

**Cairo University**  
**Faculty of Veterinary Medicine**  
**Department of Pathology**



# **Pathological And Clinicopathological Studies On Nano Technology As A Tool for Treatment of Diethylnitrosamine-induced Hepatic Affections in Albino Rats**

**Thesis**  
**Presented by**

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For Ph.D. in Veterinary Medical Science, Veterinary Pathology  
(General, Special and Postmortem)

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# **Supervision Sheet**

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### **Abstract**

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**Title of thesis: Pathological And Clinicopathological Studies On Nano Technology As A Tool For Treatment of Diethylnitrosamine-induced Hepatic Affections In Albino Rats**

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This study was designed to perform the ability of gold nanoparticles (GNPs) to improve the hepatotherapeutic effect of cisplatin against diethylnitrosamine (DNA)-induced Hepatocarcinogenicity with minimal side effect. 13nm sized GNPs were prepared by citrate reduction method and conjugated by cisplatin, and then the prepared particles were characterized by using U.V. spectrophotometer, TEM and Zetasizer nano. The experiment was carried out on 120 male albino Wister rats (average b.wt 70-100g). The animals were divided into 2 groups, group (A) kept as negative control and group (B) received DNA and CCL4. Each group was subdivided into 7 subgroups according to different methods of treatments. Concerning group (B) the 1<sup>st</sup> group received DNA and CCL4 then kept as positive control. The 2<sup>nd</sup> and 3<sup>rd</sup> group received DNA and CCL4 then treated by cisplatin for short and long period respectively. The 4<sup>th</sup> and 5<sup>th</sup> group received DNA and CCL4 then treated by GNPs for short and long period respectively. The 6<sup>th</sup> and 7<sup>th</sup> group received DNA and CCL4 then treated by GNPs-cisplatin conjugates for short and long period respectively. Group (A) treated with the same methods as in positive control groups. Then recording the clinical signs, body and tissue weights, clinical biochemical parameters (ALT, AST, ALP, T.Bil., D.Bil. and GGT), liver oxidative stress markers (MDA, GSH and CAT) as well as gross lesions, histopathological lesions of liver and kidneys and immunohistochemical staining of liver tissues were done. GNPs residues were determined in different organs by using ICP-MS to study the biodistribution of GNPs. The results of this study revealed the antioxidant and hepatotherapeutic effect of nontoxic GNPs against DNA-induced hepatocarcinogenicity and also confirmed the detoxification of cisplatin by GNPs.

**Key words:** Gold nanoparticles- cisplatin- diethylnitrosamine- carbon tetrachloride- oxidative stress.



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# **List of CONTENTS**

## **INTRODUCTION**

## **REVIEW OF LITERATURE**

1- Liver histology and physiology .....	1
2- Hepatotoxicity .....	1
3- Pattern of liver injury .....	7
4- Liver regeneration .....	27
5- Liver function tests .....	29
6- Nanotechnology (definition and application) .....	32
7- Nanomedicine (definition and application) .....	33
8- NanoOnchology .....	34
9- History of use gold and gold nanoparticles in medicine .....	36
10-Importance of gold nanoparticles .....	37
11-Cellular uptake and accumulation of gold nanoparticles .....	38
12-Chemical preparation of gold nanoparticles .....	39
13-Methods of detection of gold nanoparticles .....	42
14-Toxicity and biocompatibility of gold nanoparticles .....	44
15-Application of gold nanoparticles in medicine .....	46
16-Uses of gold nanoparticles in different liver affections .....	48
17-Cisplatin .....	49
18-Detoxification of cisplatin by gold nanoparticles .....	51

## **MATERIALS AND METHODS**

### **1- Materials**

1-1- Animals .....	54
1-2- Diagnostic kits .....	54
1-3- Drugs and chemicals .....	54
1-4- Stains used for histopathological studies .....	55
1-5- Immunohistochemical stains for tumor markers .....	56
1-6- Instruments .....	56

<b>2- Methods</b>	
2-1- Experimental procedure.....	57
2-2- Experimental design.....	59
2-3- Clinical observation.....	61
2-4- Animal body and tissue weighting.....	61
2-5- Sampling.....	61
2-6- Immunohistochemical staining.....	64
2-7- Preparation of liver tissue homogenates.....	65
2-8- Evaluation of biochemical parameters.....	66
2-9- Statistical analysis.....	67
<b>RESULTS</b>	
1- Characterization of the prepared nanoparticles.....	68
2- Clinical signs.....	73
3- Animal body and liver weights.....	74
4- Clinical biochemistry finding.....	76
5- Tissue distribution of GNPs.....	80
6- Postmortem finding in liver and kidneys.....	80
7- Histopathological finding.....	86
8- Grading and scoring of hepatotoxicity.....	94
9- Immunohistochemical staining.....	130
<b>DISCUSSION.....</b>	<b>140</b>
<b>SUMMARY AND CONCLUSION.....</b>	<b>154</b>
<b>REFERENCES.....</b>	<b>158</b>

