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PLATINUM DISTRIBUTION IN INSECT TESTIS AFTER CIS-DIAMMINEDICHLOROPLATINUM TREATMENT, AN EELS STUDY IN THE HOUSE CRICKET, ACHETA DOMESTICUS

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Résumé : Après traitement avec le *cis*-diamminedichloroplatinum (II), on trouve du platine dans le chromatine et les chromosomes, dans le nucléole et dans les lysosomes.

Abstract : After treatment with *cis*-diamminedichloroplatinum (II), platinum is found in chromatin and chromosomes, in nucleoli and in lysosomes.

Cisplatin or *cis*-diamminedichloroplatinum (II), the first metal coordination complex to be introduced in cancer chemotherapy, is used clinically for the treatment of head and neck cancer, ovarian carcinoma, testicular teratoma and other cancers. This prompted us to study its effects on meiosis and spermiogenesis.

With the aid of EELS, we detected platinum in chromatin, chromosomes, nucleoli and lysosomes.

Abstract:

**CHROMOSOME**

**(Metaphase)**

Metaphase I chromosome. Insect injected with 20 μg of cisplatin. Treatment lasting 2 h 30.

**NUCLEOLUS**

Nucleolus in a pachytene nucleus. Insect injected with 20 μg of cisplatin. Treatment lasting 2 h 30.

**LYSOSOME**

Lysosome in a metaphase I cell. Insect injected with 20 μg of cisplatin. Treatment lasting 2 h 30.

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The house crickets were injected intra-abdominally with 10 μl of an aqueous solution of cisplatin. The doses were 5 μg, 10 μg and 20 μg per insect. The crickets injected with a dose of 20 μg were all dead (24) after 7 days. All survived for 4-6 h. We, therefore, examined other animals injected with 20 μg, the treatments lasting 2 h 30 and 4 h; we obtained clear peaks. Crickets injected with 10 μg of cisplatin were in poor condition after 3 days, the majority having died. With a dose of 5 μg per insect and a duration of treatment of 1 h, 2 h, 3 h or 4 h, the crickets were in apparent good health and very lively; nevertheless, as seen in TEM, there was a marked action on chromatin, chromosomes and nucleoli.

The analyses were performed on material fixed in 2.5 % buffered glutaraldehyde, without osmium treatment, and embedded in Epon. The sections were 200 nm thick and stained with uranyl acetate. The energy loss spectrum, corresponding to a selected area 100 nm in diameter, was obtained with an O-filter connected to the Toulouse 1.2 MV microscope and analysed with the aid of a Tracor TN-11 unit. We worked at 1 MV. The M45 line of platinum was detected at 2200 eV in chromatin, chromosomes, nucleoli and lysosomes. The EELS study was in good agreement with our results in TEM. All in all, the action of cisplatin is very similar to that of the other alkylating agents we studied.

This EELS study would not have been possible without the help of Madame Kihn with the Tracor system. We thank her most warmly.