

## Fullerene C<sub>60</sub> *in vivo*: influence on the basic types of metabolism

Piotrovskiy L.B., Okunevich I.V.\*, Dumpis M.A., Litasova E.V., Saprnov N.S.

*Institute of Experimental Medicine NWB RAMS, 197376, St. Petersburg, Russia*

*\*e-mail: irina\_okunevich@mail.ru*

The impact of fullerene C<sub>60</sub> on the basic types of metabolism, namely lipid, protein and carbohydrate, was investigated during the continuous studies of its toxicological properties *in vivo*. Fullerene C<sub>60</sub> was used as a complex of C<sub>60</sub> with polyvinylpyrrolidone (C<sub>60</sub>/PVP complex, 0.5% of C<sub>60</sub> and PVP m.m. 12000 pharmaceutical grade). It has to be mentioned that in this complex fullerene molecules are in low aggregation state.

The study was done on 120 Wistar rats (180-200 g). The aqueous solution of the C<sub>60</sub>/PVP complex was intraperitoneally (i.p.) injected at doses of 350 and 700 mg/kg within 30 days.

After 30 days in the serum of experimental rats, in comparison with intact animals, there were determined the following indexes of lipid, carbohydrate and protein metabolism: total cholesterol and triglycerides, concentration of high density lipoprotein cholesterol, glucose, total protein and albumin. Also the content of the serum globulin and the albumin/globulin ratio were determined.

After 30 days of introduction of C<sub>60</sub>/PVP complex and vehicle (PVP) there were not observed any significant changes in the levels of triglycerides, high density lipoprotein cholesterol, glucose and total protein. There was slight increase of the concentration of total serum cholesterol. However, this increase was within the normal range and can be explained as a reaction of animals to handling.

It was also found the decrease of albumin concentration and albumin/globulin ratio, which can be explained by the known ability of albumin to absorb fullerene C<sub>60</sub> molecules from C<sub>60</sub>/PVP complex.

However all these changes do not go beyond the normal ranges for rats and can be caused by vehicle PVP.

Thus, our data indicate that chronic administration of C<sub>60</sub>/PVP complex do not affect on the basic types of metabolism and once again indicate the safety of fullerene C<sub>60</sub> in low aggregation state *in vivo*.