

**XIV INTERNATIONAL CONFERENCE ON MAGNETIC  
RESONANCE IN BIOLOGICAL SYSTEMS**

**University of Warwick, September 9th-14th, 1990**

**XIV ICMRBS  
WARWICK 1990**



**ABSTRACTS**  
**of Lecture and Poster Presentations**

P15-43

"IN VITRO" SPIN TRAPPING DETECTION OF HYDROXYL RADICALS IN IRON OVERLOADED RAT LIVER TISSUES  
 O. Raffal, M.S. Figueiredo<sup>2</sup>, M.A. Zago<sup>2</sup>, M. Tabak<sup>1</sup> and O.R. Nascimento<sup>1</sup>. <sup>1</sup>Faculdade de Filosofia, Ciências e Letras-USP, 14049-Ribeirão Preto-SP, Brazil, <sup>2</sup>Faculdade de Medicina de Ribeirão Preto-14049 Ribeirão Preto-SP, Brazil and <sup>3</sup>Instituto de Física de São Carlos, C.P. 369, 13560-São Carlos, SP, Brazil.

The exact mechanisms by which iron overload causes its well known biological damage is still under investigation. Methods using NMR to measure tissue iron concentration have been developed by our group (1). More recently we have been studying the presence of free radicals in iron overloaded rat liver since the formation of free radicals is one of the possible mechanisms of the cell damage in iron overload.

Liver tissue from controls and iron overloaded males Wistar rats were freeze-dried, powdered and stored at -20°C before use. The iron overload was obtained by successive intravenous injection of iron hydroxide saccharate. Histological analysis indicate iron deposition within the Kupffer cells and hepatocytes accompanied by histological signs of tissue damage. About 30 mg of the powdered tissue was suspended in 0.1 M HEPES buffer at pH 7.4 or in 0.1 M acetate buffer at pH 5.0. After stirring for 1 minute the suspension was centrifuged and the supernatant was mixed with an equal volume 100 mM aqueous solution of the spin trap 5,5-dimethyl-1-pyrroline-N-oxide (DMPO). The reaction mixture was placed in a ESR flat cell, and spectra were recorded at different times. The spectra at pH 5.0 clearly indicate the formation of the hydroxyl radical, while at pH 7.4 no radical was observed. No free radical was observed for normal controls at either pHs. Furthermore, when the suspensions were incubated with desferrioxamine (Desferal, from CIBA-GEIGY) no radical was observed at either pHs. These results indicate that the free radical hydroxyl is generated by the iron deposited in the liver. The detection of free radicals only at pH 5.0 suggests that free radical tissue damage would initiate in the lysosomal environment, where the pH is around 5.0. Moreover, the results indicate that one of the possible effects of Desferal in clinical use, besides the iron chelation and excretion, is to prevent that iron act as a catalyst of the formation of the hydroxyl radicals.

References: 1) Changes in NMR Relaxation Times of Iron Overloaded Mouse Tissue. O. Baffa, A. Tannus, M. A. Zago, M.S. Figueiredo and H. Panepucci. Bull. Mag. Res. 8 (3-4):69-73 (1986).

WORK PARTIALLY SUPPORTED BY THE BRAZILIAN AGENCIES: CNPq and FAPESP.

<b>Campo</b>	<b>Dado</b>
****	Documento 1 de 1
No. Registro	000810953
Tipo de material	TRABALHO DE EVENTO-RESUMO - INTERNACIONAL
Entrada Principal	Baffa, Oswaldo
Título	In vitro spin trapping detection of hydroxyl radicals in iron overloaded rat liver tissues.
Imprenta	Londres, 1990.
Descrição	p.15-43.
Assunto	MEDICINA INTERNA
Autor Secundário	Figueiredo, Mauro Silvério
Autor Secundário	Zago, M A
Autor Secundário	Zago, M T (*)
Autor Secundário	Nascimento, Otaciro Rangel
Autor Secundário	International Conference Or Magnetic Resonance in Biological System (14. 1990 Londres)
Fonte	Abstracts, 1990
Unidade USP	FMRP -- FAC DE MEDICINA DE RIBEIRÃO PRETO
Unidade USP	FMRP -- FAC DE MEDICINA DE RIBEIRÃO PRETO
Unidade USP	IFQSC-F -- INST DE FÍSICA DE SÃO CARLOS
Unidade USP	FFCLRP -- FAC DE FILOSOFIA, CIÊN LETRAS DE RIBEIRÃO PRETO
Localização	IFSC PROD001617