Role of alternative sigma factor PP4553 in stress response and biofilm formation of *Pseudomonas putida* KT2440

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Pseudomonas putida is a Gram-negative, aerobic, flagellated and non-pathogenic soil bacterium, which is well known for its extremely metabolic versatility. Because of this, *P. putida* offers a considerable potential for biotechnological applications. The remarkable versatility of this bacterium is at least in parts driven by sophisticated and coordinated regulation of gene expression mediated by a repertoire of transcriptional regulators, in particular the so called sigma factors. Sigma factors are essential for prokaryotic transcription initiation and enable specific binding of the RNA polymerase to the respective promoter recognition sites. Bacteria generally contain one housekeeping sigma factor and a pool of alternative sigma factors which are activated in response to different and often stressful conditions. The genome of *P. putida* exhibits with 24 a striking number of putative sigma factors, one of which is open reading frame PP4553. To analyze this putative sigma factor in more detail, we constructed a gene knock-out deletion mutant of PP4553 in *P. putida* KT2440. Further characterization of this PP4553-mutant revealed a twofold increase in attachment as well as biofilm formation on abiotic surfaces in comparison to the wild type strain. Moreover, growth analyses of wild type and PP4553-mutant strain under different stressful conditions suggested that PP4553 is also involved in stress response of *P. putida* KT2440. To gain a deeper insight into the regulatory circuit of the putative sigma factor PP4553, we performed transcriptome analysis using Illumina sequencing.