ESEM

INTERNATIONAL CONFERENCE 2025

ENLIGHTENING INVISIBLE

Let's Help Each Other

The Egyptian Society of Electron Microscopy

INTERNATIONAL CONFERENCE 2025

ENLIGHTEN THE INVISIBLE

13 - 15 October 2025
At Theodor Bilharz Research Institute

"Uncover the hidden
with
Electron Microscopy
from life to material innovations."

Hybrid Event

In Collaboration with

Theodor Bilharz Research Institute

Tanta University

Assiut University

CIQTEK

JOIN NOW

https://esem-egypt.org

ElNile street ,
Warak ELHadar, Imbaba,

Welcome message

Dear Professors & Colleagues,

On behalf of ESEM Board of Directors, we are pleased to invite you to the Electron Microscopy Conference 2025, held from October 13th to 15th, 2025, at Theodor Bilharz Research institute, Egypt. This year, it is organized with three prestigious scientific institutions: Theodor Bilharz Research Institute, Tanta University and Assiut University. It will follow a Hybrid format, allowing participants from around the world to join us both in person and virtually, ensuring an inclusive and accessible experience for all.

The theme of this year's conference is:"The Importance of Electron Microscopy in Enlighten the Invisible". It reflects the profound impact that electron microscopy continues to have across diverse scientific disciplines, from biology to materials science.

Over the conference three days, you will have the opportunity to engage in-depth tutorials, keynote sessions and explore the latest technological advancements in the field of electron microscopy. We have gathered a distinguished group of experts who will share their knowledge and experiences.

We are confident that this conference will provide you with valuable insights, practical knowledge, and inspiring conversations that will drive your research forward.

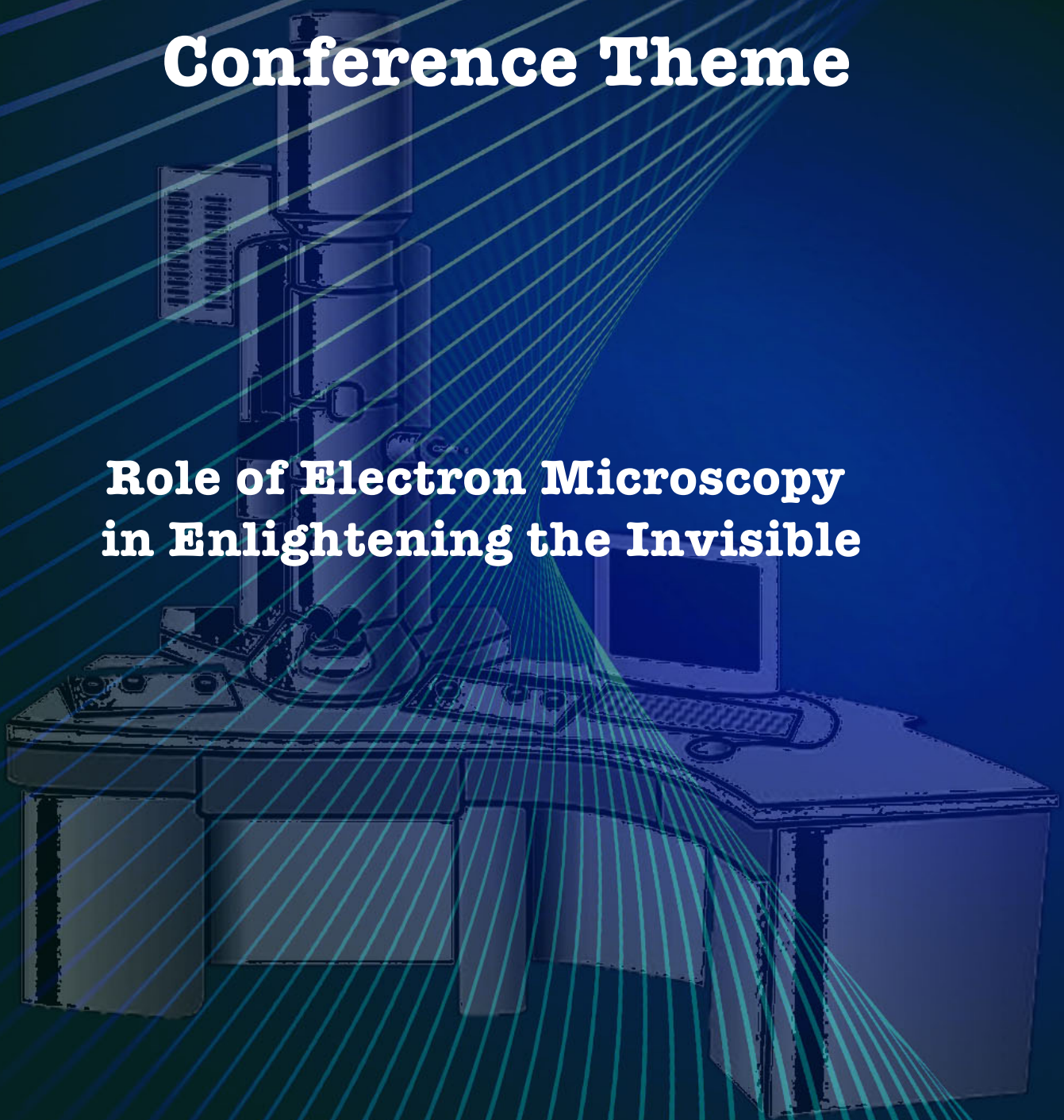
We look forward to your participation and to an inspiring conference experience.

Best Regards,

ESEM & Conf. President	Conf. Vice President	Conf. Secretary
Prof.Soheir Mansy	Prof. Ayman Ghallab	Prof. Naglaa Sarhan

Conference Theme

Role of Electron Microscopy in Enlightening the Invisible



Target Audience

- ***Pathologist***
- ***Histologist***
- ***Structural biologist***
- ***Molecular biologists & Biotechnologists***
- ***Microbiologists & Hematologists***
- ***Pharmaceutical researchers***
- ***Advanced users of EM***
- ***Engineers (especially in instrumentation, cryogenics, image analysis)***
- ***Physicists (especially in electron optics, materials science, image reconstruction)***
- ***Computer scientists (image processing, AI integration)***
- ***Technicians***
- ***Those familiar with TEM looking to upgrade skills***
- ***Graduated students and postdocs in related field (immunology, cell biology, Biophysics, genetics/genomics……)***

Program of
Tuesday 13 October 2025

The Egyptian Society of Electron Microscopy INTERNATIONAL CONFERENCE 2025		
13 October 2025		
8:00 a.m. : 9:45 a.m	**Registration and Name Badge Pick-Up**	
Welcome talks		
10.00 a.m.-10:05 a.m.	***Welcome Speech President of ESEM & the Conference***	***Emeritus Prof. Soheir Mansy***
10:05 a.m.-10:.10 a.m.	***Welcome Speech of the Acting President of TBRI***	***Prof. Ahmed AbdelAziz***
10:10 a.m.-10:.15 a.m.	***Welcome Speech of the President of Tanta University***	***Prof.Mohamed Hussein Mahmoud***
10:15 a.m.-10:.20 a.m.	***Welcome Speech of the Acting President of Assiut University***	***Prof. Ahmed El-Minshawy***
Session I *EM and Different Disciplines*		
10:30 a.m.-11:00 a.m.	***Electron Microscopy across disciplines: from molecules to materials.***	***Prof. Naglaa Sarhan (Tanta University)***
11:00 a.m.-11:30 a.m.	***Imaging Modes of Transmission Electron Microscopy: Types, Uses, and Advancements***	***Dr.Hesham El-Sherif McMaster University,Canada. &Harvard University, Cambridge, MA, USA***
11:30 a.m.-12:00 p.m.	***Is it Worth Investing in Electron Microscopy? Understanding the Impact and Potential***	***Prof. Soheir Mansy (TBRI)***
Session II Electron Microscopy and Diagnostic Diseases-1		
12:00 p.m.-12:30 p.m. [11:00 am-11:30am Berlin time]	***Diagnostic Electron Microscopy in Neuropathology – Current status and Perspectives***	***Dr. med. Carsten Dittmayer (Berlin)***
12:30 p.m.-1:00 p.m.	***The role of electron microscopy in solving diagnostic challenges in renal diseases: insights from a long-term personal experience***	***Prof.Wesam Ismail Beni-Suef University***
1:00 p.m.–1:30 p.m.	***Modern Renal Biopsy Practice and the Integral role of Electron Microscopy***	***Prof.Lillian W. Gaber.(USA)***
Coffee Break 1: 30– 1:45 p.m. Documentary Video for ESEM Will be Displayed During Coffee Break		
Session III *Electron Microscopy and Diagnostic Diseases-2*		
1.45 p.m.-2.15 p.m.	***The role of electron microscopy beyond immunohistochemistry in muscle biopsy***	***Prof.Nadia Galal El Hefnawy Ain Shams University***
2.15 p.m.-2.45 p.m.	***Electron Microscopy and Hematological Disorders***	***Assist. Prof. Ayat Hassan (TBRI)***
2:45 p.m.-3:15 p.m.	***Essential daily electron microscopic tips for diagnostic renal biopsies***	***Assist. Prof .Sarah Tawfic (TBRI)***
Snack break 3.15 p.m.-3.30 p.m.		
Session IV *Electron Microscopy and Diagnostic Diseases-3*		
3:30 p.m. –4:00 p.m. 8:30 a.m. – 9:00 a.m. Carolina time zone	***Monoclonal Gammopathy of Renal Significance: Diagnostic Pitfalls***	***Prof. David N. Howell (USA)***
4: 00 p.m. –4:30 p.m. 9:00 a.m. – 9:30 a.m. Carolina time zone	***Renal Transplant Pathology: Diagnostic Contributions of Electron Microscopy***	***Prof. David N. Howell (USA)***
4::30 p.m.- 4:35p.m.	***Wrap up & Notification***	***Prof.Soheir Mansy***

Join us

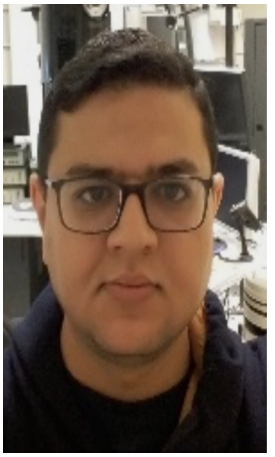
Explore how EM guides discoveries in every field & its importance in Disease outbreaks

Prof.Naglaa Sarhan

Head of Histology& Cell Biology Dept.

