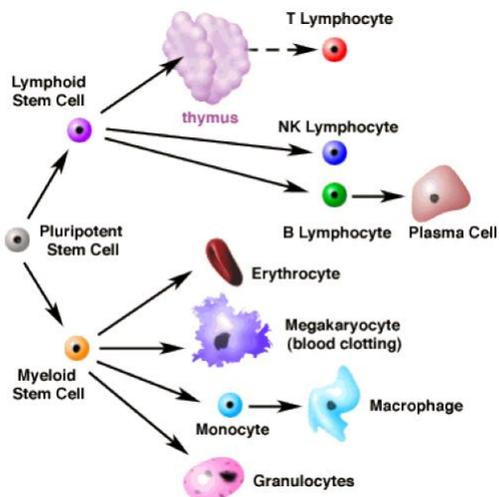
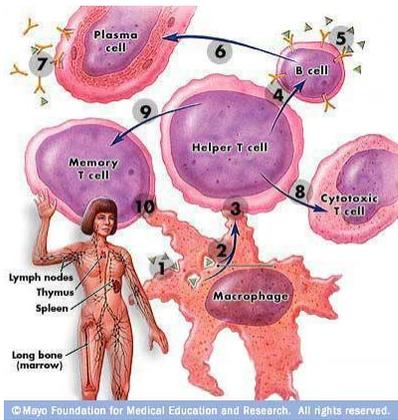


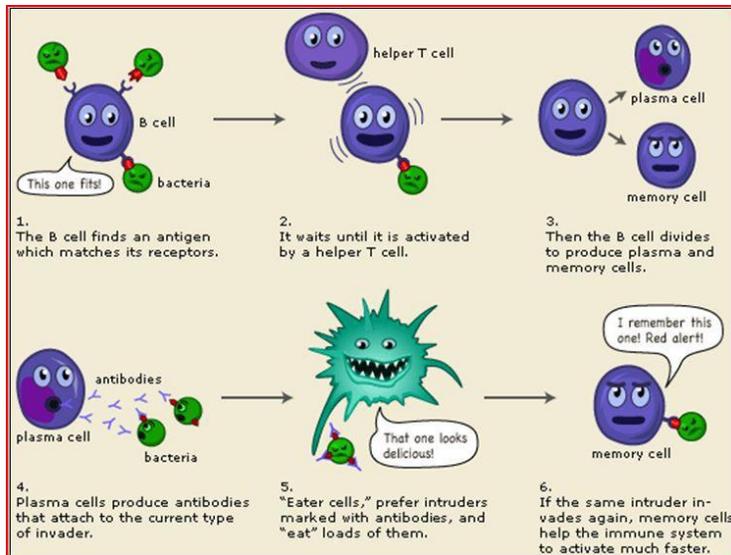
IMMUNOLOGICAL FACTORS

(autoimmune, alloimmune)

