

Lactate Dehydrogenases from Extremophile Organisms: Clues for Radio-resistance?

Emanuela Fioravanti, Frédéric M. D. Vellieux, Dominique Madern, Martin Weik, *Laboratoire de Biophysique Moléculaire, Institut de biologie structurale Jean-Pierre Ebel, Grenoble, France*. E-mail: emanuela.fioravanti@ibs.fr

Lactate dehydrogenases (LDH) catalyse the last step of glycolysis in which pyruvate is reduced by NADH to lactate. Our structural study of LDH from *D. radiodurans* finds its place in a broader project aimed at investigating the effect of ionising radiation on many enzymes of the malate/lactate dehydrogenase family from extremophile organisms (thermophiles, psychrophiles, halophiles and radio-resistant).

Ionising radiation, including synchrotron radiation, has specific effects on structure, activity and stability of biological macromolecules and represents at the same time the cause of the damage and the tool to study it [1].

In order to better understand how molecular adaptation to extreme environments is achieved, and if it confers radio-resistance, the structure of LDH from *D. radiodurans* has been solved, both in its native form and in complex with the allosteric cofactor fructose 1,6-biphosphate (FBP). A structural comparison with LDHs from other extremophile organisms is under way. Furthermore, the sensitivity to ionising radiation of the two allosteric forms and the possible protective effect of FBP and NADH against radiation damage is currently being investigated.

[1] Weik M., Ravelli R.B., Kryger G., McSweeney S., Raves M.L., Harel M., Gros P., Silman I., Kroon J., Sussman J.L., *Proc Natl Acad Sci USA*, 2000, **97**, 623.

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