



# Ghada KHAWAJA, PhD

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## SUMMARY

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Molecular Biologist and Immunologist with more than 10 years of experience in teaching courses in both undergraduate and graduate levels for Science and Biomedical engineering students. Served as main and co-supervisor for 16 Master's thesis and 5 PhD dissertations and examiner for several graduate theses' evaluation. My research interests lie in understanding the dynamics of the immune system in disease states e.g. infectious diseases, inflammation, autoimmunity and cancer through disease-relevant experimental models. In addition to prophylactic and therapeutic areas, like vaccine formulation and immunogenicity evaluation, phytotherapy and cancer epigenetic therapy.

## PROFESSIONAL APPOINTMENTS

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**2018 - Present**      **Assistant Dean**  
*Beirut Arab University, Faculty of Science*

- Forged and developed new relationships with international institutions
- Worked collaboratively in reviewing and reinforcing the Faculty programs to provide students with scientific knowledge as well as transferrable skills to meet with market needs.
- Oversaw and coordinated all activities that support student recruitment, registration and orientation.
- Conceptualized and organized a series of Internship and Career Talks to connect students, graduates and alumni with potential employers and help them explore career options and internship opportunities in the market.
- Conceptualized and coordinated a series of Career Development Workshops to provide students with the foundational "soft skills" and enhance workforce readiness.
- Reinforced local internships programs in schools, pharmaceutical companies, healthcare centers, hospitals, industries as well as international research collaborations.
- Reinforced the services that could be provided to communities and businesses to improve community engagement and outreach.
- Strengthened relationships with Faculty alumni and stakeholders.
- Assisted in the preparation of Faculty-related documents: curriculum, annual reports, quality assurance reports, Faculty webpage content, etc. according to BAU policies and procedures.
- Managed and coordinated Science Outreach Programs to High School Students.
- Assisted the Dean in day-to-day administrative operations.

**2012 - Present**     **Assistant Professor of Molecular Biology & Immunology**  
*Beirut Arab University, Faculty of Science, Department of Biological Sciences*

- Full time faculty member.
- Worked in a professional, collegial and team-oriented mindset.
- Taught a total of 15 undergraduate and 6 graduate courses, including Clinical Immunology, Microbiology & Immunology and Molecular Biology & Genetics for Medical Faculties' students.
- Supervised 15 Master's thesis projects and 4 PhD dissertations and served as an examiner for several graduate thesis' evaluation.
- Supervised undergraduate senior students' projects.
- Supported effectively undergraduate and graduate students through academic advising and office hours.
- Established concentrations within the Department undergraduate programs.
- Participated in the development of new specializations in MS programs.
- Participated in all quality assurance activities.

## **EDUCATION**

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- 2008 - 2012**     **PhD - Molecular Biology, virology & Immunology**  
*Claude Bernard Lyon1 University (UCBL), FRANCE*  
Mentors: Pr. Lucyna COVA, Lyon Cancer Research Center, UCBL  
Pr. Thierry Buronfosse, *VetoAgro Sup, UCBL*
- 2007 - 2008**     **Master of Research – Structural and Functional Biochemistry**  
*Claude Bernard Lyon1 University, FRANCE*
- 2003 - 2007**     **Master of Chemical Sciences - Specialty: Biochemistry**  
*Lebanese University, LEBANON*

## **RESEARCH EXPERIENCE**

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- Projects Undertaken, Beirut Arab University** 2012-2023
- Studies of association between genetic variations, including single nucleotide polymorphisms (SNPs) and variation in Rheumatoid arthritis (RA) disease susceptibility in the Lebanese population.
  - Investigating the therapeutic effect of several promising natural antioxidants with anti-inflammatory activities in modulating the progression of Rheumatoid Arthritis disease and/or circumventing the hepatocellular toxicity induced by conventional treatment using an experimental model for RA in rats known as Adjuvant-Induced Arthritis model.
  - Investigating complementary & alternative treatment strategies (natural compounds or epigenetic drugs) for Colon Cancer and deciphering the impact of combined therapy *in vitro* on proapoptotic, antiproliferative and proliferative pathways.
  - Molecular detection of Antimicrobial resistance and virulence markers.

