List of figures and tables



Chapter 1

		C. C. S. S. S. S. S. S.
Figures	Title	Page #
1	The network of testis	6
2	Transverse section of testis	6
3	Scanning electron micrograph of a transverse section of testis	7
4	Steroidogenic pathways	13
5	The Brain-Testicular Axis	18
6	The prostate structure	22
7	Structural relationship between ducts, glandular cells of the prostate	23
8	Metal clusters of metallothionein	38

Tables	Title	Page #
1	Lower Urinary Tract Symptoms	26
2	Signs and symptoms associated with lead toxicity	34
3	Signs and symptoms of cadmium toxicity	39

Figures	Title	Page #
1	Estrogen synthesis and metabolism	90
2	Effect of lead and cadmium alone and co-exposure on hypothalamic 3α -hydroxy steroid dehydrogenase activity in adult male rats	95
3	Effect of lead and cadmium alone and co-exposure on pituitary 3α -hydroxy steroid dehydrogenase activity in adult male rats	95
4	Effect of lead and cadmium alone and co-exposure on testicular 3β -hydroxy steroid dehydrogenase activity in adult male rats	96
5	Effect of lead and cadmium alone and co-exposure on testicular 17β -hydroxy steroid dehydrogenase activity in adult male rats	96
6	Effect of lead and cadmium alone and in co-exposure on liver 17β -hydroxy steroid oxidoreductase activity in adult male rats	97
7	Effect of lead and cadmium alone and in co-exposure on liver UDPGT activity in adult male rats	97

8	Histological observation of the liver after lead and cadmium exposure	99
9	3β -hydroxy steroid dehydrogenase activity in testicular fraction after treatment with lead and cadmium alone and in co-exposure <i>In vitro</i>	101
10	17β-hydroxy steroid dehydrogenase activity in testicular fraction after treatment with lead and cadmium alone and in co-exposure <i>In vitro</i>	101

Tables	Title	Page #
1	Effect of lead and cadmium alone and in co-exposure on (A) Body weight gain and (B) Relative liver weights of hypothalamus, pituitary, testis, prostate and liver	94
2	Effect of lead and cadmium in isolation and co-exposure on hepatic DNA, RNA content and alanine transaminase activity of adult male rats	94
3	Lead and cadmium levels in the testis of male rats exposed to lead acetate and cadmium acetate alone and co-exposure	102
4	Lead and cadmium levels in the liver of male rats exposed to lead acetate and cadmium acetate alone and co-exposure	102

Figures	Title	Page #
1	Effect of lead and cadmium in isolation and co-exposure on hypothalamic dopamine content	116
2	Effect of lead and cadmium in isolation and co-exposure on hypothalamic norepinephrine content	116
3	Effect of lead and cadmium alone and in co-exposure on serum testosterone levels	117
4	Effect of lead and cadmium alone and in co-exposure on intra testicular testosterone levels	117
5	Effect of lead and cadmium in isolation and co-exposure on epididymal fructose content	119
6	Effect of lead and cadmium in isolation and co-exposure on prostatic fructose content	120
7	Histological observation of the testis after lead and cadmium exposure	120
Tables	Title	Page #
1	Effect of lead and cadmium in isolation and co-exposure on testicular, cauda epididymal sperm count levels and cauda epididymal sperm motility	118

Figures	Title	Page #
1	Antioxidant enzymatic reactions	131
2	Lipid peroxidation mechanism	132
3	Generation of etheno-adducts	133
4	Effect of lead and cadmium in isolation and co-exposure on mitochondrial lipid peroxidation levels in testis	138
5	Effect of lead and cadmium in isolation and co-exposure on post-mitochondrial lipid peroxidation levels in testis	138
6	Effect of lead and cadmium in isolation and co-exposure on mitochondrial lipid peroxidation levels in liver	139
7	Effect of lead and cadmium in isolation and co-exposure on post-mitochondrial lipid peroxidation levels in liver	139
8	Effect of lead and cadmium in isolation and co-exposure on lipid peroxidation levels in pituitary	140
9	Effect of lead and cadmium in isolation and co-exposure on mitochondrial reduced glutathione levels in testis	145
10	Effect of lead and cadmium in isolation and co-exposure on post-mitochondrial reduced glutathione levels in testis	145
11	Effect of lead and cadmium in isolation and co-exposure on mitochondrial reduced glutathione levels in liver	146
12	Effect of lead and cadmium in isolation and co-exposure on post-mitochondrial reduced glutathione levels in liver	146
13	Effect of lead and cadmium in isolation and co-exposure on mitochondrial reduced glutathione levels in prostate	147
14	Effect of lead and cadmium in isolation and co-exposure on post-mitochondrial reduced glutathione levels in prostate	147
15	Effect of lead and cadmium in isolation and co-exposure on reduced glutathione levels in pituitary	148
16	Steroidogenic pathway	151
17	Rat StAR promoter (Todd et al, 1998; Busygina et al, 2003)	152
18	Promoter organization of the MT gene	156
19	Mechanism of MTF-1 activation by heavy metal	157
20	Total RNA extraction from testis	160
21	Effect of lead and cadmium in isolation and co-exposure on StAR protein expression analysis in testis	161

