Diagnostic and Prognostic Biomarkers for Graft-Versus-Host Disease After Allogeneic Hematopoietic Stem Cell Transplantation

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Administration of donor stem cells, called allogeneic hematopoietic stem cell transplantation (allo-HSCT), is an effective therapeutic option for several hematologic malignancies. Allo-HSCT allows a patient to receive higher doses of chemotherapy and induce graft-versus-tumor effect for maximum tumor response. However, about 30%–70% of recipients after allo-HSCT will develop graft-versus-host disease (GVHD) (Zeiser & Blazar, 2017). The sequela of acute GVHD (aGVHD), chronic GVHD (cGVHD), or both after allo-HSCT can be a major cause of morbidity and mortality despite the use of immune-suppressive prophylaxis. Although the pathologic mechanisms are not clearly understood, the donor stem cells trigger an immunologic attack on single or multiple recipient organs, which can result in inflammation, decreased immunity, and fibrosis (Zeiser & Blazar, 2017). Depending on the severity of GVHD, the undesirable consequences can appear in the skin, gastrointestinal tract, liver, lungs, eyes, and genitals, and may cause functional and activity impairments, adverse general health, non-relapse mortality, dysfunctional organs, secondary malignancies, and poor quality of life (Wingard et al., 2011).

Diagnosis of cGVHD can be particularly challenging because clinical manifestations may not present for as long as a year, and symptoms resemble other diseases, such as Sjögren’s syndrome, scleroderma, wasting syndrome, chronic immunodeficiency, bronchiolitis obliterans, and primary biliary cirrhosis (Flowers & Vogelsang, 2009).

In an effort to predict and accurately diagnose GVHD, the role of biomarkers has shown potential benefit. Advances in protein biomarker research are paving the way for new tools in tackling diagnostic