

# MAJOR HISTOCOMPATIBILITY COMPLEX(MHC) MOLECULES IDENTIFICATION IN VAGINAL CELLS DURING MENSTRUAL CYCLE

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**ABSTRACT** Causes of subfertility in women are under investigation, with the vaginal canal being the first barrier before the fertilization and implantation process. Although the mechanisms of protection of the allogeneic fetus from the maternal immune response seem to have a main role through the preimplantation period, they are not yet described in detail. There appears to be an important relation between them and the polymorphism of major histocompatibility complex (MHC) proteins. However, it is unknown which are expressed in the vaginal canal cells and how they behave during the menstrual cycle. This clinical research aimed to prove the existence of these unusual MHC proteins in vaginal cells, especially during ovulation. We selected women of reproductive age in different menstrual cycle phases and collected vaginal samples. The samples then were processed with immunofluorescence protocol or ELISA protocol techniques. The protein molecules that were calculated are MHCI, MHCII, TCR $\alpha$   $\beta$ , TCR $\gamma$   $\delta$ . During ovulation, MHCII and TCR $\gamma$   $\delta$  were expressed in higher numbers over MHCI and TCR $\alpha$   $\beta$  ( $p=0.0461$ ,  $p=0.0104$ ), using immunofluorescence. Whereas using ELISA showed statistical significance only in the expression of TCR $\gamma$   $\delta$  over TCR $\alpha$   $\beta$  ( $p=0.0012$ ). Managing to identify the existence of polymorphic molecules of the immune system in the vagina proves the immunological reaction starts taking place in the vagina, and there is possibly a relation between the immunosuppression mechanisms surrounding trophoblast implantation and early pregnancy success. As the research progresses, it is possible to trace those mechanisms back to subfertility cases.

**KEYWORDS** subfertility, major histocompatibility complex, vaginal cells

## Introduction

The polymorphic molecules of the immune system, for example, the products of the Major Histocompatibility Complex (MHC), can be observed in the vaginal environment of any woman of reproductive age, and probably they have an important role in the research in the field of subfertility and especially unexplained subfertility[1]. This study demonstrated the existence of

those polymorphic molecules in the human female vagina- the first environment - the spermatozoa, initially meet during their journey to the ovum and start the conception process[2]. The polymorphic molecules that can be either the Major Histocompatibility Complex or T-cell receptors have been detected in the human female vagina at the end of this original clinical study.

## Aims and Objectives

The goal of the present clinical research is to prove the existence of these unusual MHC proteins in vaginal cells, especially during ovulation.

## Materials and Methods

We selected women of reproductive age in different phases of the menstrual cycle. We followed routine protocol for obtain-

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ing vaginal sampling: using sterile gloves, insert colposcope, lavage with 5ml sodium chloride 0,9%, aspiration and repeat the procedure 2 times[3-4]. The samples then were processed with immunofluorescence protocol or ELISA protocol techniques.

## Results

The protein molecules that were calculated are MHCI, MHCII, TCR $\alpha$   $\beta$ , TCR $\gamma$   $\delta$ . During ovulation, MHCII and TCR $\gamma$   $\delta$  were expressed in higher numbers over MHCI and TCR $\alpha$   $\beta$  (p=0.0461, p=0.0104), using immunofluorescence. Whereas using ELISA showed statistical significance only in the expression of TCR $\gamma$   $\delta$  over TCR $\alpha$   $\beta$  (p=0.0012).

## Discussion

Polymorphism is the ability of a cellular-molecular entity to take different and various forms under different conditions; this condition may be very important in human reproduction.

To achieve pregnancy, local immunosuppression mechanisms are activated to protect the hemiallogenic embryo[5-6].

The vaginal cells being the first environment of passage for the semen, ignite local immunological reactions that may affect a couple's fertility.

Managing to identify the existence of polymorphic molecules of the immune system and precisely the MCHI, MHCII, TCR  $\alpha$   $\beta$  and TCR $\gamma$   $\delta$  in the vagina proves the immunological reaction that starts taking place in the vagina[7].

## Conclusion

The identified proteins are possibly related to the immunosuppression mechanisms surrounding trophoblast implantation and early pregnancy success. As the research progresses, it is possible to trace those mechanisms back to subfertility cases.

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## Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

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