

PERSONAL INFORMATION

Sally M. Helmy Abdalla, PhD



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Sex Female | Date of birth 01 April 1988 | Nationality Egyptian

STUDIES APPLIED FOR

Membrane Biophysics, Extracellular Vesicles, Membrane-Membrane interactions, Liposomes, Supported Model Lipid Membranes, Drug-delivery systems, Conformational changes, Bacteriology, Antibiotics resistance, Cell culture.

LABORATORY EXPERIENCE

Lipid model membranes preparation, Extracellular Vesicles characterization, Calorimetry, Dynamic light scattering, Atomic force microscopy, Neutron reflectometry, Neutrons & X-ray scattering, Fourier-Transform infrared spectroscopy, Liposomal-drug loading.

CAREER

December 2024– Present

Lecturer of Biophysics

Biophysics group, Physics department, Faculty of Science, Ain Shams University, Egypt.

- Laboratory supervisor for 4th year biophysics students.

January 2017 – Nov 2021

Assistant Lecturer

Biophysics group, Physics department, Faculty of Science, Ain Shams University, Egypt.

- Conducting research & teaching physics labs for 1st year all majors' students, biophysics lab course and graduation projects for 4th year biophysics students, co-developing biophysics lab curriculum.

April 2011 – December 2016

Teaching Assistant / Demonstrator

Biophysics group, Physics department, Faculty of Science, Ain Shams University, Egypt.

- Conducting research and teaching physics lab courses for 2nd year all majors' students, biophysics lab courses for 3rd and 4th year biophysics students, co-developing biophysics lab curriculum.

EDUCATION

January 2021 – July 2024

PhD in Biophysics (Physics, Astrophysics and Applied Physics school)

36th School of Physics, Astrophysics and Applied Physics, UNIMI, Department of Medical Biotechnology and Translational Medicine, Università degli Studi di Milano, Italy

- PhD Thesis: “**Structural investigation of extracellular vesicles and their interaction with biomimetic interfaces**”. Final Grade: Excellent.

March 2017 – March 2019

Pre-Phd courses in Biophysics/Physics

Biophysics group, Physics department, Faculty of Science, Ain Shams University, Egypt.

- Theoretical Physics Courses: Thermodynamics, Classical Physics, Statistical Physics, Quantum Mechanics.

February 2013 – Nov 2016

M.Sc. in Biophysics

Biophysics group, Physics department, Faculty of Science, Ain Shams University, Egypt.

- M.Sc. Thesis: “**Interaction of various encapsulated antipathogenic drugs with phospholipid liposomes**”. Final Grade: Excellent.

Sep 2010 – Sep 2011

Pre-M.Sc. courses in Biophysics

Biophysics group, Physics department, Faculty of Science, Ain Shams University, Egypt.

Sep 2006 – June 2010

B.Sc. in Biophysics

Grade: Excellent, 1st in biophysics class 2010. Faculty of Science, Ain Shams University, Egypt.

