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Thymine starvation causes abortive initiation of chromosome replication critical for cell death in *Escherichia coli*

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Thymineless death (TLD), a phenomenon in which thymine auxotrophy becomes lethal when cells are starved for thymine, can be prevented by rifampicin addition. In this work, we have obtained evidence indicating that among the effects of RNA polymerase inhibition by rifampicin, the inhibition of chromosomal replication initiation is the process responsible for TLD suppression. We show that diminishing, abolishing or increasing the transcription level around *oriC* alleviates TLD by limiting the chromosomal initiation capacity (ChIC) generated under thymine starvation. TLD suppression was eliminated by DnaA inactivation or the deletion in the left half of the replication origin or deletion of the DnaA-boxes located in the right half of the *oriC* region. In accordance with these data, two-dimensional DNA electrophoresis gels showed an accumulation of simple-Y and bubble arc replication intermediates, as well as recombination structures at the *oriC* region during thymine starvation. None of these structures were observed under genetic or physiological conditions that suppress TLD. These results demonstrate that abortive initiations of chromosome replication occur under thymine starvation, supporting the idea that these events are a critical target for the lethal damage caused by thymine starvation and that results in TLD.