### **List of tables**

<b>Table no.</b>	<b>Content of table</b>	<b>Page no.</b>
1	Experimental design	59
2	The different treatment procedures	60-61
3	Rat's body weight (/grams) from the start point of the experiment till 8 <sup>th</sup> month post injection of DENA	74
4	Rat's body weight (grams) in different groups at 10 <sup>th</sup> month before treatments and at 11 <sup>th</sup> month after treatment commencement	75
5	Relative liver weights (/grams) at 2 <sup>nd</sup> , 5 <sup>th</sup> and 8 <sup>th</sup> month post injection of DENA	76
6	Relative liver weights (/grams) in different groups at 11 <sup>th</sup> month of the experiment after treatment commencement	76
7	The effect of different treatment on serum ALT, AST and ALP at 11 <sup>th</sup> month from the start point of the experiment	77
8	The effect of different treatment on serum total and direct bilirubin and GGT at 11 <sup>th</sup> month from the start point of the experiment	78
9	The effect of different treatment on liver oxidative stress value at 11 <sup>th</sup> month from the start point of the experiment	79
10	Tissue distribution of GNPs in different organs of experimental rats at 11 <sup>th</sup> month from the start point of the experiments	80



### **List of figures**

<b>Fig. no.</b>	<b>Content of figure</b>	<b>Page no.</b>
1	Spectrophotometer results of GNPs characterization showing peak absorption (0.97) at wavelength 530 nm	68
2	Spectrophotometer results of GNPs-cisplatin conjugates characterization showing no absorption	69
3	Transmission electron microscope image showing spherical shapes of GNPs with different sizes ranging from (13-50) nm	69
4	Transmission electron microscope image showing shell of cisplatin conjugate around GNPs	70
5	Transmission electron microscope image showing spherical shapes of GNPs-cisplatin conjugates with different sizes ranging from (50-100) nm	70
6	Particle size distribution by Zetasizer nano showing peak percentage (20.32%) at 17.5 nm diameter.	71
7	Particle size distribution by Zetasizer nano showing peak percentage (32.32%) at 58.5nm diameter.	71
8	Zeta potential distribution of the prepared particles showing peak count (82.1% and 17.9%) of the particles at -30.4 and -1.38 mV zeta potential respectively.	72
9	Zeta potential distribution of the prepared particles showing peak count (100%) of the particles at -0.48 mV mV zeta potential	72
10	Liver of rat received DENA (5 months) showing pale white focal areas and raised nodules all over the hepatic parenchyma	82
11	Liver of rat received DENA (11 months) showing multiple raised nodules all over the liver	82
12	Liver of rat received DENA (11 months) showing hepatomegally	83

	with rounded hepatic borders	
13	Liver of rat received DENA (11 months) showing multiple white raised nodules	83
14	kidney of rat received DENA and CCL4 (11 months) showing pale white focal areas of necrosis together with reddish areas of congestion	84
15	kidney of rat received DENA and CCL4 (11 months) showing multiple white different sized nodules	84
16	kidney of rat received DENA and treated by cisplatin showing multiple white different sized nodules	85
17	Liver of rat received DENA and CCL4 (3months) showing mononuclear inflammatory cells infiltration in sinusoids and portal area with fibroblast cells proliferation. Hepatocytes with karyomegalic nuclei and prominent nucleoli (H&E stain X400).	96
18	Liver of rat injected by DENA and CCL4 (3months) showing vacuolation and hyperplasia of epithelial lining bile ducts as well as fibroblastic proliferation in portal area (H&E stain X400).	96
19	Liver of rat injected by DENA and CCL4 (3months) showing small clear focus of hepatocellular alteration (H&E stain X400).	97
20	Liver of rat received DENA and CCL4 (5 month) showing focal hepatocellular coagulative necrosis infiltrated with inflammatory cells surrounded by karyomegalic hepatocytes with prominent nucleoli (H&E stain X400).	97
21	Liver of rat received DENA and CCL4 (5 month) showing karyomegalic nuclei with prominent nucleolus in most of hepatocytes with diffuse oval cells proliferation (arrow) in	98

	between hepatocytes (H&E stain X 400).	
22	Liver of rat received DENA and CCL4 (5 month) showing karyomegalic nuclei with prominent nucleolus in most of hepatocytes with diffuse Kupffer cells proliferation in between hepatocytes and fibrosis in portal area (H&E stain X 400).	98
23	Liver of rat injected by DENA and CCL4 (5months) showing hepatocytes with multiple mitotic figures (arrow), karyomegalic nuclei and prominent nucleoli as well as hyperactivity of Kupffer cells (H&E stain X400).	99
24	Liver of rat received DENA (8months) showing microvesicular steatosis and vacuolation of hepatocytes (H&E stain X400).	99
25	Liver of rat injected by DENA and CCL4 (8months) showing focal hemorrhage in between hepatocytes in hepatic parenchyma (H&E stain X400).	100
26	Liver of rat injected by DENA and CCL4 (8months) showing large clear irregular focus of hepatocellular alteration (H&E stain X200).	100
27	Liver of rat injected by DENA and CCL4 (8months) showing focal circumscribed area of vacuolated hepatocytes with compression of normal adjacent parenchyma (H&E stain X100).	101
28	Higher magnifications of hepatocellular adenoma showing vacuolated hepatocytes compress to the adjacent hepatic parenchyma (H&E stain X400).	101
29	Liver of rat injected by DENA and CCL4 (8months) showing fibrosis and fat cell metaplasia in glissonian capsule (H&E stain X100).	102
30	Liver of rat injected by DENA and CCL4 (8months) showing	102