THE AMERICAN UNIVERSITY IN CAIRO

Yousef Jameel Science and Technology Research Center

ABOUT THE CENTER

The Yousef Jameel Science and Technology Research Center (YJ-STRC) was established as a result of the generous support of Yousef Jameel, who graduated from AUC in 1968. The center is interdisciplinary and draws on the expertise of the university's engineering and science departments. The center supports a variety of nanoscience and technology-oriented projects, which make use of its state-of-the-art equipment housed in its new premises at AUC New Cairo.

Research activities are centered around generic imaging, analysis and fabrication equipment and a focus on nanomaterials characterization, the design and fabrication of micro/nano-electromechanical systems (MEMS/NEMS), clinical diagnostics, marine genomics, as well as environmental engineering. People are the center's key assets. Therefore, the center aims to attract high-caliber researchers from around the world who, together with the current members, contribute to its research themes and help steer its future research activities.

FACTS AND FIGURES

- 15 faculty members
- Six research groups
- Five postdoctoral fellows
- 17 master's students
- Nine PhD students
- 10 researchers
- $12 million in funding
- 20 active projects
- Two technical staff members

Yousef Jameel Science and Technology Research Center: A Success Story in Egypt

The Yousef Jameel Science and Technology Research Center (YJ-STRC) was established in 2003 as a result of the generous support of AUC alumnus Yousef Jameel. At that time, there were no research facilities in Egypt capable of fabricating micro/nano devices. Jameel had the vision to create a center of excellence at AUC in the field of nanotechnology. To achieve this goal with the limited resources available, faculty members at the School of Sciences and Engineering formulated an initiative to realize this objective and have been committed to providing a vibrant research environment since then. Research facilities were selected in a way that complements, rather than replicates, what is available at world-class centers of excellence.

The first collaborative research project was conducted with Interuniversity Microelectronics Center (IMEC), one of the most reputable microelectronics centers in Europe. The project yielded a patent, which paved the way for more collaborative research projects between the two institutions, all of which proved to be successful. The center gradually developed over time, adding new state-of-the-art fabrication and characterization facilities, which include a class-100 clean room equipped with full-scale fabrication tools — the first-of-its-kind in Egypt. Using such a setup, together with the knowledge and expertise of the faculty, it became possible to expand the center's collaborative research projects with more than 20 top-notch research institutions including Stanford University and Virginia Tech in the United States, Kyoto University in Japan and the Royal Institute of Technology in Sweden.

The continued success of the center prompted the establishment of a partnership agreement with King Abdullah University of Science and Technology (KAUST), a world-class graduate-level research university in Saudi Arabia. Within this framework of collaboration, prospective KAUST researchers are trained at AUC, after which they move to KAUST to transfer the knowledge and know-how they gained. This not only helps build similar expertise at KAUST in various fields of science and technology, it also opens channels for future collaborative work between the two institutions. Initial success of this partnership was reflected in the filing of several patents related to the development of high-performance miniaturized systems.

Other crucial work performed by the YJ-STRC includes conducting research on the hepatitis C virus (HCV), which has an impact on more than 10 million patients in Egypt and 200 million worldwide. Cost-effective, sensitive diagnostic tests have been developed using the expertise available at the center. The Arab Science and Technology Foundation has supported activities related to this program. Currently, the YJ-STRC has ties with several international institutes and universities including the National Institute of Materials Science in Japan, the Universidade Nova de Lisboa in Portugal, Vrije Universiteit in the Netherlands, and Oregon Health & Science University in the United States.

Today, the YJ-STRC supports a variety of nanoscience and technology-oriented projects. Bringing together internationally renowned and published scientists from around the world, the center employs state-of-the-art equipment in the physical sciences and engineering. Its research activities encompass five main areas: micro-nanosytems, nanostructured materials, surface chemistry, biotechnology, novel diagnostics and therapeutics, and environmental science and engineering. Taking a multidisciplinary approach and fostering the transfer of knowledge through a variety of partnerships, the YJ-STRC is poised to develop AUC as a premier center for scientific research regionally and globally.

Our People

The principal investigators leading the research projects conducted at the YJ-STRC include physicists, chemists, biologists, material scientists and engineers. Having researchers with such diverse backgrounds has resulted in an interdisciplinary research environment conducive to achieving world-class accomplishments. To date, research conducted at the center has resulted in five different patents that have been filed with the U.S. patent office. Such patents are expected to have high commercial potential, which will help put the center on the correct path toward a healthy industrial presence.

Our Mission

The YJ-STRC at the American University in Cairo is an interdisciplinary center that draws on the expertise of the university's engineering and science departments. Its mission is to establish an internationally competitive research hub at AUC, with premier resources and the highest level of support.

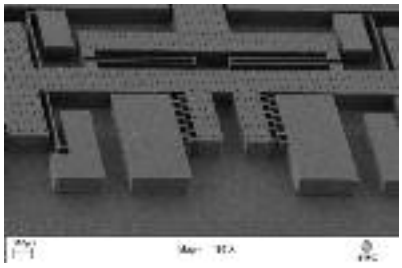
Intellectual Property Policy

The YJ-STRC has an intellectual property (IP) policy that takes into consideration the rights of all parties contributing to research. The center has several models of collaboration where IP is either jointly owned by all parties or solely owned by one of the parties. For each case, an IP agreement that is satisfactory for all parties involved in the research is developed. This has been implemented successfully with IMEC in Belgium and KAUST in Saudi Arabia.

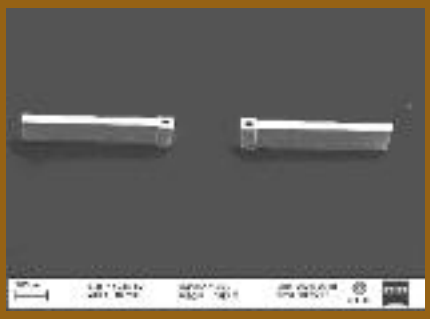
Research Activities

The activities conducted at the center cover an array of topics, from marine genomics, diagnostics and therapeutics to nanostructured materials, micro/nano electromechanical systems (MEMS/NEMS) and environmental engineering. This gives the center a competitive advantage in the region, and has attracted the attention of various local and international microelectronics, pharmaceutical and construction industries.The center's work is conducted by six research groups:

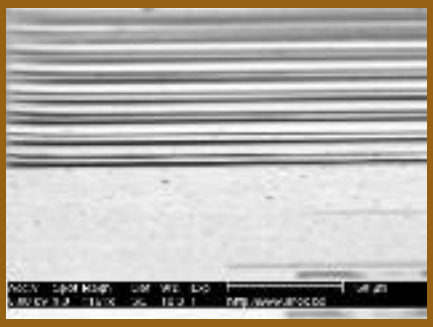
- Micro-Nanosytems
- Nanostructured Materials
- Surface Chemistry
- Biotechnology
- Environmental Research
- Novel Diagnostics and Therapeutics



First micromachined structures fully designed and fabricated in Egypt



First miniaturized antenna designed and fabricated using YJ-STRC expertise and facilities. The antenna is operating at 77 GHz and can be reconfigured to work as either dipole or monopole. This design is the outcome of the collaboration between the center and King Abdullah University of Science and Technology, and a U.S. patent has been filed in December 2009.



