

**THE CROATIAN ACADEMY OF SCIENCES AND ARTS**  
**The Department of Biomedical Sciences in Rijeka**

**UNIVERSITY OF RIJEKA - FACULTY OF MEDICINE**  
**Center for digestive and metabolic medicine**

**THE CLINICAL HOSPITAL CENTER RIJEKA**

**THE CROATIAN SOCIETY OF GASTROENTEROLOGY**

**THE CROATIAN MEDICAL ASSOCIATION**

**INTEGRATED DIGESTIVE AND METABOLIC  
MEDICINE – THE FUTURE FOR BETTER  
TREATMENT OUTCOMES**



**p3**

**KBCri**



**CENTAR ZA  
DIGESTIVNU I  
METABOLIČKU  
MEDICINU**



**HRVATSKO  
GASTROENTEROLOŠKO  
DRUŠTVO**



**medri**

**Rijeka, October 01 2025.**

**CHC Rijeka, New hospital complex, Lecture Hall P5-112, 5<sup>th</sup> floor**  
**Vjekoslava Dukića 7, Rijeka, Croatia**

### ***Organizers***

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### ***Organizing Committee***

Marko Zelić, Goran Hauser, Stipan Jonjić,  
Ivana Mikolašević, Dorian Kršul,  
Goran Poropat, Alen Ružić

**Registration: online via [registration form](#)**

**Free admission for registrations**

### ***Information***

**Željana Mikovčić**, Department of Biomedical Sciences in Rijeka  
Radmile Matejčić 2, Rijeka;  
Phone: 051 584 578, e-mail: rimed@hazu.hr

**Congress agency:** Vivid original d. o. o., Zagreb  
Phone: +385 (0)98 508 502; e-mail: info@vivid-original.com

**P R O G R A M**  
**OPENING**  
**(09:00-9:30)**

***Welcome addresses:***

**Marko Zelić**, Head of the Center for Digestive and Metabolic Medicine,  
Faculty of Medicine, University of Rijeka, Rijeka, Croatia

**Goran Hauser**, Dean, Faculty of Medicine, University of Rijeka, Rijeka, Croatia

**Alen Ružić**, Head, Clinical Hospital Center, Rijeka, Croatia

**Željko Krznarić**, president of Croatian Medical Association, Zagreb, Croatia

**Davor Miličić**, Vice President of the Croatian Academy of Sciences and Arts,  
Zagreb, Croatia

**Irena Hrstić**, Minister of Health of Republic of Croatia, Zagreb, Croatia

|                       |
|-----------------------|
| <b>9,30 – 10,10 h</b> |
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**I. CENTER FOR DIGESTIVE AND METABOLIC MEDICINE,  
WHO AND WHY?**

**Chairs: Goran Hauser and Alen Ružić**

**09:30 – 09:45** **Marko Zelić**, Faculty of Medicine, University of Rijeka and  
Clinical Hospital Center  
Rijeka, Croatia  
***Center for digestive and metabolic medicine – a solution for  
improved treatment outcomes?***

**09:45 – 10:00** **Vesna Eraković Haber**, Selvita Ltd, Zagreb, Croatia  
***Translational research at Center for digestive and metabolic  
medicine***

**Discussion: 10:00 – 10:10**

**10,10 – 10,50 h**

## **II. NEW HIGHLIGHTS OF CDMM / STATE OF THE ART – NEUROMODULATION IN GASTROINTESTINAL MEDICINE**

**Chairs: Marko Zelić and Goran Hauser**

**10:10 – 10:25** **Sanja Klobučar**, Clinical Hospital Center Rijeka and Faculty of Medicine, University of Rijeka, Rijeka, Croatia  
*Gastric pace for diabetic gastroparesis*

**10:25 – 10:40** **Dorian Kršul**, Clinical Hospital Center Rijeka, Rijeka, Croatia  
*Sacral neuromodulation for fecal incontinence, LARS and beyond – techniques and cost-effectiveness*

**Discussion: 10:40 – 10:50**

**Coffee break: 10:50 - 11:10**

**11,10 – 11,50 h**

## **III. SPECIALIZED NURSES IN DIGESTIVE AND METABOLIC MEDICINE**

**Chair: Marko Zelić**

**11:10 – 11:25** **Vesna Konjevoda**, Croatian Society of medical technicians/nurses of digestive surgery  
*Nursing in digestive and metabolic medicine?*

