

# Synergistic Effects of Cisplatin and Synchrotron Irradiation on F98 Gliomas Growing in Nude Mice

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## Rationale & objectives

Among brain tumors, glioblastoma multiforme appears as one of the most aggressive form of cancer with poor prognosis and no curative treatment available. Recently, the synchrotron photoactivation therapy of cisplatin (PAT-Plat) has been developed showing a cure of 33% of rats bearing F98 gliomas<sup>1</sup>. However, the efficiency of the treatment was only measured in term of overall survival. The aim of the present study was to investigate the effects of the PAT-Plat and its different modalities (radio- and chemotherapy alone) on tumor growth and vasculature.

## Methods

The F98 glioma was implanted subcutaneously in mice hindlimb. Animals were randomized in four different groups (control, chemotherapy alone, radiotherapy alone and combined therapy). The tumor growth was measured for 6 weeks after the treatment. Changes in tumor blood perfusion were measured at 5 and 12 days after treatment using intravital multiphoton microscopy.

## Results

Cisplatin alone had no detectable effect on the tumor volume. A reduction of tumor growth was measured after a 15 Gy synchrotron irradiation, but the combined therapy (15 Gy irradiation + cisplatin) showed the largest decrease in tumor volume indicating a synergistic effect of both radio- and chemotherapy. In comparison with untreated controls, a high number of non perfused vessels were observed in between 5 and 12 days after the combined treatment in the peritumoral area of animals. This may explain partly the important tumor growth reduction.

## Conclusion

For the first time, the synergistic effect of the combination of cisplatin with synchrotron irradiation is reported.

## References

- [1] Biston M.-C, Joubert A, Adam J.-F, Elleaume H, Bohic S, Charvet A.-M, Esteve F, Foray N, and Balosso J. Cure of Fisher Rats Bearing Radioresistant F98 Glioma Treated with cis-Platinum and Irradiated with Monochromatic Synchrotron X-Rays. *Cancer Research* 2004; 64; 2317-2323.