Tanta University

Electron Microscopy from molecules to material



Dr. Hesham El-Sherif

University, Hamilton, ON Canada

& Harvard University, Cambridge, MA.USA

Imaging Modes of Transmission Electron Microscopy: Types, Uses, and Advancements

Emeritus Prof. Soheir Mansy

Prof.of Pathology & EM

President of ESEM & President of ARS-TBRI

Councilor for Middle East & North Africa at SUP

Theodor Bilharz Research Institute

is it Worth Investing in Electron Microscopy? Understanding the Impact and Potential

Join us

Neuropathology, muscle biopsies and Hematological disorders- EM as a Key of accurate diagnosis

Dr. med.Carsten Dittmayer
Consultant Neuropathologist, Resident in General Pathology and Head of Electron Microscopy Department of Pathology
Charité – Universitätsmedizin Berlin

Diagnostic Electron Microscopy in Neuropathology – Current status and Perspectives

Emeritus Prof. Nadia Galal
Prof.of Pathology&EM
Former Director of EM Unit specialized Hospital
Ain Shams University

The role of electron microscopy beyond immunohistochemistry in muscle biopsy

Assistant Prof. Ayat Hassan.
Assist.Prof.of Clinical Pathology & EM
Theodor Bilharz Research Institute

Electron Microscopy and Hematological Disorder

Join us

EM in renai diseases : From routine biopsies to rare cases
Follow experts to discover EM's essential role in kidney disease diagnosis

Prof. David N. Howell

Professor and Senior Vice Chair
Department of Pathology
Past President, Renal Pathology Society
Duke University Medical Center, USA

Monoclonal gammopathy of renal significance: diagnostic pitfalls

Renal transplant pathology: diagnostic contribution of electron microscopy

Prof. Wesam Ismail

Head of Pathology Dept.
Beni-Suef University

The role of electron microscopy in solving diagnostic challenges in renal diseases: insights from a long-term personal experience

Join us

EM in renai diseases : From routine biopsies to rare cases
Follow experts to discover EM's essential role in kidney disease diagnosis

Prof. Lillian W. Gaber

Associate Director of Renal Pathology in the Department of Pathology and Genomic Medicine at Houston Methodist Hospital and Professor of Pathology and Genomic Medicine at Weill Cornell Medical School USA

Modern Renal Biopsy Practice and the Integral role of Electron Microscope

Assistant Prof. Sarah H. Tawfic

Assist.Prof.of Pathology & EM

Theodor Bilharz Research Institute

Essential daily electron microscopy tips for diagnostic renal biopsies

Program of
Tuesday 14 October 2025

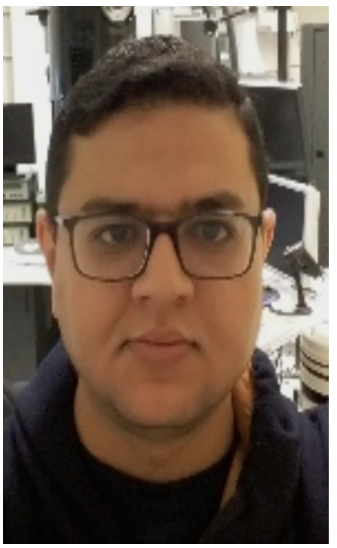
The Egyptian Society of Electron Microscopy INTERNATIONAL CONFERENCE 2025		
14 October 2025		
8:00-9:45	**Registration**	
10:00 a.m.- 10.05 a.m.	*Overview of the day sessions*	*Emeritus Prof.Soheir Mansy*
***Session* V** **Nanoscale Analysis: AFM & Aberration- Corrected STEM**		
10:10 a.m.-10:40 a.m.	*Atomic force microscopy: From imaging to characterization*	*Prof. Manar Elsayed Abdel-Raouf (EPRI).*
10:40 a.m. – 11:10 a.m. 10: 40 a.m. -11:.10 a.m.	*Advances of Aberration-Corrected Scanning Transmission Electron Microscopy*	*Dr.Hesham El-Sherif* *Canada & USA.*
Session VI **EM at the Interface of Applied Research-1**		
11:15 a.m. -11:45 a.m. 10:15 a.m. – 10:45 a.m. Time zone Nertherland	*Mycobacteria and Microscopes; a Massive Mixture*	*Associate Prof.Nicole van der Wel* *Amsterdam*
11:45 a.m. – 12:15 p.m	*The Invisible Pathogens in Vegetables and their Human Health Implications*	*Prof. Zakaria Baka Etta.* *Damietta University-* *New Damietta*
12:15p.m. -12:45 p.m.	*Electron Microscopy in the Characterization and Application of Nano-Formulated Drug Carriers*	*Prof. Mona AbouSamra (NRC)*
12:45 p.m.-1.15 p.m.	*Telocytes'Role-Play in Urinary Bladder Cancer*	*Dr. Ehab Osama (TBRI)*
Coffee Break 1:15 – 1: 30 p.m. During break documentary video for ESEM will be displayed		
***Session* VII** **EM at the Interface of Applied Research-2**		
1:30 p.m.-2:00 p.m. 5:30 a.m.– 6:00 a.m. time zone Chicago USA	*Development of an AI Histologic Biomarker Exceeding Pathologist Performance for Breast Cancer Prognosis: Lessons Learned and Opportunities for Electron Microscopy Assessment*	*Dr Mohamed T. Amgad* *(USA)*
2.00 p.m. - 2.30 p.m.	*From Micro to Nano: How Electron Microscopy Contributed to my Research Findings.*	*Prof. Soheir Mansy* *(TBR)I*
Snack Break 2:30 – 2:45 p.m. During break documentary video for ESEM will be displayed		
Session* VIII** ***EM and Microorganisms		
2.45 p.m.-3.15 p.m.	*Deep Learning Meets Transmission Electron Microscopy: A New Era in Virus Classification*	*Dr. Omar Sayouh* *(TBRI) & (USNMC)*
3:15 p.m.- 3: 45 p.m. 8:15 a.m. – 8:45 a.m. Carolina time Zone	*EM of Viruses: Specimen Handling, Virus Identification, and Look-Alikes*	*Prof. Sara E. Miller* *(USA)*
3:45 p.m. -4.15 p.m. 8:45 a.m. – 9: 15 a.m. Carolina time Zone	*Tropical and Subtropical Viruses (Diseases, Etiology, and Identification)*	*Prof. Sara E. Miller(USA)*
4.15 p.m. – 4.25 p.m. 3.15 p.m – 3.25 p.m. UK time zone	*e. poster* *Ethical Considerations in the Integration of Artificial Intelligence into Histopathology* Practice: A Narrative Review.	*Dr. Nada Shamina* *(UK)*
4:25 p.m. – 4: 30 p.m.	**Wrap- up & Notifications**	*Prof. Soheir Mansy*

Join us

Learn more about nanoscale analysis: AFM & Aberration-corrected STEM

Prof. Manar E. Abdel-Raouf
Prof. of Polymer Science-Head of Additives Lab
Egyptian Petroleum Research Institute

An AFM: From imaging to characterization



Dr. Hesham El-Sherif
University, Hamilton, ON Canada
& Harvard University, Cambridge, MA.USA

Advances of aberration-corrected scanning transmission electron microscopy

Join us

EM and Infectious Agents from Mycobacteria to emerging viruses Attends to discover how EM Reveals the hidden world of pathogens

Prof. Sara E. Miller

Professor, Department of Pathology
Director, Center for Electron Microscopy & Nanoscale Technology
Duke University Medical Center, USA

EM of viruses: Specimen handling, virus identification, and look-alikes

Tropical and subtropical viruses (Diseases, Etiology, and Identification)

Assoc. Prof. Nicole van der Wel

Associate Professor Medical Biology
Head of Electron Microscopy Center
Amsterdam institute for Immunology and Infectious diseases

Mycobacteria and Microscopes; a Massive Mixture

Join us

EM and Infectious Agents from Mycobacteria to emerging viruses Attends to discover how EM Reveals the hidden world of pathogens

Emeritus Prof. Zakaria A.M.Baka
Em.Prof.of Mycology and plant Pathology
Dept. of Botany and Microbiology Faculty of Science
Damietta University- New Damietta.

The Invisible Pathogens in Vegetables and their Human Health Implications

Dr.Omar Sayouh
Researcher of Clinical Microbiologist,EM and Director of IPC unit
Theodor Bilharz Research Institute
Clinical Microbiology Consultant

Deep Learning Meets Transmission Electron Microscopy: A New Era in Virus Classification

Join us

Electron Microscopy in Applied Research: The Hope of Tommorow for treating Resistant Diseases
Electron Microscopy From Cells to Nanomedicine and AI prognostics

Prof.Mona AbouSamra

Prof. of Pharmaceutics

Pharmaceutical Technology Department

National Research Center

Electron Microscopy in the Characterization and Application of Nano-Formulated Drug Carriers

Dr Mohamed T. Amgad

Resident Pathologist,

Northwestern University

Feinberg School of Medicine USA

Development of an AI histologic biomarker exceeding pathologist performance for breast cancer prognosis: Lessons learned and opportunities for electron microscopy assessment

Researcher Lecturer Ehab Osama

Researcher Lecturer of Pathology &EM

Electron Microscopy Research Dept

Theodor Bilharz Research Institute

Telocytes'role-play in urinary bladder cancer

Join us

Electron Microscopy in Applied Research: The Hope of Tommorow for treating Resistant Diseases

EM in Focus: Past Contributions and Emerging Opportunities

Emeritus Prof.Soheir Mansy

Prof.of Pathology & EM

President of ESEM & President of ARS-TBRI

Councilor for Middle East & North Africa at SUP

Theodor Bilharz Research Institute

From Micro to Nano: how electron microscopy contributed to my research findings

Join us

E-Poster

Title:

Ethical Considerations in the Integration of Artificial Intelligence into Histopathology Practice: A Narrative Review

Author:

Dr. Nada Shamina
Department of chemical Pathology,
NHS, Nottingham, UK

Program of wednesday 15 October 2025

The Egyptian Society of Electron Microscopy

INTERNATIONAL CONFERENCE 2025

15 October 2025

8:00 a.m. -9:45 a.m.	**Registration**	
10:00 a.m.- 10.05 a.m.	***Overview of the day sessions***	***Emeritus Prof.Soheir Mansy***
Session IX ***From imaging to Immunolabeling***		
10:10 a.m. - 10: 30 a.m.	***From Preparation to Imaging: Artifacts in TEM and SEM***	***Assist. Prof.Shaimaa Mostafa Kashef (Tanta University).***
10:30 a.m. – 11:00 a.m.	***Immunohistochemistry and Immunogold Techniques***	***Prof. Mona Abdel-Hamed Yehia Alexandria University***
Session X ***Technical Session* with Demonstration** ***The Multidisciplinary Research Center of Excellence*** ***Waste to Worth – Nanotechnology in Water Remediation***		

Waste to Worth – Nanotechnology in Water Remediation
Organized by
The Multidisciplinary Research Center of Excellence
Faculty of Science- Assiut University

Introduction

Converting waste materials into nanomaterials for water remediation is a sustainable, cost-effective approach that aligns with the circular economy and green nanotechnology principles.