- Doctoral Researcher, Cancer Research Center-Lyon affiliated to UCBL** 2008-2012
- Thesis: "Development of a therapeutic DNA vaccination against chronic hepatitis B infections".
- Investigated the effect of an Electroporation-based DNA delivery approach on the safety, immunogenicity and dose-efficiency of a prophylactic DNA vaccine, and on the immunotherapeutic efficacy of a DNA vaccine for chronic Hepatitis B virus infections. In a preclinical animal model, I provided first evidence on the efficiency of this novel delivery approach to cure chronic Hepatitis B, which has been extrapolated to clinical research and reached phase II trials.

## PROFESSIONAL SKILLS

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### Molecular Biology techniques

Plasmid construction, Plasmid and genomic DNA and RNA isolation, PCR, RT-PCR, Plasmid Giga preparation, Enzyme and hormonal assays, Gene cloning from bacteria, Protein isolation, SDS-PAGE, Western blotting,

### Immunological techniques

Radioimmunoassay (RIA), Enzyme-Linked Immunosorbent Assay (ELISA), Epitope mapping, Serum virus neutralization assays, Isolation of leukocyte subpopulations, Assessment of functional activity of lymphocytes by ELISPOT, Detection of T-cell subsets through intracellular staining for expression of cytokines

### Cell Biology techniques

Cell culture and maintenance, Physiological assays investigating cellular death, growth and apoptosis, Light / Fluorescent microscopy, Establishment of primary cell cultures, Flow Cytometry

### Histological techniques

Histological processing and sectioning of paraffin embedded tissues, Differential staining of tissue sections, Immunohistochemistry

### Bioinformatics

Next-generation sequencing analysis, Molecular sequence analysis, Primer design.

### Animal handling

### Teaching

Curriculum design and development, syllabus construction, lecturing.

### Computer skills

Advanced user of Microsoft Office Suite, including Excel, PowerPoint and Word, Graphpad Prism

## THESIS SUPERVISION

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### PhD. Thesis Supervision

- **Katia Sawaya**; "Effect of the Desert Truffle *Terfezia boudieri* extracts on Colon Cancer Cell Lines" (co-supervision – **In progress**)
- Sonia Abou Najem; "Effect of Epigenetic Therapy on Acute Myeloid Leukemia and Colon Cancer" (**Main supervision - collaboration with Lebanese American University (LAU), Lebanon, submitted**).
- Mourouj Ismail; "Study of Cannabinoid Receptor 2 Gene Polymorphism in Rheumatoid Arthritis (RA) in Lebanese Patients and the effect of its Agonist  $\Delta^9$ -tetrahydrocannabinol on an RA mouse model" (**Main supervision - submitted**).
- Alissar Khatib; "The Dynamics of Antimicrobial Resistance of Some Food-Borne Pathogens in Lebanese Fresh Produce: Control and Prevention" (**co-supervision - submitted**).
- Alyaa Hamieh; "Microbial Diversity and Biological Treatment of Microbial Communities in Drinking Water Distribution Systems in Lebanon" (**co-supervision - submitted**).

### M.Sc. Thesis Supervision

- Bahaa Hassanieh; "Effect of Propolis and 5-Fluorouracil on HCT-116 cells" (**Co-supervision - Submitted**).
- Amine Salla; "Effect of the Co-treatment of the Essential Oil of Rosemary and 5-Fluorouracil on Colon Cancer *in vitro*" (**Co-supervision - Submitted**).
- Ahmad Kasha; "Effect of Metformin and/or Glimebride on some Inflammatory Markers in a Cohort of Iraqi Patients with Type II Diabetes Mellitus" (**Main supervision - Submitted**).
- Ahmad Al Aljanabi; Effect of Insulin and Saxagliptin on IL-6, CRP, CCL-2 and TNF- $\alpha$  in a Cohort of Iraqi Patients with Type II Diabetes Mellitus (**Main supervision - Submitted**).

