ACADEMY OF SCIENCES AND ARTS OF BOSNIA AND HERZEGOVINA
DEPARTMENT OF MEDICAL SCIENCES
COMMITTEE FOR MALIGNANT DISEASES AND CENTER FOR COORDINATION OF MEDICAL RESEARCH

International Scientific Symposium
„Recent Advances in the Diagnosis and Treatment of Lung Cancer“

PROGRAM AND BOOK OF ABSTRACTS

Academy of Sciences and Arts of Bosnia and Herzegovina
Sarajevo, Bistrik 7

18th of September 2026

ORGANIZING COMMITTEE

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SPEAKERS

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Prof. Šefika Umihanić, MD, PhD, Clinic for Oncology and Radiotherapy, University Clinical Center Tuzla, Tuzla, Bosnia and Herzegovina

Dr. Mirko Kolak, MD, Oncology, Public Health Institution Hospital Trebinje, Trebinje, Bosnia and Herzegovina

INTRODUCTION

We are pleased to invite you to the 14th multidisciplinary scientific meeting entitled “Recent Advances in the Diagnosis and Treatment of Lung Cancer,” which will take place on September 18, 2026, at the Academy of Sciences and Arts of Bosnia and Herzegovina (ANUBiH) in Sarajevo.

The meeting is jointly organized by the Committee for Malignant Diseases and the Center for Coordination of Medical Research of ANUBiH. The event will focus on contemporary advances in the diagnosis and treatment of lung cancer, with particular emphasis on novel diagnostic approaches, molecular pathology, precision medicine, and modern therapeutic strategies. Special attention will be devoted to the prevention, diagnosis, and treatment of lung cancer in Bosnia and Herzegovina.

The topic of this meeting corresponds to the thematic issue of the journal *Acta Medica Academica*, which will highlight current scientific and clinical developments in this important field.

The meeting aims to bring together researchers, clinicians, and experts from various medical disciplines to exchange knowledge, discuss recent advances, and foster collaboration in lung cancer research and clinical practice.

We would be honored by your presence and participation.

Sincerely,

Professor Semir Vranić, M.D., Ph.D., corresponding member of ANUBiH
Professor Gordan Srkalović, M.D., Ph.D., domestic member of ANUBiH

PROGRAM

8.30–9.00 Registration

9.00–9.10 Opening of the event and introductory remarks
- Event organizers
- Representative of the Ministry of Civil Affairs of Bosnia and Herzegovina
- Minister of Health of Sarajevo Canton, Enis Hasanović, MD, MSc

9.10–9.40 The Croatian program for the prevention of lung cancer (Miroslav Samaržija)

9.40–10.10 A new era in the classification of lung carcinoma: From morphology to molecular taxonomy (Dalma Udovičić Gagula)

10.10–10.40 Molecular profiling and targeted therapy in the treatment of non-small cell lung cancer (Gordan Srkalović)

10.40-11.10 Redefining Operability and Resectability in Non-Small Cell Lung Cancer in the Era of Neoadjuvant Systemic Therapy (Alen Pilav)

11.10–11.30 *Coffee break*

11.30–12.00 Perspectives of the application of artificial intelligence in decisions about the treatment of lung cancer in Bosnia and Herzegovina (Šefika Umihanić)

12.00–12.30 Precision radiotherapy in lung cancer: Bridging innovation and real-world outcomes (Shruti Jolly)

12.30–13.00 The role of NGS in molecular profiling of non-small cell lung cancer (Miroslav Samaržija, Krešimir Tomić, Dalma Udovičić Gagula) (Roche Diagnostics Hrvatska)

13.00–13.30 The treatment of small cell lung cancer (Krešimir Tomić)

13.30–14.15 *Lunch*

14.15–14.45 Immunotherapy in the treatment of metastatic non-small cell lung cancer: Experience from Bosnia and Herzegovina – Trebinje (Mirko Kolak)

14.45-15.15 Implementation of lung cancer screening in Bosnia and Herzegovina through the LIFEGATE project (Krešimir Tomić)

15.15-15.45 The role of immunohistochemistry in precision oncology of non-small cell lung carcinoma (Zoran Gatalica/Semir Vranić)

15.45–16.30 Discussion and Conclusions

ABSTRACTS

The Croatian Lung Cancer Screening and Early Detection Program

Miroslav Samaržija and Kristina Krpina

The Croatian National Lung Cancer Screening and Early Detection Program aims to identify disease at an early, potentially curable stage and thereby reduce lung cancer mortality by 20%. Croatia was the first European Union member state to introduce such a systematic program nationwide. The program is fully digitalized and integrated into primary healthcare. The following overview presents key data, results, and technical aspects of its implementation.

More than 3,000 people are diagnosed with lung cancer in Croatia each year. The primary objective of this ten-year national plan is to reduce lung cancer mortality in the country by 20%. International studies, including the European NELSON trial, have shown that regular low-dose computed tomography (LDCT) screening of high-risk populations can reduce lung cancer mortality by 25% in men and by up to 61% in women.

The Croatian system has been officially recognized as a model program, and several other European countries are drawing on the “Croatian model” as they develop their own screening programs.

A New Era in Lung Cancer Classification: From Morphology to Molecular Classification

Dalma Udovičić-Gagula

The classification of lung cancer has undergone a significant transformation over the past decades, evolving from a purely morphological approach to an integrated model that combines histopathological, immunohistochemical, and molecular characteristics of tumors. The advent of precision oncology and the increasing availability of targeted therapies have created a need for more detailed tumor characterization, making classification a critical tool not only for diagnosis but also for predicting therapeutic response and patient prognosis.

The aim of this lecture is to present the evolution of lung cancer classification, with particular emphasis on the latest recommendations of the World Health Organization (WHO) and contemporary diagnostic algorithms. The role of morphological assessment and immunohistochemistry in distinguishing major histological subtypes will be discussed, along with the growing importance of molecular biomarkers in defining biologically and clinically relevant tumor subgroups. Special attention will be given to the changes driven by the discovery of actionable molecular alterations, including mutations and gene rearrangements that form the basis for personalized treatment strategies.

The lecture will highlight how the integration of morphological and molecular data is reshaping the traditional understanding of lung cancer, enabling more precise disease classification and supporting individualized patient management.

Molecular Profiling and Targeted Therapy in Non-Small Cell Lung Cancer

Gordan Srkalović

The promise of precision oncology is rapidly changing the therapeutic landscape of advanced- and early-stage non-small cell lung cancer (NSCLC). Beginning with the identification of EGFR mutations (L858R, exon 19 del, exon 20 insertion, S768L, L861Q, G719X) followed by KRAS G12C (and now G12D and soon other KRAS mutations), ALK and ROS1 fusions, BRAF V600E, NTRK 1/2/3, MET exon 14 skipping, RET

fusion, ERBB mutations and NRG1 fusion our understanding and treatment of this disease have changed dramatically. Adding to these genomic-based decisions are options based on protein expression-based biomarkers such as HER2 IHC 3+ and c-MET IHC ≥ 50% 3+ in EGFR wild-type tumors. Tumor mutational burden (TMB), assessed through genomic testing, opens another therapeutic option that includes immunotherapy in patients with EGFR- and ALK-wild-type cancers. In the future, the use of the HRD (Homologous Recombination Deficiency) signature as a pattern of genomic scars could be used as a clinically actionable marker in NSCLC, as it currently is in ovarian cancer. Targeted therapy in NSCLC was initially used in metastatic disease and, until then, never showed improvement in survival. However, use of EGFR tyrosine kinase inhibitors in the adjuvant setting irreversibly transformed the treatment of this cancer after initial surgery. With the final survival results from the ADAURA study and very promising results of the ARTS trial, adjuvant EGFR inhibition became the global standard. Although not accepted as a standard adjuvant, ALK inhibition is showing improved results compared to immunotherapy in the adjuvant treatment of patients with ALK fusion. However, the future of targeted therapy for NSCLC and other cancers will likely rely on individualized combination therapies tailored to patients' genomic alterations rather than a single targeted approach. Longitudinal monitoring using circulating tumor DNA (ctDNA) and related approaches may allow us to evaluate the success of the treatment and promptly respond in the case of the development of resistance.

