MicroRNA as biomarker for acute graft versus host disease

Dianzheng Zhang
Philadelphia College of Osteopathic Medicine, USA

Allogeneic hematopoietic stem cell transplantation (allo-HSCT) is a valuable therapeutic strategy for a wide variety of diseases. Acute graft-versus-host disease (aGVHD) is a major complication in up to 75% of allo-HSCT. It is known that donor-derived T lymphocytes are the primary effector cells responsible for triggering aGVHD and mechanistically an enhanced Th1 response is considered the leading cause of aGVHD. However, the exact mechanisms involved in aGVHD development remain largely unknown. The lack of a reliable predictive biomarker of aGVHD onset prevents preemptive treatment and impedes widespread and successful application of this therapy. By monitor the changes of the miRNA levels after transplant, we found that the levels of miR-181a were reduced significantly 3-4 days prior to the onset of aGVHD. Importantly, the degree of its reduction correlated with the severity of aGVHD. Mechanistically, miR-181a affects the function of T lymphocytes by down-regulating IFN-γ in a dose-dependent manner. In addition, using a murine allo-HSCT model, we demonstrated that murine miR-181b, the human miR-181a homolog, served as an effective predictor of aGVHD. Moreover, expression of this microRNA also ameliorated the severity of aGVHD. Collectively, we demonstrated that the level of miR-181a can serve as a reliable biomarker for the prediction of the aGVHD and this provided a window for treating aGVHD preemptively. Finally, results from the experiments conducted in the mouse model indicate that manipulation of miR-181a levels may be a potential strategy in prevention of aGVHD.

Biography
Dianzheng Zhang has completed his PhD from University of Arizona and Postdoctoral studies from Baylor College of Medicine. He assumed an Assistant Professor position at PCOM in 2006 and promoted to an Associate Professor in 2011. He has published more than 40 papers in reputed journals and has served as a Chairman for multiple international conferences.

dianzhengzh@pcom.edu

Notes: