50 years

TÜRK ELEKTRON MİKROSKOPİ DERNEĞİ

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İZMİR YÜKSEK TEKNOLOJİ ENSTİTÜSÜ 1992

25. ULUSAL ELEKTRON MİKROSKOPİ KONGRESİ

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EMK 2021

22-24 EYLÜL 2021

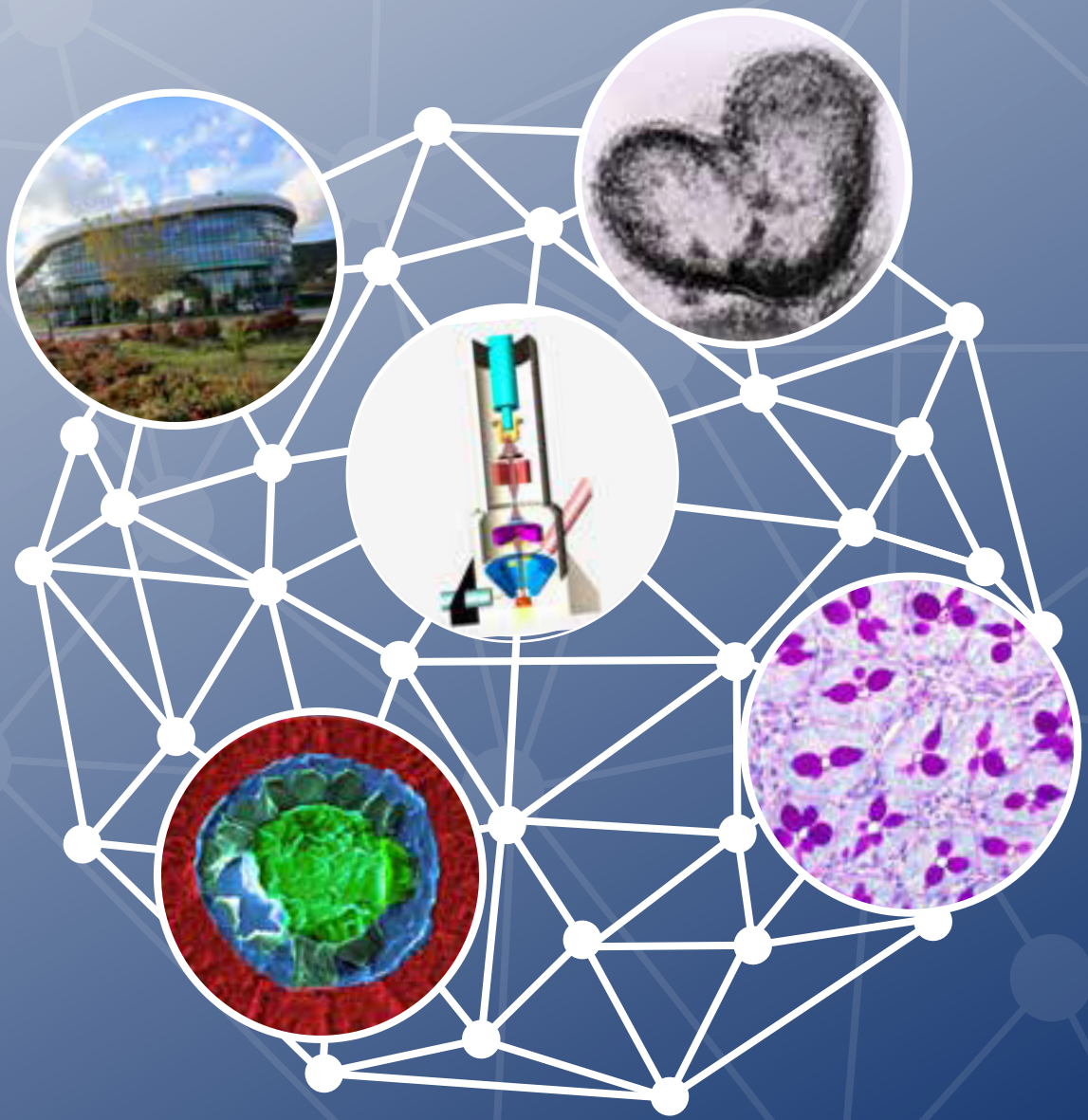
1st INTERNATIONAL MICROSCOPY and SPECTROSCOPY CONGRESS

25th NATIONAL ELECTRON MICROSCOPY CONGRESS

MSC 2021

22-24 SEPTEMBER 2021

Book of Abstracts



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25. ULUSAL ELEKTRON MİKROSKOPİ KONGRESİ
1st INTERNATIONAL MICROSCOPY & SPECTROSCOPY CONGRESS

