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Recent advances in stem cell biology and implications for tropical pathology practice

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Stem cells have long been defined by their remarkable potential to repopulate tissue systems indefinitely. This ability depends on their capacity for self-renewal, extensive proliferation and differentiation into the mature progeny. These ensure that they maintain the many different cell types in the body during embryogenesis and normal growth. Stem cells are conventionally of two types: Embryonic stem cells and somatic or adult stem cells. Hematopoietic stem cell transplantation (HSCT) has found extensive use in the management of both malignant and non-malignant hematologic diseases ranging from leukemias, lymphomas and myelomas to sickle cell anemia and thalassemias. Replacement gene therapy is also becoming increasingly relevant, though ensuring efficient viral transduction of the hematopoietic stem cells remains a challenge. These and similar advances in blood transfusion and supportive care have significantly improved the outlook for these diseases. However, in the tropics, these gains are either non-existent or largely restricted to patients in the immediate vicinity of specialized healthcare facilities which are far too few.

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Translational genomics: Ethical and policy issues

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We are at a time of unprecedented increase in knowledge of rapidly changing technology. Such biotechnology especially when it involves human subjects raises complex ethical, legal, social, regulatory and religious issues. One of these advances is translational genomics being seen as the best new hope in the search for cures to diseases. However, this research raises sensitive ethical, regulatory and religious arguments which are balanced against possible great benefit of such research in regenerative medicine for patients suffering from so far incurable diseases. If the regulatory policies in each country are put forward for such research, the major remaining barriers to realizing the medical benefits of translational genomics might be the lack of skilled scientists in the field, the source of funding, pressure on researchers to develop commercialized products and to build links with industry and policies for sharing materials and data and for commercialization in the presence of informed consent. In conclusion the excitement over the scientific, medical and financial possibilities of translational genomics has been accompanied by ethical concerns therefore there is a need of developing international approaches to address these concerns across the continuum of such research from bench to bedside and to publication with the attention to global equity and benefit sharing.

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