The Potential of Artificial Intelligence to Support Lung Cancer Treatment Decisions in Bosnia and Herzegovina

Šefika Umihanić

Lung cancer remains the leading cause of mortality associated with malignant diseases worldwide, despite significant progress in molecular diagnostics, immunotherapy and personalized treatment. The development of large language models (LLMs) and other tools based on artificial intelligence (AI) opens new opportunities for improving oncology practice through support for clinical decision-making, analysis of medical documentation, patient education and optimization of multidisciplinary communication. These technologies may be of particular importance in healthcare systems with limited resources, such as the healthcare system of Bosnia and Herzegovina. LLMs are increasingly being explored as a support for multidisciplinary teams (MDTs) through the integration and summarization of a large number of clinical, radiological, pathohistological and molecular data, the interpretation of findings, preparation of cases for consultation meetings and standardization of medical documentation. In this way, they can contribute to more efficient therapeutic decision-making and better compliance with modern expert guidelines for the treatment of lung cancer. In line with ESMO recommendations, AI systems cannot replace the clinical judgment of physicians, but should serve as auxiliary tools with mandatory expert verification of all generated information. Their application is associated with challenges that include the risk of inaccurate or outdated data, algorithmic bias, and issues of patient privacy and data security. Artificial intelligence opens up opportunities for the development of predictive and personalized medicine through the integration of clinical, radiological and molecular data, enabling more precise risk assessment and better monitoring of treatment outcomes. In line with ESMO and WHO guidance and the European regulatory framework, AI should be used to support physicians in decision-making, while preserving their key role and responsibility in patient treatment.

Precision Radiotherapy in Lung Cancer: Bridging Innovation and Real-World Outcomes

Shruti Jolly

Radiation therapy continues to play a central role in the management of lung cancer, with recent technological advances enabling increasingly precise and individualized treatment approaches.

Innovations, including stereotactic body radiotherapy (SBRT), image-guided radiotherapy, adaptive treatment strategies, and integration with systemic therapies, have expanded opportunities to improve tumor control while minimizing toxicity. However, translating these advances into consistent improvements in patient outcomes requires more than technological innovation alone. Equally important are the systems, processes, and quality infrastructures that ensure evidence-based care is delivered reliably across diverse practice settings.

This presentation will review contemporary advances in precision radiotherapy for both early-stage and locally advanced lung cancer, highlighting the evolving role of treatment personalization based on tumor characteristics, patient factors, and multidisciplinary decision-making. Particular emphasis will be placed on the challenges of implementing innovation in real-world clinical practice and the importance of quality measurement, clinical pathways, and learning health systems in reducing variation in care.

Drawing upon experiences from statewide, national, and multi-institutional quality initiatives, the lecture will explore how prospective data collection, outcome monitoring, and collaborative quality improvement efforts can complement technological advances to improve patient outcomes. The intersection of precision medicine and quality-driven care offers an important framework for ensuring that innovations in lung cancer treatment achieve their intended impact at scale. By bridging scientific advancement with real-world implementation, radiation oncology can continue to advance both the effectiveness and equity of lung cancer care.

Redefining Operability and Resectability in Non-Small Cell Lung Cancer in the Era of Neoadjuvant Systemic Therapy

Alen Pilav

Contemporary management of non-small cell lung cancer (NSCLC) requires a reassessment of the boundaries of resectability and operability, particularly in the era of neoadjuvant chemotherapy and immunotherapy. This presentation aims to stimulate multidisciplinary discussion about whether patients previously considered to have unresectable disease or to be inoperable may become candidates for surgical resection following advances in systemic and multimodal treatment.

