



## KEY WORDS

- ✓ Granulocyte
- ✓ Platelet
- ✓ Hemostasis
- ✓ Aggregometer
- ✓ Thromboelastogram

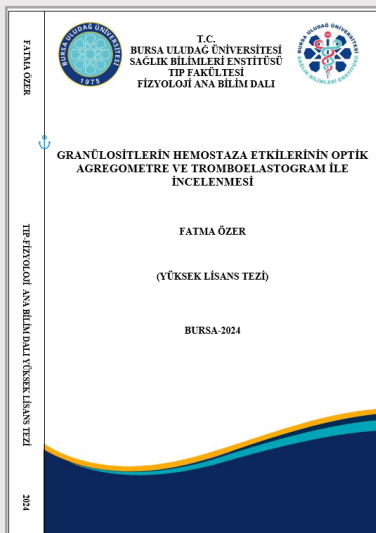
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# INVESTIGATION OF THE EFFECTS OF GRANULOCYTES ON HEMOSTASIS BY OPTICAL AGGREGOMETER AND THROMBOELASTOGRAM

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## THESIS ABSTRACT

In this study, the effects of granulocytes, one of the leukocyte subgroups, on hemostasis were studied using optical aggregometer and thromboelastogram. Experiments were performed immediately after the granulocytes obtained from whole blood were separated and incubated for 4 hours without stimulation and with stimulation with lipopolysaccharide. Platelet aggregation was observed by stimulating aggregation with ADP, collagen and epinephrine. Maximum aggregation values were evaluated compared to the control group. In thromboelastogram experiments, granulocytes were added to platelet-rich plasma and the hemostasis process was observed in the presence of Ca<sup>2+</sup>. Values were evaluated according to the control group. In 0th hour aggregometer experiments, granulocytes significantly decreased the maximum aggregation values in ADP and collagen-stimulated aggregations compared to the control group. Neither incubation of granulocytes for 4 h nor stimulation with LPS showed any difference on ADP, collagen, and epinephrine-stimulated aggregations. In thromboelastogram experiments, while hour 0 and unstimulated granulocytes did not affect hemostasis parameters, stimulated granulocytes activated hemostasis and created a hypercoagulant state. While granulocytes inhibit platelet aggregation, they increase hemostasis when stimulated, not only highlighting the differences between methods, but also showing that the activation status of granulocytes is important.

## APPLICATION AREAS OF THE THESIS RESULTS

Platelet-leukocyte aggregates are observed in many pathophysiological conditions, particularly cardiovascular diseases. Understanding the granulocyte-platelet relationship may shed light on the treatment of these pathophysiological conditions.

## ACADEMIC ACTIVITIES

- 1- Investigation of Hemostasis, Anticoagulant, and Antithrombotic Drug Activities in the Presence of SARS CoV-2 Spike Protein and Subunits (S1, S2) In Vitro, TÜBİTAK 1001 project scholarship holder
2. Özer, F., Gürel, Ö., Sağdılek, E., & Kılınc, E. (November 1-4, 2023). Investigation of the Effects of SARS CoV-2 Spike Protein S1 Subunit on Hemostasis Using Thromboelastography. 48th National Physiology Congress of the Turkish Physiological Sciences Association, p. 72. Sakarya, Turkey.
3. Kılınc, E., Özer, F., Gürel, Ö., & Sağdılek, E. (September 6-9, 2023). Effects of SARS CoV-2 Spike Protein Subunit S1 on Platelet Aggregation. 5th International Biophysics Congress, Izmir Institute of Technology, Izmir, Turkey.