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Commentary Article

Escherichia coli's Crowning Behavior and the Glucose Effect

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DESCRIPTION

Escherichia coli use different behavioural strategies to colonize diverse types of environmental niches. Thus, using its flagella *E. coli* can swim individually [1] or swarm collectively [2-4] to colonize liquid medium (also inside agar semisolid) and viscous substrates (e.g. semisolid agar surfaces) respectively. In addition, when *E. coli* finds an abiotic solid surface (e.g. plastic) a transition in its lifestyle is carry out and the formation of a sessile biofilm is realized [5]. On the other hand, crowning has recently been described as a novel sessile colonizing behaviour in *E.coli* [6]. The corona formation is independent of the principal genetic network that control biofilm formation [6]. An intriguing aspect of the *E.coli's* crowning behaviour is that the corona generation is suppressed by the availability of glucose in the growth medium (glucose effect) [6]. Contrary to that is observed in biofilm formation [7], this suppressive effect on the corona development is not mediated by the classical catabolic repression system, the cyclic AMP (cAMP)-cAMP Receptor Protein (CRP) complex [6]. In a first glimpse, this effect appear to be contradictory because the glucose is the preferred sugar consumed in the carbon metabolism of *E. coli* [8] and in principle theoretically could be anticipated that glucose should stimulate corona formation no its repression. Intriguingly, the availability glucose is necessary to swarming migration in semisolid agar surfaces, promoting thus the swarming behaviour [2-4]. It has been suggested that this positive effect is due glucose metabolism provides the required energy for swarmer cell differentiation and swarming motility [4]. Although how glucose carry out these effects in swarming behaviour is still unknown. On the other hand, contrarily to swarming migration, the swimming motility is repressed by glucose [8]. Again, indicating that is not clear the metabolic logic with respect to glucose that underlies to the different *E. coli* colonizing behaviours: swimming, biofilming and crowning. I hope that in the future the isolation of *E.coli's* mutants (or genes in multicopy) capable to generate corona, despite that the glucose is available in the medium of growth, should inform us of the genetic basis that underlies to phenomenon of glucose mediated coronal suppression. To this respect the use of a set of single-gene knockout mutants of all the nonessential genes in *E. coli* K-12 (the Keio collection) [9] and the plasmids collection [10] should help to clarify this important issue.

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