The main objectives of this technical session is to:

1. ***Introduce the concept of nanotechnology in water treatment.***
2. ***Explore how waste materials can be converted into nanomaterials for water remediation.***
3. ***Applications and case studies.***
4. ***Encourage innovation in sustainable and scalable water purification technologies.***

11:00 a.m. -1:00 p.m.	**-Welcome note and technical session overview** **-Keynote lecture:** ***"Future of Clean Water The Role of Nanotechnology***	***Prof. Nagwa Abo El-Maali (MRCE). Assiut University***
	Fundamentals of Nanotechnology **-Types of nanomaterials: metal oxides, carbon-based, polymeric, etc.** **-Synthesis methods (top-down vs bottom-up)**	***Dr.Asmaa Wahman New Valley University, New Valley***
	Water Contamination and Challenges **-Types of water pollutants (organic, inorganic, biological)** **-Global and local water crisis statistics** **-Conventional vs nano-enabled treatment technologies**	***Prof. Nagwa Abo El-Maali (MRCE). Assiut University***
	Waste-Derived Nanomaterials and their Applications in Water Remediation **-Converting agricultural/industrial waste into nanomaterials** **-Green synthesis techniques** **-Lifecycle analysis and environmental safety**	***Dr. Kawthar Abdel Hamed Assiut University (MRCE).***
	Hands-on Demo: **Lab video on the application of electron-microscopy for the synthesized nanoparticles** **Lab Activity: Test of pollutant removal using the prepared nanomaterials prepared from different wastes.**	***Dr.Azza Abdel-Moniem Mohamed Assiut University(MRCE)***
	Safety, Regulation & Ethics **-Toxicity and risk assessment of nanomaterials** **-Regulatory frameworks (e.g., EPA, REACH)** **-Ethical considerations in nanotechnology deployment**	***Prof. Nagwa Abo El-Maali (MRCE).Assiut University*** ***Dr.Asmaa Wahman New Valley University, New Valley***
1:00 p.m. - 1:10 p.m.	**Wrap- up & conference recommendation**	***Prof. Soheir Mansy***
1:30 p.m.	**Meeting point at the bus for the participants who booked the social activity visit**	

Join us

Immunogold, sample preparation, and artifact recognition

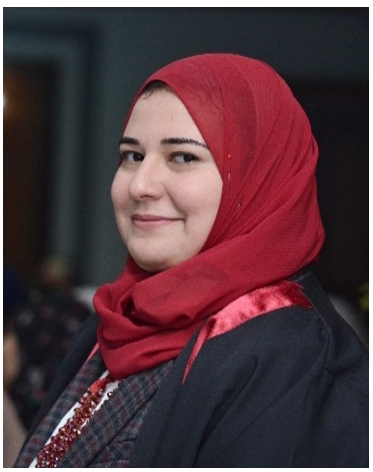
Join this practical sessions to increase your skills and avoid common pitfalls

Emeritus Prof.Mona Abdel-Hamed Yehia

Prof. of Histochemistry & Cell Biology

Medical Research Institute Alexandria University

Immunohistochemistry and Immunogold Techniques



Assist. Prof. Shaimaa Mostafa Kashef

Assist.Prof.of Histology & Cell Biology

Tanta University

From preparation to imaging: Artifacts in TEM and SEM

Join us

Technical Session
Nanotechnology Driving the Future of Clean Water

Water Treatment with Nanotechnology from concept to Hands –on Demo

Emeritus Prof.Nagwa Abo El-Maali

Prof. of Analytical Chemistry.Executive Manager, Multidisciplinary Research centre of Excellence (MRCE), Assiut University

Future of Clean Water The Role of Nanotechnology

Water Contamination and Challenges

Safety, regulation and ethics

DR.Asmaa Wahman

Lecturer of Applied Analytical Chemistry, Faculty of Science

New Valley University - MRCE

Fundamentals of Nanotechnology

Join us

Technical Session
Nanotechnology Driving the Future of Clean Water

Water Treatment with Nanotechnology from concept to Hands –on Demo

Dr Kawthar Abdel Hamed
Technical Manager –Analytical Chemistry unit
-Faculty of Science ,MRCE- Assiut University

Waste derived nanomaterials and their applications in water remediation

Dr. Azza Abdel-Moniem
Operator of TEM - MRCE-Assiut University

Hands –on Demo

Key Benefits of Attending

1.Interdisciplinary Insights – Gain exposure to the diverse applications of electron microscopy in biology, clinical diagnosis, pathology, research, and materials science.

2.Latest Advances – Stay updated with cutting-edge developments in EM technologies, techniques, and instrumentation.

3.Real-world Applications – Learn how EM contributes to accurate diagnosis of biological samples, structural understanding in biomedical research, and innovation in materials science.

4.Expert Knowledge Sharing – Hear from leading national and international experts sharing practical experience and case studies.

5.Hands-on Learning – Benefit from tutorial sessions and workshops covering fundamental EM principles, sample preparation, and image analysis.

6.Networking Opportunities – Connect with researchers, clinicians, engineers, and students across disciplines to foster collaboration and knowledge exchange.

7.Career Development – Enhance your understanding of EM as a powerful tool in both scientific investigation and industrial applications, supporting your professional growth.

Abstracts of
13 October 2025
Sessions

1

Electron Microscopy Across Disciplines

Prof. Naglaa Ibrahim Sarhan

Professor of Histology & Cell Biology

Faculty of Medicine, Tanta University

Electron microscopy is a powerful multidisciplinary tool that plays an essential role in scientific research. It enables researchers to observe materials at extremely high resolutions, down to the atomic level. This advanced imaging technique is widely used across various scientific fields, including biology, materials science, physics, chemistry, and nanotechnology.

In biological sciences, electron microscopy visualizes the ultrastructure of cells, viruses, and proteins, providing deep insights into cellular functions and disease mechanisms. In materials science, it displays the microstructure of metals, polymers, semiconductors, and other materials, thus helping researchers to understand their properties such as strength, conductivity, and corrosion resistance.

Electron microscopy also plays an essential role in nanotechnology, where precise imaging of nanoscale structures is vital for the design and development of new materials and devices. Additionally, it contributes to forensic science, environmental studies, and even archaeology by revealing surface details and compositions not otherwise detectable.

Because of its versatility, electron microscopy supports both basic and applied research, aiding in the discovery of new materials, the development of medical treatments, and the advancement of technology. Its ability to provide detailed structural and compositional information makes it an indispensable tool for scientific innovation and problem-solving across disciplines

2

Imaging Modes of Transmission Electron Microscopy: Types, Uses, and Advancements

Dr. Hesham El-Sherif[1,2]
[1]Materials Science and Engineering Department, McMaster University, Hamilton, ON, Canada.
[2]The Rowland Institute at Harvard, Harvard University, Cambridge, MA, USA.

In this tutorial lecture, we discuss the basics of image formation of transmission electron microscopy. A typical TEM microscope usually has multiple imaging modes such as bright-field, dark-field, mass-thickness contrast, high-resolution imaging, or scanning transmission electron microscopy modes. Shifting between these imaging modes can be controlled by the microscope optics and apertures at the back focal plane of the microscope.

We also discuss briefly the advantage of each imaging mode and its uses for material inspections. The selection of each mode depends on the sample nature and the needed information from the inspection. For example, for studying nano scale precipitates in an alloy steel, the dark field imaging is the common imaging mode to visualize the precipitates in an image so we can study their size and distribution.

Finally, we discuss the differences between typical TEM microscopes and the advanced aberration-corrected microscopes that achieves sub-angstrom resolution and low-dose imaging capabilities. These advanced microscopes are key for the single particle analysis for biological samples, and atomic resolution imaging and spectroscopy for atomically engineered materials.

3

Is it Worth Investing in Electron Microscopy? Understanding the Impact and Potential.

Emeritus Prof. Soheir Mansy
Prof.of Pathology & Electron Microscopy
Electron Microscopy Research Dept.Theodor Bilharz Research Institute
President of the Egyptian Society of Electron Microscopy
President of the Association of TBRI Research staff
Councilor for Middle East and North Africa /SUP

Electron microscopy (EM) has emerged as one of the most powerful tools in modern science, enabling researchers to visualize structures at the nanoscale with unprecedented precision. From revealing the architecture of complex biomolecules to uncovering the microstructure of advanced materials, EM has played a pivotal role in advancing research across disciplines including medicine, materials science, nanotechnology, and energy.

This talk explores the strategic importance of investing in electron microscopy sciences. It examines key milestones in scientific discovery made possible through EM, highlights transformative innovations driven by imaging at the atomic level, and outlines the economic and societal benefits of sustained investment in EM infrastructure and talent. The discussion will also address the challenges of accessibility, cost, and training, proposing pathways to build capacity and ensure that EM continues to support the frontiers of scientific progress.

Through real-world examples and forward-looking insights, this presentation aims to demonstrate why investment in electron microscopy is not only worthwhile but essential for driving innovation in the 21st century.

4

Diagnostic electron microscopy in neuropathology – current status and perspectives

Dr. med. Carsten Dittmayer
Department of Pathology, Head of electron microscopy
Consultant neuropathologist, resident in general pathology
Charité – Universitätsmedizin Berlin

In the field of neuropathology, diagnostic electron microscopy (EM) is mainly used in muscle and nerve pathology. It provides important information in complex cases of inflammatory myopathies such as dermatomyositis, anti-synthetase syndrome and inclusion body myositis. Furthermore, identification of specific deposits in congenital myopathies may guide genetic analysis in otherwise unusual cases. However, EM findings are often not solely sufficient for a diagnosis, requiring integration of clinical data, imaging results and laboratory results (e.g. autoantibodies). In this presentation, showcase examples of daily diagnostic practice are presented, highlighting the importance of electron microscopy as a diagnostic tool. Furthermore, limitations of conventional EM are highlighted, and promising techniques for future diagnostic EM approaches are discussed.

6

Modern Renal Biopsy Practice and the Integral role of Electron Microscopy

Prof.Lillian W. Gaber
Prof . Of Pathology
Associate Director of Renal Pathology in the Department of Pathology and Genomic Medicine at Houston Methodist Hospital and Professor of Pathology and Genomic Medicine at Weill Cornell Medical School
USA

Objectives of the lecture:

- ***Describes the importance of electron microscopy in current practice of renal pathology***
- ***Highlights the importance of best practice in pathology clinical settings***
- ***Goals achieved through three biopsy cases of unusual and rare kidney disease in which electron microscopy was crucial***

7

The Role of Electron Microscopy Beyond Immunohistochemistry in Muscle Biopsy

Prof. Nadia Galal El Hefnawy
Prof.of Pathology& EM
Ain Shams University
Former Director of EM Unit of
Ain Shams University Specialized Hospital
Head of Promotion Committee for Pathology SCU

Muscle biopsy remains a cornerstone in the diagnosis of neuromuscular disorders. While immunohistochemistry (IHC) has significantly enhanced diagnostic precision by enabling targeted protein expression analysis, it does not always provide definitive answers, particularly in complex or subtle myopathies. This talk explores the critical complementary role of electron microscopy (EM) in muscle biopsy interpretation beyond IHC.

EM provides ultrastructural insights that can reveal hallmark features of specific muscle diseases, including mitochondrial abnormalities, myofibrillar disorganization, storage material accumulation, and subtle alterations in sarcomeric architecture. Conditions such as congenital myopathies, mitochondrial myopathies, and certain storage diseases often require EM for definitive diagnosis or classification. Furthermore, EM can uncover early or focal changes not visible with light microscopy or IHC.

By highlighting representative case studies and correlating EM findings with clinical and histological data, this presentation will demonstrate how EM enhances diagnostic accuracy and contributes to a deeper understanding of muscle pathology. The integration of EM into routine diagnostic workflows remains essential, especially in settings where genetic or advanced molecular diagnostics are limited or inconclusive.

