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Identification of individual antigen-specific T cell clones in patients undergoing allogeneic stem cell transplantation and their in vivo monitoring with quantitative real-time PCR

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The authors studied the possibilitity of identifying antigen-specific T cells in patients undergoing allogeneic stem cell transplantation for hematological malignancy. An attempt was made to identify harmful donor T cells causing life-threatening graft-versus-host disease (GVHD) and also beneficial donor T cells causing a graft-versus-leukemia (GVL) effect. Using mixed lymphocyte reaction, flow cytometry, and molecular detection of individual T cell receptor beta, we were able to identify individual GVHD-specific T cell clones (Michálek et al. Lancet 2003, 361: 1183-5) and GVL-specific T cell clones in vitro before the transplantation. We were also able to monitor these individual clones in vivo after transplantion using quantitative real-time clone-specific PCR (Michálek et al. Proc Natl Acad Sci USA 2003, 100: 1180-4). This novel approach can be applied for identification and quantitative monitoring of individual T cell clones in both allogeneic and autologous situations and it can be used as a powerful tool in planning clinical trials with adoptive immunotherapy using tumor-specific T cell clones.

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