

blood transfusions because of two characteristics of MHC molecules - these molecules are the major cause of transplant rejection. The term "histocompatibility" MHC polymorphism refers to the multiple MHC proteins on cells and MHC polymorphism refers to the multiple alleles in the human population that can be expressed. When a donor organ expresses MHC molecules that are different from the recipient, the latter will often mount a cytotoxic T cell response to the organ and reject it. Histologically, if a biopsy of a transplanted organ exhibits massive infiltration of T lymphocytes within the first weeks after transplant, it is a sign that the transplant is likely to fail. The response is classical, and very specific, primary T cell immune response. As far as medicine is concerned, the immune response in this scenario does the patient no good at all and causes significant harm.

### Immune response against cancer

It is clear that with some cancers, for example Kaposi's sarcoma, a healthy immune system does a good job at controlling them. This disease, which is caused by the human herpesvirus, is almost never observed in individuals with strong immune systems

such as the young and immunocompetent. Other examples of cancer caused by viruses include liver cancer caused by the hepatitis B virus and cervical cancer caused by the human papilloma virus. As these last two viruses have vaccines available for them, getting vaccinated can help prevent these two types of cancer by stimulating the immune response. On the other hand, as cancer cells are often able to divide and mutate rapidly, they may escape the immune response. Just as certain pathogens such as HIV do. There are three stages in the immune response to many cancers: elimination, equilibrium and escape. Elimination occurs when the immune response first develops toward tumor-specific antigens specific to the cancer and generally kills most cancer cells, followed by a period of continued equilibrium during which the remaining cancer cells are held in check. Unfortunately, many cancers mutate, so they no longer express any specific antigens for the immune system to respond to, and a subpopulation of cancer cells escape the immune response, continuing the process.