- **PROJECT-2 : K^+ - transport mediated by the Kdp transporter and its regulation**

E.coli possesses several transporters for the active uptake of K^+. Of these, Kdp is a P-type ATPase comprised of three major polypeptide subunits (KdpA,KdpB and KdpC) encoded by genes of the *kdp* operon, and is the only one whose synthesis is induced at the level of transcription under K^{+-} limiting growth conditions. Our group had shown that the *kdp* operon is induced during steady-state growth by ionic solutes such as NaCl but not by non-ionic solutes such as sucrose (1); these and other findings have led us to argue that the signal regulating *kdp* expression is not turgor as was previously believed, but perhaps the rate of transmembrane K^+ flux (2). Recently, we have shown that cytoplasmic thiol oxidation status as well as the H-NS protein are also involved in regulating *kdp* transcription in vivo (3). We have also obtained evidence to suggest that an N-terminal fragment of KdpA, comprising less than one-third of the length of the native polypeptide, is sufficient to confer a membrane potential-driven uptake of K^+ in vivo, even in the absence of the other two subunits KdpB and KdpC (4). Our current interests are in further understanding the mechanism of K^+ transport through Kdp as well as its transcriptional regulation.

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