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SIMULATION ANALYSIS OF DNA CONTENT AS A FACTOR INFLUENCING CELLS SUSCEPTIBILITY TO DAMAGE IN PARTICULAR CELL CYCLE PHASES

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ABSTRACT

Replication and mitosis processes are related with changes in DNA content during the cell cycle. Our purpose was to check whether the changing amount of transcriptionally active DNA may be a source of heterogeneity in cells population response to ionizing irradiation. The results obtained using our model indicate that cells are more radiosensitive during the later stages of the cell cycle and that the critical dose which kills more than half of desynchronized population, in reality kills mainly cells in G2/M cell cycle phase. Our model based on simple assumptions is able to explain some sources of heterogeneity observed in cell population.

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