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Determination of rRNA Operon Copy Number in the *Caulobacter* Group

Redundancy in bacterial genomes is rare. Bacteria tend to have single copies of their genes, but an exception is seen with the rRNA genes. rRNA operon copy number in prokaryotes varies between 1 and 15 within a genome, and a correlation has been detected between growth rate and the number of rRNA operons. This relationship has been explored in intestinal and soil microorganisms, and it has been found that the number of rRNA genes is higher in bacteria that respond to sudden nutrient availability by growing rapidly. Organisms that live in environments with high, fluctuating nutrient levels have more copies of the rRNA operon than organisms that live in environments with a low, constant supply of nutrients. We are trying to determine whether there is a correlation between copy number and growth rate in the aquatic bacteria of the genus *Caulobacter*. The strains that we are investigating can be sorted into three groups: the fast growers (generation time 2-2.5 hrs), the intermediate growers (3-4 hrs.) and the slow growers (>4 hrs). *Caulobacter crescentus*, the only species in this group whose copy number is known, has a generation time of 2-2.5 hrs and two copies of the rRNA operon. We hypothesized that the slower-growing *Caulobacter*s would have only one copy of the rRNA operon. This will be determined by southern hybridization of digested whole-genomic DNA prepared from nine strains of *Caulobacter*, and from *Caulobacter crescentus* and *Escherichia coli* as controls with known copy numbers. The probe was prepared by PCR-amplification of *E.coli* 16S rRNA and tagged with chemiluminescent antibody. [findings yet to come]