STAGES ABROAD

- 1– 31 October 2023 **Internship in the Nannolnovation Laboratory – Elettra Synchrotron**
 Elettra Synchrotron, **Trieste, Italy**.
 ▪ *Project: “Atomic force microscopy measurements for studying the morphological & interaction mechanisms of extracellular vesicles with complex model membranes.”*
 Performing AFM measurements for characterizing extracellular vesicles and their interaction with a 3-component raft model membrane.
- 26 – 29 September 2023 **SAXS/WAXS Beamtime, European Synchrotron Research Facility**
 BM26 beamline at the **ESRF, Grenoble, France**
 ▪ *Project: “Extracellular vesicles characterization and interaction with model membranes”*
 Performing Small & Wide Angle Xray Scattering measurements on the structure of Extracellular vesicles and their interaction with model lipid membranes.
- 17– 22 October 2022 **NR & SANS Beamtimes, Budapest Neutron Centre**
 GINA neutron reflectometer & SANS Yellow submarine, **BNC, Budapest, Hungary**
 ▪ *Project: “Extracellular vesicles internalization mechanisms: role of target membrane composition”*
 ▪ *Project: “Structural characterization of multimodal innovative theranostic nanosystem”*
 Performing Neutron Reflectometry & Small Angle Neutron Scattering measurements for 1 week on the interaction of Extracellular vesicles & nanoparticles with model lipid membranes.
- 26 – 31 May 2022 **OFFSPEC NR Beamtime, ISIS Neutron & Muon Source**
 STFC Rutherford Appleton Laboratory, **Oxfordshire, Oxford, UK**
 ▪ *Project: “Carbohydrate-mediated protein-protein interaction at membrane surface”*
 Performing Neutron Reflectometry measurements for 1 week on the interaction of protein-protein membrane interactions and on Extracellular vesicles interaction with complex model lipid membranes. DOI: [10.5286/ISIS.E.RB2210183](https://doi.org/10.5286/ISIS.E.RB2210183)
- 31 March 2022 – 6 April 2022 **OFFSPEC NR Beamtime, ISIS Neutron & Muon Source**
 STFC Rutherford Appleton Laboratory, **Oxfordshire, Oxford, UK**
 ▪ *Project: “Interaction of model phospholipid bilayer membranes with Extracellular vesicles”*
 Performing Neutron Reflectometry and FTIR measurements for 1 week on the interaction of Extracellular vesicles interaction with simple model lipid membranes.
 DOI: [10.5286/ISIS.E.RB2210198](https://doi.org/10.5286/ISIS.E.RB2210198)
- 15 February 2021 – 30 April 2021 **Internship in the Nannolnovation Laboratory – Elettra Synchrotron**
 Elettra Synchrotron, **Trieste, Italy**.
 ▪ *Project: “Atomic force microscopy measurements, aimed at studying the morphological, mechanical and interaction properties of extracellular vesicles.”*
 Performing AFM measurements for characterizing extracellular vesicles and their interaction with model membranes.
- 26 July 2015 – 2 October 2015 **Internship in the IHRS guest student program**
 International Helmholtz Research School of Biophysics & Soft Matter
 ‘IHRS BioSoft’, **Jülich, Germany**.
 ▪ *Project: “Doxorubicin delivery into cancer cells using fusogenic liposomes”*
- 18 May 2014 – 8 June 2014 **Internship in the JINR international students exchange practice**
 Joint Institute for Nuclear Research ‘JINR’, **Dubna, Russia**.
 ▪ *Project: “Non-destructive analysis of element & isotope composition by neutron spectroscopy methods”.*

PUBLICATIONS

- 1- **“A supported lipid bilayer to model solid-ordered membrane domains”**, Sally Helmy, Paola Brocca, Alexandros Koutsioubas, Stephen C. L. Hall, Luca Puricelli, Pietro Parisse, Loredana Casalis, & Valeria Rondelli – Journal of Colloid & Interface Science (2025), <https://doi.org/10.1016/j.jcis.2025.137333>
- 2- **“Integrated Strategies for a Holistic View of Extracellular Vesicles”**, Valeria Rondelli, Sally Helmy, Giulia Passignani, Pietro Parisse & Dario Di Silvestre - ACS Omega (2022), <https://doi.org/10.1021/acsomega.2c01003>

- 3- **"Calorimetry of extracellular vesicles fusion to single phospholipid membrane"**, Miriam Grava, Sally Helmy, Mario Gimona, Pietro Parisse, Loredana Casalis, Paola Brocca & Valeria Rondelli - *Biomolecular Concepts* (2022), <https://doi.org/10.1515/bmc-2022-0011>
- 4- **"Small extracellular vesicles impact on target membrane structure and dynamics"**, M. Grava, S. Helmy, M. Gimona, P. Parisse, L. Casalis, P. Brocca, V. Rondelli - *Nuovo Cimento C- Colloquia and Communications in Physics* (2022), <https://doi.org/10.1393/ncc/i2022-22196-2>
- 5- **"The status of Egyptian women physicists"**. M. Mohsen, Heba Kahil, R. Mohammed, & Sally Helmy. Country Paper in the AIP Conference Proceedings 2109, 050014 (2019); <https://doi.org/10.1063/1.5110088>
- 6- **"Preparation and Characterization of DMPC Liposomal-Gentamicin; Antibacterial Time-Kill Study on Escherichia coli ATCC 8739."**, Helmy, S., Mohamed, S. S., Mahmoud, S. S., & Talaat, M. S. - *International Journal of Innovative Science, Engineering & Technology* (2016), 3(8), 221-224 http://ijiset.com/vol3/v3s8/IJSET_V3_I8_27.pdf
- 7- **"Women In Physics In Egypt: Challenges And Progress"**, Karimat El-Sayed, Hala Hosny & Sally Helmy. Country paper in the International conference of women in physics '4th IUPAP' (2013) <http://aip.scitation.org/doi/abs/10.1063/1.4794238>