Figures	Title	Page #
22	Effect of lead and cadmium in isolation and co-exposure on CYP11 expression analysis in testis	161
23	Effect of lead and cadmium in isolation and co-exposure on 3β -HSD expression analysis in testis	162
24	Effect of lead and cadmium in isolation and co-exposure on 17β -HSD expression analysis in testis	162
25	Effect of lead and cadmium in isolation and co-exposure on metallothionein I (MT-I) expression analysis in testis	163
26	Effect of lead and cadmium in isolation and co-exposure on metallothionein II (MT-II) expression analysis in testis	163
27	In vitro effect of lead and cadmium in isolation and co- exposure on 3β -HSD activity in leydig cells	169
28	In vitro effect of lead and cadmium in isolation and co- exposure on 17β -HSD activity in leydig cells	169
29	<i>In vitro</i> effect of lead and cadmium in isolation and co- exposure on LH binding to leydig cells	170
30	<i>In vitro</i> effect of lead and cadmium in isolation and co- exposure on FSH binding to leydig cells	170
31	<i>In vitro</i> effect of lead and cadmium in isolation and co- exposure on testosterone secretion by leydig cells	171

Tables	Title	Page #
1	Endogenous and exogenous sources of ROS	129
2	Effect of lead and cadmium in isolation and co-exposure on antioxidant enzymes activities in testis of adult male rats	141
3	Effect of lead and cadmium in isolation and co-exposure on antioxidant enzymes activities in liver of adult male rats	142
4	Effect of lead and cadmium in isolation and co-exposure on antioxidant enzymes activities in prostate of adult male rats	143
5	Effect of lead and cadmium in isolation and co-exposure on antioxidant enzymes activities in pituitary of adult male rats	144
6	Expression sites of 3β-HSDs from rat	154
7	Primer sequences, PCR-product sizes, optimized cycles, annealing temperature and Gene Bank accession numbers for all genes studied	159

Figures	Title	Page #
1	Correlation of Cd content with PSA level in human serum of BPH patients	196
2	Correlation of Cd content with PAP in human prostate of BPH patients	196
3	Correlation of Cd content with Qmax level of BPH patients	197
4	Correlation of Pb content with PSA level in human prostate of BPH patients	197
5	Correlation of Pb content with PAP activity in human prostate of BPH patients	198
6	Correlation of Pb content with Qmax level in human prostate of BPH patients	198
7	Correlation of Cd with histopathological observation of BPH patients	199
8	Cd levels in nonsmokers and smokers: An effect of smoke in BPH patients	199
9	Pb levels in nonsmokers and smokers: An effect of smoke in BPH patients	200
10	Qmax levels in nonsmokers and smokers: An effect of smoke in BPH patients	200
11	Age dependent effect on Qmax level in BPH patients	201
12	Age of genetically non lineage and lineage BPH patients	201
13	Qmax of genetically non lineage and lineage BPH patients between 45 to 64 age	202
14	Correlation of Cd content with (A) mitochondrial and (B) post mitochondrial LPO level in human prostate of BPH patients	203
15	Correlation of Cd content with (A) mitochondrial and (B) post mitochondrial SOD activity in human prostate of BPH patients	203
16	Correlation of Cd content with (A) mitochondrial and (B) post mitochondrial GPx activity in human prostate of BPH patients	204
17	Correlation of Cd content with (A) mitochondrial and (B) post mitochondrial reduced glutathione level in human prostate of BPH patients	204
18	Correlation of Cd content with post-mitochondrial catalase activity in human prostate of BPH patients	205

Figures	Title	Page #
19	Correlation of Pb content with (A) mitochondrial and (B) post mitochondrial LPO level in human prostate of BPH patients	205
20	Correlation of Pb content with (A) mitochondrial and (B) post mitochondrial SOD activity in human prostate of BPH patients	206
21	Correlation of Pb content with (A) mitochondrial and (B) post mitochondrial GPx activity in human prostate of BPH patients	206
22	Correlation of Pb content with (A) mitochondrial and (B) post mitochondrial reduced glutathione level in human prostate of BPH patients	207
23	Correlation of Pb content with catalase activity in human prostate of BPH patients	207

.

.