

Experimental report exp MD18 (23-29 April 2003)

***In vitro* experimentation-Molecular studies of DNA damage**

We studied in this experiment the *in vitro* behaviour of the F98 cell of rat glioma (the same model we used in our *in vivo* protocol). The objective was to compare the DNA damage when irradiating above (78.8 keV) or below (78 keV) the platinum k-edge. Cells were exposed to CDDP at high concentration (30 μ M) and irradiated above and below platinum k-edge. The same experiment was performed in our team on the human cell line (SQ20B) (1). The results confirm that an irradiation just above the platinum k-edge results in a more important number of slowly repairable DSB. We have also tested other energies: 30, 40 and 85 keV. However, the extra-number of DSB is only observed at 78.8 keV. We also performed survival curves on the F98 cell line, with doses (0 to 6Gy) and platinum concentrations (1 and 3 μ M) lower than previously. We did not observe any flagrant difference in toxicity between different energies, probably because the platinum concentrations were too low.

Therefore the difference in toxicity for the two irradiation energies, clearly observed *in vitro*, is not discernible *in vivo*, probably because the difference between biochemical, cellular and tissue scales are too much important.

Paper:

Biston MC., Joubert A., Adam JF., Elleaume H., Bohic S., Charvet AM., Estève 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*, accepted vol 64 April 1 (2004).