Organ transplant biomarker using donor-reactive T-cell receptors determine donor-host tolerance

Since donor-reactive T-cell receptors (TCRs) target and trigger immune responses against transplanted organs, they can also be used as biomarkers for tolerance or rejection in organ transplant recipients. Unique donor-reactive TCRs are identified for transplant recipients and their presence is monitored over time. With reductions in donor-reactive TCRs indicative of organ tolerance, these biomarkers can serve as valuable diagnostics in transplant medicine.

Personalized diagnostics for multiple types of organ transplant recipients

This technology uses donor-reactive TCRs as biomarkers for tolerance or rejection in blood, bone marrow, and end-organ transplant recipients. In addition to being independent of other markers and methods for diagnosing organ rejection and tolerance, this technology identifies donor-reactive TCRs that are unique to each transplant recipient. Monitoring these specific TCRs over time provides personalized transplant diagnostics, allowing individualized post-transplant management strategies.

The reproducibility in identifying donor-reactive TCRs using mixed lymphocyte reactions has been demonstrated. In addition, donor-reactive TCRs have been identified in a combined kidney and bone marrow ITN036ST transplant patient, with reductions in TCR levels observed 6 months and 1.5 years after transplant.

Lead Inventor:

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Applications:

- Identify donor reactive T-cell receptors in organ transplant recipients.
- Track the population of donor-reactive T-cell receptors to identify organ transplant rejection or tolerance.
- Evaluate compatibility between organ transplant donors and recipients.

Advantages:

- Monitors tolerance and rejection for blood, bone marrow, and end-organ transplants.
• Uses TCRs as biomarkers, which are independent of other markers and methods of diagnosing organ rejection and tolerance.
• Identifies unique donor-reactive TCRs sequences for individual transplant patients.
• Tracks levels of multiple donor-reactive TCRs.
• Distinguishes between deletional and anergy mechanisms of organ tolerance.
• Uses standard biomedical diagnostic techniques (cell culture, fluorescence, gene amplification and sequencing) to identify and monitor levels of donor-reactive TCRs.
• Allows the development individualized post-transplant management strategies for organ recipients.

**Patent information:**
Patent Pending

**Licensing Status:**
Available for licensing and sponsored research support

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**Related Publications:**

**Inventors**

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