It is essential to distinguish resectability from operability, as these terms are not interchangeable. Technical resectability refers to the feasibility of achieving a complete (R0) resection. However, this alone does not mean that surgery is medically or oncologically justified. Decision-making must consider functional status, comorbidities and anticipated perioperative risk, technical feasibility, psychological readiness, and the expected benefits of surgery for survival and quality of life. Stage III NSCLC, particularly N2 disease, requires special attention: the extent and distribution of mediastinal involvement (single-station versus multistation; bulky versus non-bulky) and the potential need for pneumonectomy are central to assessing local treatment options.

The decision to operate should not be made in isolation. It should be reached by a multidisciplinary lung cancer team, supported by high-quality radiological and metabolic staging with PET/CT, invasive mediastinal assessment using EBUS/EUS, selective mediastinoscopy, and evaluation of the likelihood of achieving an R0 resection. This approach helps distinguish patients for whom surgery is part of an optimal multimodal strategy from those who are likely to benefit more from definitive nonsurgical multimodal treatment.

Results from large phase III randomized trials confirm that neoadjuvant or perioperative chemoimmunotherapy can improve outcomes in patients with already established resectable NSCLC. However, these trials do not, in themselves, show that all initially unresectable tumors can be converted

into operable disease. In CheckMate 816, among patients with resectable stage IB–IIIA NSCLC, three cycles of neoadjuvant nivolumab plus platinum-based chemotherapy increased median event-free survival to 31.6 versus 20.8 months (HR 0.63) and the pathological complete response rate to 24.0% versus 2.2%, without adversely affecting surgical feasibility.[1]

The perioperative approach was further evaluated in KEYNOTE-671 and AEGEAN. In KEYNOTE-671, four cycles of neoadjuvant pembrolizumab plus cisplatin-based chemotherapy, followed by adjuvant pembrolizumab, improved two-year event-free survival compared with the control group (62.4% versus 40.6%; HR 0.58). Higher rates of major pathological response (30.2% versus 11.0%) and pathological complete response (18.1% versus 4.0%) were also reported.[2] In AEGEAN, perioperative durvalumab plus platinum-based chemotherapy reduced the risk of progression, recurrence, or death (HR 0.68), with pathological complete response rates of 17.2% versus 4.3% in the control group.[3]

These findings support incorporating immunotherapy into neoadjuvant or perioperative treatment for carefully selected patients with resectable NSCLC. Nevertheless, decisions must remain individualized and based on accurate staging, tumor biology, the potential for R0 resection, anticipated surgical morbidity, and alternatives for definitive treatment. Multistation bulky N2/N3 disease, an inability to achieve R0 resection, or a situation in which surgery is expected to offer less benefit than definitive multimodal treatment are important limits to a surgical approach. The central question is therefore not simply whether a tumor can be technically removed, but whether surgery offers a measurable oncological benefit to the individual patient.

Treatment of Small Cell Lung Cancer

Krešimir Tomić

Small cell lung cancer (SCLC) accounts for approximately 15% of all lung cancers and is characterized by aggressive biological behavior, rapid proliferation, and high metastatic potential. In limited-stage SCLC, concurrent chemoradiotherapy remains the cornerstone of treatment, while surgery is reserved for a small subset of carefully selected patients with early-stage disease. Recent trials have demonstrated that consolidation immunotherapy with durvalumab following chemoradiotherapy significantly improves progression-free and overall survival, establishing a new treatment standard in limited-stage disease.

In extensive-stage SCLC, platinum-etoposide chemotherapy represented the standard of care for more than three decades. However, the addition of immunotherapy has changed the therapeutic landscape. The pivotal IMpower133 and CASPIAN trials demonstrated that adding atezolizumab or durvalumab to first-line platinum-based chemotherapy significantly improved survival outcomes.

