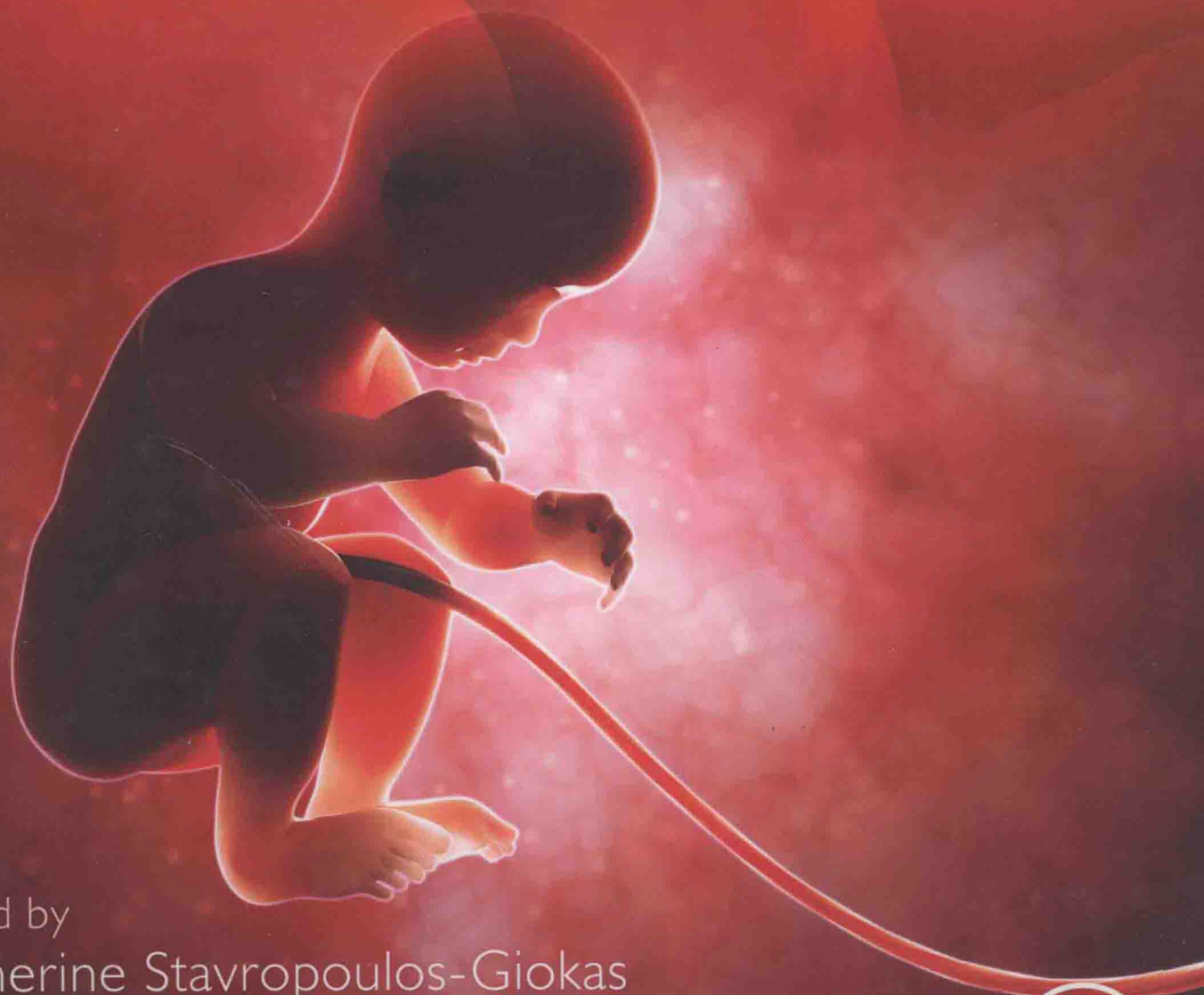
Cord Blood Stem Cells Medicine



Edited by
Catherine Stavropoulos-Giokas
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Foreword

TWENTY-FIVE YEARS OF CORD BLOOD TRANSPLANT

Since the first human cord blood transplant, performed in 1988, cord blood banks have been established worldwide for collection and cryopreservation of cord blood for allogeneic hematopoietic stem cell transplant. Umbilical cord blood (UCB) has now become a commonly used source of hematopoietic stem cells for allogeneic transplantation. Today, a global network of cord blood banks and transplant centers has been established for a common inventory with an estimated 600,000 UCB banked and an estimated 30,000 UCB units distributed worldwide for adults and children with severe hematological diseases. Several studies have shown that the number of cells is the most important factor for engraftment while some degree of HLA mismatches is acceptable. The absence of ethical concern, the unlimited supply of cells explains the increasing interest of using cord blood for stem cell therapy.

Much has been learned in a relatively short time on the properties of cord blood hematopoietic progenitors and their clinical application. Cord blood transplant needs to meet several new challenges. First, several methods of improvement of the speed of engraftment and decreasing transplant-related mortality are investigated such as the increase of donor pool to decrease the number of HLA mismatches or the use of double cord blood transplants. Other methods are currently investigated such as cord blood intrabone infusion, ex vivo expansion with cytokine cocktails or homing factors or addition of mesenchymal stromal cells. More interestingly, nonhematopoietic stem cells have been isolated from cord blood and placenta and could be used for the treatment of auto-immune diseases or for regenerative medicine.

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