

SPECIMEN FORMAT FOR THESIS OF MONTH

Faculty : Science

Department : Biochemistry, Biotechnology & Bioinformatics

Branch/ Area: : Biotechnology

Sub Subject Heading: : Biotechnology

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Title of the thesis : *In vivo* and *In vitro* Studies on the Expression of
Metallothioneins in Response to Silver Exposure
among Jewellery Unit Workers

(i) In Roman Script -

(ii) In roman Script -

Nomenclature of Degree: : Ph. D.

Month & Year of Enrolment: : March, 2011

Month & Year of Registration: : March, 2011

Month & Year of Submission: : May, 2015

Month & Year of Award : February, 2016

Name of Supervisor : Dr. G.P. Jeyanthi

Designation of Supervisor : Professor in Biochemistry , Biotechnology &
Bioinformatics

**Centre/department/school in
which research was conducted** : Department of Biochemistry, Biotechnology &
Bioinformatics

University's Name & Address : Avinashilingam University for Women,
Coimbatore - 641043

Abstract within 300 words:

i) Objectives :

- ❖ To assess the health status of the workers in jewellery industry with special reference to silver exposure
- ❖ To characterize the metallothioneins from peripheral blood and cultured peripheral blood lymphocytes among the selected workers
- ❖ To assess the relationship between insult to exposure to hazardous levels of silver and the metallothioneins status among the workers

ii) Salient Findings:

The outcome of the present study clearly indicated that increase in systolic blood pressure might be due to the insufficient sleep among extensive over time workers. Decrease in RBC count and raise in MCH and MCHC levels on exposure to silver in the jewellery units. High levels of metallothionein in serum pointed that it provides a cellular defense strategy against silver exposure. Increased ALT, AST and decreased ALP activities on silver exposure would have altered metabolism of liver enzymes. Increased levels of serum urea, uric acid, creatinine and urine P/C ratio might suggest minor renal dysfunction among jewellery unit workers. Active accumulation of Ag-MT complex in the kidney might be the responsible factors for reduction in kidney function. Percent of MT in the samples was estimated as 40% and 11% in exposed and control groups respectively by HPLC method.

AgNO₃ caused a dose and time dependent loss of cell viability in cultured PBLs with the highest dose of 4μM after 48 h. TEM images of 4μM AgNO₃ treated PBLs showed the presence of electron-dense precipitates. HPLC spectral analysis of MT recorded 46% and 47% in 0.5 μM and 4 μM AgNO₃ treated cells respectively and it could be induced by metal exposure. MT scavenged the free radicals - almost 54% of superoxide radicals followed by 45% of DPPH and 38% of ABTS. Raised levels of MT in PBLs might serve as a biomarker of silver exposure.

Examiners

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