**11:25 – 11:40** **Anita Beg and Robert Zmirić**, Clinical Hospital Center Rijeka, Rijeka, Croatia  
*The role of the oncology coordinator in the care of patients with digestive system tumors*

**Discussion: 11:40 – 11:50**

11,50 – 13,15 h

#### IV. MULTIDISCIPLINARY APPROACH IN THE TREATMENT OF INFLAMMATORY BOWEL DISEASES

**Chairs: Goran Poropat and Dorian Kršul**

- 11:50 – 12:10** **Marina Babić Čač**, Department of Histology and Embryology, Faculty of Medicine, University of Rijeka, Rijeka, Croatia  
*Regulation of immune response in the context of Inflammatory bowel disease*
- 12:10 – 12:30** **Željko Krznarić**, Faculty of Medicine, University of Zagreb, Zagreb, Croatia  
*New therapeutic options in Inflammatory bowel diseases*
- 12:30 – 12:50** **Janindra Warusavitarne**, St Mark's Hospital, London, UK  
*The essential role of a multidisciplinary approach in inflammatory bowel diseases – what surgeon needs?*
- 12:50 – 13:05** **Damir Karlović**, Clinical Hospital Center Rijeka, Croatia  
*Perianal Crohn's disease: a persistent clinical challenge*

**Discussion: 13:05 – 13:15**

**Lunch break: 13:15 – 14:15**

14,15 – 15,45 h

#### V. MULTIDISCIPLINARY APPROACH IN METABOLIC MEDICINE

**Chairs: Sanja Klobučar and Zdenko Boras**

- 14:15 – 14:35** **Davor Miličić**, Clinical Hospital Center Zagreb, Zagreb, Croatia  
*Cardiometabolic syndrome*
- 14:35 – 14:55** **Maja Baretić**, KBC Zagreb, Zagreb, Croatia  
*Changing taste perception thorough oestrogen: the missing links between weight loss and GLP-1 RA*

**14:55 – 15:15** **Valerio Pontecorvi**, Policlinico Universitario Agostino Gemelli, Rome, Italy  
*Endoscopic treatment of obesity*

**15:15 – 15:35** **Zdenko Boras**, Clinical Hospital Center Osijek, Osijek, Croatia  
*Bariatric and metabolic surgery: What I can transfer to Croatia from my experience learned at Cleveland Clinic*

**Discussion: 15:35– 15:45**

**Coffee break: 15:45 – 16:00**

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|------------------------|
| <b>16,00 – 17,30 h</b> |
|------------------------|

## **VI. MULTIDISCIPLINARY APPROACH IN ONCOLOGICAL MEDICINE**

**Chairs: Boris Belev and Ivana Mikolašević**

**16:00 – 16:20** **Domenico Mavilio**, Humanitas Research Hospital, Milan Italy  
*Innate immune response and immunotherapies in the fate of metastatic colorectal cancer: friends or foe?*

**16:20 – 16:40** **Danilo Mišković**, St Mark's Hospital, London, UK  
*Complex gastrointestinal oncological surgery – to do lap or robotic is multidisciplinary team decision (MDT)*

**16:40 – 17:00** **Janja Ocvirk**, Institute of Oncology, Ljubljana Slovenia  
*Multidisciplinary team on the path from molecular diagnostics to personalized treatment selection for malignant diseases of the digestive system*

**17:00 – 17:20** **Ana Wilson**, St Mark's Hospital, London, UK  
*Management of acute and chronic gastrointestinal symptoms and complications as a result of treatment for cancer*

**Discussion: 17:20 – 17:30**

17,30 – 17,40 h

## VII. CLOSING REMARKS

Chairs: Goran Hauser and Marko Zelić

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# ABSTRACTS

## **Center for digestive and metabolic medicine – a solution for improved treatment outcomes?**

**Marko Zelić<sup>1,2</sup>**

<sup>1</sup>Faculty of Medicine, University of Rijeka, Rijeka, Croatia

<sup>2</sup>Clinical Hospital Center Rijeka, Rijeka, Croatia

Today, in modern medical practice, a multidisciplinary approach to each patient is the gold standard of treatment. The current horizontal model of connection between medical professions is outdated and does not provide adequate treatment results in modern medicine. Vertical integration is based on modern advances in the medical profession and on constant scientific research into the causes, clinical course and treatment of diseases of the digestive system. Vertical integration of related professions in modern medicine has proven to improve treatment outcomes in a wide range of digestive and metabolic diseases.