- Farouk Al-Kaakour; "Investigating the Selective Inhibition of Regulatory T cells by Targeting PI3K Isoforms on Tumor Growth and Mice Survival". (Main supervision - collaboration with Georgetown University in US, Submitted).
- Mireille Annan; "Potential Therapeutic Effect of Chrysin in Arthritis Rat Model" (Main supervision - submitted).
- Ola Ghaziri; "The Potential Therapeutic Effects of Lebanese Ceratonia Siliqua in Arthritis Rat Model" (Main supervision - submitted).
- Farah Yazbek; "Prevalence and Antibiotic Resistance Pattern of Group B Streptococcus Isolated from Pregnant Women in South Lebanon" (co-supervision - submitted).
- Mohammed Alazzawi; "A study of the Cytokines Profile in Treatment-Naïve HCV Infected Patients in Iraq" (Main supervision - submitted).
- Youmna El-Orfali; "The Effect of Silibinin against Methotrexate-Induced Hepatotoxicity in Arthritis Rat Model" (Main supervision - submitted).
- Hanan Ismail; "The Effect of Indole-3-Carbinol on Methotrexate-Induced Hepatotoxicity in Arthritis Rat Model" (Main supervision - submitted).
- Hiba Hasan, "The Anti-inflammatory Effect of Indole-3-Carbinol and Silibinin in Collagen Induced Arthritis Mouse Model" (Main supervision - submitted).
- Mohammad Nsaif; "Antimicrobial Resistance Pattern in Biofilm Associated with Medical Devices" (co-supervision - submitted).
- Ghaida Mohamad; "Assessing the Antioxidant Activity of Rubus Hedycarpus Plant Extracts *in Vitro* and *in Vivo*" (co-supervision - submitted).
- Zeinab Naser El Dine, "Environmental Factors Affecting Microbial Pectinase Production" (co-supervision - submitted).
- Omar Asafiri; "Evaluating the Antibacterial Effects of Different Parts of Rubus hedycarpus Against Drug Resistant Bacterial Strains" (co-supervision - submitted).

## PUBLICATIONS

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- Proapoptotic and Antiproliferative Effects of the Desert Truffle *Terfezia boudieri* on Colon Cancer Cell Lines. Katia Sawaya, Sonia Abou Najem, **Ghada Khawaja**, Mahmoud Khalil. *Evidence-based Complementary and Alternative Medicine* 2023, <http://doi: 10.1155/2023/1693332> (IF 2.064)
- Adjuvant Epigenetic Therapy of Decitabine and Suberoylanilide Hydroxamic Acid Exerts Anti neoplastic Effects in Acute Myeloid Leukemia cells. Sonia Abou Najem, **Ghada Khawaja**, Mohammad Hodroj, Patil Babikian and Sandra Rizk, *Cells*. 2019 8(12). <https://doi: 10.3390/cells8121480>. (IF 4.366)
- Synergistic Effect of Epigenetic Inhibitors; Decitabine and Suberoylanilide Hydroxamic Acid, on Colon Cancer. Sonia Abou Najem, **Ghada Khawaja**, Mohammad Hassan Hodroj, Sandra Rizk. *Current Molecular Pharmacology* 2019, 12 (4). <https://doi.org/10.2174/1874467212666190313154531>. (IF 2.254)
- Effect of Adjuvant Epigenetic Therapy on KG-1 Acute Myeloid Leukemia Cells in Vitro. Sonia Abou Najem, **Ghada Khawaja**, Sandra Rizk. *Clinical Lymphoma, Myeloma and Leukemia* 2019, Volume 18, S207. <https://doi.org/10.1016/j.clml.2018.07.061>. (IF 2.02)
- Association of cannabinoid CB2 receptor gene (CNR2) polymorphism, Q63R variant, with Rheumatoid Arthritis in the Lebanese Population. Ismail M. & **Khawaja G\*** *Clinical Rheumatology* 2018, 37:2933. <https://doi.org/10.1007/s10067-018-4217-9>. (IF 2.042)
- Anti-Inflammatory, anti-oxidative and hepatoprotective effects of trans- $\Delta$ 9-Tetrahydrocannabinol/sesame oil on adjuvant- induced arthritis in rats. Ismail M., Hasan H., El-Orfali Y., Ismail H., **Khawaja G.\*** *Evidence-based Complementary and Alternative Medicine* 2018, vol. 2018, Article ID 9365464, 13 pages, 2018. <https://doi.org/10.1155/2018/9365464>. (IF 2.064)
- Therapeutic Benefits of Indole-3-Carbinol in Adjuvant-Induced Arthritis and its Protective Effect against Methotrexate Induced-hepatic Toxicity. Hasan H., Ismail H., El-Orfali Y., **Khawaja G.\*** *BMC Complementary and Alternative Medicine*. 2018; 18(1):337. <https://doi.org/10.1186/s12906-018-2408-1>. (IF 3.020)