Micromachined cantilever realized by SiGe deposited at 210°C and treated by Excimer laser to eliminate stress gradient and to tune the electrical properties to fit a wide range of MEMS applications. This work has been conducted within the framework of joint collaboration between IMEC in Belgium and the YJ-STRC, and it has been patented in Europe and the United States.

State-of-the-Art Clean Room

Core Facilities

Micro and Nanosystems

- Clean Room
- Deep Reactive Ion Etcher
- PECVD
- Mask Aligner
- RF Sputtering Machine
- Pulsed Laser Deposition
- Electroplating
- Excimer Laser
- Probe Station
- Wafer Geometry Gauge
- Four-Point Probe Station
- Semiconductor Parameter Analyzer
- Spectrum/Network/Impedance Analyzer
- Photospectrometer
- Stylus Surface Profiler

Materials Facility

- RITSCH High Energy Ball Mill
- Turbula Mixer
- Controlled Environment Glove Box
- Sintering Furnace (1200C)
- Heat Treatment Furnaces
- ISOMET Precision Cutting Furnaces
- Hydraulic Presses (up to 100 MPa)
- Rolling Machine
- Programmable Melting Furnace
- Differential Scanning Calorimeter (DSC)
- LICKA Optical Microscope
- MTS Hydraulic Testing Machine
- INSTON Screw Drive Testing Machine
- Mettatoya Vickers Microhardness Tester
- Rockwell and Brinell Hardness Testers
- Mettlers Digital Densitometer

Biotechnology

- Real-Time PCR
- Plate Reader (Fluorescence, UV, Vis)
- Protein and DNA Electrophoresis Units
- PCR Thermo-cyclers
- High Speed Centrifuge
- Incubator Shaker
- Millipore Direct Q Water
- Spectrophotometer
- High Performance Computational Facility
- High Throughput Genome Sequencer
- DNA Analyzer (ABI 96 Capillary)

Surface Chemistry

- BETASP 2020
- Chemisorb 2750
- Hydrosorb 1000
- Mercury Porosimeter Poremaster G60
- Flame Photometer
- Powder X-ray Diffractometer
- UV-visible Spectrometer

Characterization Facility

- LEO Field Emission SEM
- Energy Dispersive Spectroscopy
- Electron Back Scattered Diffractometer
- MTS XP Nanohardness Tester
- Vecco Atomic Force Microscope

Micro and Nanosystems Group

Group Objectives

The main objective of this group is to develop know-how in new research areas that are not widely investigated by other internationally recognized research groups. To realize such an objective, the group acquired state-of-the-art equipment that complements what is already available in advanced international research labs. This provides the opportunity for collaboration with internationally recognized research centers of excellence. The micro-nanosytems group supports a variety of MEMS/NEMS and photonics-oriented projects that make use of its advanced equipment. The group aims to attract high-caliber researchers from around the world.

Research Activities and Interests

Research conducted by the group covers two main areas, namely MEMS/NEMS and photonics.

1) MEMS / NEMS

The primary research objective is:

- To develop a low thermal budget process for MEMS/NEMS that can be integrated on top of standard pre-fabricated driving and control electronics. There are several projects that aim to optimize the electrical and mechanical properties of a wide variety of materials to be suitable for a broad range of MEMS/NEMS applications. Thin films are prepared using pulsed laser deposition (PLD), plasma enhanced chemical vapor deposition (PECVD) or sputtering. The physical properties of the deposited films are tuned locally using pulsed laser annealing.
- To develop know-how in the field of design, modeling, fabrication and characterization of a wide variety of MEMS/NEMS devices that have a potential commercialization value. This includes, but is not limited to, MEMS inertial systems, MEMS and NEMS antennas, and NEMS energy harvesters.

2) Photonics

This research group is interested in the development of optical and photonics components that can be integrated in a variety of applications. One focus is on the development and characterization of photonic bandgap materials. Special emphasis is put on studying quasiperiodic structures, metamaterials and subwavelength cavities. Another direction involves the design and fabrication of microlens arrays that can be used as sources for the generation of slowly diffracting beams. Further work is directed toward the development and fabrication of optical MEMS used in the construction of compact optical sensors.

Collaboration

- Stanford University (United States)
- KU-Lueven (Belgium)
- King Abdullah University of Science and Technology (Saudi Arabia)
- Kyoto University (Japan)
- Cairo University (Egypt)
- Ain Shams University (Egypt)
- Helwan University (Egypt)

Members

- Sherif Sedky, group leader
  Department of Physics
- Amr Shaarawi
  Department of Physics
- Ezzeldin Soliman
  Department of Physics
- Ehab Abdel Rahman
  Department of Physics
- Amro Elshurafa, KAUST postdoctoral fellow
- Ahmed Emira, KAUST postdoctoral fellow
- Mohamed Serry, KAUST postdoctoral fellow

Collaboration

- Royal Institute of Technology - KTH (Sweden)
- Birmingham University (United Kingdom)
- North Carolina State University (United States)
- Manchester University (United Kingdom)
- San Diego State University (United States)
- Farmingdale State University (United States)

Members

- Mahmoud Farag, group leader
  Department of Mechanical Engineering
- Hanadi Salem
  Department of Mechanical Engineering
- Amal Esawi
  Department of Mechanical Engineering

Nanostructured Materials

Group Objectives

Materials science and engineering at the American University in Cairo has been an established area of research and teaching for many years. With the ever-increasing demand for products with higher performance, the group's work has gradually shifted to the processing and characterization of advanced materials, which can be grouped into nanostructured materials, nanocomposites (metal and polymer matrices), smart materials and structures, natural fiber reinforced plastics, and thin films and coatings for biomedical, wear-resistance and high-temperature applications. Research focuses on the synthesis and characterization of five groups of advanced materials, including nanostructured materials, nanocomposites (metal and polymer matrices), smart materials and structures, natural fiber reinforced plastics and thin films for biomedical applications.

Research Activities and Interests

Research interests of the nanostructured materials group include:

- NiTi shape memory alloys: behavior of bulk material and thin films
- Carbon nanotube and natural fibers reinforced composites
- Mechanically alloyed high-performance nanostructured Al-alloys and nanocomposites
- Nanostructured coatings for wear-resistance and biomedical applications
- Materials for hydrogen storage
- Surface alloying for superior wear-resistance components
- Advanced materials for high-performance gears and bearing for automotive industry
- Deposition and characterization of Al2O3 , SiN, TiO2, SiO2, and SiC thin films

Research conducted by the group has been published in 16 international journals, one local journal and 14 refereed international conference publications, in addition to numerous non-refereed conference and workshop publications and presentations.