The clinical components of the center have programs that are recognized as leading in Croatia and abroad. Two referral centers of the Ministry of Health, educational programs, international projects, active involvement in international organizations and cooperation with biotechnology companies are already part of our daily work.

We want to significantly increase basic, translational and clinical research and connect it with everyday clinical practice.

Our research directions will include intestinal mucosal function, intestinal neuromotility, inflammatory processes and liver metabolism, signal transduction mechanisms, malignant diseases of the digestive system, research on the intestinal microbiome and functional diseases of the digestive system and metabolic diseases.

For this reason, the Center for Digestive and Metabolic Medicine was established at the Faculty of Medicine as a product of synergy between professional clinical and scientific research medical sciences.

## **Translational research in digestive and metabolic medicine: spatial omics, microbiota and personalized therapy**

**Vesna Eraković Haber**

Selvita d.o.o.

Translational research is a dynamic, bidirectional process that connects clinical practice with fundamental discovery and applied research, including biomarker development and drug discovery, to enable the development of targeted interventions that improve patient outcomes. The presentation outlines an integrative approach to translational research in digestive and metabolic disorders, with a particular focus on colorectal cancer (CRC), inflammatory bowel disease (IBD) and obesity-related metabolic dysfunction. The first part of the talk focuses on the application of spatial omics technologies in CRC. Using mass spectrometry imaging integrated with histological analysis, single-cell RNA sequencing, and extracellular vesicle profiling in plasma, tumor heterogeneity and the microenvironment are characterized at high resolution. These multi-modal data are complemented by microbiota profiling in both tumor and adjacent non-tumor tissues, revealing microbial signatures associated with tumor subtypes and therapeutic response. Together, these insights inform patient stratification and support the development of personalized therapeutic strategies.

In parallel, research on IBD employs advanced molecular profiling to dissect immune cell dynamics and tissue remodeling. The goal is to identify predictive biomarkers and novel therapeutic targets that can be translated into precision medicine approaches for chronic inflammatory conditions. The talk also addresses the role of adipose tissue in obesity-related metabolic dysfunction, focusing on the translational relevance of adipocyte-derived inflammatory and hormonal signals in shaping disease progression and therapeutic strategies.

By combining spatial and molecular profiling with clinical insight, this work highlights the value of using surgically resected human tissues in translational research. Clinical experts play a vital role in designing disease-relevant models and interpreting experimental data in the context of human pathology. The presentation emphasizes the importance of interdisciplinary collaboration, data integration, and innovation in advancing personalized medicine in digestive and metabolic health.

*This research is supported by Croatian National Recovery and Resilience Plan (project NPOO.C3.2.R3-I1.04.0266: Spatial omics for profiling of colorectal cancer heterogeneity, identification of biomarkers, microbiota characterization and translation into personalized therapy).*

## **Gastric pace for diabetic gastroparesis**

**Sanja Klobučar**

<sup>1</sup>Clinical Hospital Centre Rijeka, Rijeka, Croatia

<sup>2</sup>Faculty of Medicine, University of Rijeka, Rijeka, Croatia

Diabetic gastroenteropathy, a complex and often underrecognized complication of long-standing diabetes mellitus, encompasses a range of gastrointestinal (GI) symptoms resulting from autonomic neuropathy and disordered motility. It may involve any segment of the GI tract, presenting with symptoms such as nausea, vomiting, bloating, early satiety, constipation, diarrhea, or fecal incontinence. Despite its significant impact on quality of life, nutritional status, and glycemic control, it remains underdiagnosed and poorly understood in both clinical and research settings. Gastroparesis is the most well-characterized manifestation, though distal bowel dysfunction is increasingly recognized. Diagnostic evaluation remains challenging due to symptom overlap with other GI conditions and the lack of specific biomarkers. The management is multidisciplinary and includes dietary modification, pharmacological agents such as prokinetics and antiemetics, and surgical interventions including gastric electrical stimulation and pyloromyotomy reserved for patients with refractory disease that severely impairs quality of life. Future research should focus on the development of standardized diagnostic tools and targeted therapies to improve patient outcomes and reduce disease burden.

