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## Is nucleoid complexity hence cell diameter limited by the eclipse?

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Cell width  $W$  of *Escherichia coli* is correlated with the mean complexity of its nucleoid, which is expressed as the ratio between the mean times to replicate it and to duplicate the cell aka the number of replication positions  $n$ . A set of old, puzzling observations of cell size and dimensions is qualitatively consistent with the view that  $W$  is determined by  $n$ , and that branching results from breaching a maximum possible value. This maximum  $n_{max}$  is interpreted in terms of a minimal distance possible between successive moving replisomes, so-called eclipse. The data is subject to analytical quantification designed to model the correlations in a way that may (1) shed light on the necessary coupling between the two unique structures in a bacterial cell, nucleoid and sacculus, and (2) lead to decipher the primary signal transduced from DNA to the peptidoglycan biosynthetic pathway. The first approximation is not sufficient to account for the rate at which average cell size rises with time (Po-Yi H and Amir A, personal communication), hence two additional causes are considered to reconcile this discrepancy: loss of division capacity of some DNA-less cells and dependence of the time needed for division on  $W$ . A physical signal is invoked, related to transcription/translation of membrane protein genes coupled to membrane-insertion of these proteins termed "transertion", but means to measure the reciprocal stress imposed by transertion strings on both nucleoid and cell envelope are sorely lacking.

### Biography

Arieh Zaritsky of Ben-Gurion University's Faculty of Natural Sciences (<http://ariehz.weebly.com/>) runs a laboratory investigating parallel fields, pure and applied. During his career at BGU (1973-todate), Dr. Zaritsky has instructed over 50 trainees (graduate students and scientists) and was awarded numerous research grants, allowing him to study both fields of expertise. He visited many higher education Institutions around the world and delivered invited lectures related to both research fields at international meetings. After obtaining a distinguished MSc in Genetics at The Hebrew University of Jerusalem (1967), he graduated at Leicester University (1971) and post-doc'ed at The Copenhagen's Institute of Microbiology (1972). Professor Zaritsky is a recognized expert on bacterial cell physiology and bacteriophage multiplication and published over 130 peer-reviewed articles (<http://ariehz.weebly.com/articles.html>). Dr. Zaritsky Chaired BGU's Life Sciences department (1989-1991) and is an Editorial Board member of Bioengineered and awardee of 1994 Burroughs-Wellcome/ASM Visiting Professorship.

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