Surface Chemistry

Group Objectives

The overall objectives of the group is two-fold:

- The preparation of nanoporous catalysts for industrial applications. To date, different potential catalysts have been synthesized and characterized, with preliminary determinations of catalytic activity carried out. However, there is a need to further determine the catalytic activity of such catalysts for a wider spectrum of reactions. This would necessitate a CATLAB system
- The characterization of ancient materials

Research Activities

Research activities carried out entail the synthesis of metal oxides and mixed metal oxides nanopourous materials, together with the characterization of their textural, structural and surface properties. In addition, activated carbons are prepared from organic agricultural waste, with the characterization of their chemical composition, as well as textural and surface properties. A number of archeological materials (primarily ancient mortars and clay) are also studied.

Research Interests

- Ancient materials
- Textural properties
- Surface acidity and basicity
- Metal and mixed metal oxides
- Investigation of single oxide components
- Preparation of activated carbons from organic matter as adsorbents
- Isolation and characterization of schistosomal neutral sphingomyelinase
- Biomedical applications
- Preparation of catalytically viable micro/mesoporous mixed metallic oxides

Collaboration

- Sao Paulo University (Brazil)
- University of Provence (France)
- Cairo University (Egypt)
- Ain Shams University (Egypt)

Members

- Jehan Ragai, group leader
  Department of Chemistry
- Adham Ramadan
  Department of Chemistry
- Nahed Yacoub, postdoctoral associate
- Christine Azer, postdoctoral associate
- Gehan Ghaly, PhD student
- Omar Zaki, PhD student

Collaboration

- King Abdullah University of Science and Technology (Saudi Arabia)
- Virginia Bioinformatics Institute at Virginia Tech (United States)
- Woods Hole Oceanographic Institution (United States)
- McGill University (Canada)
- University of Jena (Germany)
- Istituto Superiore di Sanita (Italy)
- U.S. Naval Medical Unit (Egypt)
- National Research Center (Egypt)
- Theodor Bilharz Research Institute (Egypt)

Members

- Hamza El Dorry, group leader
  Department of Biology

- Rania Siam, clinical chemistry
  Department of Biology

- Suher Zada, clinical chemistry
  Department of Biology

Biotechnology Group

Group Objectives

The biotechnology group focuses on cutting-edge research addressing crucial regional challenges with broad international impact. The group utilizes contemporary molecular and genomic approaches to address important biomedical challenges. In addition to the well-established Yousef Jameel Biotechnology Laboratory, which is equipped with state-of-the-art equipment in the field of molecular and cell biology, the group also makes use of the latest contemporary genomics facility, including a high-throughput genome analyzer sequencing system and a high-performance computational facility. Our goal focuses on utilizing fundamental scientific research to develop diverse applications in the biotechnology field.

Research Activities and Interests

The biotechnology group focuses on research related to:

- Genomic approaches to the production of alternative energy
- Regional molecular characterization of the influenza virus for effective vaccine design
- Environmental genomics of the Nile River and the Red Sea
- Nanostructured coatings for wear resistance and biomedical applications
- Transcription regulation of tumor suppressor genes in selected cancer
- Gene therapy design application for HCV genome
- HCV docking for novel drugs
- Endemic diseases in Egypt like bilharzias, fascioliasis and liver cancer

Environmental Science and Engineering Group

Group Objectives

The environmental science and engineering group became closely involved with the YJ-STRC in 2006 via supplemental funding of a project related to control of disinfection by-products in residential water supply. This project is typical of objectives that link the group with the center, namely research related to control of micro-pollutants, and micro-scale measurement of the chemical composition and physical properties of solids of environmental interest.

Research Activities and Interests

Researchers in environmental science and engineering are conducting projects in the general areas of:

- Control of disinfection by-products in residential water quality
- Water quality and control
- Treatment of toxic compounds by developing low-cost adsorbents
- Reuse of treated wastewater in agriculture
- Recycling of agricultural waste and biofuel production
- Environmental hydraulics

Research Facilities

- Basic wet chemistry and solids handling facilities including three visible light spectrophotometers, turbidimeter, membrane filtration apparatus and still with UV-deionizer unit for the production of high-quality distilled-deionized water
- Jar test apparatus for coagulation, flocculation, sedimentation simulation and treatability studies
- BOD-Trak analyzer and COD digestion reactor for surrogate organic analysis
- Biological parameter test equipment
- Flame atomic absorption spectrophotometer (GBC SensAA) for metals analysis
- Research-grade gas chromatograph (Perkin Elmer Autosystem XL)
- Total organic carbon analyzer (Teledyne Tekmar with auto sampler)
- Ultraviolet spectrophotometer (Shimadzu UV-1650)
- Lab scale crossflow membrane filtration test unit (GE Sepa CF II Med/High Foulant System)

Collaboration

- Holding Company for Water and Waste Water (Egypt)
- National Research Center (Egypt)
- King Abdullah University of Science and Technology (Saudi Arabia)

Members

- Edward Smith, group leader
  Department of Civil Engineering

- Salah El Haggar
  Department of Mechanical Engineering

Collaboration

- Vrije Universiteit (The Netherlands)
- National Institute for Materials Science (Japan)
- The Scripps Institute (United States)
- Oregon Health & Science University (United States)
- Universidade Nova de Lisboa (Portugal)

Members

- Hassan Azzazy, group leader
  Department of Chemistry
- Sherif Shawky, PhD student
- Mai Mansour, MSc student
- Sara Radwan, MSc student
- Reem Olabi, MSc student
- Basem Guirgis, MSc student
- Shairy Danial, MSc student
- Heba Adel, MSc student

Novel Diagnostics and Therapeutics

Group Objectives

The group is dedicated to the development of novel and innovative diagnostic assays and drug delivery platforms. Advanced nanostructures and recombinant DNA technologies are employed to develop diagnostic tests for direct, sensitive and cost-effective detection of different disease biomarkers and viral infections. Targeted drug delivery systems based on nanoparticles are also being developed. The group's work focuses on diseases of strategic significance to Egypt, such as the hepatitis C virus.

Research Activities and Interests

Research activities of the novel diagnostic group include:

- Development of novel nanodiagnostic strategies for the detection of viral antigens and nucleic acids
- Using gold nanoparticles for sensitive, direct and cost-effective detection of HCV RNA
- Detection of tumor markers using nanoparticle-based immunoassays
- Lab-on-chip technologies
- Development of real-time PCR assays for the detection of viruses
- Development of smart drug/gene nanocarriers

Research Facilities

- Real-Time PCR
- Plate Reader (Fluorescence, UV, Vis)
- Protein and DNA Electrophoresis Units
- PCR Thermo-Cyclers
- Incubator Shaker
- Millipore Direct Q
- Spectrophotometer
- -80°C Freezer


SCHOOL OF SCIENCES AND ENGINEERING

Sherif Sedky
Professor, Department of Physics
YJ-STRC Director and Micro and Nanosystems Group Leader

Sherif Sedky was born in Cairo, Egypt in 1969. He received a BSc, with honors, in electronics engineering from Cairo University in 1992. A year later, he received a diploma in engineering physics, and in 1995, acquired his master's in the same field, both from Cairo University. Sedky then joined the MEMS group of the Interuniversity Microelectronics Center in Leuven, Belgium, where he received his second master's in 1996 and his doctorate in 1998, both from the Katholieke Universiteit Leuven. In 1999, Sedky became an assistant professor at Cairo University.