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Preface

Turkish Society for Electron Microscopy (TEMD) and İzmir Institute of Technology (IzTECH) are pleased to welcome you to the the 25th National Electron Microscopy Congress (EMK2021) and 1st International Microscopy and Spectroscopy Congress (MSC2021) as virtual congresses on September 22-24, 2021. This year marks the 50th anniversary of the TEMD and our national microscopy congress will be held online for the first time due to the pandemic all around the world. It would be our pleasure to welcome you in beautiful İzmir for such a monumental congress, but the health of our participants is our priority. Given the circumstances, we decided to take advantage of the convenience of an online event and organized the first ever International Microscopy and Spectroscopy Congress (MSC2021) along with the EMK2021. Such an international event would not have been possible without the international experience, community support and interest accumulated over the last 50 years. During this three-day virtual event, participants have the opportunity to hear speakers from all around the world on the wide variety of microscopy related research and technical developments in the fields of life sciences and materials sciences. The conference mainly focuses on:

- Biomaterials and regenerative medicine
- Cancer biology
- Cell death and its ramification
- Cryobiology
- Developmental and reproductive biology
- Neuroscience
- Pathology and clinical medicine
- Patogen biology
- Structure and dynamics of cell
- STEM cells
- Correlative microscopy and spectroscopy techniques for life sciences and materials sciences
- Catalysts
- Functional nanomaterials
- In-situ microscopy
- Nanofabrication
- Nano-imaging and spectroscopy
- Metals and alloys
- Thin films and interfaces

The opening plenary speech about the MINFLUX nanoscopy and related matters is given by Prof. Stefan W. Hell, who won the 2014 Nobel Prize in Chemistry for the development of super-resolved fluorescence microscopy. Three more plenary sessions comprise keynote lectures given by Prof. Toyoshi Fujimoto, Prof. Quentin Ramasse and Prof. Jordi Arbiol. The subjects of the congresses are divided into 29 sessions and 43 internationally renowned scientists have been invited to present state-of-the-art research they have been working on. The scientific program also includes contributed oral presentations and poster presentations, which are reviewed by our Scientific Committee. We are proud to mention that TEMD provided numerous registration grants to support the young scientists' contributions. In addition, several talks mentioning about the most advanced level technical developments in the fields of life sciences and materials sciences is included in the scientific program, which are given by our sponsors. Our ability to provide a high quality event would not be possible without their generous support.

We strongly believe that this conference will provide an inspiring discussion on the current issues and the state-of-the-art in the field of microscopy. We wish you a very stimulating and informative conference with a lot of excellent discussions and new insights into the various aspects of the microscopy research and technical developments. We also hope that the information shared during the congress and in this "Book of Abstracts" will stimulate new research, provide useful insights to the researchers across the fields of life sciences and materials sciences, and ultimately benefit the individuals who attended the congress.

Aziz Genç & Servet Turan
On behalf of the Organising Committee of MSC2021 and EMK2021

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Application of Stereology in Studying the Programming Consequences

Milica Manojlović Stojanoski
University of Belgrade

Changes during fetal development may have long-lasting consequences as Professor J. Barker observed, and defined as a concept of programming or developmental origin of health and disease. This concept implies a linkage between adverse environmental signals during prenatal development and low birth weight as a marker, along with a greater incidence of pathophysiological conditions in postnatal life. Today, the programming concept becomes increasingly important because it explains the occurrence of many diseases during adulthood and include cardiometabolic, reproductive and mental disorders. During prenatal development periods of rapid cell division have been marked as critical since the establishment of the future structure and thus the function of tissues and organs are determined at these periods. Every change during these windows of vulnerability, that are organ-specific, can influence developmental trajectory resulting in future or persistent malfunction. Glucocorticoids have been powerful modulators of gene expression and epigenetic modifications which control the proliferation and maturation of tissues to harmonize development with given environmental conditions. Acting on the tissue morphology and function in preparation for extrauterine life they promote nervous, respiratory, cardiovascular and immune system differentiation and biochemical maturation. Therefore, glucocorticoids as the main communicating signals between environment and developing organism represent a key link involved in the programming mechanism that shapes future physiology or predispositions to health or disease.

Design-based stereology remains one of the pillars of quantitative biomedical research. This modern methodological approach offers the possibility to obtain unbiased results of every aspect of an organ or tissue structure. The exact size of the structure, number and volume of cells or other constituent elements, length or surface of the studied structure can be unambiguously and accurately determined, in absolute terms by following the basic principles of stereological measurements. Combining histological analysis, and immunohistochemistry and/or immunofluorescence with quantitative microscopy as are stereological measurements and intensity of above-mentioned stainings, structural alterations can be measured and determined, enabling an understanding of the basic functional mechanisms of examined changes.

Changes that are the cause or consequence of programming in fetuses and offspring, respectively are the focus of this presentation. Prenatally, alterations of brain control centers, pituitary gland, adrenal, thyroid and reproductive axes, obtained by stereology will be presented. In offspring, the application of stereology provides physical evidence that structural changes of vide variety of tissues are the result of prenatal changes, showing that quantitative differences in early life evolve in qualitative i.e. functional problems later in life.