8

Electron Microscopy and Hematological Disorders

Assist Prof.Ayat S.M. Hassan
Assist. Prof. of Clinical Pathology &EM
Electron Microscopy Research Dept.Theodor Bilharz Research Institue

Electron microscopy (EM) has played a pivotal role in advancing our understanding of hematological disorders by enabling ultrastructural visualization of blood cells, bone marrow components, and pathological inclusions at nanometer resolution. This talk explores the evolving applications of electron microscopy in the diagnosis and research of hematological diseases, as well as, highlights the enduring value of electron microscopy as a complementary tool in the diagnosis and pathophysiological investigation of hematological disorders. Key examples include the characterization of platelet granule defects in inherited thrombocytopenias, visualization of abnormal hemoglobin polymers in sickle cell disease, and the ultrastructural features of malignant cells in leukemias and lymphomas. EM also provides critical insights into bone marrow stromal architecture and the interactions between hematopoietic cells and their microenvironment. We will discuss the integration of EM with modern techniques such as immunogold labeling and correlative light-electron microscopy, and consider its relevance in the era of molecular diagnostics.

9

Essential Daily Electron Microscopy Tips for Diagnostic Renal Biopsies

Assist. Prof. Sara Hassan Tawfic
Assist. Professor of Pathology and Electron Microscopy, Electron Microscopy Department, Theodor Bilharz Research Institute, Giza, Egypt.

Many kidney diseases require needle core biopsies for proper diagnosis and treatment such as; infection related glomerular lesions (e.g. HCV and HBV), renal diseases 2ry to autoimmune disorders (e.g. SLE) or metabolic diseases (e.g. DM). Electron microscopic examination using Transmission electron microscope is reported as a crucial diagnostic tool for 20%-30% of renal biopsies. These cases include Minimal change disease, Thin Basement Membrane disease, Alport syndrome, and Dense Deposit Disease (DDD). Moreover, Electron Microscopic examination supports the histopathologic diagnosis in 65% of cases. For this reason its use should clinically justify the increase in cost and testing time. This talk aims at summarizing the experiences of TBRI nephropathology working group in the electron microscopic examination of the diagnostic renal biopsy specimens. Renal core biopsies that have been referred for nephropathologic diagnostic purposes have been selected and teaching points will be highlighted to share our experiences.

Finally we will conclude and gather by the end of this talk the essential daily electron microscopic tips for diagnostic renal biopsies, which would be essential for nephropathology practitioners.

10

Monoclonal Gammopathy of Renal Significance: Diagnostic Pitfalls

Prof.David N. Howell
Department of Pathology, Duke University Medical Center, Durham, North Carolina, USA

Analysis of renal biopsies by light, immunofluorescence, and electron microscopy (LM, IF, and EM, respectively), along with selective use of other analytic methods, is central to the diagnosis of monoclonal gammopathy of renal significance (MGRS). In many cases, such biopsies are performed in patients with monoclonal gammopathy of undetermined significance (MGUS): individuals with laboratory evidence of a circulating M-protein but no definitive evidence of a plasma cell dyscrasia or lymphoma.

Electron microscopy plays a vital role in the analysis of monoclonal deposits in patients with MGUS. In many cases, EM (usually in combination with IF) provides a definitive diagnosis. It sometimes helps establish a diagnosis unexpected based on clinical clues (e.g., M-protein light-chain type). In other instances, it may yield findings of limited specificity that nonetheless provide guidance for further diagnostic work-up. In rare cases, EM may give potentially misleading information that could elicit an incorrect diagnosis in inexperienced hands.

In a separate set of cases, renal M-protein deposits are occasionally found in patients with no prior evidence of a circulating M-protein. In some instances, one or more serologic tests may have been performed, but failed to detect a circulating M-protein (perhaps in some instances because the M-protein has a strong propensity for tissue deposition). In other patients, the relevant tests may simply not have been performed. This presentation will provide examples of all of these categories and suggest ways of avoiding diagnostic pitfalls.

11

Renal Transplant Pathology: Diagnostic Contributions of Electron Microscopy

Prof.David N. Howell

Department of Pathology, Duke University Medical Center, Durham, North Carolina, USA

Electron microscopy (EM) plays a vital role in the analysis of renal transplant biopsies. It is often crucial for the identification of glomerular diseases in the transplant. Though certain glomerular disorders are notorious for recurring (e.g., IgA nephropathy, focal segmental glomerulosclerosis, dense deposit disease) or occurring de novo (e.g., membranous nephropathy) in transplants, the list of possibilities is almost endless, and includes monoclonal gammopathies of renal significance. The "open view" afforded by EM is ideal for hunting for unsuspected glomerular pathology, and in some cases is crucial for guiding further diagnostic investigations. The line between the recurrent and de novo categories is frequently blurred; for many patients, no native renal biopsy has been performed, and the original cause of renal failure is either unknown or conjectural ("end-stage renal disease attributed to hypertension/diabetes"). Ultrastructural analysis can also detect unanticipated glomerular disorders present in the donor kidney.

Electron microscopy is also central to the analysis of some forms of transplant rejection; in particular, it can detect microvascular abnormalities associated with chronic antibody-mediated rejection. These include alterations of the glomerular capillary loop (chronic transplant glomerulopathy) and multilayering of peritubular capillary basement membranes. Finally, though to some extent supplanted by immunohistochemical and molecular diagnostic methods, EM is occasionally indispensable for detecting infectious complications of transplantation, particularly those involving unexpected pathogens. Though a comprehensive survey is beyond the scope of this presentation, it will provide examples of all of these categories

Abstracts of
14 October 2025
Sessions

1

Atomic Force Microscopy: From Imaging to Characterization

Prof. Manar ElSayed Abdel-Raouf
Prof.of Polymer Science
Head of Additives Lab –The Egyptian Petroleum Research Institute

Atomic Force Microscopy (AFM) has revolutionized our ability to interrogate material surfaces at the nanoscale, transitioning from a powerful imaging tool to a comprehensive characterization platform. This presentation delineates this evolution, beginning with the fundamental principles of AFM operation. We first explore the core components of the instrument: the sharp tip, flexible cantilever, sensitive photodetector, and precise piezoelectric scanner. The discussion then moves to the primary imaging modes, including contact mode, tapping mode, and non-contact mode, highlighting their respective mechanisms, advantages, and limitations for visualizing topography in various environments. Beyond mere topography, this presentation emphasizes the advanced operational modes that facilitate quantitative nanomechanical and electromechanical characterization. Key techniques such as Force Spectroscopy for measuring adhesion and elastic modulus, Piezoresponse Force Microscopy (PFM) for ferroelectric domain mapping, and Kelvin Probe Force Microscopy (KPFM) for surface potential analysis are detailed. We further address electrical characterization modes like Conductive AFM (C-AFM) and Scanning Spreading Resistance Microscopy (SSRM). The integration of these multifunctional capabilities allows AFM to correlate morphological features with a wealth of material properties including stiffness, adhesion, magnetism, and conductivity. Finally, the presentation concludes by examining current applications across materials science, biology, and semiconductor technology, while also contemplating future directions such as high-speed AFM and automated machine learning-driven analysis. This journey from basic imaging to sophisticated characterization underscores AFM's indispensable role as a cornerstone of nanoscience and nanotechnology. Sent from my iPhone

2

Advances of Aberration-Corrected Scanning Transmission Electron Microscopy

Dr.Hesham El-Sherif[1,2]

[1]Materials Science and Engineering Department, McMaster University, Hamilton, ON, Canada.

[2]The Rowland Institute at Harvard, Harvard University, Cambridge, MA, USA.

Transmission electron microscopy (TEM) is one of the most sophisticated research tools and has great potential across many fields. Advanced materials layers and semiconductor chips are designed, fabricated, and controlled down to a single atomic layer. With such challenging samples, an aberration-corrected TEM (AC-TEM) is needed to perform advanced TEM experiments including visualizing capabilities of sub 1 Å resolution, manipulating atoms with the electron beam, mapping chemical composition at the atomic scale using EDS and EELS techniques, revealing the bonding type between atoms/layers, mapping plasmonic response of nanoscale structures and interfaces, and building 3D tomograph of nanoparticles or biological structures. In This presentation, we will explore the high microscopy-power of the AC-TEM in conducting scanning transmission electron microscopy (STEM) imaging for 2D materials, thin films and heteroepitaxial interfaces. In addition, we will explore the application of spectroscopy techniques including energy dispersive Xray Spectroscopy (EDS) and electron energy-loss spectroscopy (EELS) to characterize semiconductor devices (such as image sensors and logic circuits) in cross-section lamellae prepared by a focused ion beam (FIB) system

3

Mycobacteria and microscopes; a massive mixture

Associate Prof. Nicole N. van der Wel

Electron Microscopy Centre Amsterdam, Amsterdam University Medical Centre, the Netherland

Mycobacterium tuberculosis infections are emerging, as is extreme antibiotic resistance, thus, new treatment options are essential. We have studied the subcellular trafficking and the response to antibiotics of this highly infectious bacterium in detail using various microscopy techniques. We have shown that M. tuberculosis can escape its phagosomal compartment and reside in the cytosol, but also affects the lysosomes of the infected cells. In vivo, the escape can be only detected when the IL-1 receptor is absent, demonstrating a role for the adaptive immune response in escape but also TB infections. We have together with collaborators from Harvard and Cricks demonstrated that terpenyl nucleoside : 1-tuberculosinyladenosine (1-TbAd), secreted from M. tuberculosis, caused the arrest of lysosomal maturation and autophagy, leading to lipid storage in lysosomes. This process is essential for lysosomal swelling, and foamy cell formation, the hallmark for TB infections. In addition, we used Electron and Fluorescence Microscopy to show that in stress conditions, the DNA of mycobacteria condensates. The condensation of DNA can be detected after antibiotic treatment and treatment with inhibitors of DNA binding proteins alters the morphology of the bacteria, and the integrity of the mycobacteria is lost. Also, growth of Mycobacterium abscessus is reduced through this inhibitor in a dose dependent manner and increases over time. In summary, our data indicate that interference in DNA condensation is an effective antibiotic strategy. From these microscopy studies we learned how mycobacteria alter the morphology after antibiotic treatment and identified a whole novel antibiotic strategy. We described that DNA in mycobacteria condenses after antibiotic stress and here present data on an inhibitor of a DNA binding protein that effectively abrogates recovery after DNA condensation and most importantly kills mycobacteria.

4

The invisible pathogens in vegetables and their human health implications

Emeritus Prof. Zakaria A. M. Baka
Botany and Microbiology Department, Faculty of Science,
Damietta University,
New Damietta, Egypt

Vegetables, although healthy, can harbor invisible pathogens such as bacteria, fungi, and parasites that can cause illness. These pathogens may be present on the vegetables even before harvest and can be transferred during handling and consumption if not properly washed. Sources of microbial contamination include soil, water, and handling practices. Common invisible pathogens found in fresh vegetables are Salmonella, E. col., and Listeria. The ultrastructure of these pathogens can be observed through electron microscopy. Microbial contamination of vegetables is a major concern for food safety. Understanding the sources and factors that contribute to contamination is crucial in order to take preventive measures to reduce the risk. Implementing good agricultural practices, proper handling and storage, and increasing consumer awareness are essential steps to ensure the safety of fresh vegetables. Several invisible pathogens can affect humans by reducing available food or by contaminating human food with toxic compounds. These pathogens are well known for reducing the food availability by interfering with crop yields. This can result in inadequate food for humans, or in the worst cases, lead to starvation and death. Consuming diseased vegetables can result in anything from mild stomach pain to serious infections that require hospitalization. Foodborne infections can manifest as fever, stomach pains, diarrhea, vomiting, and nausea. Severe consequences may include meningitis, renal failure, and even death. Vulnerable groups, such as the elderly, small children, and individuals with weakened immunity, are particularly at risk. Ultracytochemical techniques using electron microscopy can reveal the chemical composition of the constituents of these invisible pathogens and thus identify the most effective method to control them.

