directly to their autoinducer peptide derive from a common ancestor. Our results elucidate origin and evolution of multicellular behaviour in bacteria, and are expected to alleviate study and drug design for a major subset of Gram(+) quorum sensors [1,2].



[1] Declerck N., Bouillaut L., Chaix D., Rugani N., Slamti L., Hoh F., Lereclus D. & Arold S.T. PNAS, 104, (2007) 18490-5

[2] Bouillaut, L., Perchat, S., Arold, S.T., Zorrilla, S., Slamti, L., Henry, C., Gohar, M., Declerck, N., Lereclus, D. Nucleic Acids Res. (2008) in press