

**Direct Radiation and Bystander Response Modifying Effects of Cu(II) (NicotinyL-L-Tyrosinate)2 and Cu(II)**M. Malakyan<sup>a</sup>, C. Mothersill<sup>b</sup>, C. Seymour<sup>b</sup> and S. Bajinyan<sup>a</sup><sup>a</sup>*Scientific Center of Radiation Medicine and Burns,, Davidashen, P.O. Box 25., 0048, Yerevan, Armenia;* <sup>b</sup>*McMaster University, Dept of Medical Physics and Applied radiation Scie, 1280 Main St. West, ON L8S 4K1 Hamilton, Canada**mothers@mcmaster.ca*

The synthesis of Cu(II) complexes with Schiff Bases derived from 3-pyridinecarboxaldehyde (nicotinaldehyde) and amino acids L-Tyrosine and L-Tryptophan was performed in a medium of sodium alcoholate with the use of copper acetate. The complexes isolated had a characteristic color: Cu(II)(NicotinyL-L-Tyrosinate)2 was brown, while Cu(II)(NicotinyL-L-Tryptophanate)2 was marsh-green. The molecular mass (Mr) of Cu(II)(NicotinyL-L-Tyrosinate)2 is equaled to ~620, and Mr of Cu(II)(NicotinyL-L-Tryptophanate)2 is corresponded to ~650. These compounds were tested for radioprotective activity in the Canadian laboratory using a clonogenic assay and a bystander assay with human keratinocytes. The complexes were diluted by 1:1000 and 1:10000 with tissue culture medium and added to the cultures 6hrs after plating the cells at a density of 600 cells for the direct assay and 200,000 cells for the bystander assay. The cultures were exposed to 0.5Gy or 5Gy cobalt 60 gamma radiation after 24 hrs. The direct effect flasks were returned to the incubator and the culture medium from the bystander donor flasks was harvested after 1 hr, filtered and added to unirradiated flasks which had also been seeded with 600 cells. Colony assays for the 5Gy dose showed that the compounds were very radioprotective, increasing the survival of the cells from about 40% to 65 and 78% in the case of the 1:1000 dilution. The weaker concentration was less effective. The results of the bystander assay confirm a very strong radioprotective effect and abolition of the bystander toxic effect and in fact increased survival of the treated cells over that seen in the untreated controls which had a plating efficiency of 21%. After 0.5Gy exposure there was no direct effect of radiation and so no radioprotection was observed but in the bystander assay, the very large protective effect was again seen. The data suggest that these compounds are potentially useful for protecting against toxic effects of radiation and appear to prevent bystander effects leading to an improved survival over the control level. The research is performed in the frames of ISTC A-1321 Project.