## **Sacral neuromodulation for fecal incontinence, LARS and beyond – techniques and cost-effectiveness**

**Dorian Kršul**

University Hospital Centre Rijeka, Rijeka, Croatia

### **Background:**

Fecal incontinence (FI) and low anterior resection syndrome (LARS) significantly impair quality of life yet remain underdiagnosed and undertreated. Conservative measures (dietary modification, pharmacotherapy, pelvic floor rehabilitation) represent first-line management, but a subset of patients remains severely affected. Sacral neuromodulation (SNM) has emerged as a minimally invasive, reversible option with growing evidence of efficacy.

### **Methods:**

We reviewed the current role of SNM in FI and LARS, emphasizing patient selection, procedural technique, and cost-effectiveness. We also present early clinical experience from University Hospital Centre Rijeka. Patients under-

went a two-stage SNM procedure, with permanent implantation indicated after  $\geq 50\%$  improvement in symptoms during test stimulation.

### **Results:**

Between October 2023 and August 2025, 14 patients (10 female, 4 male) were evaluated for SNM. Indications included FI and severe LARS. Twelve patients proceeded to permanent implantation after successful test stimulation. Two patients required explantation, and one experienced lead migration successfully managed with repositioning. No major perioperative complications were observed.

### **Discussion:**

Our initial experience confirms that SNM is a feasible and effective treatment for selected patients with refractory FI and LARS. Outcomes are consistent with international reports. Cost-effectiveness analyses suggest that appropriate patient selection and early use in severe cases may optimize value, reduce prolonged ineffective conservative therapy, and improve quality of life.

### **Conclusion:**

SNM represents a safe, testable, and effective therapeutic option for patients with refractory FI and LARS. Our early institutional results support broader adoption, with consideration of earlier intervention in severe cases.

Keywords: Sacral neuromodulation, fecal incontinence, low anterior resection syndrome, cost-effectiveness, functional bowel disorders

## **Nursing in digestive and metabolic medicine**

**Vesna Konjevoda**

Croatian society of medical technicians/nurses, Zagreb, Croatia

Nursing in the field of digestive and metabolic medicine holds an increasingly important place in modern healthcare systems. Global experience and recent literature show that specialized nurses in gastroenterology, IBD, endoscopic procedures, clinical nutrition, and diabetes care make a significant contribution to the quality, safety, and efficiency of treatment. Their role includes clinical assessment and patient follow-up, providing education and empowering patients in the self-management of chronic diseases, coordinating team-based care, and implementing standardized protocols.

Nurse-led models of care in IBD and in healthcare in general have been proven to reduce hospitalizations, accelerate access to therapy, increase patient satisfaction, and bring systemic savings. In nutritional medicine, clinical nurses play a key role in preventing and treating malnutrition, reducing complications,

and improving outcomes. Endoscopy and perioperative nurses contribute to procedural safety and optimal perioperative care.

To achieve their full potential, a clear vision of nursing specialization development is needed, together with investment in education, formalization of advanced roles, and systematic outcome monitoring. The key to success lies in partnership between nurses, physicians, and other healthcare professionals, within a multidisciplinary approach and mutual trust. Leadership in nursing, assuming responsibility for process organization, and active participation in shaping health policy all contribute to the development of a high-quality and sustainable system.

The vision is the creation of a modern, patient-centered model of care in which specialized nurses are recognized and formalized as key professionals, ensuring—through partnership and leadership—better treatment outcomes, greater safety and patient satisfaction, and more rational use of healthcare resources.

