**Changes in the steroid hormone profiles in the human follicular fluid in women undergoing hormonal stimulation of the ovaries.**

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More and more women are suffering from problems associated with getting pregnant and maintaining pregnancy. Assisted reproductive techniques (ART), including in vitro fertilization, have become increasingly popular and have started to play an important role in infertility treatment. However, collecting oocytes and applying an in vitro fertilization procedure (IVF) does not guarantee the successful pregnancy. Moreover, in the standard in vitro procedure several oocytes are collected and fertilized, and therefore, the current trends in infertility treatment try to focus on finding a method which will allow evaluating oocyte quality and selecting a suitable oocyte before fertilization, which is also crucial from an ethical point of view.

The aim of the presented project is to investigate the correlation between the steroid hormones’ concentrations in the follicular fluids, obtained from women undergoing ovarian stimulation and the effectiveness of in vitro fertilization which ends in pregnancy. The research project is divided into two parts, which are conducted simultaneously. The medical part involves taking samples of follicular fluids from the patients who have undergone a standard ovarian stimulation procedure and collecting data on the effectiveness of fertilization. The analytical part focus on developing and validating the method to determine a panel of 17 steroid hormones in follicular fluids by micro liquid chromatography coupled to tandem mass spectrometry (microLC-MS/MS) with electrospray ionization (ESI), and then on qualitative and quantitative analysis of the investigated samples. The mass spectrometer is operated in the multiple reaction monitoring (MRM) mode, which enable to detect exact investigated substances transition. Such sensitive and selective microLC-MS/MS method, which allows for simultaneous and exact measurement of the whole panel of steroid hormones in a short time and in a small sample, has considerable importance when it comes to the investigated follicular fluid, which is relatively difficult to obtain and typically available in low amounts biological material.