

INVESTIGATION OF THE EFFECT OF MATERNAL DYSBIOSIS ON THE DEVELOPMENT OF COLLAGEN-INDUCED ARTHRITIS IN MICE

Fatmanur DÜNDAR

ORCID-NO: 0000-0003-2551-3833

BURSA ULUDAĞ UNIVERSITY
INSTITUTE OF HEALTH SCIENCES IMMUNOLOGY
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Prof. Dr. Haluk Barbaros ORAL
ORCID-NO: 0000-0001-5871-6818
BURSA ULUDAĞ UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF IMMUNOLOGY
BURSA – TÜRKİYE
THESIS ABSTRACT

The gut microbiota has many different roles, including metabolizing nutrients, immunomodulation and maintaining the integrity of the intestinal barrier. Intergenerational transmission of bacteria at birth initiates the development of the gut microbiota in mammals. This process can be altered or disrupted by antibiotic exposure. These disturbances are referred to as "dysbiosis". Dysbiosis of the microbiota in early life can affect the development of the organism and its physiological, pathophysiological and immunological mechanisms in later life. Recent studies have shown that the gut microbiota can also affect distant organs, shaping both local and systemic innate and adaptive immune responses.

In our study, we aimed to investigate the effect of maternal dysbiosis and fecal microbiota transplantation (FMT) on collagen-induced arthritis (CIA), a mouse model of rheumatoid arthritis, an autoimmune disease. For this purpose, pregnant Balb/c mice were treated with a mixture of amoxicillin and vancomycin antibiotics from the last week of pregnancy until 8 weeks of age. Mice in the FMT group received oral FMT treatment after the end of antibiotic treatment. After the microbiota alteration experiments were completed, bacterial profiles in the gut microbiota of the mice were sequenced. Afterwards, CIA was established in the control group, dysbiosis group and FMT groups.

APPLICATION AREAS OF THESIS RESULTS

As a result, it was observed that maternal dysbiosis significantly decreased the bacterial population in the gut microbiota in mice, whereas FMT caused bacterial populations to repopulate. In addition, it was observed that dysbiosis increased the severity of arthritis in the CIA model and that this damage could be reversed by FMT.

Studies have shown that gut microbiota health is very important for the course and severity of autoimmune diseases. The results shed light for further studies to develop symptom-relieving or preventive treatment strategies for rheumatoid arthritis.

ACADEMIC ACTIVITIES

- Investigation of the Effect of Maternal Dysbiosis on the Development of Collagen-Induced Arthritis in Mice
Dündar F., Arslan G., Yumuşak E., Yöyen Ermiş D., Yalçın M., Akkoç A., Oral B., 2025 Immuno Rheumatology Symposium, Oral Presentation
- Tissue resident/infiltrated macrophages isolation and their artificial expansion in 3D cells culture
Dündar F., Özalp E., Etlü O., Oral B., Yöyen Ermiş D., 2022, V. International molecular immunology and immunogenetics congress (MIMIC V), Poster Presentation.
- Treatment of Experimental Allergic Encephalomyelitis with Tolerance Inducing Dendritic Cells by Multiple Gene Modifications: A New Approach for MS Treatment
Arslan G., Karaçay M., Çelik E., Yumuşak E., Etlü O., Dombaz F., **DÜNDAR F.**, Yöyen Ermiş D., Ersoy F., Yılmaztepe Oral A., Akkoç A., Sütlü T., Yalçın M., Oral B., 2022, 12th Clinical Neuroimmunology Symposium, Oral Presentation (3rd best oral presentation award)
- Conversion of Bone Marrow Derived Macrophage to M2 Phenotype Using A151 ODN Oligonucleotide
Çelik M., Arslan G., Güvenç Bayram G., **Dündar F.**, Yumuşak E., Karaçay M., Bal H., Yöyen Ermiş D., Gürsel İ., Akkoç A., Yalçın M., Oral B., 2023, Immuno-Rheumatology Symposium, Oral Presentation
- M2c-like macrophage associated immunomodulatory function on CD44/CD24 phenotype in triple negative breast cancer (TNBC) subgroups
Etlü O., Bal H., **Dündar F.**, Yağcıoğlu B., Özalp E., Oral B., Yöyen Ermiş D., 2024, ECI-7. European Congress of Immunology, Poster Presentation.
- Monocyte/Macrophage Associated Immunomodulatory Function of CD44/CD24 Phenotype in Triple Negative Breast Cancer (TNBC) Subgroups on T Cell Responses
Etlü O., **Dündar F.**, Özalp E., Oral B., Yöyen Ermiş D., 2022, V. International molecular immunology and immunogenetics congress (MIMIC V), Poster Presentation.
- Isolation of Tissue Resident/Infiltrating Macrophages and Their Growth in 3D Cell Culture Media Preserving Organ Niches
Dündar F., Etlü O., Esen C., Yağcıoğlu B., Özalp E., Oral B., Yöyen Ermiş D., 2023, XXVIIth National Immunology Congress Poster Presentation.
- Understanding Tissue-resident Macrophage Polarization in Basal-like Breast Cancer Metastasis
Özalp E., **Dündar F.**, Etlü O., Oral B., Yöyen Ermiş D., 2022, V. International molecular immunology and immunogenetics congress (MIMIC V), Poster Presentation.

İN FARELERDE KOLAJEN İLE
İT GELİŞİMİNE OLAN ETKİSİNİN
ARAŞTIRILMASI

FATMANUR DÜNDAR
Danışman: PROF. DR. HALUK BARBAROS ORAL
Bursa Uludağ Üniversitesi, Tıp Fakültesi,
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KEY WORDS

- ✓ MATERNAL DİSBIYOZİS
- ✓ FEKAL MİKROBİYOTA TRANSPLANTASYONU
- ✓ ROMATOİD ARTRİT
- ✓ BAĞIRSAK MİKROBİYOTASI

COMMUNICATION

E-POSTA:
Fatmanurdn39@gmail.com

THESIS ADVİSER

TELEFON:
+90 (0224) 295 41 14
E-POSTA:
oralb@uludag.edu.tr