5

Electron Microscopy in the Characterization and Application of Nano formulated Drug Carriers

Prof. Mona M. AbouSamra

Prof. of Pharmaceutics

Pharmaceutical Technology Department, National Research Centre Egypt.

Nanomedicine has emerged as a rapidly evolving field with the potential to revolutionize drug delivery and therapy. The development of nanocarriers—such as liposomes, polymeric nanoparticles, cubosomes, and glycerosomes—offers versatile platforms for improving drug solubility, stability, targeting, and controlled release. Selecting the most appropriate nanocarrier depends on the physicochemical properties of the drug and the intended therapeutic application.

Electron Microscopy (EM) plays a pivotal role in the structural and morphological characterization of nanocarriers. While it is not the sole analytical technique available, EM remains the cornerstone, providing unique high-resolution insights into particle size, shape, surface morphology, and internal architecture.

In this presentation, I highlight several of my recent studies where EM was employed in the characterization of advanced nanocarrier systems. Examples include hybrid vesicles combining polymers and lipids, as well as novel formulations optimized for enhanced drug delivery performance. These studies demonstrate how EM complements other analytical tools to provide comprehensive understanding, thereby guiding rational design and development of nanomedicine formulations.

6

Telocytes' role-play in urinary bladder cancer

Dr.Ehab Hafiz

Researcher Lecturer of Pathology &EM
Electron Microscopy Research Dept.
Theodor Bilharz Research Institute

Telocytes (TCs), a distinct population of interstitial cells characterized by long, slender prolongations known as telopodes, are increasingly recognized for their involvement in tissue homeostasis and tumorigenesis. In the context of urinary bladder cancer (UBC), recent evidence suggests a potential role for TCs in modulating the tumor microenvironment and influencing cancer behavior. The talk will demonstrate TCs as both morphological markers and functional players in bladder cancer, through their distribution and ultrastructure in histologically normal-appearing bladder tissues adjacent to urothelial carcinoma using immunohistochemistry and transmission electron microscopy (TEM). In order to make a precise interpretation, a special technique of reprocessing the tissue from the paraffin blocks was used.

7

Development of an AI histologic biomarker exceeding pathologist performance for breast cancer prognosis: Lessons learned and opportunities for electron microscopy assessment

Dr.Mohamed Amgad, MD PhD

Resident Pathologist,

Northwestern University Feinberg School of Medicine USA

Breast cancer is a heterogeneous disease with variable survival outcomes. Pathologists grade the microscopic appearance of breast tissue using the Nottingham criteria, which is qualitative and does not account for non-cancerous elements within the tumor microenvironment. We present the Histomic Prognostic Signature (HiPS), a comprehensive, interpretable scoring of the survival risk incurred by breast tumor microenvironment morphology using light microscopy of Hematoxylin and Eosin-stained slides. It was developed using four independent population-level cohorts and consistently outperformed pathologists in predicting survival outcomes, independent of TNM stage and pertinent variables. One of the unexpected findings was how the prognostic score was largely driven by stromal and immune features of the tumor microenvironment. To this end, the talk also explores the literature on the use of electron microscopy (EM) in the diagnosis and investigation of the tumor microenvironment, and the role that computational analysis and machine learning can help expand the use of EM in routine assessment of neoplastic pathology specimens.

8

From Micro to Nano: How Electron Microscopy Contributed to my Research Findings

Emeritus Prof. Soheir Mansy
Prof.of Pathology & Electron Microscopy
Electron Microscopy Research Dept.Theodor Bilharz Research Institute
President of the Egyptian Society of Electron Microscopy
President of the Association of TBRI Research staff

Electron microscopy (EM) has become an indispensable tool in scientific research, offering unparalleled resolution across disciplines. In this presentation, I share highlights from my personal research journey, demonstrating how EM enabled key findings from the microscale to the nanoscale.

The talk begins by outlining the core research questions that guided my investigations and how conventional imaging techniques fell in resolving critical structural details. By incorporating transmission electron microscopy (TEM) techniques I was able to explore structural and morphological details that were otherwise inaccessible.I was gain also a deeper understanding of the biological materials.

I will present selected studies from my work—where EM revealed features invisible to optical methods and provided critical evidence to support experimental hypotheses.

In addition to structural imaging, I will discuss how EM facilitated data interpretation, informed method development, and supported interdisciplinary collaboration. Challenges such as cytological sample preparation, and data interpretation will be addressed.

This presentation aims to demonstrate the transformative role of electron microscopy in accelerating early-career research and its continuing value in scientific discovery. Through concrete examples and personal reflection, I will highlight how EM not only enhanced the quality of my results but also expanded my perspective as a researcher.

9

Deep Learning Meets Transmissions Electron Microscopy: A New Era in Virus Classification

Dr.Omar Sayyouh

Clinical Microbiologist,EM Dept. Director of IPC unit,

Theodor Bilharz Research Institute

Clinical Microbiology Consultant,

US Naval Medical Research Unit-3

The integration of deep learning with transmission electron microscopy (TEM) is redefining virus classification. TEM has long been a vital tool in virology, enabling direct visualization of viral morphology at nanometer-scale resolution. However, its reliance on expert interpretation limits its speed, scalability, and consistency—particularly during outbreak scenarios that require rapid diagnostics.

Recent developments in deep learning, particularly convolutional neural networks (CNNs), have demonstrated remarkable potential in automating virus identification from TEM images. These models can detect subtle structural differences between viruses and classify them with high accuracy. Enhanced by advanced image processing techniques, such as local feature filtering and frequency domain transformations, CNNs have shown success in distinguishing multiple virus types—even from noisy or complex backgrounds.

This review presents an overview of the current landscape, tracing the progression from traditional expert-based analysis to modern AI-driven classification. Key studies are examined to highlight model architectures, preprocessing strategies, performance benchmarks, and challenges related to data availability and generalization. Emphasis is placed on methods that have achieved high classification accuracy across diverse virus families using standardized TEM datasets.

The convergence of high-resolution microscopy and artificial intelligence marks a significant advancement in virological diagnostics. By enabling rapid, reproducible, and scalable virus classification, deep learning-enhanced TEM holds promise for accelerating clinical decision-making, supporting epidemiological surveillance, and advancing research on novel or emerging pathogens.

This study aims to provide a clear, concise synthesis of recent progress in this interdisciplinary field and to highlight the future potential of AI-powered imaging in the fight against infectious diseases.

10

EM OF VIRUSES: SPECIMEN HANDLING, VIRUS IDENTIFICATION, AND LOOK-ALIKES

Prof. Sara E. Miller
Department of Pathology
Director, Center for Electron Microscopy & Nanoscale Technology
Duke University Medical Center, USA
Durham, NC, 27710 USA

Awareness of virus infection is essential for performing electron microscopy of biological samples because they not only cause disease but also can skew results of other observations. Knowledge of normal cell morphology, as well as virus appearance and morphogenesis, are essential in determining their presence. Negative staining is used to examine viruses in fluids, while routine tissue preparation for EM is sufficient to look for them in cells. Viruses come in 2 morphological "flavors": naked or enveloped. Naked ones are icosahedral and range from ~20 to 90 nm, while enveloped ones usually have a soft, pliable membrane around their nucleocapsid (the nucleic acid plus some proteins), and, therefore, are pleomorphic. They may range from ~30 to 400 nm, and some can be long (~1500 nm) and skinny (~80 nm); a few can be even bigger, (~700 nm (Megavirales). Most have spikes on their surfaces (which can be ~20 nm, ~8 nm, or short bumps). Viruses contain either DNA or RNA, not both; most human DNA viruses are produced in cell nuclei, while RNA ones are constructed in the cytoplasm. There are a few exceptions. Many normal cell organelles and structures can resemble viruses, and care must be taken not to be fooled.

Hayat MA & Miller SE. 1990. Negative Staining. McGraw-Hill Publishing Company, New York
Miller SE. 1986. Detection and identification of viruses by electron microscopy. J Electron Microsc Tech 4:265-301. https://doi.org/10.1002/jemt.1060040305

11

Tropical and Subtropical Viruses (Diseases, Etiology, and Identification)

Prof. Sara E. Miller
Department of Pathology
Director, Center for Electron Microscopy & Nanoscale Technology
Duke University Medical Center, USA
Durham, NC, 27710 USA
&DF Ferreira

***Many tropical viruses are arboviruses (arthropod, e.g., mosquito, transmitted). Dengue, a flavivirus (40-60 nm, enveloped), genetically related to yellow fever virus, is found in tropics and subtropics of the Americas, Africa, Asia and Australia. All are characterized by severe head, eye, muscle, and joint pain, and sometimes hemorrhagic fever. In Egypt, Hepatitis C virus (HCV) (~40 nm, enveloped), a bloodborne virus in the Hepacivirus genus within the flavivirus family, which also includes West Nile virus; and avian influenza, an orthomyxovirus (~80-120 nm diameter ovoid or filamentous up to 20 µm long, enveloped) are the major communicable diseases of humans. The prevalence rate of chronic HCV infection in Egypt is 9.8% of individuals 15–59 years old, one of the highest in the world. Ebola and Marburg are filoviruses (up to ~1400 nm long by 80 nm wide, enveloped); both cause hemorrhagic fevers. Lassa (50-150-nm, enveloped) in the arenavirus family, contains ribosomes which have been called "grains of sand". It causes swelling, arrythmia, fatal hemorrhage and is spread by rodents. HIV, a retrovirus (~100 nm, enveloped) is spread by bodily fluids. Destruction of T-cells results in severe immunocompromise (AIDS). HIV infections are increasing in Sub-Saharan Africa and Asia. Rotavirus, in the reovirus family (~75 nm) and Norovirus, a calicivirus (~27 nm), are both naked icosahedrons; both cause gastroenteritis, and exist worldwide, but infant mortality is higher in developing countries. Mpox (monkeypox) (brick-shaped, ~200 x 400 nm, enveloped) spreads by skin-to-skin contact and is transmitted from animals to humans. Hard, dimpled lesions leave scars. Other viruses include those seen worldwide [chickenpox (varicella) and its sequel shingles, measles, mumps, rubella, polio, and hepatitis A and B. Many viruses have molecular tests, but EM is still essential in diagn**

***osis and surveillance, especially when etiology is unknown, when there is conflicting evidence, and in pathological studies*.**

E-Poster

Dr. Nada Shamina
Registrar in Chemical Pathology
Department of Chemical Pathology, NHS, Nottingham, UK

Title:

Ethical Considerations in the Integration of Artificial Intelligence into Histopathology Practice: A Narrative Review

Introduction:

Artificial intelligence (AI), especially deep learning, is increasingly being integrated into digital histopathology. While AI holds potential to enhance diagnostic accuracy and workflow efficiency, its clinical adoption raises several ethical concerns that must be critically evaluated.

Material & Methods:

This narrative review examines literature from peer-reviewed databases (PubMed, Scopus, Web of Science) focused on AI in histopathology from 2015–2025. We highlight key applications of AI and identify recurring ethical themes such as algorithmic bias, transparency, accountability, and data privacy.