## **Regulation of immune response in the context of inflammatory bowel disease**

**Marina Babić Čač**

Faculty of Medicine, University of Rijeka, Croatia

Inflammatory bowel disease (IBD), such as Crohn's disease and ulcerative colitis, is characterized by chronic inflammation and tissue damage in the gastrointestinal tract. Pathogenesis of IBD is complicated and includes genetic and environmental factors as well as dysregulated immune response. More than two thirds of the body's immune cells reside in the gut, where they interact with the gut microbiome, intestinal epithelial cells and local immune system of the lining mucosa. Their task is complex as they are required for maintaining balance between tolerance to harmless symbionts and food-derived antigens and harmful pathogens and barrier insults. In IBD, this balance is ticked and results in uncontrolled immune reaction to own tissue.

Immune reactions in the context of IBD are mediated through T lymphocytes and innate lymphoid cells, in a dynamic communication with other cells in the mucosal barrier as well as enteric nervous system and microbiota. Tissue damage, proinflammatory milieu as well as cellular stress caused by microbial products, cytokines and reactive oxygen species can lead to upregulation of stress molecules, such as ligands for the activating receptor NKG2D. NKG2D+ Th cells as well as cells expressing elevated levels of NKG2D ligands have been identified in patients with Crohn's disease. Although the role of NKG2D in the regulation of the lymphocyte response has been a topic of therapeutic

interest, contribution of NKG2D-NKG2DL axis in the shaping of intestinal immune response is still not fully elucidated. Our data, showing the contribution of NKG2D to the intestinal immune response, will be discussed.

## **New therapeutic options in inflammatory bowel diseases**

Željko Krznarić<sup>1,2</sup>

<sup>1</sup>University Hospital Centar, Zagreb, Croatia

<sup>2</sup>School of Medicine, University of Zagreb Zagreb, Croatia

Inflammatory bowel diseases (IBD), comprising Crohn's disease and ulcerative colitis, are chronic disorders marked by alternating phases of activity and remission. Although current treatments have improved patient care considerably, a significant proportion of individuals still face inadequate disease control, loss of response over time, or treatment-related complications. These limitations continue to drive the search for new therapeutic strategies.

### **Biologics beyond anti-TNF therapies**

The introduction of monoclonal antibodies against tumor necrosis factor (TNF) was a milestone in IBD therapy. Nevertheless, many patients either fail to respond initially or experience secondary loss of efficacy. This gap has prompted the development of biologics targeting alternative immune pathways. Vedolizumab, an antibody directed against the  $\alpha 4\beta 7$  integrin, restricts the migration of lymphocytes into the intestinal mucosa and provides organ-selective immunosuppression with a favorable safety profile. Another option, ustekinumab, blocks interleukin-12 and interleukin-23 signaling and has shown lasting benefits in both ulcerative colitis and Crohn's disease, even among patients who did not respond to other biologics.

### **Oral small molecules as emerging therapies**

In recent years, small oral agents have gained attention for their ease of administration and rapid onset of action. Janus kinase (JAK) inhibitors such as tofacitinib, filgotinib and upadacitinib act at the level of intracellular signaling, offering effective control of inflammation, particularly in ulcerative colitis. Selective sphingosine-1-phosphate (S1P) receptor modulators, including ozanimod and etrasimod, work by preventing lymphocyte circulation into inflamed tissues, thereby reducing immune activity within the gut. These agents expand the treatment landscape and provide alternatives for patients who prefer oral over injectable medications.

### **Innovative approaches**

Research is increasingly shifting toward more precise and targeted interventions. New monoclonal antibodies that selectively inhibit interleukin-23

(mirikizumab, guselkumab, rizankizumab) are showing results which put them into the clinical praxis, particularly in Crohn's disease. Strategies aimed at modifying the intestinal microbiome, such as fecal microbiota transplantation and live microbial therapies, seek to restore microbial balance and reduce inflammation. In addition, cellular therapies, including mesenchymal stem cell infusions, have demonstrated potential in managing complex complications like fistulizing Crohn's disease. There is a bunch new molecules under the studies investigations.

### **Toward individualized treatment**

A major focus in IBD care is the move toward personalized medicine. Advances in biomarker discovery, therapeutic drug monitoring, and integration of genetic and microbial profiling are helping clinicians tailor treatment decisions to individual patient characteristics.

### **Conclusion**

The therapeutic landscape in IBD is rapidly expanding, with biologics, oral small molecules, microbiome-based treatments, and cell therapies all contributing new possibilities. While challenges such as cost, access, and long-term safety remain, the future points toward a more individualized and strategic use of these agents.

