immunoSEQ®

AUTOIMMUNITY/ INFLAMMATORY DISEASE

CASE STUDY

T-cell repertoire following autologous stem cell transplantation for multiple sclerosis

Muraro PA, *et al.* (2014) *J Clin Invest* 124(3):1168–72
MARCH 2014

WHY IMMUNOSEQ?

The immunoSEQ Assay allowed investigators to monitor reconstitution of the immune repertoire post-transplant

Changes in the repertoire could be investigated pre- and post-transplant

immunoSEQ metrics, such as diversity and clonality, allowed correlation of data to treatment outcomes

amplify ***discovery***™

CASE STUDY: T-cell repertoire following autologous stem cell transplantation for multiple sclerosis — Muraro PA, *et al.* (2014) *J Clin Invest* 124(3):1168–72

BACKGROUND

- Autologous hematopoietic stem cell transplantation (HSCT) is commonly employed for hematologic and non-hematologic malignancies and is being evaluated for severe autoimmunity to 'reset' the immune system
- In a Phase II study of HSCT for poor-prognosis multiple sclerosis, immune reconstitution post-transplant was monitored and correlated with outcomes

AIM

To understand the relationship between diversity of T-cell repertoire after HSCT and outcomes

METHODS

Peripheral blood samples were collected from 24 subjects with multiple sclerosis and peripheral blood mononuclear cells (PBMCs) were obtained

1. Before HSCT: PBMCs → gDNA extraction → **immunoSEQ® (TCRB)**
2. **HSCT**
3. 2 months: PBMCs → gDNA extraction → **immunoSEQ (TCRB)**
4. 1 year: PBMCs → gDNA extraction → **immunoSEQ (TCRB)**

RESULTS

Figure 1.

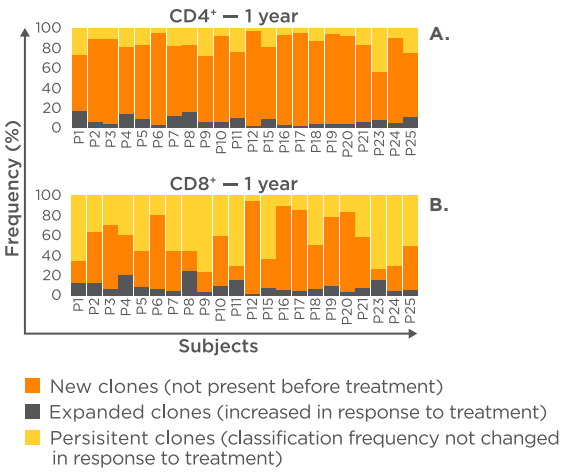

Figure 2.

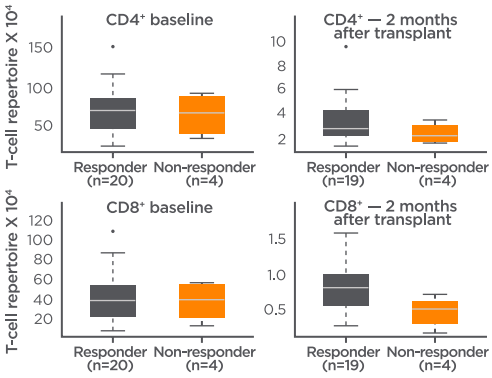

Figure 1.A. Subjects largely developed a new CD4⁺ repertoire after treatment

Figure 1.B. The reconstituted CD8⁺ repertoire was created by clonal expansion of cells present before treatment

Figure 2. Subjects who failed to respond to treatment had less diversity in their T-cell repertoire early during the reconstitution process

CONCLUSIONS

- These results underpin the notion that repertoire complexity is critical for the re-establishment of immune tolerance
- Low T-cell diversity may be an early indicator of inadequate immune reconstitution and may be used to tailor monitoring and therapy post-transplant

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