ANIARA

Manufactured By: U-CyTech Biosciences

ELISPOT in Organ Transplantation

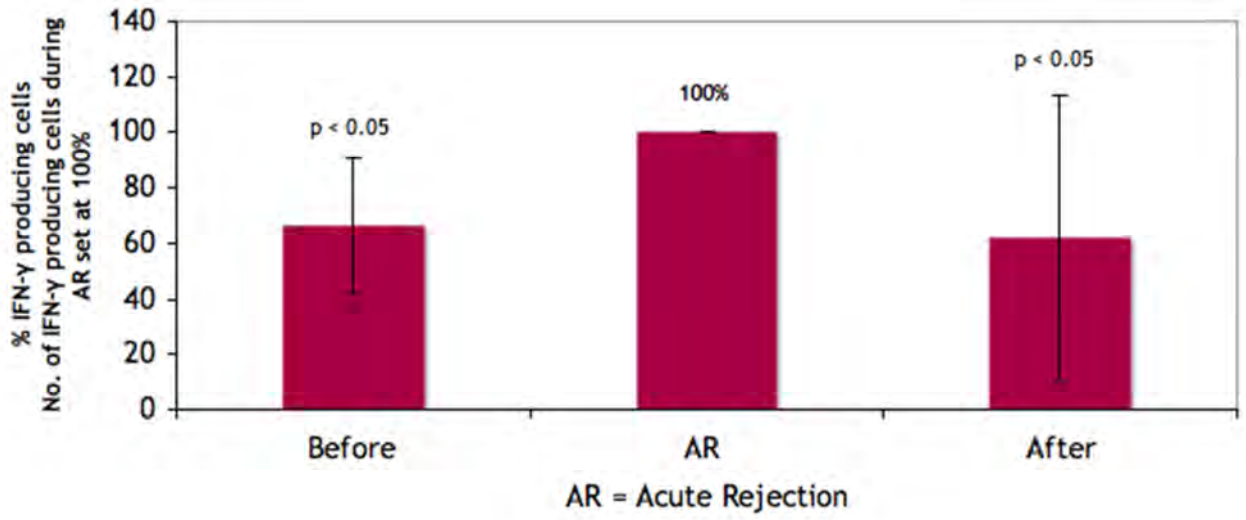
In the field of organ transplantation, there is a great need for the development of reliable *in vitro* assays to predict outcome and guide for therapeutic interventions after transplantation. The ELISPOT assay has proven to be a promising tool to generate these markers, since it can accurately quantify the frequency and cytokine profile of circulating donor-reactive T lymphocytes. Different studies have shown that the number of IFN-γ producing T cells correlated with posttransplantation outcomes. Increased frequency of donor-specific IFN-γ producing cells before transplantation was related with risk of acute rejections and impaired posttransplant function. Additionally, the assay has high value in immune monitoring of alloreactivity after reduction or withdrawal of toxic immunosuppressants and identifying patients tolerant to their allograft. Frequent and reliable T-cell monitoring is feasible by the ELISPOT assay. Therefore, clinicians may use the ELISPOT assay in conjunction with additional tests as a routine basis to optimize immunosuppressive therapy with minimal side effects to prolong transplant and patient survival.

For example, Van Besouw ***et al.*** (2005) measured the number of IFN-γ producing cells reactive to donor cells in peripheral blood mononuclear cells (PBMC) of heart transplant patients with the human IFN-γ ELISPOT before, during and after a period of acute rejection (AR). The recognition of allo-major histocompatibility complex (MHC) antigens by T cells is the central event that initiates AR.

The authors showed that the T cell response directed against donor antigens was always readily detectable (Figure 1). This response increased significantly during an episode of AR and after successful treatment the response decreased ($p<0.05$). Van Besouw ***et al.*** showed in their study that the ELISPOT assay is a useful tool to determine T cell alloreactivity.

