

# Expression of the translocator protein (TSPO) from *Pseudomonas fluorescens* Pf0-1 requires the stress regulatory sigma factors AlgU and RpoH.

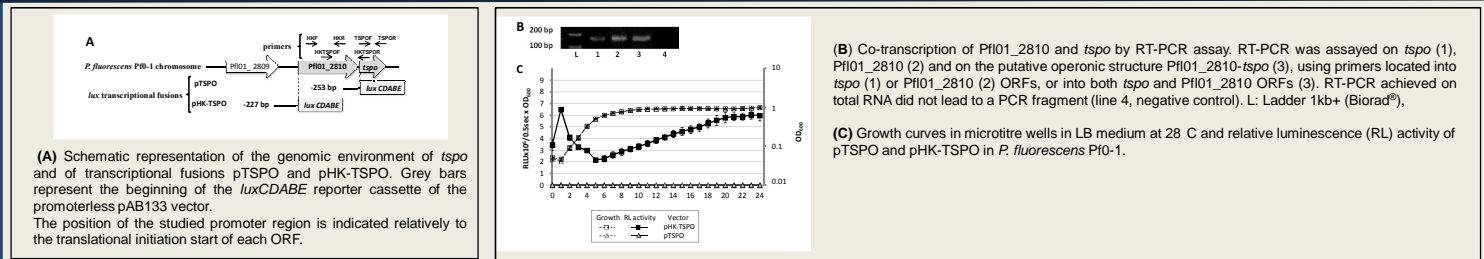
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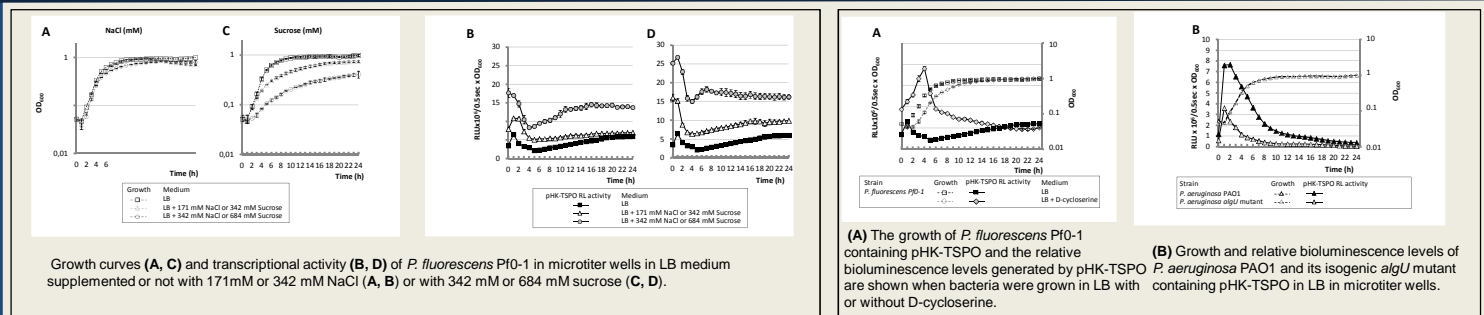
The translocator protein (TSPO), previously designated as peripheral-type benzodiazepine receptor, is an evolutionary conserved protein that is found in many Eukarya, Archae and Bacteria, in which it plays several important functions including membrane biogenesis, signaling and stress response. A *tspo* homologue gene has been identified in several members of the *Pseudomonas* genus, among which the soil bacterium *P. fluorescens* Pf0-1. In this bacterium, the *tspo* gene is located in the vicinity of a putative hybrid histidine kinase-encoding gene.

Since *tspo* has been involved in water stress related response in plants, we explored the effects of hyperosmolarity and temperature on *P. fluorescens* Pf0-1 *tspo* expression using a strategy based on *lux*-reporter fusions.

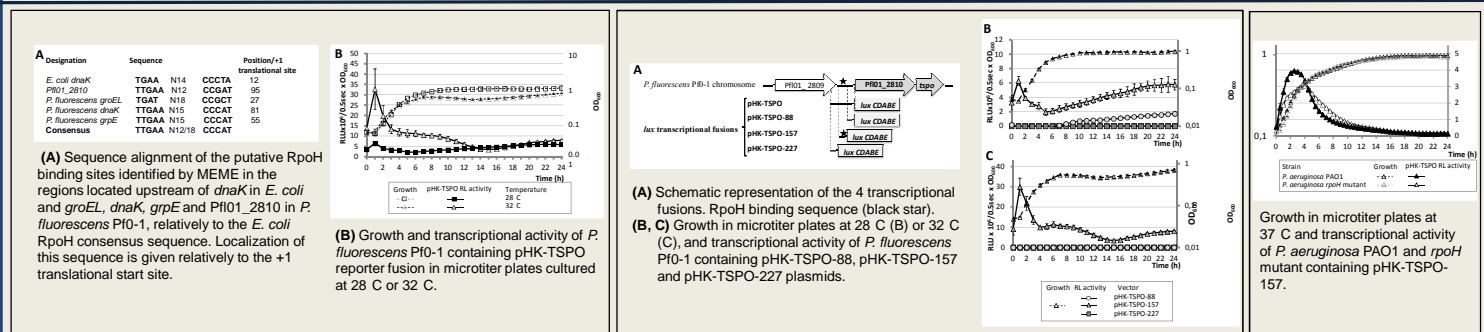
The *tspo* gene (Pfl01\_2811) of *P. fluorescens* Pf0-1 forms an operonic structure with Pfl01\_2810 and is expressed transiently during the bacterial growth.



Expression of *tspo* is increased in response to hyperosmolarity at least partly via the extracytoplasmic function sigma factor AlgU activity.



A putative RpoH-consensus binding site is located in Pfl01\_2810-*tspo* promoter region: effect of temperature on growth and TSPO expression.



## Conclusions

We show that the two genes Pfl01\_2810 and *tspo* are co-transcribed forming a transcription unit. The expression of this operon is growth phase-dependent and is increased in response to high concentrations of NaCl, sucrose and to a D-cycloserine treatment, which are conditions leading to activity of the major cell wall stress responsive extracytoplasmic sigma factor AlgU. The promoter region activity is strongly lowered in a *P. aeruginosa algU* mutant, suggesting that AlgU may be involved at least partly in the molecular mechanism leading to Pfl01\_2810-*tspo* expression. *In silico* analysis of this promoter region failed to detect an AlgU consensus binding site; however, we detect a putative binding site for the heat shock response RpoH sigma factor. Accordingly, the promoter activity of the region containing this sequence is increased in response to high growth temperature and slightly lowered in a *P. aeruginosa rpoH* mutant strain. Taken together, our data suggest that *P. fluorescens tspo* gene may belong at least partly to the cell wall stress response.