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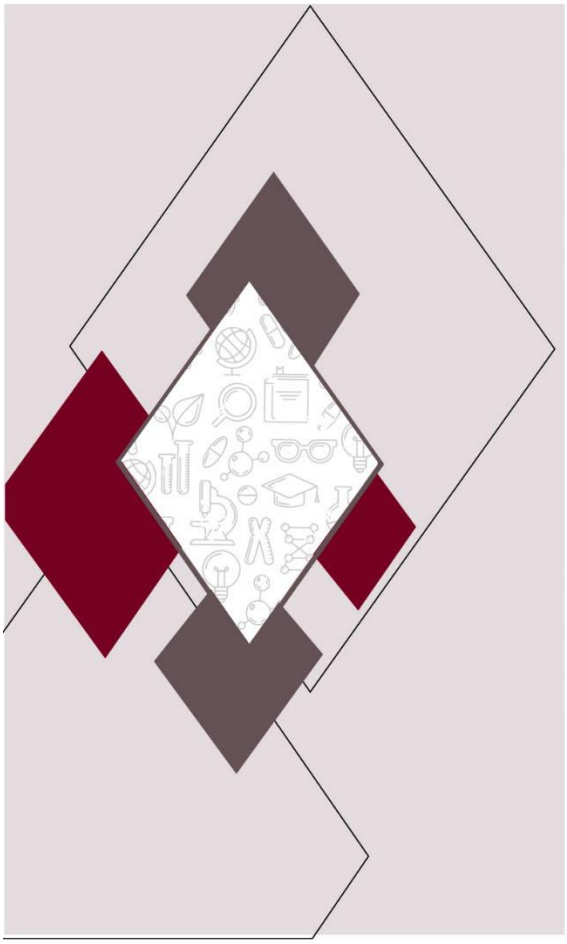

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"Does Brain or Renal Expression of KRAS be influenced by Silver-Nanoparticles?"

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Abstract:

There have been several reports claiming that silver nanoparticles (AgNPs) are not absolutely safe. The purpose of this study is to look into the potential of CNS and renal molecular toxicities (expressed by changes in KRAS expression) that might occur when mice are injected with various AgNP doses. The results showed that as the AgNPs dosage was raised, KRAS expression rose significantly.

Introduction:

Nanoparticle production is increasing these days for different and important purposes. (1-3). For a variety of reasons, AgNPs are widely employed nanoparticles, including antibacterial action against numerous species (4, 5, 6, 7), cheap cost of synthesis (8), and other unique features (9) make them used in a variety of everyday items (10-12), but the likelihood of Ag+ ions leakage might compromise their safety (13-17). According to several studies, the AgNPs hazardous and the Ag+ emission have no correlation (18, 19), moreover, some investigations have indicated that metallic Ag nanoparticles toxicity may be stronger than the cytotoxicity of silver ions alone. (20, 21). N-, K-, and H-RAS are three often mutated human oncogenes that are important therapeutic targets (22). KRAS is the most often altered of the three RAS genes in various malignancies (23). The study here attempted to find the effects of employing AgNPs on KRAS genetic expression in CNS and kidneys.

Material & Methods

Nasir et al., (2020) accomplished the AgNPs formulation, mice grouping, the

Table (1): The primers used in this study for K-RAS & control genes.

Primers			Sequence (5 →3)	MT (°C)
Target gene	K-RAS	Forward	AGGCCTGCTGAAAATGACTG	63.9 °C
	K-RAS	Reverse	TCTGAATTAGCTGTATCGTCAAGG	65.9 °C
Control gene	β-ACTIN	Forward	CCTGAACCCTAAGGCCAAC	60 °C
	β-ACTIN	Reverse	ACGTACATGGCTGGGGTGT	62 °C

extraction of RNA, and the production of cDNA in a prior works (24, 25).

Results

Table 2 below shows the varying expression concentrations of KRAS in the

Table-2:

Duration	AgNPs/Kg	Mean ± SE	
		Brain	Kidney
7 days	0.025 mg	0.1096 ± 0.0328 a	0.0779 ± 0.0314 a
	0.5 mg	0.0223 ± 0.0038 c	0.0797 ± 0.0234 a
	1 mg	0.0480 ± 0.0042 bc	0.0183 ± 0.0057 b
14 days	0.025 mg	0.1005 ± 0.0367 ab	0.0585 ± 0.0237 ab
	0.5 mg	0.0609 ± 0.0147 abc	0.0107 ± 0.0045 b
	1 mg	0.0708 ± 0.0047 abc	0.0215 ± 0.0111 b
	Control	0.0259 ± 0.0059 c	0.0151 ± 0.0017 b
	LSD value	0.0543 *	0.0497 *
* (P<0.05).			

various organs investigated.

Discussion

There are a lot of evidences demonstrated that utilizing silver-containing items, even if they only contain a little quantity of silver, can cause molecular toxicity to the body's immune system and overall wellness. (26, 27).

The present study explained the positive connection of brain KRAS expression with the AgNPs concentration. Anyhow, the mice who received 0.5 mg of AgNPs for 7 days showed brain KRAS expression level less than that of control group. It has been conducted that human glioblastoma development is associated with activating RAS by specific pathway (28, 29). The activation of this pathway can generate mice glioma as a result of increased expression of oncogenic KRAS (30-33). Furthermore, Ju *et al.* found related results in zebrafish brain (34).

The current data announced the significant linkage of renal KRAS levels and the silver-nanoparticles dose. Nevertheless, the mice who spent 14 days on 0.5 mg of AgNPs gave renal KRAS concentration lower than that of the control group. KRAS overexpression or mutations stimulate abnormal cell proliferation (24, 35, 36). It has been found that the KRAS expression is increased significantly in 13.7% of renal cell carcinoma patients (37, 38). Furthermore, Kozma *et al.* (39) conducted that 16.6% of renal cell carcinoma samples showed KRAS amplifications and they found that these amplifications were correlated with the grade and size of tumor.

Conclusion

The findings of this investigation exhibited a strong link between KRAS levels and AgNPs dosage, indicating a possible hazardous connected with using AgNPs products.

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