## **Perianal Crohn's Disease: A persistent clinical challenge**

**Damir Karlović**

Clinical Hospital Center Rijeka, Rijeka, Croatia

**Perianal Crohn's disease (PCD)** represents one of the most challenging manifestations of Crohn's disease, characterized by the presence of fistulas, abscesses, strictures, and skin tags around the anal region. It affects up to 30% of patients with Crohn's disease and significantly impairs quality of life due to pain, drainage, and recurrent infections.

Management of PCD requires a multidisciplinary approach involving gastroenterologists, colorectal surgeons, radiologists, and specialized nursing care. According to the latest guidelines from the European Crohn's and Colitis Organisation (ECCO, 2023), treatment should begin with control of sepsis through drainage of abscesses, followed by optimization of medical therapy.

Biologic agents, particularly anti-TNF therapies such as infliximab and adalimumab, have demonstrated efficacy in inducing and maintaining fistula closure. Recent studies also highlight the role of newer biologics like ustekinumab and vedolizumab in refractory cases. Combined medical and surgical approaches improve outcomes, with surgery aimed at drainage, seton placement, and preservation of sphincter function.

Advanced imaging techniques, especially pelvic MRI and endoanal ultrasound, are critical for accurate diagnosis and monitoring of fistula tracts. Among surgical innovations, the Video Assisted Anal Fistula Treatment (VAAFT) procedure has emerged as a minimally invasive technique that allows direct visualization and controlled treatment of fistula tracts, offering a sphincter-saving alternative that improves healing rates, reduces recurrence, ameliorates symptoms, and enhances patients' quality of life.

Despite these advancements, PCD remains difficult to treat, with a high rate of recurrence and a need for repeated interventions. Ongoing research focuses on novel therapeutic targets, stem cell therapies, and personalized treatment plans. Comprehensive patient support and multidisciplinary coordination are essential to manage this "nightmare" condition effectively.

In my upcoming lecture, I will review the current ECCO guidelines and share our experience managing perianal Crohn's disease at a high-volume tertiary clinical hospital center, highlighting practical insights and outcomes from our multidisciplinary approach

### **Innate immune response and immunotherapies in the fate of metastatic colon rectal cancer: friends or foe?**

**Domenico Mavilio**

Medical School of University of Milan "La Statale", Milan, Italy

Cancer immunotherapies often target adaptive immune responses (i.e. T lymphocytes), while neglecting the impact and the role of innate immune compartments especially at tissue sites. Colorectal cancer represents one of the most frequent malignancies worldwide, with more than 50% of the patients developing colorectal liver metastasis (CRLM). Among them, simultaneous synchronous CRLM represents a particularly challenging clinical entity, occurring in approximately 15% to 25% of colorectal cancer cases.

By combining unbiased single-cell transcriptomic with multiparametric flow cytometry analysis, we identified an abundant family of intrahepatic CD56Bright NK cells in CRLMs endowed with anti-tumor functions resulting from specific transcriptional liver programs. Intrahepatic CD56Bright and CD56Dim NK lymphocytes expressed unique transcription factors (IRF8, TOX2), high level of chemokines, and targetable immune checkpoints (ICs), including CXCR4 and the IL-1 receptor family member IL-1R8. CXCR4 pharmacological blocking and an anti-IL-1R8 mAb enhanced the effector function of CRLM NK cells. Targeting the diversity of liver NK cells and their distinct immune-checkpoint repertoires is key to optimize the current immune-therapy protocols in CRLM.

## Multidisciplinary team on the path from molecular diagnostics to personalized treatment selection for malignant diseases of the digestive system

Janja Ocvirk

Institute of oncology Ljubljana, Ljubljana, Slovenia

The integration of molecular diagnostics into multidisciplinary team (MDT) decision-making is reshaping the therapeutic landscape of malignant diseases of the digestive system. Biomarkers have become pivotal in guiding treatment strategies for gastric, colorectal, pancreatic, and gallbladder cancers, enabling a shift from empirical to biomarker-driven, personalized therapy.