PERSONAL SKILLS

Mother tongue Arabic

Other languages English: Proficient user: C1 Level. **IELTS: 7.5** (Listening: 8, Reading: 9, Writing: 6.5, Speaking: 7)
Italian: Intermediate user: A2 Level

Communication skills

- Excellent communication skills gained through my experience in faculty teaching and travelling abroad for scientific trainings, collaborations and schools.
- Excellent communication skills with students gained through my experience as a faculty teaching assistant for over than 12 years.

Organisational / managerial skills

- Excellent organisational skills as main organizer for 5 national scientific conferences.
- Excellent team-playing skills gained from different internships and stages abroad.

Other personal/artistic skills

- Painting & crafting, owner of embroidery, resin & clay handmade accessories project.
- Playing oriental oud music, performed in 7 group concerts in Cairo Opera House.

HONOURS & AWARDS

- 2020-2024 Awarded with a fully funded PhD scholarship (mission call 2019/2020) from the cultural affairs and missions sector of the Ministry of Higher Education in **Egypt** to fund my PhD study in UNIMI, Milano, **Italy**.
- 2021 Best Poster Flash Presentation **"Extracellular Vesicles from neuroblastoma Neuro2a cells treated with OligoGM1, a biophysical insight"** in the 5th BIOMETRA Annual Workshop, LITA, Segrate, **Italy**.
- 2018 Best oral presentation **"Antibacterial activity and FTIR spectroscopy analysis for monitoring the phospholipid bilayer conformational changes induced by encapsulating antibiotics into DMPC liposomes"** at the 1st international conference on Particles, Materials & Energy, **Egypt**.
- 2016 Best oral presentation **"Antibacterial activity of liposomal amikacin against clinical isolates of s.aureus"** in the 3rd Arab conference on biophysics; "Biophysics in medicine & environment", **Egypt**.
- 2010 Medal of Superiority from Ain Shams University.
- 2010 Honour Certificate from the Egyptian Syndicate of Scientific Professions.

MEMBERSHIPS

- SIBPA – The Italian Society of Pure and Applied Physics.
- SISN – The Italian Neutron Spectroscopy Society.
- Egyptian assembly of women in physics.
- Egyptian assembly of pure and applied biophysics.
- Egyptian society of crystallography and its applications.

