# ANTIGEN-SPECIFIC T CELL RECEPTOR DISCOVERY FOR TREATING PROGRESSIVE MULTIFOCAL LEUKOENCEPHALOPATHY

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## PATENT STATUS

Patent Pending

## BRIEF DESCRIPTION

Progressive Multifocal Leukoencephalopathy (PML) is a devastating and often fatal demyelinating disease of the central nervous system caused by the reactivation of the JC virus (JCV). In immunocompromised patients, the absence of effective T cell surveillance allows the virus to infect and lyse oligodendrocytes, leading to irreversible neurological damage. UC Berkeley researchers have developed a method for discovering and engineering antigen-specific T cell receptors (TCRs) that specifically target JCV.

## SUGGESTED USES

» Adoptive Immunotherapy: Direct treatment for patients suffering from PML to halt viral replication and disease progression.

» Prophylactic Treatment: Use in high-risk immunocompromised individuals, such as those undergoing specific monoclonal antibody therapies (e.g., natalizumab), to prevent JCV reactivation.

» Off-the-Shelf Cell Bank: Developing a library of TCR-engineered T cells covering diverse HLA haplotypes for rapid clinical deployment.

» Combination Therapy: Use alongside immune reconstitution therapies to accelerate the clearance of JCV from the central nervous system.

» Diagnostic Research: Utilizing identified JCV-specific TCR sequences as biomarkers to monitor patient immune status and risk of PML.

## ADVANTAGES

» Target Specificity: Engineered TCRs are precisely tuned to JCV epitopes, minimizing off-target effects and potential autoimmunity.

» Potent Cytotoxicity: Modified T cells demonstrate high-avidity binding and efficient killing of JCV-infected astrocytes and oligodendrocytes.

» Rapid Deployment: Provides an immediate therapeutic option for patients who cannot wait for the lengthy expansion of autologous virus-specific T cells.

## CONTACT

Laleh Shayesteh
lalehs@berkeley.edu
tel: 510-642-4537.



## INVENTORS

» Urnov, Fyodor D.

## OTHER INFORMATION

**CATEGORIZED AS**

» **Biotechnology**
» Bioinformatics
» **Medical**
» Diagnostics
» Disease: Central Nervous System
» Disease: Infectious Diseases
» Gene Therapy
» Therapeutics
» Vaccines
» **Research Tools**
» Bioinformatics
» Cell Lines

**RELATED CASES**

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Broad Applicability: Discovery platform can be scaled to identify TCRs for various HLA subtypes, ensuring a wider patient reach.

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Overcomes Immunosuppression: Bypasses the patient's compromised immune system by providing "pre-programmed" functional T cell immunity.

## RELATED MATERIALS

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2150 Shattuck Avenue, Suite 510, Berkeley,CA 94704
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