ANIARA 7768 Service Center Drive • West Chester OH 45069
Phone: 513.770.1991 Toll Free: 866.783.3797 Fax: 513.573.9241 Email: info@aniara.com
www.aniara.com

Figure 1. Mean percentage of IFN-γ producing cells to donor cells (determined from PBMCs of heart transplant patients by the human IFN-γ ELISPOT) is significantly lower before and after acute rejection (AR)



Examples of studies using our ELISPOT assay:

van Besouw NM, Zuijderwijk JM, Vaessen LMB, Balk AHMM, Maat APWM, van der Meide PH, and Weimar W.
The direct and indirect allogeneic presentation pathway during acute rejection after human cardiac transplantation. Clin Exp Immunol **141: 1**534-40 (2005). *Abstract*
U-CyTech products used in this study:
Human IFN-γ ELISPOT kit

Gerrits JH, van de Wetering J, Drabbels JJ, Claas FH, Weimar W, and van Besouw NM.
Donor-reactive cytokine profiles after HLA-identical living-related kidney transplantation.
Nephrol Dial Transplant **23:**2016-23 (2007). *Abstract*
U-CyTech products used in this study:
Human IFN-γ ELISPOT kit
Human IL-10 ELISPOT kit
Human IL-13 ELISPOT kit
Human Granzyme B ELISPOT kit

ANIARA 7768 Service Center Drive • West Chester OH 45069
Phone: 513.770.1991 Toll Free: 866.783.3797 Fax: 513.573.9241 Email: info@aniara.com
www.aniara.com

Hochmeister S, Zeitelhofer M, Bauer J, Nicolussi EM, Fischer MT, Heinke B, Selzer E, Lassmann H, and Bradl M.
After injection into the striatum, in vitro-differentiated microglia- and bone marrow-derived dendritic cells can leave the central nervous system via the blood stream.
Am J Pathol **173:**1669-81 (2008). *Abstract*
U-CyTech products used in this study:
Rat IFN-γ ELISPOT kit

Kloosterboer FM, van Luxemburg-Heijs SA, Willemze R, and Falkenburg JH.
Similar potential to become activated and proliferate but differential kinetics and profiles of cytokine production of umbilical cord blood T cells and adult blood naive and memory T cells.
Hum. Immunol. **67:** 874-83 (2006). *Abstract*
U-CyTech products used in this study:
Human IFN-γ ELISPOT kit
Human IL-2 ELISPOT kit
Human IL-4 ELISPOT kit
Human IL-10 ELISPOT kit

Lv M, Li Y, Yu M, Sun Y, Lin Z, Qiao C, Luo Q, Gu X, Huang Y, Feng J, and Shen B.
Structured to reduce the mitogenicity of anti-CD3 antibody based on computer-guided molecular design.
Int J Biochem Cell Biol **39:** 1142-55 (2007). *Abstract*
U-CyTech products used in this study:
Human IFN-γ ELISPOT kit
Human IL-2 ELISPOT kit

van der Meide PH, Joosten AM, Hermans P, Kloosterman TC, Olsson T, and de Labie MC.
Assessment of the inhibitory effect of immunosuppressive agents on rat T cell interferon-gamma production using an ELISPOT assay.
J Immunol Methods **144:** 203-13 (1991). *Abstract*
U-CyTech products used in this study:
Rat IFN-γ ELISPOT kit

Zanone MM, Favaro E, Quadri R, Miceli I, Giaretta F, Romagnoli R, David E, Perin PC, Salizzoni M, and Camussi G.
Association of cytomegalovirus infections with recurrence of humoral and cellular autoimmunity to islet autoantigens and of type 1 diabetes in a pancreas transplanted patient.
Transpl Int **23:**333-7 (2010). *Abstract*
U-CyTech products used in this study:
Human IFN-γ ELISPOT kit

ANIARA 7768 Service Center Drive • West Chester OH 45069
Phone: 513.770.1991 Toll Free: 866.783.3797 Fax: 513.573.9241 Email: info@aniara.com
www.aniara.com