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**Title of the proposed project in Arabic:**

التأثير الوقائي للكيوريسيتين على التغيرات الناتجة عن أسيتات الرصاص في وظيفة الكولاجين في كلى الفئران

**Title of the proposed project in English:**

**Protective effect of quercetin treatment on lead acetate induced alterations in the function and collagen matrix of rat kidneys**

المشرف الرئيس – PI: Prof. Nikhat Siddiqi

التخصص الدقيق للمشرف الرئيس - Specialty of PI: Collagen biochemistry and oxidative stress

Supervisor Assistant - Co-PI: Prof. A.S. Alhomida

Expected duration of completion of research since obtaining the approval of the Deanship of Graduate Studies (months) - Expected time in month to finish:

12

**Abstract of the proposal (No more than 200 words):** Lead is a common environmental pollutant. The target organs of lead toxicity include the liver, kidneys, reproductive organs to name a few. Lead poisoning in animals occurs from feed, soil from industrial pollution and agricultural practices. Lead affects the kidneys and liver through generation of oxidative stress and inducing apoptosis (Assi et al., 2016). Lead is stored in the bones which discharge it into the circulation. Quercetin is a well known dietary flavanoid with antioxidant properties. In the proposed study the effect of quercetin on lead acetate induced changes in kidney hydroxyproline fractions/collagen in rats will be studied.

**Hypothesis of the proposal:**

The effect of lead on kidney function and the protection afforded by quercetin on kidney function will be studied. Lead is known to exert its toxic effects by generation of oxidative stress. Quercetin being an antioxidant is expected to afford protection against the oxidative stress generated by lead. Therefore quercetin may be postulated to protect the collagen in the kidneys against lead induced toxicity.

**Specific objectives:** See the protective effect of quercetin on lead induced changes in

- a) Bone
- b) Kidney function
- c) Kidney hydroxyproline/collagen

**Methodology & Major Techniques to be used:**

**Part I:** This will consist of four groups of rats. Each group will consist of ten rats.

Group 1- will consist of ten rats which will serve as control.

Group 2- rats treated with lead acetate at the dose of 100 mg/kg body weight for five days.

Group 3- rats treated with lead acetate at the dose of 50 mg/kg body weight for five days.

Group 4- rats treated with lead acetate at the dose of 30 mg/kg body weight for five days.

**Part II:** This will consist of following groups of rats each consisting of ten rats.

Group 1- rats receiving quercetin 50 mg/kg body weight.

Group 2- rats receiving quercetin 50 mg/kg body weight (depending upon the survival) plus lead acetate (50 mg/kg) for five days.

The rats will be killed by CO<sub>2</sub> asphyxiation. The blood will be collected to prepare the serum.

#### Biochemical determinations

Kidney functions will be evaluated in the serum by using the levels of creatinine and blood urea nitrogen using relevant kits.

Bone specific alkaline phosphatase in the will be determined by heat inactivation of total alkaline phosphatase. Bone specific alkaline phosphatase will be measured by commercial kit.

Various hydroxyproline fractions viz., free hydroxyproline, peptide bound hydroxyproline and protein bound hydroxyproline and soluble and insoluble collagen Hyp will be determined in the kidneys by the method of Reddy & Enwemeka, (1996).

**Availability of Samples: No**

Kindly justify: The samples will be available after ethical approval of the project.

**Availability of Chemicals: Partly available**

Kindly justify: The kits will be purchased for determination of alkaline phosphate and kidney function. Lead acetate will have to be procured from the university store for chemicals.

**Availability of Instruments: Yes**

**Ethical Approval:** The ethical approval will be available after approval of the project by the department and assigning the project to the student.

**Recent References:**

Reddy, G. K., & Enwemeka, C. S. (1996). A simplified method for the analysis of hydroxyproline in biological tissues. *Clin Biochem*, 29(3), 225-229.

Assi MA , Hezmee MNH, Haron AW, SabriMUM and RajionMA. The detrimental effects of lead on human and animal health. *Veterinary World*, EISSN: 2231-0916 Accessed from [www.veterinaryworld.org/Vol.9/June-2016/20.pdf](http://www.veterinaryworld.org/Vol.9/June-2016/20.pdf) on 8/1/2017