Sedky joined AUC in 2002. Today, he is professor of physics at the university, director of the YJ-STRC and leader of the center's micro and nanosystems group. In 2007, he received AUC's Excellence in Research and Creative Endeavors Award. Sedky is also the recipient of the prestigious 2002 Egyptian National Award for Advancement in Technological Sciences, offered by the Academy of National Research, and the 1996 graduate studies award from Cairo University. In addition, Sedky has been invited as a visiting professor at numerous universities, including the Katholieke Universiteit Leuven in Belgium, Stanford University and the University of California, Berkeley. His biography is listed in Marquis Who's Who in the World.

Sedky holds eight patents dealing with the introduction of new techniques for controlling the physical properties of thin films by either alloying different materials together or by localized thermal treatments using short laser pulses. Sedky also invented new miniaturized devices that can convert physical phenomena such as infrared radiation, linear acceleration, angular velocity and heat into electrical signals.

A prolific author, Sedky has authored and co-authored more than 70 scientific articles published in highly ranked international journals and conferences. He is the author of the book, *Post-processing Techniques for Integrated MEMS*, published by Artec House in 2006, and author of a book chapter in the *Handbook of Computer Visions and Applications*, published by the Academic Press in 1999. Sedky is also a member of the Materials Research Society and the Institute of Electrical and Electronic Engineers, and has served on the scientific committees of several international conferences.

Mark Welland
Professor, Physics Department, Cambridge University
YJ-STRC Co-Director

Born in October 1955, Professor Mark Welland received his BS in physics from the University of Leeds in 1979, a PhD in physics from the University of Bristol in 1984 and an MA from the University of Cambridge in 1988 . After serving as World Trade Visiting Scientist at the IBM Research Division in the United States from 1985 to 1986, Welland was appointed to a Lectureship in Electrical Engineering at the University of Cambridge, where he currently serves as professor of nanotechnology, researching a broad range of both fundamental and applied problems. These include protein mis-folding problems related to human disease, nanostructured materials for solar cells, biologically inspired functional nanomaterials, nanoelectronics and the development of tools for the fabrication and characterization of nanostructures. Welland established the Nanoscience Centre at the University of Cambridge in 2003 and was appointed director of the Interdisciplinary Research Collaboration in nanotechnology, funded through the government's UK Research Councils in 2002.

Welland has participated in numerous national and international reports on nanotechnology including the highly cited Royal Society and Royal Academy of Engineering report, *Nanoscience and Nanotechnologies*: *Opportunities and Uncertainties*, published in 1994. He has substantive international connections in the United States, Japan, Europe, India and the Middle East.

Welland has established and now co-directs the YJ-STRC at AUC, and is the international principal investigator of the recently established £100M World Premier Research Institute in nanomaterials based in Tsukuba, Japan. He has given a number of prestigious lectures that include the Turing Lecture; IEE and British Computing Society (2002); the Sterling Lecturer (2003), an annual appointment made by the Sterling Group of universities; the Annual Materials Research Society of India Lecture in Mumbai (2006); and the Max Planck Society Lecture (2007) in Stuttgart, Germany. Welland was elected a fellow of the Royal Society, the Royal Academy of Engineering and the Institute of Physics in 2002. He joined the Ministry of Defence as chief scientific adviser in April 2008. He will retain his position at Cambridge during the course of his secondment to the MOD.

ADMINISTRATION

Researchers

Abeer Arafa
PhD student

Khaled Basheer
PhD student

Nelly Kamel
Financial and Administrative Manager

After graduation, Nelly Kamal joined American Express, working there for nine years, first as a trainee in the travel department, then moving to the systems department, where she worked on developing in-house programs and software support. Kamal climbed up the ladder, becoming regional head of the systems department in 1995, a position she held for two years. During the course of her career with American Express, Kamal worked extensively with the headquarters in Brighton, visited different markets in many European countries as part of the company's international technologies team, and attended several courses and seminars inside and outside Egypt.

In 1998, Kamal joined the Egyptian American Bank as an executive officer in the re-engineering department, after which she served as a consultant for consumer banking and cards. Kamal then decided to devote a few years to her three children before joining AUC in 2005 as an administrative assistant at the YJ-STRC. Three years later, she was promoted to assistant to the director and today, she serves as the center's financial and assistant manager.

Mohamed Elwi
PhD student

Haytham El Gazar
PhD student

Joumana El Rifai
PhD student

PRINCIPAL INVESTIGATORS

Researchers

Gehan Ghaly
PhD student

Abdel Hameed Sharaf
PhD student

Hassan Azzazy
Professor and Chair, Department of Chemistry
Novel Diagnostics and Therapeutics Group Leader

Hassan Azzazy is a tenured professor at AUC, where he serves as chair of the chemistry department and director of the graduate program in chemistry. Azzazy is also an adjunct professor with the graduate biotechnology program at the University of Maryland University College. In addition, he is director of the new training program for international medical technologists that was established in collaboration with the American Society for Clinical Pathology in Chicago.

Holder of a BSc and postgraduate diploma in biochemistry from Alexandria University, Azzazy received his PhD in 1994 from the Department of Biochemistry and Molecular Biology, Graduate School of Biomedical Science, University of North Texas Health Science Center at Fort Worth. There, he was recognized as the top doctoral graduate and received the faculty award.

Prior to joining AUC, Azzazy was as a postdoctoral fellow at the University of Maryland Medical Center, Department of Pathology. He also served as assistant professor from 1997 to 2003 at the University of Maryland School of Medicine in the pathology and medical and research technology departments.

Azzazy is certified as a diplomate of the American Board of Clinical Chemistry in Washington, D.C. in two specializations: clinical chemistry and molecular diagnosis. He is also certified as specialist in chemistry by the Board of Registry, American Society for Clinical Pathology. In addition, Azzazy is a fellow of the National Academy of Clinical Biochemistry (FACB) in Washington, D.C.

With 20 years of extensive research and teaching experience, Azzazy has authored more than 120 publications including peer reviewed articles, book chapters, conference abstracts, monographs and technical methods — all in internationally recognized conferences, books and journals. Azzazy is a member of the editorial boards of several journals including *Clinical Biochemistry*, *Clinical Chimica Acta* and *Clinical Chemistry Laboratory Medicine*. He is a reviewer for numerous international journals and funding organizations.