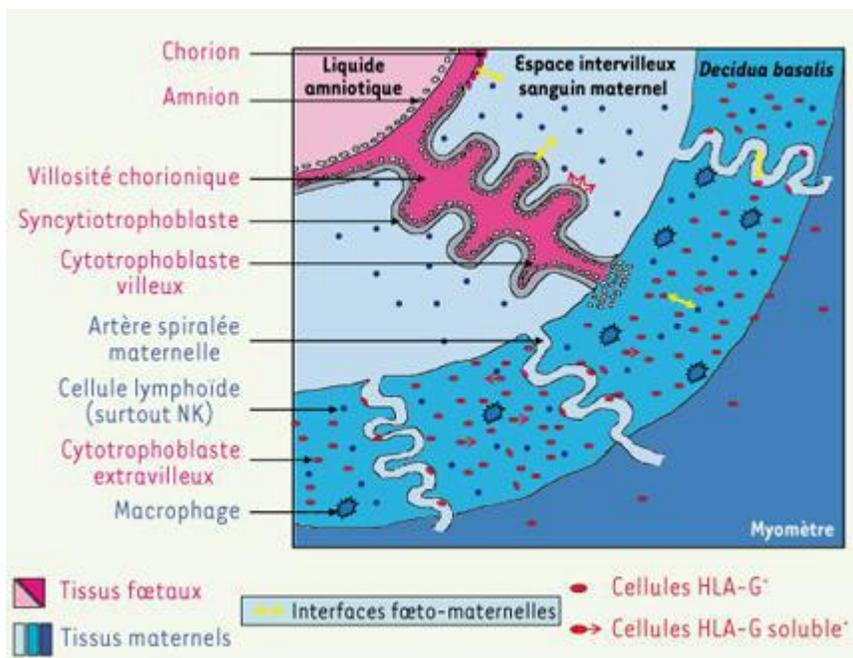
ALLOIMMUNE



Every cell of a living organism neighbours and cooperates with all other cells next to it. For a good neighbouring and cohabitation to be successful, each of the cells has to identify the cell next to it as a friendly one; otherwise it would start an attack against it.



This is achieved by the cell-surface expression of histocompatibility antigens. Histocompatibility antigens are like a unique identification number that every cell has on its external surface (cell membrane). This type of identification of cells in every living organism makes them identify each other and cooperate at tissue or organ level and finally at organism level. This mechanism allows protection mechanisms to develop against any identified alien agent. Therefore, an alien (allo) agent is anything that has and expresses a different histocompatibility antigen (different identification number). Based on this principle, every organism develops a complex protection system against anything foreign, always starting with the identification by a group of specialised cells, both locally and in the blood. After the identification, there is a response with humoral (substances in the fluid – blood plasma and intracellular fluids) and cellular mechanisms. Therefore, anything xeno- or allo- (xeno-protein, virus, germ, alien cell) through this identification-response process is treated either in a friendly or an unfriendly way.



Since the baby carries a mix of genetic material from both mother and father, it is 50% foreign to the mother, as its histocompatibility antigens contain half the identification number from the father and half from the mother. The only tissues in contact with each other between the mother and the amniotic sac (the sac in which the foetus develops) are trophoblasts and chorion (outer layer of the sac) on the foetus's side and the decidua cells (modified endometrial cells) on the mother's side. These foetal tissues carry histocompatibility antigens; however, the said antigens belong in a different category and are similar to the ones of the foetus body cells. This is where the immunological paradox of pregnancy begins. Even though two foreign cell populations meet each other, most pregnancies are not immunologically rejected.

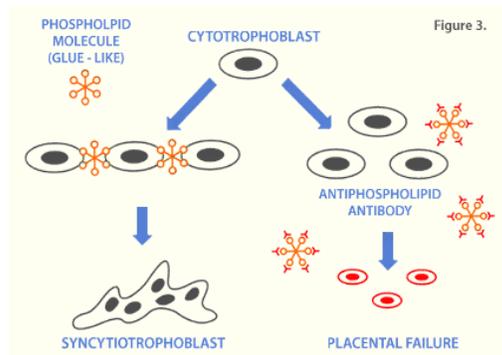
AUTOIMMUNE

Sometimes, during the immunological responses of the organism, our body identifies tissue parts or specific tissues as foreign and starts attacking them. Such conditions are called autoimmune diseases and range from classic collagen diseases (lupus erythematosus, rheumatoid arthritis, scleroderma, etc.) to the detection of autoantibodies directed against cells or parts of cells (core, mitochondria, membrane).

Such conditions clinically appear as a destructive response to cell groups of particular tissues in our organism or to any tissue of immunological resemblance (foetal tissue, since it shares the mother's organism identification number). The existence of autoantibodies is diagnostically examined, while treatment varies between treatment of alloimmune causes and thrombophilia, as will be discussed below.

