

## The effect of radiation and cement dust on the DNA of female and male samples

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### KEYWORDS

Radiation, cement, DNA

### SHORT SUMMARY

*Nyquist plots of DNA samples were made for female and male DNA samples under laser or gamma radiation to detect effects of cement dust.*

### EXTENDED ABSTRACT

The Nyquist plots of female and male DNA samples were recorded using electrical impedance spectroscopy. The recorded curves were of the same features. The peak of each curve and its half-width were increased and shifted to higher impedance component values as, the exposure time increased 0, 5, 10, 15, 20, 25 and 30 min, under the effect of any of laser radiation or gamma radiation. The obtained results for the female healthy DNA samples were: The electrical resistance was increased from 346.11 K $\Omega$  to 922.4 K $\Omega$ , while the electric capacity was increased from 15.3 $\mu$ F to 24.6 $\mu$ F under the effect of laser radiation of constant Power 100 mW, ( $\lambda = 532$  nm). These results under the effect of gamma radiation were the increase of the electric resistance from 145.37 K $\Omega$  to 161.45 K $\Omega$  and the increase of the electric capacity from 9.5  $\mu$ F to 14.1  $\mu$ F.

For the male healthy DNA samples, the obtained results were: The electric resistance increased from 140.12 K $\Omega$  to 929.17 K $\Omega$ , while the electric capacity was increased from 2.02  $\mu$ F to 7.10  $\mu$ F. This means that the DNA efficiency of the female

samples decreased more than that of the male samples.

The effect of cement dust on female and male healthy DNA Samples was studied. The selected cement dust concentrations were 0, 1, 2, 3, and 4 $\mu$ L. The results of the DNA female samples were an increase in the electrical resistance from 131.30 K $\Omega$  to 2853.34 K $\Omega$  and the increase of the electric capacity from 7.86  $\mu$ F to 71.4  $\mu$ F.

The obtained results of the DNA healthy male, samples were the increase of the electric resistance from 583.07 K $\Omega$  to 4440 K $\Omega$  and the electric capacity from 19.9  $\mu$ F to 4.82  $\mu$ F. These results confirm the decrease of the female DNA efficiency as a result of the increase of the cement dust concentration, more than that of the DNA male sample.