Toxicity, Metabolism And Excretion Of [60]Fullerene In Rats

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Over the last decade, it has been shown that some fullerene derivatives exhibit considerable biological activity; however, only few additional studies concerning fullerene toxicity have been performed. Most of these studies suggest that C_{60} accumulates in the liver and remains apparently unchanged with no acute toxic effects in general. Therefore, use of C_{60} derivatives that could be cleaved back to the parent C_{60} *in vivo* would likely lead to long-term fullerene accumulation (1), which is a negative factor for potential biomedical applications.

We report here the *in vivo* behavior and potential metabolism of C_{60} in rats, after intraperitoneal injection of a single large dose (0.5 g/kg) of an aqueous suspension of micronized C_{60}. Our results show that: i) most of the C_{60} crystals (< 2 µm) accumulate in the liver and spleen within 2 to 4 days as revealed by light and electronic microscopy as well as by HLPC determination; ii) there is no acute toxicity; 3) C_{60} reacts with vitamin A and its ester forms in rat livers as previously observed in mouse livers (2); 4) C_{60} is slowly but significantly eliminated (up to 7 mg per week) through the bile ducts as demonstrated by HPLC analysis of feces extracts. The mechanism of elimination is now under investigation in our laboratory.;.

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