At the YJ-STRC, Azzazy is the leader of the novel diagnostics and therapeutics research group. His research is centered on bionanotechnology, with a focus on developing new diagnostic tests and drug delivery platforms. Azzazy has extensive knowledge and experience in the development and optimization of immunoassays and molecular diagnostic assays. He also has expertise in antibody production, DNA vaccines, phage display and the employment of novel approaches for the detection of disease biomarkers, with a focus on cardiac markers and infectious agents.

Sherif Shawky
PhD student

Omar Zaki
PhD student

Nessma AbulKhair
MS student

Hamza El Dorry
Professor and Chair, Department of Biology
Biotechnology Group Leader

Hamza El Dorry is a professor and chair of AUC's Department of Biology. He received his BSc in toxicology and pesticides chemistry from the University of Alexandria's Faculty of Agriculture, and his PhD in biochemistry from the Department of Biochemistry, Institute of Chemistry, University of Sao Paulo, Brazil. El Dorry's doctorate is focused on enzymology and protein chemistry, as well as habilitation in biochemistry and molecular biology. Hamza completed his postdoctoral research at the Department of Molecular Biology, Albert Einstein College of Medicine in New York, after which he moved to the Department of Physiological Chemistry, Roche Institute of Molecular Biology in Nutley, New Jersey.

El Dorry served as a faculty member in the biochemistry departments at Cornell University Medical College and the University of Sao Paulo, Brazil. He was awarded the Cardiovascular Center Mellon Scholar in Basic Medical Sciences, and received the Scientific and Technological Merit Award by the government of Sao Paulo. He has published more than 50 articles in refereed journals, served as a thesis adviser for five MS and 12 PhD students, as well as a mentor for seven postdoctoral fellows. El Dorry's primary research interests are enzymology and regulation of metabolic pathways, regulation of gene expression, as well as structural and functional genomics.

PRINCIPAL INVESTIGATORS

Researchers

Noha Ali
MS student

Noran ElBadawy
MS student

Mahmoud Farag
Professor, Department of Mechanical Engineering
Nanostructured Materials Group Leader

Mahmoud Farag received his BSc in mechanical engineering from Cairo University (1959), and his MMet (1962) and PhD (1965) from the University of Sheffield in the United Kingdom. He was assistant professor at Ain Shams University from 1965 to 1971, after which he joined AUC. Farag was appointed as the first chair of the engineering department when it was established in 1984 and served as vice provost from 1992 to 2005.

Farag's research interests are focused on engineering materials and manufacturing. He has published four engineering textbooks, edited one book and written several engineering book chapters. He has also authored and co-authored more than 80 papers in academic journals and conference proceedings on issues related to the effect of microstructure on the behavior of engineering materials. His current research interests include studying the behavior of nanostructured materials, with an emphasis on NiTi alloys, natural fiber reinforced plastics and the use of quantitative methods in selecting materials for engineering applications.

In addition to his academic work, Farag has extensive industrial experience, having served as a board member of El-Nasr Company for Refractories and Ceramics (SORNAGA) from 1992 to 1999.

With more than 30 years of teaching experience, Farag has taught an array of materials courses at the undergraduate and graduate levels, in addition to manufacturing courses with a special focus on how processing affects the properties of materials.

Farag served as a visiting scientist/scholar at the University of Sheffield (United Kingdom), Massachusetts Institute of Technology and the University of Kentucky-Lexington (United States), Aachen Technical University (Germany), and Joint Research Center, Commission of the European Communities (Italy). He is a member of the American Society of Mechanical Engineers, the Materials Information Society, ASM International, the Institute of Materials Minerals and Mining, and the Egyptian Society for Engineers. He is listed in Marquise Who's Who in the World, Who's Who in Science and Engineering and Who's Who in Finance and Industry. Farag is a recipient of the Egyptian State Award for the Promotion of Science and the First Order of Merit in Arts and Sciences.

Taiba Gamaleddine
MS student

Samah Ghanem
MS student

Maria Ghattas
MS student

Jehane Ragai
Professor, Department of Chemistry
Surface Chemistry Group Leader

Jehane Ragai is a chemistry professor at AUC, where she served as chair of the chemistry department from 2000 to 2006 and chair of the University Senate from 1998 to 2000. Ragai is currently head of the surface chemistry group at the YJ-STRC.

In 2008, Ragai was a member of the international jury for the L'Oreal-Unesco Women in Science Award, founded by Nobel laureate Christian de Duve and chaired by Nobel laureate Ahmed Zewail. Since 2007, she has served as an editorial board member of the international journal, A*dsorption Science and Technology*.

Previously, Ragai served as a member of two national committees for the development of higher education in Egypt (appointed by the Minister of Higher Education), the National Committee for Basic Sciences and Development (appointed by the Minister of Scientific Research), and the National Committee for the Study of the Giza Sphinx (appointed by the Egyptian antiquities organization). In the early 1980s, she was a chemical consultant to the Sphinx Project conducted by the American Research Center in Egypt. From 1987 to 1991, she was appointed as an honorary research fellow at Brunel University in West London. At AUC, she was the School of Sciences and Engineering faculty representative at the Board of Trustees Century Committee.

With a total of 45 published refereed papers and conference proceedings, Ragai's research interests are in the field of surface chemistry, and her published work deals with the gas/solid and liquid/solid interfaces. She also has a keen interest in archaeological chemistry and has published several articles that deal with the interaction of the humanities and the sciences. Ragai is a member of the American Chemical Society and a former member of the New York Academy of Science.

Ragai was invited as a lecturer at various institutions including Cambridge, Cornell, Exeter, North Carolina at Raleigh, Princeton and Rutgers universities, as well as the Mahmoud Khalil Museum in Cairo, the American University in Paris and the French National Center for Scientific Research in Marseille. In February 2009, she was also invited by the Fitzwilliam Museum in Cambridge as the keynote speaker at the Marlay Lecture.

Ragai holds a BS in chemistry and an MS in solid state science, both from AUC. In 1976, she earned her PhD in surface chemistry from Brunel University in West London. Her general interests include poetry, music and jewelry making.

PRINCIPAL INVESTIGATORS

Researchers

Bassem Guirgis
MS student

Mohamed Hussein
MS student

Hanadi Salem
Professor, Department of Mechanical Engineering

Hanadi Salem has been an associate professor at AUC's Department of Mechanical Engineering since Fall 1999. She received her BS and MS in materials science and engineering from AUC, and her PhD in mechanical engineering with a specialization in materials and manufacturing in 1997 from Texas A&M University.

Salem is one of the founders of the YJ-STRC, and served as its associate director from 2007 to 2009. She has taught courses related to engineering materials, materials design, nanomaterials synthesis, processing and applications, failure in mechanical components, composite materials, as well as other fields.

Outside AUC, Salem worked as a research associate in the Department of Materials Science, Georgia Institute of Technology and at the University of South Carolina. She was also a visiting professor at North Carolina State University and the Royal Institute of Technology in Stockholm, Sweden. She has research collaborations with prolific researchers and principal investigators at Birmingham and Manchester universities in the United Kingdom.