Our real-world clinical experience demonstrated a median overall survival of 7 months in patients with extensive-stage SCLC. The best outcomes in extensive-stage SCLC were observed in patients who received consolidative thoracic radiotherapy, achieving a median overall survival of 12 months, further supporting the importance of multimodal treatment approaches in carefully selected patients. Despite recent therapeutic advances, prognosis in SCLC remains poor, highlighting the need for continued development of more effective systemic therapies.

Immunotherapy for Metastatic Non-Small Cell Lung Cancer: Real-World Experience from Trebinje, Bosnia and Herzegovina

Mirko Kolak

Non-small cell lung cancer (NSCLC) is the most common histological type of lung cancer, which is a leading cause of cancer-related mortality in Bosnia and Herzegovina (BiH). Immunotherapy is now a standard treatment option for metastatic NSCLC. This study aimed to assess the effectiveness, predictors of response, and safety of immunotherapy in routine clinical practice at a single oncology center in BiH. In this retrospective analysis of patients with metastatic NSCLC treated with immunotherapy at Trebinje Hospital, we evaluated clinicopathological characteristics, survival outcomes, and the frequency and severity of treatment-related toxicities. Between January 2021 and December 2025, 30 patients received treatment: 53.3% received pembrolizumab, 43.3% atezolizumab, and 3.3% nivolumab. Twenty-two patients (73%) received immunotherapy as first-line treatment. Most patients had a history of smoking (93%). Adenocarcinoma was diagnosed in 76.7%, and 6.6% had a targetable mutation. Metastases involving multiple organs were present in 66.6%, and brain metastases were identified in 26.7%. High PD-L1 expression (≥50%) was found in 53.3%. Disease progression or death occurred in 53.3%, while 46.7% remained progression-free at the end of the analysis. High PD-L1 expression (≥50%) was associated with longer median overall survival compared with PD-L1 expression <50% (13 versus 6 months). Adverse events were reported in 36.6% of patients. Toxicity was generally mild, with grade 3 toxicity recorded in only 3.3%. Immunotherapy provided clinically meaningful benefit in this real-world cohort of patients with metastatic NSCLC. High PD-L1 expression was associated with better treatment outcomes, and toxicity did not lead to treatment discontinuation. Given the limited availability of immunotherapy in BiH, these findings are encouraging and highlight the need for broader access across approved indications.

The Role of Immunohistochemistry in Precision Oncology of Non-Small Cell Lung Carcinoma

Zoran Gatalica, Semir Vranić

Immunohistochemistry (IHC) remains an essential component of biomarker testing in non-small cell lung cancer (NSCLC), particularly for identifying patients who may benefit from immune checkpoint inhibitors (ICIs) by assessing PD-L1 expression levels. Beyond immunotherapy, immunohistochemistry can be used to detect therapeutic targets including ALK, MET, BRAF V600E, and HER2. For each biomarker, we discuss the underlying biology, prevalence, therapeutic relevance, available targeted agents, validated antibody clones and platforms, scoring approaches, and diagnostic performance compared with molecular assays. We highlight FDA-approved and widely used diagnostic IHC assays for ALK (D5F3) and MET (SP44), and summarize reported sensitivity and specificity data for selected, but less commonly observed, biomarkers, such as HER2 (4B5) and BRAF V600E (VE1). A review of antibody clones, staining patterns, interpretation criteria, and clinically relevant cutoffs is provided, together with a practical reflex-testing algorithm for routine diagnostic workflows. Key recommendations include the use of validated assays for PD-L1 testing, molecular confirmation of IHC screening results for other non-PD-L1 biomarkers by fluorescence in situ hybridization or gene sequencing, and prudent use of genomic profiling when tissue “is an issue”. We also discuss persistent challenges, including interobserver variability in PD-L1 interpretation, assay/platform heterogeneity, and the limited sensitivity of pan-TRK IHC in some settings.

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