SELECTED SCHOOLS & WORKSHOPS

- Workshop "Tech4EVIta" - Advanced Technologies for Extracellular Vesicles, author of "Disclosing the mechanisms of interaction of different extracellular vesicles with complex model membranes", **Trieste, Italy** on **18-20 September 2024**.
- 7th Workshop of BIOMETRA, poster presentation "Membrane rafts mimics: exploiting biophysical tools to build up complex membrane models" & "A biophysical study of an innovative nanoconstruct designed for theranostic against Multiple Myeloma" in LITA, **Segrate, Italy** on **19 September 2023**.
- 6th Workshop of BIOMETRA, poster presentation "Integrative Techniques For Characterizing Extracellular Vesicles and Investigating Their Cellular Internalization Mechanisms" in LITA, **Segrate, Italy** on **20 September 2022**.
- The ISIS Small Angle Neutron Scattering Online Training Course, by the ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, **Oxfordshire, Oxford, UK** on **1-10 February 2022**.
- The Virtual ISIS Neutron Reflectivity Online Training Course, by the ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, **Oxfordshire, Oxford, UK** on **16-25 November 2021**.
- XXV International school of pure and applied biophysics on Quantitative analysis of optical imaging for Medicine and Biophysics: foundations, applications, and perspectives. **Online Winter School** by: Società Italiana di Biofisica Pura e Applicata, Università di Milano-Bicocca Milano, Institute Pasteur, Paris CNR, ISASI Napoli, on **18-21 January 2021**.
- 5th Workshop of BIOMETRA, Winner of the best Poster Flash Presentation on "Extracellular Vesicles from neuroblastoma Neuro2a cells treated with OligoGM1, a biophysical insight" in LITA, **Segrate, Italy** on **27 September 2021**.
- School on Biophysical approaches to macromolecules and cells: Integrated tools for life sciences and medicine in **Arusha, Tanzania** on **9-20 September 2019**.
- Workshop on "Computational techniques using Python programming" in the Physics Department, Faculty of Science, Ain Shams University in **July 2018**.
- Workshop on "Using technology in teaching" held in the Training & Development Center of Ain Shams University, **May 2018**.
- Workshop on "Scientific writing" held in the Training & Development Center of Ain Shams University, **May 2018**.
- Workshop on "Examination systems & student assessment" held in the Training & Development Center of Ain Shams University, **May 2018**.
- Workshop on "Ethics & Professional Behaviour", held in the Training & Development Center of Ain Shams University, **June 2016**.
- Workshop on "Data Management and Basic Statistics", held in the Training & Development Center of Ain Shams University, **June 2016**.
- Workshop on "International publication of scientific research", held in the Training & Development Center of Ain Shams University, **June 2016**.
- Organiser & speaker in the workshop of Egyptian women in physics on "Career development for Young Women Physicists in Egypt" held in the Physics Department, Faculty of Science, Ain Shams University on **December 2015**.
- The 12th International Workshop on "Synchrotron Radiation in Nanomaterials" held in El-Gouna, Hurghada, Red Sea, Egypt on **November 2014**.
- The 11th International school and workshop of crystallography on "Macro-Molecular structure of biological & non-biological materials" held in Hurghada, Red Sea, Egypt on **November 2012**.
- Workshop on "Quality standards in the educational process", held in the Faculty and Leadership Development Center (FLDC), **June 2012**.
- Workshop of the Egyptian assembly of pure & applied biophysics held in the faculty of science, Al-Azhar University on **December 2010**.

CONFERENCES

- Co-Author of "Extracellular vesicles internalization mechanisms into cells" in the European Conference on Neutron Scattering, **Garching, Germany** on **20-23 Mar 2023**.
- Co-Author of "Extracellular Vesicles: structure and interaction with model plasma membranes" in the BESS 'Bilayers at ESS' conference in **Lund, Sweden** on **13-15 June 2022**.
- Co-Author of "Internalization of extracellular vesicles in model membranes" in the **Online 107^o Congresso Nazionale della Società Italiana di Fisica** on **28 June-01 July 2021**.
- Co-Author of "DSC unveils new aspects of extracellular vesicles mixing with model membranes" in the **Online 107^o Congresso Nazionale della Società Italiana di Fisica** on **13-17 September 2021**.
- Speaker on the First International Conference on Particles, Materials and Energy in **Luxor, Egypt** on **December 2018**.
- Speaker in the 7th Annual International Ain Shams University Conference, "Internationalization and Mobility", **April 2018**.
- Speaker in the First International Conference of Faculty of Science, Ain Shams University, New Frontiers in Science, **Hurghada, Egypt, October 2017**.
- One day Symposium on "Structural Role of Crystallography in Pharmacological Sciences" held in the National Research Center, **Egypt** on **September 2014**.
- One day Symposium on "Recent Trends in Biophysics" held in the Central Library at Cairo University, Biophysics Department on **September 2014**.
- **Organizer** of the Egyptian one-day Symposium "The Egyptian Nuclear Program prospects for construction of the nuclear power plant at El-Dabaa", held in Ain Shams University on **March 2012**.
- 4th IUPAP International Conference on Women in Physics held in **Stellenbosh, Cape Town, South Africa, April, 2011**.
- The National conference of women in physics in **Egypt** on **October 2010**.