Salem's research interests include the synthesis and fabrication of nanomaterials, starting from micronpowders refined into nanosized powder particles with a nanosize internal structure. In her research on the production of nanostructured bulk products with superior properties, she employed various techniques including a combination of the powder metallurgy technique and sever plastic deformation, such as high-energy ball milling for powders and equal channel angular extrusion, high-pressure torsion, twist extrusion for powder consolidation, as well as friction stir processing and welding for plates and sheets.

Salem has been published in more than 50 international journals and conference proceedings, and has received many grants in the field of nanomaterials synthesis and processing for high-performance applications. She has supervised more than 40 MS and PhD students, and is a key reader and reviewer in many international journals in the field of materials science.

Kareem Khairalla
MS student

Samar Mamdouh
MS student

Raghda Ramadan
MS student

Amr Shaarawi
Professor, Department of Physics
Associate Dean for Graduate Studies and Research

Amr Shaarawi is the holder of two BSc degrees in electrical engineering (1978) and physics (1980), both from Cairo University. Shaarawi received his MSc (1984) and PhD (1989) in electrical engineering from Virginia Polytechnic Institute and State University. As a graduate student, he worked on the characterization of dielectric materials using time domain techniques, hybrid microelectronics and the study of the slow decay of ultra-wideband localized pulses.

In 1989, Shaarawi joined the Department of Engineering Physics and Mathematics at Cairo University as an assistant professor, teaching undergraduate and graduate physics courses to engineering students. Shaarawi is a recipient of a Fulbright Senior Research Fellowship, spending the 1996 - 1997 academic year as a visiting Fulbright scholar at the Bradley Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University. In 1998, he was promoted to associate professor at Cairo University, and a year later, he joined the physics department at AUC. In addition to his teaching duties at AUC, Shaarawi was the coordinator of a Core Curriculum course, Scientific Thinking, from 2000 to 2008, and is affiliated with the YJ-STRC. Since 2006, Shaarawi has been serving as the associate dean for graduate studies and research at AUC's School of Sciences and Engineering.

Shaarawi's research interests include theoretical studies of ultra-wideband localized pulses and ultra-fast transmission of tunneling pulses. In addition, he works on the modeling of ultra-short slowly decaying pulses, their generation, propagation and scattering. He also conducted research in the field of photonics band-gap materials.

Shaarawi is a member of the Optical Society of America, the Antennas and Propagation Society, the Photonics Society, the Institute of Electrical and Electronics Engineers, and Phi Kappa Phi Honorary Society. Shaarawi also served as an adviser for the Society of Physics Students AUC chapter for eight years.

PRINCIPAL INVESTIGATORS

Researchers

Ehab Salama
MS student

May Sallam
MS student

Edward Smith
Professor, Department of Construction and Architectural Engineering
Environmental Group Leader

Edward Smith is professor of environmental engineering at the Department of Construction and Architectural Engineering, and director of the graduate program in environmental engineering at AUC. Smith has more than 25 years of experience in environmental engineering education and research, with academic appointments at Southern Methodist University in Dallas, Texas and Kuwait University, in addition to AUC.

Smith is author and co-author of more than 100 refereed publications in environmental engineering journals and international conference proceedings, and has been the principal investigator on funded research totaling more than $2 million. In 2003, he was the recipient of AUC's first Excellence in Research Award, and was issued a U.S. patent in 1997 for a process to treat contaminated water using recycled waste material.

In addition to teaching undergraduate and graduate courses in engineering sciences and environmental engineering related to water and pollution control, Smith has served as an adviser to more than 30 MS and PhD thesis graduates. He has also participated in international academic symposia and consultancies in environmental engineering in the United States, Mexico, Lithuania, Russia, Nigeria, Kuwait, Egypt, Uzbekistan and Turkmenistan. Smith holds a BSc and MSc in civil engineering in 1977 and 1980, respectively, from the University of Delaware, and a PhD in environmental engineering from the University of Michigan, Ann Arbor, in 1987.

Smith and his wife, Laurie, have resided in Cairo since 1998 and are the parents of five children.

Hani Tawfik
MS student

Mohannad Yomn
MS student

Ahmed Abdelgawad
Research assistant

Suher Zada
Professor, Department of Biology

Suher Zada received her BSc with honors in chemistry and zoology (1965) from the Faculty of Science, Cairo University. After graduation, she taught science and premedical students at the zoology department. She then received her MSc (1969) and PhD (1975) from Cairo University with an external examiner from St. Mary's Hospital Medical School in London, Professor Angus d' A. Bellairs. In 1989, Zada became professor of immunology and embryology.

In 1991, Zada joined AUC as a part-time faculty member. In 1998, she became a full-time professor at the university and was asked to help develop a biology major. The program flourished, and its first students graduated in 2000. Zada became a tenured professor in 2004 and served as chair of the biology department from 2004 to 2006.

With a passion for immunology, Zada studied the ontogeny of hemopoietic and lymphopoietic tissues in the lizard Chalcides ocellatus and published her work in the *Journal of Morphology* and in *Developmental and Comparative Immunology*.

Zada's work has taken several productive paths involving the use of different technologies and assays. The first was during her move to France, where she worked at the internationally recognized Cellular and Molecular Embryology Laboratory of Professor Nicole le Douarin, member of the French Academy of Science. During her time there, she published two articles, one in *C. R. Academie des Sciences*, and the other in *Cell and Tissue Research*. A third paper published in the *Journal of Immunobiology* represents the first substantial work on the molecular characteristics of snake immunoglobulin using monoclonal antibodies. Zada's work was later geared toward a more biomedical approach to problems of the immune system, working on schistosomiasis and inflammatory cells of the liver. Her research results were published in the *International Journal of Parasitology* and *Acta Pathologica Microbiologica et Immunologica*.

As hepatitis C disease followed schistosomiasis, Zada has become increasingly concerned with common public health threats in Egypt that lead to hepatocellular carcinoma. She has now begun the use of advanced techniques in nanotechnology and computational studies, and was recently published on the topic in the *Annals of the New York Academy of Sciences*, 2009.

PRINCIPAL INVESTIGATORS

Researchers

Mohammad Abdo
Research assistant

Mohamed Beshr
Research assistant

Ehab Abdel Rahman
Associate Professor, Department of Physics

Ehab Abdel Rahman is an assistant professor of physics at AUC. He received his BSc and MSc in physics from Helwan University in 1988 and 1993, respectively. In 2000, he earned his PhD in physics from the University of Utah. He joined AUC as a full-time faculty member in Fall 2006. His primary teaching activities are in the areas of optics, nuclear physics, modern physics, quantum physics and acoustics.

Research conducted by Abdel Rahman is multidisciplinary, focusing on developing smart functional materials, as well as energy generation and conservation. Abdel Rahman holds several patents for developing miniaturized devices capable of pumping thermal energy into or out of a desired volume. He has conducted research on selecting the appropriate material for self-tuned smart windows, which control the intensity of light and heat, and can, in turn, significantly reduce energy consumption in a certain region.

