Abstract

The Human Leukocyte Antigen genetic system is the most polymorphic in humans. It plays a central role on immune response regulation by its interaction with molecules like the T-cell receptor, participating in the antigen presentation process and self-recognition. This role added to its polymorphism make the human leukocyte antigens a fundamental factor for transplantation, especially when it comes to hematopoietic stem cell transplants. Consequently, techniques for human leukocyte antigen typing for compatibility studies have experienced great development over the last decades. Various molecular typing methodologies currently predominate for this characterization. Information obtained with these technologies has prompted the development of stem cell adult donor registries and cord blood banks which raise the probability of finding a suitable compatible donor for patients in need of transplantation. Stem Cell Transplantation Programs in Costa Rica urgently need the updating to molecular typing technologies for patient-donor compatibility studies. Moreover, the creation of a National Stem Cell Donor Registry and the pursuing of the public Cord Blood Bank need to be addressed. The present review aims to present state-of-the-art concepts and knowledge on human leukocyte antigen genetics, typing strategies and protocols, and applications on stem cell transplantation. Additionally, perspectives for Costa Rican development on these areas are given.

Keywords

HLA antigens, histocompatibility testing, hematopoietic stem cells, donor banks, Costa Rica.