The role of ppGpp in E. coli cell size control

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PROPOSITIONS

accompanying the dissertation

CONTROLLING PPGPP IN BACTERIAL CELLS

by

FERHAT BÜKE

1-Lives of microorganisms are dominated by stochastic events and a complete understanding of bacterial physiology has to account for this.

2- *Escherichia coli* cell size correlates with the concentration of Guanosine tetraphosphate (ppGpp) through a growth rate independent mechanism.

3- A light activated ppGpp hydrolysis enzyme can be used to alter the concentration of ppGpp within minutes upon activation by light.

4- *Escherichia coli* maintains a high capacity for phospholipid (PL) synthesis at slow growth rates by inhibiting PlsB post-translationally. This allows PL production rate to respond rapidly to a change in the environmental conditions.

5- The slow response by governments to the COVID-19 global pandemic will result in thousands of people dying. These deaths could have been prevented by a more informed public, and governments that rely on information produced by reputable scientists and institutions.

6- A recent increase in science denying in the form of vaccine deniers or flat earthers is a failing in the part of science community. Every scientist should think and act on increasing the public's understanding of science and technology.

7- Public science communication efforts from talented individuals with the help of the internet has huge potential for reach, teaching and direct interaction. However, universities should encourage and help scientists in their efforts.

8- Excess paperwork forced on PhD students is a significant contributor to mental health issues which are overly represented in their population compared to master students or Post Docs.

9- Research and teaching require a completely different set of skills, so expecting a great researcher to also be a great teacher is delusional (barring a few exceptions). Forcing researchers who are uninterested and unskilled in education leads to less efficient research and even worse teaching.

10- A bright future awaits humanity if we can learn from bacteria.

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