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NMR Characterization of Animals' Follicular Fluids

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Follicular Fluid (FF) provides a special environment to the oocyte during its maturation in vivo. The FF is derived from the sanguineous plasma and secretions, synthesised in the follicle wall that contain a large variety of metabolites (1). These metabolites are probably involved in the physiology of the oocytes (1). The chemical composition of follicular fluids is important because it is an indicator of the secretory activities and metabolism of follicular cells and thus could be related to the follicular quality. It could also provide a useful indication of the oocyte growth and maturation (2).

High Resolution Nuclear Magnetic Resonance (NMR) spectroscopy provides a unique tool for studying metabolites. Initially, NMR spectroscopy was used mainly in biomedicine but it is found now in many physiological applications (3). As the NMR spectroscopy provides opportunities for obtaining qualitative and quantitative data from body fluids, it was hypothesized that this technique could provide information on mammals' follicular fluid and on intrafollicular changes that occur during follicular growth and ovulation. As some of these changes are probably of crucial importance for oocyte developmental competence, a better knowledge of the mammals' follicular fluid composition by ¹H NMR analysis should help to resolve some of the problems encountered during in vitro procedures in the mammals.

The characterization of the chemical composition of mammals follicular fluids, namely sheep, cattle, mare and pork, and the study of the changes observed during follicular growth and maturation using NMR spectroscopy will be presented. FF samples were collected from antral follicle of different dimensions. One-dimensional (1D) ¹H experiments (ES, CPMG, DOSY) were obtained for all the FF samples. In addition, several two dimensional (2D) (homo and heteronuclear) experiments (DQF-COSY, TOCSY, JRES, ¹H-¹³C HSQC) were performed to aid in the assignment of the signals and in the identification of the metabolites in FF. A direct evaluation of the lipids, carbohydrates and metabolites were obtained from the combination of the 1D and 2D NMR experiments.

(1) Edwards, RG. *J. Reprod. Fertil.* **1974**, *37*, 189-219.

(2) Gèrard, N.; Loiseau, S.; Duchamp, G.; Seguin, F. *Reproduction*, **2002**, *124*, 241-248.

(3) Van den Thillart, G.; Van Waarde, A. *Physiological Reviews*, **1996**, *76*, 799-837.