Abdel Rahman is the recipient of the 2010 President's Distinguished Service Award from AUC. Upon receiving the award, Abdel Rahman was commended by Medhat Haroun, dean of the School of Sciences and Engineering, as follows:

"Dr. Ehab Abdel Rahman is a prolific developer and writer of educational and research proposals that often find their way on the favorable side at funding agencies. In only four years since he joined AUC, Dr. Abdel-Rahman and his colleagues have succeeded in raising well over $10 million to fund innovative educational and research ideas. His first successful proposal, with [Physics] Chair Hosni Omar, was a TEMPUS project for improving physics education in Egypt. As part of this grant, AUC was able to develop the renowned Fun Laboratory, where students can experience the fundamentals of physics through well-developed demonstration experiments. Shortly after his first grant, Dr. Abdel-Rahman was also successful in attracting another TEMPUS project, but this time with AUC being, for the first time in Egypt, the grant holder of an EU project. The project, which is titled Enterprise University Partnership, has a main objective of establishing four technology transfer offices in four Egyptian universities. Upon its completion, it will have a profound impact on the transfer of academic research to practical applications.

Other examples of Dr. Abdel-Rahman's success story are the project on Leadership in Higher Education Management, having the main objective of improving leadership, governance and management of the MEDA region higher education, and the European Erasmus Mundus exchange program that enables AUC undergraduate and graduate students to study for a limited time at European universities."

Mahmoud ElHefnawy
Research associate

Ola ElKateb
Research assistant

Joseph Ernest
Research assistant

Amal Esawi
Associate Professor, Department of Mechanical Engineering

After completing her BS in mechanical engineering (1989) and MS in materials engineering (1990), both from AUC, Esawi joined the University of Cambridge in the United Kingdom, where she obtained her PhD in the field of materials and manufacturing process selection (1995). She was then appointed as a postdoctoral research associate at the Engineering Design Center of Cambridge University Engineering Department, working under Professor M. F. Ashby until 2000. The research methodologies she developed during both her doctoral and postdoctoral studies were implemented in the Cambridge Engineering Selector, the world's leading teaching resource for materials in engineering, science, processing and design used by more than 600 universities worldwide. In 2001, she joined the mechanical engineering department at AUC.

Esawi is one of the founding members of the YJ-STRC and was its assistant director during the first years of its operation. In addition to teaching and research, Esawi has served on the University Senate and is currently a member of several university, departmental and school committees. She is a chartered engineer — the only female chartered mechanical engineer in Egypt — and a member of the British Institute of Mechanical Engineers, the American Society of Mechanical Engineers and the Egyptian Syndicate for Engineers. Esawi was the co-chair and technical chair of the ASME Second Multifunctional Nanocomposites and Nanomaterials Conference and Exhibition, which was held in Sharm El Sheikh, Egypt in 2008. She is also a reviewer for several international journals in the field of nanocomposites.

Dr Esawi's current research interests are in the field of nanocomposites with a particular emphasis on carbon nanotube reinforced aluminium. Other on-going research projects focus on Clay nanocomposites, Nanocomposites for dental applications, Carbon nanotube strain sensors, Membrane materials, and Material Selection/Substitution. She has written two book chapters and has authored/co-authored over 30 peer-reviewed international journal and conference publications.

PRINCIPAL INVESTIGATORS

Researchers

Nafisa Hassan
Research assistant

Shaimaa Hassan
Research assistant

Adham Ramadan
Associate Professor, Department of Chemistry

Adham Ramadan obtained his BS from AUC in 1991, with a major in chemistry and a minor in computer science. He was the recipient of the President's Cup, awarded to the student with the highest grade point average in the graduating class. He went on to pursue graduate studies at Cambridge University in the United Kingdom, where he obtained his PhD in physical chemistry in 1996.

In 1997, Ramadan joined the Egyptian Environmental Affairs Agency, Ministry of State for Environmental Affairs, and in 2000, he moved to the field of private environmental consultancy. During his environmental career, Ramadan has been involved in a number of national and international initiatives concerned with environmental management at large, with an emphasis on the management of hazardous substances and wastes, which is his area of expertise. In 2003, Ramadan joined the Department of Chemistry at AUC.

Ramadan's research interests lie in the fields of catalysis, with a focus on the synthesis of different metal oxide catalysts and activated carbons; nanocomposites, with a focus on clay polymer and carbon nanotube polymer composites; studies of the solid-liquid interface at the nanoscale; in addition to hazardous substances and waste management.

Ramadan is a chartered chemist and a chartered scientist. He is a member of the Royal Society of Chemistry, the Society of Chemistry and Industry, the American Chemical Society, the International Adsorption Society and the International Association of Solid Waste Management.

Ahmed Kamal
Research associate

Mona Kamar
Research assistant

Mai Mansour
Research assistant

Rania Siam
Associate Professor, Department of Biology

Rania Siam serves as associate professor of biology and director of the biotechnology graduate program at the School of Sciences and Engineering. Siam's research interests are in cell cycle regulation and how genomic integrity is maintained during DNA replication. She has addressed these topics by studying replication origins in different model systems, and by examining the interaction of cell cycle regulatory proteins with different elements in the replication origin. She is interested in the model bacterium Caulobacter crescentus, as she believes this model bacterium will help her analyze how cell cycle regulation results in the replication competent and non-replication competent progeny. She has also focused on the closely related bacterium Rickettsia prowazekii and proposed a similar model for the regulation of replication at the replication origin.

Siam's resesarch interests research interests have evolved to explore replication origins in proteobacteria habituating harsh environments. In particular, she is interested in unidentified bacteria in the Red Sea. Utilizing environmental genomics, she is exploring bacterial vertical and horizontal zonation in the Red Sea and addressing how the organization of replication elements in the replication origin regulates the cell cycle under differential environments.

Siam holds an MBBCh from Ain Shams University, Faculty of Medicine. In 2001, she earned a PhD in microbiology and immunology from the Faculty of Medicine, McGill University in Montreal, Canada. Siam held several postdoctoral positions including McGill Oncology Group and Royal Victoria Hospital in Montreal, Quebec, Canada. She has also held positions at the Salk Institute for Biological Studies, Molecular and Cellular Biology Laboratory and The Scripps Research Institute, Department of Molecular and Experimental Medicine.

PRINCIPAL INVESTIGATORS

Researchers

Mahitab Mochtar
Research assistant

Ibrahim Rabie
Research associate

Ezzeldin Soliman
Associate Professor, Department of Physics

Ezzeldin Soliman was born in Cairo, Egypt in 1970. He received his BSc, with honors, in electronics and communications engineering from Cairo University in 1992, followed by a diploma (1993) and MSc (1995) in engineering physics from the same university. In 1996, he joined both the microwave group of the Interuniversity Microelectronics Center (IMEC) and the computational electromagnetics group of the Katholieke Universiteit Leuven, both in Belgium. He received his PhD in electrical engineering, with highest honors, from the Katholieke Universiteit Leuven in 2000.