In gastric cancer, the identification of **HER2 amplification**, **MSI status**, and **PD-L1 expression** informs the selection of targeted agents and immunotherapies, leading to improved response rates and prolonged survival. In colorectal cancer, **RAS** and **BRAF** mutation status, along with **MSI** and **TMB profiling**, are essential for tailoring systemic therapy, particularly in the metastatic setting. **Pancreatic cancer**, traditionally characterized by limited therapeutic options, is now benefiting from the integration of biomarker testing, with **BRCA1/2 mutations** and other homologous recombination deficiency markers enabling the use of PARP inhibitors, and **MSI-H** or **high TMB** tumors showing responsiveness to immunotherapy. For gallbladder carcinoma, emerging biomarkers such as **FGFR2** and **IDH mutations** are expanding treatment possibilities and facilitating inclusion in clinical trials.

This presentation will highlight the evolving role of MDTs in interpreting molecular profiles, integrating them into clinical workflows, and ensuring timely and evidence-based therapeutic decisions. By linking biomarker status with treatment efficacy and survival outcomes, we underscore the critical importance of comprehensive molecular diagnostics in optimizing patient care and advancing precision oncology in gastrointestinal malignancies.

## Changing taste perception through oestrogen: the missing links between weight loss and GLP-1 RA

Maja Baretić

Clinical Hospital Center Zagreb, Zagreb, Croatia

Obesity remains a major global health challenge, with current treatments offering limited long-term success. Glucagon-like peptide-1 receptor agonists (GLP-1 RA) have shown strong efficacy in weight reduction, traditionally attributed to delayed gastric emptying, enhanced satiety, and reduced appetite. Emerging evidence, however, suggests that GLP-1 may also influence taste perception and food reward, potentially serving as a missing link between pharmacological treatment and sustained weight loss.

To explore this, we conducted a double-blind, placebo-controlled crossover study in 14 healthy participants (6 males, 8 females). After an overnight fast, subjects received either placebo (0.9% saline) or synthetic GLP-1 infusion (1.5 pmol/kg/min). Following each intervention, participants reported food preferences across five basic tastes (sweet, bitter, salty, sour, umami). Body composition was assessed by bioelectrical impedance, while insulin sensitivity was estimated from fasting glucose and insulin levels.

GLP-1 infusion significantly altered taste preferences compared with placebo, with clear sex-specific differences. Women were more likely than men to shift their taste preferences ( $\chi^2 = 4.667$ ,  $p = 0.031$ ). Among responders, body fat mass correlated positively with basal insulin levels, and insulin resistance correlated strongly with insulin levels post-infusion ( $r = 0.89$ ,  $p < 0.01$ ).

These findings suggest that GLP-1 modulates taste in a gender-dependent manner, potentially influenced by estrogen-related pathways. Such mechanisms may enhance the efficacy of GLP-1-based therapies in women and individuals with higher insulin resistance. Understanding these differences could help optimize incretin-based treatments and inform new strategies combining hormonal and sensory pathways in obesity management.

### **Bariatric and metabolic surgery: What I can transfer to Croatia from my experience learned at Cleveland Clinic**

**Zdenko Boras,**

Clinical Hospital Center Osijek, Osijek, Croatia

We are living in the era of obesity pandemic with more than 1 billion people living with obesity. Worldwide, adult obesity has more than doubled since 1990, and adolescent obesity has quadrupled. In 2022, there were approximately 890 million adults with obesity and 160 million children and adolescents (aged 5-19) with obesity.

Indeed, the number of overweight and obese people has been growing in recent years, and many people find it increasingly difficult to maintain a normal weight in today's largely obesogenic environment. Croatia is almost at the top of the list in prevalence of obesity in Europe with almost 40% of adults being obese.

Bariatric and metabolic surgery is currently the obesity treatment with the best long term weight reduction results but also in metabolic syndrome remission. After 4 years spent at Cleveland Clinic Abu Dhabi as a general surgeon in Bariatric surgery team, we introduced the whole Bariatric program settings to Clinical Hospital Osijek Croatia.

We applied the rules and regulations of preoperative bariatric work-up, forming MDT, using latest intraoperative surgical techniques and materials, following ERAS protocol for discharge of our patients.

We were able to serve more than 300 patients successfully, continuously improving the program and educating residents.