- **Antiphospholipid syndrome**

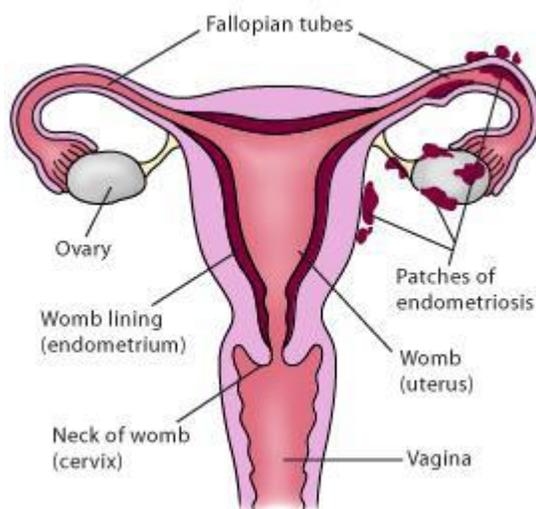
Phospholipids are molecular components of cell membranes in all cells. The antibodies against phospholipids affect cellular functionality as humoral factors and result in cellular reactions (without germs – aseptic inflammation) and an increase in blood coagulation.

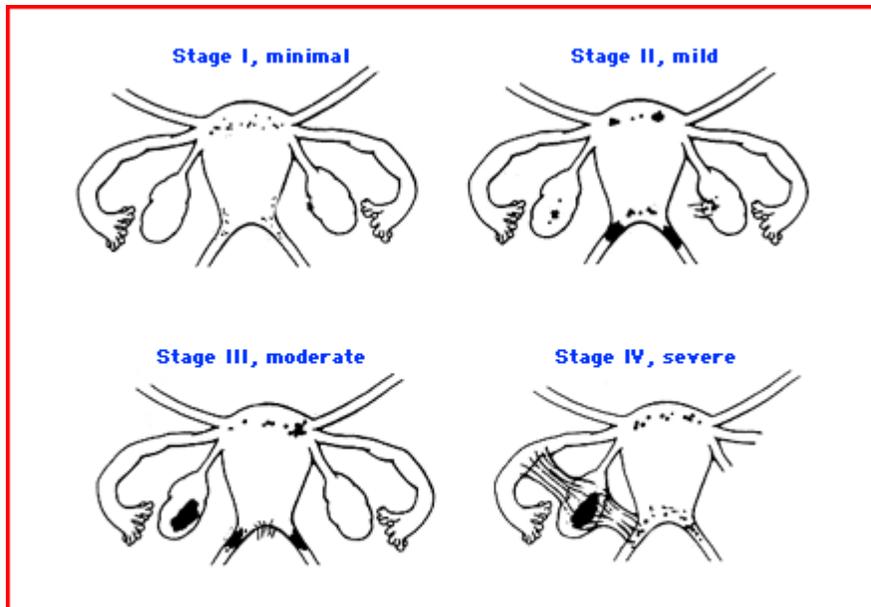


It is proven that any tissue damage (even a small injury with a kitchen knife) at cell level results in the formation of antibodies against phospholipids, which are called antiphospholipid antibodies. These are: Cardiolipin, ethanolamine, glycerol, inositol, phosphatidic acid, sericin. 1 out of 5 women with a miscarriage have antiphospholipid antibodies. Sericin and ethanolamine are very important phospholipids as they have an important role in the transformation process of cytotrophoblast cells to syncytiotrophoblast and are used as cell adhesion molecules of the placenta to the endometrium during the implantation process.

- **ENDOMETRIOSIS**

Within the autoimmune causes, endometriosis is also mentioned. Endometriosis is a clinical and pathological condition in which endometrial tissue (glands and stroma) grows outside the uterus.





Examples of the classification of endometriosis Modified from the American Society for Reproductive Medicine.

Recent studies have shown that autoantibodies are produced in women with endometriosis. However, immunobiological disorders of endometriosis enhance infertility in such women and result in an increase of miscarriages. This latter data is still under research, as there is no clear proof of an interconnection between the endometriosis and recurrent miscarriages. Diagnosis is performed by a laparoscopy. A pharmaceutical or surgical treatment may be followed or a combination of both.