

# **Inhibitory Effects of Oral Zinc Supplementation on Liver Copper Accumulation and Inhibition of carcinogenesis in LEC Rats Maintained on High Zinc Diets Studied by PIXE and Estimation of the Natural Life-Span.**

A. Ohta, G. Bu<sup>\*1</sup>, K. Hayakawa, Y. Sone<sup>\*2</sup>, S. Nakayama<sup>\*3</sup>,  
<sup>\*4</sup> K. Sera, <sup>\*5</sup> S. Futatsugawa, <sup>\*5</sup> S. Hatakeyama, and <sup>\*5</sup> Y. Saitoh

Department of Radiology, <sup>\*2</sup> Biochemistry, and <sup>\*3</sup>Animal science,  
Kitasato University School of Medicine, Sagamihara Kanagawa  
228-8555 Japan

E-mail: ohkensei@med.kitasato-u.ac.jp

<sup>\*1</sup>Department of Preventive Medicine, Norman Bethune University for Medical Science  
13 Xinmin da jie, Changchun, 130021 P.R.China

<sup>\*4</sup> Cyclotron Research Center, Iwate Medical University  
348-58 Tomegamori, Takizawa, 020-0173 Japan

<sup>\*5</sup> Nishina Memorial Cyclotron Center, Takizawa Institute, Japan Radioisotope Association  
348-58 Tomegamori, Takizawa, 020-0173 Japan

## **Abstract**

The effects of the intake of dietary of  $ZnCl_2$  on liver copper accumulation in Long-Evans Cinnamon (LEC) rats was investigated. LEC rats were freely given experimental diets without or with supplemental zinc chloride (containing 1 g of  $ZnCl$  as total per 100g diets) for lifetime.

The quantity of copper determined in triplicate in tissue obtained from rats fed a standard or a zinc supplement diet using a PIXE.

The presence of  $ZnCl_2$  caused a significant decrease in copper concentrations in the livers of Long-Evans Cinnamon rats.

When 1%  $ZnCl_2$ -fortified diet was administered, 4 of 10 LEC rats were alive at month 30, and no significant tumor production was detected, while none of the rats in the control groups was alive at that time.