



TREATMENT OF EXPERIMENTAL ARTHRITIS WITH TOLERANCE INDUCING DENDRITIC CELLS OBTAINED BY GENE MODIFICATION

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THESIS ABSTRACT

Rheumatoid arthritis (RA) is an autoimmune disease characterized by chronic inflammation and joint deformities. Current biological agents, particularly TNF- α inhibitors, are insufficient to alter the course of the disease in some patients, and their long-term use is associated with high costs and significant side effects. This study investigated the efficacy of dendritic cells (DCs), genetically modified to induce tolerance, in the treatment of RA. For this purpose, dendritic cells engineered to express CTLA4-KDEL and overexpress the immunosuppressive enzyme IDO were produced. These modified tolerogenic dendritic cells were administered to classic DBA/1 mice with CIA (collagen-induced arthritis), as well as C57BL/6 and BALB/c mice to evaluate model flexibility. Clinical scores, joint inflammation, and histopathological findings were significantly reduced.

APPLICATION AREAS OF THE THESIS RESULTS

This study demonstrated that the CIA model can be successfully established not only in DBA/1 mice but also in C57BL/6 and BALB/c strains. This provides greater flexibility for RA research in different genetic backgrounds. Despite the general difficulty of genetically modifying primary dendritic cells, optimization of the combined method resulted in higher transduction efficiencies than those reported in the literature. Administration of tolerogenic dendritic cells to CIA-induced mice significantly reduced clinical scores, inflammation, and joint destruction. These findings indicate that, beyond conventional immunosuppressive treatments, a cell-based therapeutic strategy is feasible.

ACADEMIC ACTIVITIES

1. **Gözde Arslan**, Fatmanur DüNDAR, Elif Çelik, Ezgi Yumuşak, Diğdem Yöyen Ermiş, Tolga SÜTLÜ, Ahmet Akkoç, Murat Yalçın, Haluk Barbaros Oral. *Therapeutic Use of Bone Marrow-Derived Tolerogenic Dendritic Cells Modified by Lentiviral Transduction in the CIA Model*. 6th International Molecular Immunology & Immunogenetics Congress, Istanbul, 2025 (Oral Presentation).
2. Simge Er Zeybekler, Ahmet Çifçi, Diğdem Yöyen Ermiş, **Gözde Arslan**, Haluk Barbaros Oral, Dilek Odacı. *Electrochemistry-Based Assay for Monitoring Adherent Macrophages and Foam Cells on Ab-CD36 Modified Electrospun Nanofibers*. **Advanced Materials Interfaces**, 2024.
3. Projects:
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KEY WORDS

- ✓ Rheumatoid Arthritis
- ✓ Genetic Modification
- ✓ Dendritic Cell
- ✓ CIA Mouse Model
- ✓ Tolerance

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