SİVAS CUMHURİYET ÜNİVERSİTESİ

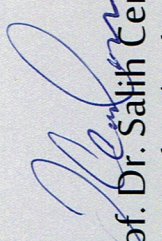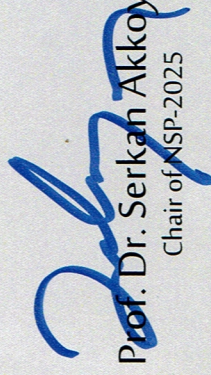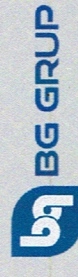## XVII. INTERNATIONAL CONFERENCE ON NUCLEAR STRUCTURE PROPERTIES

NSP-2025

Certificate of Appreciation

Fouzia Bouchelaghem

has participated as a speaker at 17th International Conference on Nuclear Structure Properties – NSP2025 organized by Sivas Cumhuriyet University, Sivas Türkiye on 25 – 27 June, 2025.

Prof. Dr. Salih Cem İnan
Dean of Faculty of Sciences

Prof. Dr. Serkan Akkoyun
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SİVAS BELEDİYESİ

SİVAS VALİLİĞİ

Machine learning for the prediction of recurrence after radiotherapy and immunotherapy in thyroid cancer: Identification of clinical and biological signatures.

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Abstract

Thyroid cancer recurrence remains a significant clinical concern despite standard treatments such as surgery followed by radiotherapy. This study aims to compare recurrence rates between patients treated with radiotherapy versus immunotherapy, with a focus on sex differences and biological hypotheses that may explain variability in treatment response.

A cohort of over 5,000 thyroid cancer patients was analyzed, stratified by treatment type (radiotherapy or immunotherapy). Recurrence rates were calculated and cross-tabulated with sex. Further analysis explored treatment timing, potential biological influences such as hormone interactions, and adherence patterns.

Recurrence after radiotherapy was notably higher than after immunotherapy, particularly among male patients (7.5% vs. 0%). The absence of recurrence in the immunotherapy group raises questions about selection bias, treatment indication severity, or a genuinely higher therapeutic efficacy. Additionally, sex-based differences in immune response and hormonal regulation may underlie this divergence.

Immunotherapy shows promise as a potentially more favorable treatment option for select patients with thyroid cancer, possibly due to enhanced immune responsiveness or fewer systemic disruptions. Further investigations are warranted to validate these findings, explore sex-specific treatment strategies, and integrate biological markers into future clinical decision-making.

Keywords —Thyroid cancer recurrence, Machine learning, prediction of recurrence.