Soliman became an assistant professor at Cairo University in 2000. For one years, he worked as a postdoctoral fellow at McMaster University in Canada, after which he returned to teaching at Cairo University, becoming an associate professor in 2005. He then joined King Abdulaziz University in Saudi Arabia, and stayed there for two years before joining AUC in 2007 as an associate professor. In addition, Soliman was invited several times as a visiting professor at both the Interuniversity Microelectronics Center and the Katholieke Universiteit Leuven.

Soliman has two main lines of research. The first deals with the development of novel designs of integrated antenna systems. His research in this area covers a wide range of operating frequencies, such as planar antennas operating in the RF and microwave ranges, in addition to MEMS antennas operating in the millimeter-wave range. Soliman has also invented several new miniaturized antenna devices that are known worldwide. His second line of research is directed toward computational electromagnetics. He has been interested in developing new techniques for the efficient and accurate simulation and optimization of planar microwave devices in layered media. His most recent research interest is the field of plasmonics.

Holder of three patents in the area of integrated antennas, Soliman has more than 40 technical papers published in the most reputable journals in the field, in addition to more than 20 publications and presentations in well-recognized international conferences. He is a member of the Institute of Electrical and Electronic Engineers, Antennas and Propagation Society, and the Microwave Theory and Techniques Society. He is also a member of the microfabrication group at the YJ-STRC. Soliman's biography is listed in Marquis Who's Who in Sciences and Engineering and Marquis Who's Who in the World.

Peter Refki
Research assistant

Radwa Riyad
Research assistant

Tamer Saeed
MS student

POSTDOCTORAL FELLOWS

Researchers

Mohy Safwat
Reseacher

Hany Saleeb
Research assistant

Christine Azer
Postdoctoral Fellow

In 1985, Christine Azer acquired her PhD in surface chemistry from Ain Shams University. She carried out part of her experimental work at the Ludwig-Maximilians University in Munich, Germany, working with Professor H. P. Boehm, one of the leading figures in inorganic chemistry. Currently, Azer is associate professor of physical chemistry at Ain Shams University, with research interests in physico-inorganic chemistry and catalysis.

Eman El Ahwany
Postdoctoral Fellow

Eman El Ahwany is an associate professor in the immunology department at the Theodor Bilharz Research Institute. Currently, she is taking part in the establishment a new immuno-molecular unit there. She has written articles in 10 international publications (with impact factor), as well as eight research papers published in local journals.

El Ahwany has been a part-time faculty member at AUC's biology department since 1999, instructing general biology and immunology labs. She was co-principal investigator in four successful projects. She is currently involved in research projects conducted by the YJ-STRC, and is taking part in four other projects funded by both AUC and the Theodor Bilharz Research Institute. The majority of her publications focus on hepatitis C and its complications.

Amro ElShurafa
Postdoctoral Fellow

Amro ElShurafa received his BSc (2001), MSc (2004) and PhD (2008) from the University of Dalhousie, after which he joined the MEMS/NEMS group at the YJ-STRC as a postdoctoral fellow. ElShurafa's research interests are RF MEMS, multi-physics simulations and microfabrication.

Amr Seleem
Research assistant

Eman Ramadan
MSc Student

Mohamed Maged
MSc Student

Ahmed Emira
Postdoctoral Fellow

Ahmed Emira was born in Cairo, Egypt, in 1974. He received his BSc (1997) and MSc (1999) in electronics and communications from Cairo University, and his PhD (2003) from Texas A&M University. He is currently an assistant professor at Cairo University's electronics and communications department, and a visiting scholar at King Abdullah University of Science and Technology.

From 2001 to 2002, he worked as an intern at Motorola in Austin, Texas, after which he served as design engineer in the wireless division of Silicon Laboratories in the same city. He then moved to the American University of Sharjah, teaching there for one year, after which he worked as a senior RFIC design engineer in Newport Media Inc., Lake Forest, California from 2006 to 2008.

Emira has consulted for a number of companies such as MEMS Vision, Newport Media Inc. and Silicon Vision. He has more than 25 journal and conference publications, as well as a number of U.S. patents (three issued and four pending). His current interests include mixed-signal circuits, analog filter design, RF circuits, MEMS interface electronics and wireless communication system architectures. Emira received the Third Best Student Paper award in Radio Frequency Integrated Circuits, Seattle, Washington, in 2002.

Mohamed Serry
Postdoctoral Fellow

Mohamed Serry was born in Cairo in 1975. He received his BSc (1999) in mechanical engineering from Ain Shams University, MSc (2003) from the University of Alberta and PhD (2007) from the University of Toronto. In 2008, he received a fellowship from the Japan Society for the Promotion of Science to work as a postdoctoral fellow at Kyoto University's microengineering department. A year later, Serry joined the micro and nanosystems group at the YJ-STRC as part of the collaborative research project with the King Abdullah University of Science and Technology. Serry has authored and co-authored more than 20 reviewed research papers.

Nahed Yacoub
Postdoctoral Fellow

Nahed Yacoub has been working at the YJ-STRC since 2006 with the surface chemistry group. Her research aims to study the surface properties of some metal oxides and mixed metals oxides that are used as catalysts. Yacoub received her BSc (1984) in chemistry from Ain Shams University, MS in solid state science (1988) from AUC and PhD (1998) in physical chemistry.

LABORATORY AND ADMINISTRATIVE ASSISTANTS

Sarah Refaat
Junior Secretary

Sarah Refaat graduated in 2009 with a bachelor's in accounting from the Faculty of Commerce, English Section, Ain Shams University. In 2008, she interned with Olympic Group as an assistant to the brand manager in the marketing communications department. She also received training in 2007 in the National Bank of Egypt's customer service department. As an undergraduate, she participated in many extracurricular activities and was one of the founders of an Egyptian non-governmental organization, working there as vice head for research and development, as well as project coordinator and project manager.

Rami Wasfi
Laboratory Engineer

Rami Wasfi received his BS in physics in 2006 from AUC. He began his career in the field of education, before joining the YJ-STRC in 2008 as a lab engineer. His work is centered on coordinating and facilitating the use of YJ-STRC facilities by the different research groups.

Mohamed Ibrahim
Laboratory Engineer

Mohamed Ibrahim received his BS in electrical engineering from Zagazig University in 2004, after which he joined the service team of Xerox International, where he was the first to receive the customer service engineer award for three consecutive years. In 2006, he was recognized as a Huawei certified network engineer, and in 2010, he received the service stars award from Xerox for exceptional customer service. Ibrahim holds an MBA from Westbrook University in Canada (2010) and works as part of the technical support team of the YJ-STRC.

Saleh George
Laboratory Technician

Saleh George graduated from the Technology Institute of Matariya in 1995. He joined AUC in 2001 as a junior technician, and in 2006, worked at the YJ-STRC as a lab technician. George's main areas of expertise are production technology, welding technology and electronics. He is married and has two children.

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