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EDITORIAL

Chimerism and transplant-related diagnostics

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Over the past decades, allogeneic stem cell transplantation (allo-SCT) has gained increasing importance as a treatment option for both malignant and non-malignant disorders. In particular, the relatively recent introduction and successful clinical application of reduced intensity conditioning regimens and transplantations across HLA barriers have rendered this type of treatment available to a growing number of patients who have previously had no curative therapy options.

The new developments in approaches to allo-SCT have greatly enhanced the role of adequate diagnostic support. The increasing implementation of transplantations from HLA-mismatched (e.g. haploidentical) donors and the use of T-cell depleted grafts on one hand and conditioning regimens with reduced toxicity on the other hand have resulted in greatly increased and prolonged immunosuppression. This fact has produced a major impact on the severity of ensuing complications and the success of allo-SCT therefore depends to a large extent on optimal pre- and post-transplantation diagnostics. Examples of important diagnostic tests prior to transplantation include high-resolution HLA and NK-cell receptor typing, assessment of residual disease in patients with leukemia, investigation of latent or active viral infections in patient and donor, and determination of risk factors for severe graft-versus-host disease (GvHD). During the post-transplant period, adequate monitoring of hematopoietic chimerism is one of the most essential diagnostic challenges permitting early documentation of successful engraftment, detection and timely treatment of graft rejection or impending relapse. Close surveillance of chimerism within total peripheral blood leukocytes or specific cell lineages is therefore an indispensable tool for the clinical management of transplant recipients. Other important tasks in clinical diagnostics after allo-SCT include documentation of hematopoietic cell recovery by flow cytometry, investigation of immune reactions indicative of GvHD, identification of viral, bacterial, fungal and protozoal infections and monitoring of response to antimicrobial treatment. Moreover, in patients with leukemia, surveillance of residual disease by molecular techniques is of great relevance for disease outcome. Despite the availability of diagnostic assays for many of the clinical problems indicated above, development of improved or novel approaches, for example, to the investigation of lymphocyte function pertaining to GvHD, graft-versus–leukemia (GvL) and reactivity to viral pathogens, rapid identification of invasive fungal infections or reliable detection of antimicrobial drug resistance still remain a major challenge. The list of urgently required diagnostic developments and improvements could be continued.

Leukemia has addressed the challenges of clinical diagnostics in the allo-SCT setting, particularly with regard to chimerism analysis, by publishing pertinent high-quality research articles and by initiating a Debate Round Table entitled '*Chimerism testing after allogeneic stem cell transplantation: importance of timing and optimal technique for testing in different clinical-biological situations.*' This Debate has been launched with the aim to provide a platform for broad scientific discussion and, ultimately, for the establishment of international consensus criteria for optimal surveillance of hematopoietic chimerism during the post-transplant period in the light of the possible therapeutic implications. In addition to a series of stimulating papers addressing this topic, which have appeared in *Leukemia* over the past years,[1–35] this Debate Round Table has contributed to the initiation of a European study under the title: '*Diagnostic approaches to chimerism testing after allogeneic stem cell transplantation for early detection of graft rejection and relapse: Technical development, standardization, and European coordinated clinical implementation.*' Twelve leading laboratories from 10 European countries, the *Eurochimerism (EUC) Consortium,* were involved in this study, which was supported by the European Commission within the fifth Framework Program and which has recently been completed. *Leukemia* has assumed sponsorship of the research activities of the EUC group, and the results emanating from the collaborative efforts of the EUC Consortium will be communicated to a broad readership on the pages of this journal. The first contributions of the EUC study group are presented in this issue of *Leukemia*.

In view of the increasing clinical importance of stem cell transplantation-related diagnostics, the editors of *Leukemia* have decided to establish a new section covering this topic. The section, which is devoted to chimerism and transplant-related diagnostics, is intended to serve as an authoritative source of the latest achievements in the field. Moreover, it will provide a forum for the exchange of experience and discussion between leading experts in order to increase the awareness of diagnostic problems and to stimulate novel technical developments.

In this way, *Leukemia* aims at contributing to a more rapid progress in the field of transplant-related diagnostics, with the ultimate goal to improve patient outcome of allogeneic stem cell transplantation.

The first two articles within the new section by M Tilanus, 'Short tandem repeat markers in diagnostics: what's in a repeat?' and by F Watzinger *et al.*, 'The RSD code: Proposal for a nomenclature of allelic configurations in STR-PCR based chimerism testing after allogeneic stem cell transplantation', are published in this issue on pp 1353–1355 and 1448–1452, respectively.[36,37]

The editors of *Leukemia* encourage the submission of highly selective quality articles fitting within the scope of the new Section. Pertinent manuscripts should be in all cases submitted to Dr Muller-Bérat Killmann at the *Leukemia* office in Paris and should be labelled: *for Professor Thomas Lion's Section*.

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