Results:

AI systems show promise in automating tumor detection, cell quantification, and molecular prediction. However, ethical risks persist:

· Bias due to non-diverse training datasets.

· Lack of transparency ("black-box" models) affecting clinician trust.

· Accountability gaps in diagnostic error responsibility.

· Patient data privacy concerns with large, sensitive datasets.

While regulatory frameworks (e.g, FDA,HIPAA,NHS) are evolving, they often lag behind technological advances. Multidisciplinary collaboration is needed to align innovation with patient-centered ethics.

Conclusion:

AI integration in histopathology must balance technological advancement with ethical integrity. Addressing bias, explainability, accountability, and data protection is essential to protect patient welfare and maintain public trust. Responsible AI implementation will require transparent governance and collaboration across medical, technical, and ethical domains.

Keywords:

Artificial intelligence, histopathology, ethics, algorithmic bias, transparency, data privacy

References:

Daniele Giansanti, (2024), AI in Cytopathology: A Narrative Umbrella Review on Innovations, Challenges, and Future Directions, National Library of Medicine

Matthew G. Hanna, Liron Pantanowitz, Brian Jackson, Octavia Palmer, Shyam Visweswaran , Joshua Pantanowitz, Mustafa Deebajah, Hooman H. Rashidi, (2025), Ethical and Bias Considerations in Artificial Intelligence/Machine Learning

Takanobu Hirosawa, Taro Shimizu, (2025), A Narrative Review of Artificial Intelligence in Medical Diagnostics

Abstracts of 15 October 2025 Sessions

1

From Preparation to Imaging: Artifacts in TEM and SEM

Dr. Shaimaa Mostafa Kashef

Assist. Prof. of Histology
Histology Dept. Faculty of Medicine
Tanta University

Electron microscopy is crucial to science because it is a particular tool to observe the ultrastructure of cells and materials at very high magnification and resolution. Transmission Electron Microscopy (TEM) and Scanning Electron Microscopy (SEM) brought an unprecedented scientific revolution in many fields ,such as cell biology, nanotechnology, microstructural evolution, forensic science, pharmaceutical research, and microbiology .However, improper processing and imaging of tissue and materials can lead to artifacts in electron micrographs. Different forms of artifacts can be induced during the different preparation processes, such as fixing, dehydrating, embedding, sectioning (for TEM), and covering (for SEM). Moreover, many artifacts can occur during imaging, such as beam-induced damage and charging effects. Special emphasis is placed on distinguishing the difference between real ultrastructural features and preparation-induced artifacts, which is very important for the correct interpretation of data. Identifying different types of artifacts can be done by knowing their source, types and comparing the images of ideal preparation of similar specimens. Illustrating real examples of artifacts and comparing them with true structural features equips researchers with practical knowledge to differentiate between genuine data and misleading artifacts. Strategies for artifact minimization will also be discussed, including optimized sample handling protocols. Understanding how artifacts form and identifying their different types can change the interpretation of morphology and the reliability of our data. Taking steps to minimize them is necessary to make studies and research utilizing TEM and SEM more scientifically sound and honest.

2

Immunohistochemistry and Immunogold Techniques

Emeritus Prof.Mona Abdel-Hamed Yehia
Prof. of Histochemistry and cell Biology
Former Head of Histochemistry and cell Biology Dept.
Medical Research Institute Alexandria University

Modern technology has become an integral part of our lives. Its impact on our field has transformed various aspects of practice and diagnosis. This has made our information and experiences punctual. It has been known that immunohistochemistry transforms the way of discovering the many beneficial roles of the biomarker proteins (polyclonal and monoclonal antibodies) in the diagnosis and treatment of the many immune diseases and treatments. Immunoelectron labelling (gold or silver stain particles) is also a high resolution technique that provides information about the localization and density of biomarker proteins and oligomer biomarkers expressed in transfected cells, and it can be applicable to tissues. The topic will illustrate the quality control of the immunohistochemical and immunoelectron labelling techniques.

3

Waste to Worth: Nanotechnology in Water Remediation

Emeritus Prof. Nagwa Abo El-Maali

Prof. of Analytical Chemistry.

Executive Manager, Multidisciplinary Research centre of Excellence (MRCE). Assiut University

Converting waste materials into nanomaterials for water remediation is a sustainable, cost-effective approach that aligns with the circular economy and green nanotechnology principle

The main objectives of this technical session is to:

1. ***Introduce the concept of nanotechnology in water treatment.*** .
2. ***Explore how waste materials can be converted into nanomaterials for water remediation.***
3. ***Applications and case studies.***
4. ***Encourage innovation in sustainable and scalable water purification technologies***

Short Biography of Speakers
13 October 2025

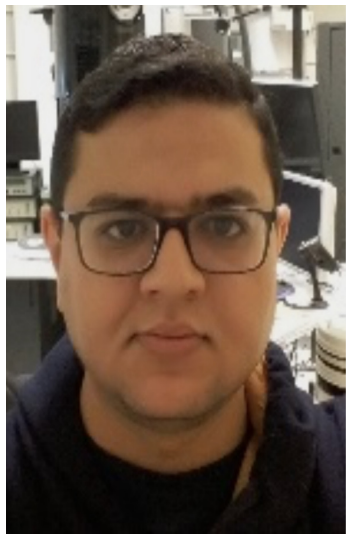
1

Prof. Naglaa Ibrahim Sarhan

Dr. Naglaa Ibrahim Sarhan is a Professor of Histology and Cell Biology at the Faculty of Medicine, Tanta University, where she also earned her medical degree. She serves as secretary and board member of the Egyptian Society of Electron Microscopy and is a member of the Egyptian Society of Histology and Cell Biology. Dr. Sarhan has published over 60 peer-reviewed scientific articles, including 30 in international journals, and has supervised numerous postgraduate theses. In addition, she is an active reviewer for several scientific journals. Her research spans a wide range of topics, with a particular focus on the interface of pharmacology, histology, and clinical applications. She received diploma in total quality management of health care service and in specialized faculty development program and she is a professional trainer in FLDP (International Center for Faculty & Leadership Development). Currently, she holds the positions of Head of the Histology Department and Director of the Electron Microscopy Unit at the Faculty of Medicine, Tanta University.

2

Dr. Hesham El-Sherif



Dr. Hesham El-Sherif is a materials scientist and electron microscopy expert with over a decade of experience in advanced characterization techniques for nanomaterials and semiconductor devices. He earned his Ph.D. in Materials Science and Engineering from McMaster University, Canada, where his research focused on multiscale electron microscopy of atomically thin layers at heteroepitaxial interfaces. Dr. El-Sherif held a postdoctoral fellowship at Harvard University's Rowland Institute and completed a visiting fellowship at MIT.nano, where he specialized in atomic-resolution imaging and spectroscopy of novel oxide and layered materials. His research has contributed to over 18 journal publications and numerous conference presentations, with a focus on 2D materials, graphene heterostructures, and confined heteroepitaxy. He has also held technical roles in industry, including as a TEM Process Engineer at imec and Advanced Microscopy Specialist at TechInsights Inc., applying microscopy to semiconductor reverse engineering and failure analysis. Beyond research, Dr. El-Sherif has taught over 3,500 students across four universities and mentored multiple undergraduate and graduate researchers. He actively bridges academic and industrial research through collaborative projects in materials characterization and semiconductor technologies.

3

Emeritus Prof. Soheir Mansy

Prof. Soheir Mansy graduated from the Faculty of Medicine, Cairo University, and earned her M.Sc. and Ph.D. in Pathology. She is currently Emeritus Professor of Pathology and Electron Microscopy at the Electron Microscopy Research Department (Pathology), Theodor Bilharz Research Institute (TBRI), Ministry of Higher Education and Scientific Research, where she previously served as Head of the Electron Microscopy Research Department and Deputy of the Clinical Laboratories Research Division. Prof. Mansy is President of the Egyptian Society of Electron Microscopy, President of the TBRI Staff Association, Member of the Electron Microscopy Council, Referee Member of the Permanent Committee of Promotion, Councillor for the Middle East and North Africa at the Society for Ultrastructural Pathology, and a Member of the Editorial Board of the Journal of Ultrastructural Pathology. She received advanced training in ultrastructural pathology of the liver and kidney, electron microscopy techniques, molecular morphology, and immuno-techniques at renowned institutions including the Pasteur Institute (Lyon, France), the Center for Electron Optics at Michigan State University (USA), the Histotechnology Unit and Environmental Pathobiology Laboratory at Michigan State University, the University of York (UK), and Philips FEI Company. With over 30 years of expertise in ultrastructural pathology of the liver and kidney, she has served as Principal Investigator or task leader in 17 research projects funded by ARST, STDF, USAID, TBRI, and the EU, supervised 26 M.Sc., Ph.D., and MD theses, authored 79 manuscripts in peer-reviewed journals, and published a book, Electron Microscopy Mastery Guide, which has been translated into six languages. She has organized and participated as an invited speaker in more than 60 training courses and conferences, and implemented three international cooperation agreements with Private Universität Witten/Herdecke (Germany), the Laboratory of Electron Microscopy, Mossakowski Medical Research Centre, Polish Academy of Sciences (Poland), and the Department of Electron Microscopy and Molecular Pathology at the Cyprus Institute of Neurology and Genetics. Prof. Mansy is also a scientific reviewer for numerous international journals and an active member of the Society for Ultrastructural Pathology, the European Association for the Study of the Liver (EASL), the Egyptian Society of Pathologists North America, and the Egyptian Society of Laboratory Medicine (ESLM). Beyond her scientific contributions, she founded the Association of Theodor Bilharz Research Staff in 2015, a non-governmental body dedicated to social activism and community service. Her achievements have been recognized with multiple awards, including the TBRI Excellence Award for distinguished management of the Electron Microscopy Research Department and linking research to community service, the TBRI Shield for Excellence (2014), and the Sawsan Omran Award in (2009 and 2015).

4

Dr. med. Carsten Dittmayer

Dr. Carsten Dittmayer currently he is Consultant Neuropathologist, Head of Electron Microscopy and Resident in General Pathology in the Department of Pathology – Charité Universitätsmedizin Berlin.

He studied medicine at the Charité, where he was first introduced to electron microscopy during his medical thesis at the Department of Anatomy. Following medical school, he made his residency training in neuropathology, focusing on the implementation of large-scale EM techniques in muscle pathology. He is currently doing his residency training in general pathology and works in the diagnostic electron microscopy unit at the Institute of Pathology.

5

Prof.Wesam Ismail

She is the head of the Pathology department, Beni-Suef University, Egypt and the CEO of Pathlab Prof. Wesam Ismail is the Past Chair of The Renal Pathology Working Group of The International Society of Nephrology (ISN-RPWG), the Chair of the African Society of Nephrology (AFRAN) Renal pathology Educational Committee, ISN Africa Regional Board Member, ISN Ambassador and the Chair of the Proagram Committee in the Renal Pathology Society.; a private renal pathology service in Cairo, Egypt. She had participated both as a speaker and course director in numerous international and regional meetings, is involved in renal pathology teaching activities in Africa and the Middle East and was awarded by The British Global Kidney Academy (GKA) for improving renal pathology services within the region.

