

# Schiff Bases derived from L-Tyrosine L-Tryptophan and their Cu(II) chelates as effective means for preventive-treatment of radiation injuries

**Malakyan M.H.<sup>1</sup>, Bajinyan S.A., Matosyan V.H.<sup>1</sup>, Tonoyan V.J.<sup>1</sup>, Babayan K.N.<sup>1</sup>,  
Boyajyan A.S.<sup>1</sup>, Yeghiazaryan D.E.<sup>1</sup>, Vardevanyan L.A.<sup>1</sup>, Sorenson J.R.J.<sup>2</sup>**

<sup>1</sup>Center of Radiation Medicine and Burns, Davidashen, Yerevan, P.O. Box 25. 0048, Armenia,

<sup>2</sup>University of Arkansas for Medical Sciences, College of Pharmacy, Little Rock, AR 72205,  
USA.

## Abstract

Study on essential metalloelement chelates as radioprotectors presents a promising direction in a search for and development of novel anti-radiation agents and offers a new approach to overcome the pathological effects of ionizing radiation. The key idea elucidating the radioprotective effects of metalloelement-containing chelates of amino acid derivatives is their role in stimulation of *de novo* synthesis of metalloelement-dependent enzymes required for recovery of hemopoietic activity and immunocompetency lost as a consequence of radiation damage.

Aimed to develop novel anti-radiation remedies of less toxicity and high efficacy, Schiff bases derived from L-Tyrosine and L-Tryptophan and their Cu(II) chelates were synthesized. In experiments *in vitro* and *in vivo* biological and pharmacological properties of the mentioned Schiff Bases and their copper complexes are under study.

According to the results obtained, L-Tyrosinate and L-Tryptophanate Schiff bases are low toxic compounds with a weak antioxidant activity and exert radioprotective effects in case of animal X-ray irradiation at a dose level equal or less than LD<sub>50/30</sub>. Unlike Schiff Bases, their appropriate Cu(II) chelates possess high antiradical/antioxidant activity and manifest expressed radio-protective action at LD<sub>100/30</sub> dose of ionizing radiation. Anti-radiation effects of amino acid Schiff bases and their metallochelates are manifested in case of both subcutaneous and oral single administration to the animal organism at 10, 20, or 40 mg/kg 1, 3, 6, or 24 hours prior to radiation exposure.

Conclusions are drawn basing on determinations of survival and average life-span indices of irradiated animals, as well as on studies for their hematological, biochemical, immunological, biophysical indices. It is revealed that on the background of preliminary administration of the compounds studied to the animal organism the characteristics of DNA are significantly improved, the immune status elevated; this latter substantively influences the active course of reparatory processes post the radiation injury of the organism.

Proceeding from data obtained the conclusion may be drawn: Schiff Bases derived from L-Tyrosine and L-Tryptophan, and their Cu(II) chelates present the interest in the aspect of development of effective pharmaceuticals for prophylaxis of radiation injuries.

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**KEYWORDS:** metallochelates, Schiff Bases, preventive-treatment, radioprotective

\* Presenting author, E-mail: ritamalakyan@email.com