6

Prof. Lillian W. Gaber

Prof. Lillian W. Gaber is Associate Director of Renal Pathology in the Department of Pathology and Genomic Medicine at Houston Methodist Hospital and Professor of Pathology and Genomic Medicine at Weill Cornell Medical School, where she is also affiliated with the Immunobiology and Transplant Science Center and the JC Walter Jr. Transplant Center. She earned her medical degree from Ain Shams University and completed residency training in Surgical Pathology at New England Deaconess Hospital within the Harvard Medical School system in Boston. She went on to complete fellowships in neonatal and gynecological pathology under Dr. Shirley Driscoll at Brigham and Women's Hospital, Harvard Medical School, and in renal pathology and research under Dr. Benjamin Spargo at the University of Chicago. Previously, Dr. Gaber served at the University of Tennessee in Memphis as Clinical Director of Anatomic Pathology, Director of Electron Microscopy, and Tenured Professor of Pathology. Her expertise lies in renal and transplant pathology; she is a key member of the renal and transplant biopsy service handling more than 1,200 biopsies, teaches pathology residents, nephrology fellows, PharmDs and visiting professors, and has authored over 200 manuscripts and book chapters. Her research covers topics such as glomerulosclerosis and incidental IgA in donor biopsies, T-cell–mediated rejection and post-treatment changes, pre-eclampsia nephropathy, the efficacy of Thymoglobulin in treating T-cell–mediated rejection, ultrastructural differences in diabetic rat kidneys treated with ACE inhibitors and calcium channel blockers, and the clinical utility of histological findings of polyomavirus nephropathy, including development of a novel histologic index compared with BANFF criteria. Dr. Gaber is a member of the Banff group, a recipient of a resident teaching award, and co-founder of Nora's Home, a nonprofit hospitality center for transplant patients and their families.

7

Emeritus Prof. Nadia Galal

Prof. Nadia Galal is a Professor of Pathology and Electron Microscopy at the Pathology Department Ain Shams University and the Head of Promotion committee for Pathology SCU. She is the Former Director of EM Unit of Ain Shams University Specialized Hospital.

8

Assist. Prof. Ayat S.M. Hassan

Dr. Ayat S.M. Hassan (MD), assistant professor of clinical pathology (Hematology), and acting as Head of Electron Microscopy Research department, Theodor Bilharz Research Institute (TBRI).

She is a faculty of medicine, Cairo university graduate (M.B, B.Ch). Completed post graduate study of clinical pathology (haematology), Kasr alaini school of medicine ,Cairo University (M.Sc &MD) and certified Egyptian fellowship of blood bank and transfusion medicine. She is a Participant and supervisor of routine laboratory work in EM Department at TBRI. The researches in EM Research department include Pathological, immunological, hematological , microbiological researches.

9

Assist.Prof. Sarah Hassan Tawfic

Dr. Sarah Hassan Tawfik (M.D.), associate professor of Pathology and Electron Microscopy, Theodor Bilharz Research Institute. Have been graduated in Faculty of Medicine Cairo University (M.B, B.Ch, 2007). And completed postgraduate studies in Faculty of Medicine Cairo University in collaboration with the Polish Academy of Science, department of surgical research and transplantology, liver cell isolation and cell culture unit (M.Sc, of pathology 2013) and M.D of pathology, in Faculty of Medicine Cairo University (nephropathology subspecialty, 2017). Successfully completed 'The International Society of Nephrology (ISN-ANIO) Clinical Nephropathology Certificate Program (CNC), Basic & Advanced courses 2015\2016 & 2019\2020. For nearly a decade we have been serving so many nephrology centers throughout Egypt including Cairo University nephrology units, Abou El RISH hospitals, Fayoum University hospital, El Azhar University hospital, Monofya University hospital and many other nephrology centers in the private sector.

10

Prof. David Howell

Prof. David Howell received his BA, PhD in Microbiology and Immunology, and MD degrees from Duke University, which has been his academic home now for a half-century. Upon completion of his doctoral work, he pursued residency training in anatomic pathology and fellowship in immunopathology in the Department of Pathology, Duke University Medical Center, where he was appointed Assistant Professor in 1988, with promotion to Associate Professor in 1999 and Professor in 2006. He was a Staff Pathologist at the Durham Veterans Affairs Medical Center for more than 30 years, serving as Chief of the Pathology and Laboratory Medicine Service from 1999-2012.

In 2015, Dr. Howell was Interim Chair of the Department of Pathology at Duke. He is now Senior Vice Chair of the department, and just completed an eight-year stint as Chair of the Departmental Appointments, Promotion & Tenure Committee. His diagnostic and research interests are in renal, transplant, and ultrastructural pathology; particular areas of focus include diagnosis and management of infectious complications of solid-organ transplantation, heritable glomerular disorders, and solving difficult diagnostic problems with multiple microscopic methods (correlative microscopy). He served as President of the Society for Ultrastructural Pathology from 2010-2012, and was President of the Renal Pathology Society in 2024. He is author of 150 journal articles and book chapters.

Short Biography of Speakers
14 October 2025

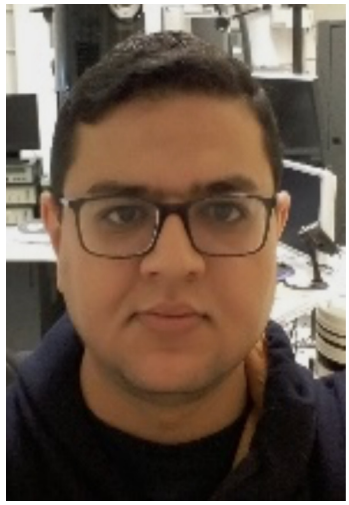
1

Prof. Manar E. Abdel-Raouf

Prof. Manar Abdel-Raouf is a professor of polymer science at the Egyptian Petroleum Research Institute since 2012. has published more than 75 research papers in reputed journals and supervised more than 30 M.Sc. and Ph.D theses. She is PI for many research projects funded by STDF and she is an editorial board member and a reviewer for several international journals. Her main interests are environmental chemistry and green polymers.

2

Dr. Hesham El-Sherif



Dr. Hesham El-Sherif is a materials scientist and electron microscopy expert with over a decade of experience in advanced characterization techniques for nanomaterials and semiconductor devices. He earned his Ph.D. in Materials Science and Engineering from McMaster University, Canada, where his research focused on multiscale electron microscopy of atomically thin layers at heteroepitaxial interfaces. Dr. El-Sherif held a postdoctoral fellowship at Harvard University's Rowland Institute and completed a visiting fellowship at MIT.nano, where he specialized in atomic-resolution imaging and spectroscopy of novel oxide and layered materials. His research has contributed to over 18 journal publications and numerous conference presentations, with a focus on 2D materials, graphene heterostructures, and confined heteroepitaxy. He has also held technical roles in industry, including as a TEM Process Engineer at imec and Advanced Microscopy Specialist at TechInsights Inc., applying microscopy to semiconductor reverse engineering and failure analysis. Beyond research, Dr. El-Sherif has taught over 3,500 students across four universities and mentored multiple undergraduate and graduate researchers. He actively bridges academic and industrial research through collaborative projects in materials characterization and semiconductor technologies.

3

Assoc. Prof. Nicole van der Wel

Nicole van der Wel is an Associate Professor, head of the Electron Microscopy Centre Amsterdam (EMCA) at the Amsterdam UMC, location Academic Medical Centre (AMC) in Amsterdam, the Netherlands

She studied Biology and received her PhD in 2000 at the Wageningen University, Laboratory of Virology on the transport of viruses between host cells. She worked for 13 years at the Netherlands Cancer Institute in Amsterdam first as a postdoctoral fellow and later as a Staff Scientist. She specialized on the interaction between mycobacteria and their host cells using Electron Microscopy techniques and combining cell biology with microbiology. Since 2014 she has been head of the Electron Microscopy Centre Amsterdam (EMCA) situated at the Amsterdam UMC, location Academic Medical Centre (AMC) in Amsterdam, the Netherlands where pathology, and basic research is combined in 1 laboratory. She became Associated Professor and besides managing the Core facility have a research team studying the mycobacteria and the interaction of mycobacteria to antibiotics and their host. The focus of the work has been high resolution analysis on mycobacteria, which resulted in many peer reviewed papers on bacterial infections in which electron microscopy was used. Much of the work she has done on mycobacteria deals with the sub-cellular localization, using immunogold labelling and cryo-sectioning. In addition, techniques like cryo-EM are applied to study the capsular layer of mycobacteria. As head of the EM centre Amsterdam, she established a collaboration between the pathology department and Amsterdam's life science research institutes, and more than a dozen international tuberculosis researchers. My team and she has a long-standing expertise in transmission electron microscopy both in research and pathology but also apply new developments such as combined light electron microscopy (CLEM), tomography, immunoEM, and Cryo-EM.

4

Em.Prof.Zakaria A.M.Baka

Professor Zakaria Baka is a plant pathologist at the Faculty of Science, Damietta University in Egypt. He obtained his Ph. D. from the University of Sheffield in Great Britain. With 140 scientific papers, 4 books and five chapters in books published, he has a wealth of research experience.

Professor Baka has also conducted post-doctoral research at the Universities of Sheffield (GB), California (USA), and Bergen (Norway). He has supervised 40 M. Sc. and Ph. D. theses, reviewed 689 scientific papers, 97 theses, and 17 scientific projects. Additionally, he has served on the standing commission for the promotion of professors and assistant professors in his field.

As a reviewer on the standing commission for the promotion of professors and assistant professors, Professor Baka has contributed significantly to the academic community. He holds a patented invention and has participated in 42 conferences, symposia, training courses, and workshops. Furthermore, He has contributed in 9 scientific projects and provided consultancy services to various scientific authorities. He is a member of numerous scientific societies. He has received several awards, including ORS, Third World, Distinguished Scientific Publication, and Scientific Excellence Awards. His expertise lies in ultrastructural and biological control research.

5

Prof. Mona AbouSamra

Professor Mona AbouSamra is a Professor of Pharmaceutics at the National Research Centre (NRC), specializing in drug delivery, formulation development, and pharmaceutical technology. She earned her PhD in Pharmaceutical Sciences in 2013 and has since authored numerous research papers in leading international journals, as well as books and reviews focusing on enhancing drug function and improving bioavailability through nanotechnology. She has served as Principal Investigator, Co-PI, or collaborator on several funded projects supported by the NRC and the Science and Technology Development Fund (STDF). In recognition of her scientific achievements, she received the Pioneers Award from the NRC in 2022. Prof. AbouSamra also contributes to the scientific community as an editorial board member for journals including the Journal of Pharmaceuticals and Formulations and the Open Journal of Pharmaceutical Science and Research. She is an active member of national and international scientific societies, including the Egyptian Society of Advanced Materials and Nanotechnology, the Egyptian Society of Electron Microscopy, the Society for Women in Science in Developing Countries—Egypt, and the Organization for Women in Science for the Developing World (OWSD), reflecting her influential role in advancing pharmaceutical research and policy.

6

Dr. Ehab Osama Hafiz

Dr. Ehab Hafiz is a researcher lecturer of Pathology in Electron Microscopy Research Department, at Theodor Bilharz Research Institute and consultant of Nephropathology.

In addition to his research in liver, GIT, urinary tract and kidney diseases, he is one of the emerging leaders of the International Society of Nephrology representing the North African region, who adopts efforts to achieve sustainable healthcare.

7

Dr.Mohamed Amgad

Dr.Mohamed Amgad is a post graduate year 3 (PGY-3) Pathology Resident at Northwestern University (USA) and an incoming Gastrointestinal and Hepatic Pathology Fellow at the University of Chicago (USA). He is an aspiring academic pathologist working in the interdisciplinary field of Computational Pathology. He obtained his MBBS from Cairo University in 2015, and his PhD in Computer Science from Emory University in Atlanta (USA) in 2021, under the supervision of Dr. Lee Cooper. His dissertation work developed highly interpretable models to improve prognosis of invasive breast cancer, with robust validation studies, which was featured on the front page of the Chicago Tribune newspaper in December 2023. He has received multiple awards for his groundbreaking work, including the 2024 Best Dissertation Award from the Association for Pathology Informatics (API), the 2021 travel award from the Digital Pathology Association, the 2021 Trainee Award and Best Poster Award from the Association for Pathology Informatics, the 2019 Graduate Research Award from Emory University, among others. He continues to be involved in research in addition to his clinical duties, with a focus on the use of computational tools to improve diagnostic and prognostic performance in histopathologic evaluation.

8

Emeritus Prof. Soheir Mansy

Prof. Soheir Mansy graduated from the Faculty of Medicine, Cairo University, and earned her M.Sc. and Ph.D. in Pathology. She is currently Emeritus Professor of Pathology and Electron Microscopy at the Electron Microscopy Research Department (Pathology), Theodor Bilharz Research Institute (TBRI), Ministry of Higher Education and Scientific Research, where she previously served as Head of the Electron Microscopy Research Department and Deputy of the Clinical Laboratories Research Division. Prof. Mansy is President of the Egyptian Society of Electron Microscopy, President of the TBRI Staff Association, Member of the Electron Microscopy Council, Referee Member of the Permanent Committee of Promotion, Councillor for the Middle East and North Africa at the Society for Ultrastructural Pathology, and a Member of the Editorial Board of the Journal of Ultrastructural Pathology. She received advanced training in ultrastructural pathology of the liver and kidney, electron microscopy techniques, molecular morphology, and immuno-techniques at renowned institutions including the Pasteur Institute (Lyon, France), the Center for Electron Optics at Michigan State University (USA), the Histotechnology Unit and Environmental Pathobiology Laboratory at Michigan State University, the University of York (UK), and Philips FEI Company. With over 30 years of expertise in ultrastructural pathology of the liver and kidney, she has served as Principal Investigator or task leader in 17 research projects funded by ARST, STDF, USAID, TBRI, and the EU, supervised 26 M.Sc., Ph.D., and MD theses, authored 79 manuscripts in peer-reviewed journals, and published a book, Electron Microscopy Mastery Guide, which has been translated into six languages. She has organized and participated as an invited speaker in more than 60 training courses and conferences, and implemented three international cooperation agreements with Private Universität Witten/Herdecke (Germany), the Laboratory of Electron Microscopy, Mossakowski Medical Research Centre, Polish Academy of Sciences (Poland), and the Department of Electron Microscopy and Molecular Pathology at the Cyprus Institute of Neurology and Genetics. Prof. Mansy is also a scientific reviewer for numerous international journals and an active member of the Society for Ultrastructural Pathology, the European Association for the Study of the Liver (EASL), the Egyptian Society of Pathologists North America, and the Egyptian Society of Laboratory Medicine (ESLM). Beyond her scientific contributions, she founded the Association of Theodor Bilharz Research Staff in 2015, a non-governmental body dedicated to social activism and community service. Her achievements have been recognized with multiple awards, including the TBRI Excellence Award for distinguished management of the Electron Microscopy Research Department and linking research to community service, the TBRI Shield for Excellence (2014), and the Sawsan Omran Award in (2009 and 2015). In addition, she was ranked in the AD Scientific Index World Scientist and University Rankings 2022,

Short Biography of Speakers 14 October 2025

10

Prof. Sara E Miller PhD

Dr. Sara Miller, Professor in the Pathology Department at Duke University Medical Center, teaches electron microscopy, virology, and presentation preparation to various student groups, including undergraduates, medical students, medical residents, and pathology assistant students. Dr Miller has given many invited talks in the USA and in numerous foreign countries. Along with Drs. Alex Hyatt and Hans Gelderblom, she taught workshops on diagnostic virology by electron microscopy at Adelaide University in South Australia and also at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (an Australian Government agency responsible for scientific research), others with Cynthia Goldsmith at the Centers for Disease Control and Prevention (CDC) (the leading USA service organization providing emergency response, expertise, public health infrastructure and global disease detection), and in the World Health Organization courses on Electron Microscopy in Medicine in China and in Thailand.

Dr. Miller performs research, directs the Center for Electron Microscopy and Nanoscale Technology at Duke University, and was awarded a National Institutional Institutes of Health (NIH) Shared Instrumentation Grant for a 200 KV Transmission EM and a High-End Instrumentation Grant for a Serial Block Face Scanning EM from NIH, in addition to other funding. She has served as president of the Microscopy Society of America (MSA), the Society for Ultrastructural Pathology (SUP), and the Southeastern Microscopy Society (SEMS), and in other capacities in several organizations. Also, she was elected a Fellow of the MSA.

Shorter Biography of Prof.Sara Miller 14 October 2025

10

Prof. Sara E Miller PhD

Dr. Sara Miller, Professor in the Pathology Department at Duke Medical Center, teaches electron microscopy (EM), virology, and presentation preparation to various student groups. Dr. Miller has given many invited talks in numerous countries. Along with Drs. Alex Hyatt and Hans Gelderblom, she taught workshops on diagnostic virology by electron microscopy at Adelaide University in South Australia and also at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (an Australian Government agency responsible for scientific research), others with Cynthia Goldsmith at the Centers for Disease Control and Prevention (CDC) (the leading USA service organization providing emergency response, expertise, public health infrastructure and global disease detection), and in the World Health Organization courses on Electron Microscopy in Medicine in China and Thailand, and in the World Health Organization courses, on EM in Medicine, in China and Thailand. Dr. Miller performs research, directs the Center for Electron Microscopy and Nanoscale Technology at Duke, and was awarded a National Institutional Institutes of Health Shared Instrumentation Grant for a 200 KV Transmission EM and a High-End Instrumentation Grant for a Serial Block Face Scanning EM, in addition to other funding. She has served as president of the Microscopy Society of America (MSA), the Society for Ultrastructural Pathology, and the Southeastern Microscopy Society. Also, she was elected a Fellow of the MSA.

Short Biography of Speakers
15 October 2025

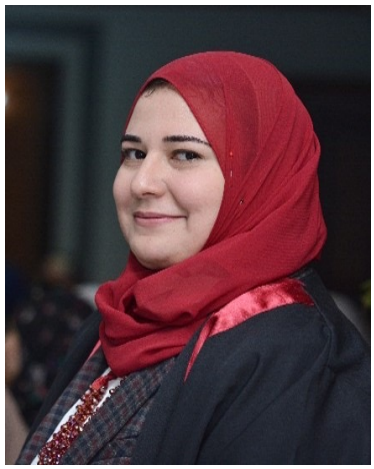
Prof.Nagwa Abo El-Maali

Prof Abo El-Maali is specialized in Analytical, Bioanalytical, Pharmaceutical and Biomedical Analyses. She studied Chemistry at Assiut University, Egypt. She received her PhD degree in 1990 when she joined the research group of Prof. Patriarche at the Institute of Pharmacy, Universite libre de Bruxelle, Belgium. In 2000 she has postdoctoral fellowship in Prof Joesef Wang Biochemistry Laboratory, New Mexico State University, USA, She was visitor Prof. 2016, 2017, 2018 in many Labs in France. In 2000, she obtained the position of Professor at Assiut University. She also obtained the position of Vice Dean of the Faculty of Science at Assiut University for Postgraduates and Research Affairs (2012–2018). She has published more than 71 research articles in SCI journals. She is the lab manager of the analytical chemistry . She is also the director of Assiut University's Proficiency Testing Center. She is the Executive Manager- Multidisciplinary Research Centre of Excellence, Assiut University (2015- currently)

Emeritus Prof. Mona Yehia

Prof. Mona Abdel-Hamed Yehia, , is Emeritus Professor of Histochemistry and Cell Biology at the Medical Research Institute, Alexandria University. She earned her PhD in Histochemistry and Cell Biology in 1994 and served as Professor in the same department from 2009 to 2018, She headed the department from January 2010 to November 2018. She is an active member of the Egyptian Syndicate of Scientific Professions, the Egyptian Society of Histology and Cytology, the German Society of Histochemistry, the Egyptian-German Society of Zoology, and the Union of Arab Biologists in Cairo. Professor Yehia has organized numerous training courses and meetings, including repeated preclinical courses on laboratory animals, pharmacokinetics, and histopathology at the Medical Research Institute's Technology Center of Alexandria between 2003 and 2017.

Assist. Prof. Shaimaa Kashef

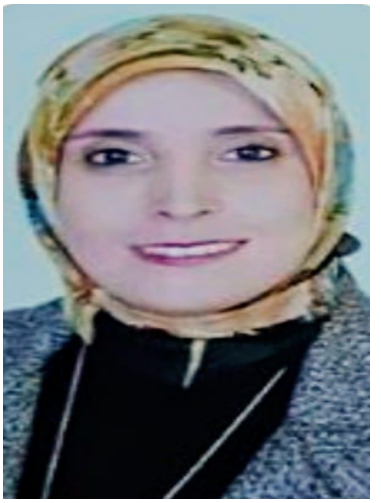


Shaimaa Mostafa Kashef, M.B.B.Ch., M.Sc., M.D., Dip.Med.Ed., is an Assistant Professor of Histology at the Faculty of Medicine, Tanta University, Egypt. She has extensive teaching experience for medical, dental, and pharmacy students, including Egyptian and international programs. Dr. Kashef's research focuses on histology and medical education, mesenchymal stem cells, immunohistochemistry, electron microscopy, regenerative medicine, and cell separation and isolation.

She has presented at numerous national and international conferences, delivering talks on digital tools in scientific research, electron microscopy, regenerative medicine, and histological interpretation. Dr. Kashef has published several studies on antioxidants, stem cells, herbal extracts, and histopathology in experimental models, including recent work on aspartame toxicity, alpha-lipoic acid in dry eye, peripheral blood mononuclear cells in sciatic nerve ischemia-reperfusion injury, and lycopene in ulcerative colitis.

In addition to her academic and research achievements, Dr. Kashef got a Diploma in Medical Education (2024), reflecting her dedication to advancing innovative teaching and learning strategies in medical sciences.

Dr. Asmaa Wahman



Dr. Asmaa Wahman is a lecturer at New Valley University, specializing in applied analytical chemistry. She works on developing green nanomaterials to clean water from harmful pollutants, aiming to provide sustainable solutions for environmental challenges.

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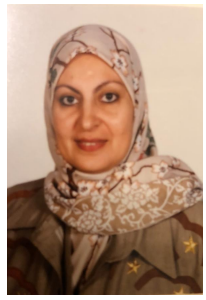
Tanta University



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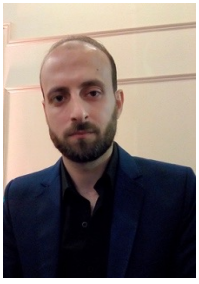

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