- Bacterial Diversity and Biofilm Formation in Drinking Water Distribution System in Lebanon  
Hamiyeh A, Olama Z, **Khawaja G.** *International Journal of Current Microbiology and Applied Sciences* 2015, Vol.4 (5), 976-990 (IF 0.16)
- Shiga Toxin-Producing E.coli (STEC) Associated with Lebanese Fresh Produce  
Khatib A, Olama Z, **Khawaja G.** *International Journal of Current Microbiology and Applied Sciences* 2015, Vol.4 (2), 481-496. (IF 0.16)
- Isolation, Purification and Identification of some Multi-Drug Resistant Food-Borne Pathogens in Lebanese Fresh Produce  
Khatib A, Olama Z, **Khawaja G.** *European Journal of Biology and Medical Sciences Research* 2015, Vol. 3 (1), 59-72.
- Enhanced magnitude and breadth of neutralizing humoral response to a DNA vaccine targeting DHBV envelope protein delivered by *in vivo* electroporation  
**Khawaja G.** Buronfosse T, Jamard C, Guerret S, Zoulim F, Luxembourg A, Hannaman D, Evans C, Hartmann D, Cova L. *Virology* 425 (2012) 61–69. (IF 2.819)
- *In vivo* electroporation significantly improves therapeutic potency of a DNA Vaccine targeting Hepadnaviral proteins  
**Khawaja G.** Buronfosse T, Guerret S, Zoulim F, Luxembourg A, Hannaman D, Evans C, Hartmann D, Cova L. *Journal of Hepatology* 2012 vol. 56 (2):S177. (IF 14.679)
- *In vivo* electroporation improves therapeutic potency of a DNA vaccine targeting hepadnaviral proteins  
**Khawaja G.** Buronfosse T, Abdul F, Jamard C, Guerret S, Zoulim F, Luxembourg A, Hannaman D, Evans C, Hartmann D, Cova L. *Virology* 433(2012)192–202. (IF 2.819)
- Co-Administration of Gamma Interferon Gene with DNA Vaccine Expressing Duck Hepatitis B Virus (DHBV) Proteins Enhances Therapeutic Efficacy of DNA-Based Immunization in Chronic Virus Carriers.  
Saade F, Buronfosse T, **Khawaja G.** Guerret S, Jamard C, Chevallier M, Pradat P, Zoulim F, Cova L. **Chapter 5, DNA Vaccines: Types, Advantages and Limitations** (2011) (E. C. Donnelly and A. M. Dixon, Ed.), pp. 119-130. Nova science publishers.

## MANUSCRIPTS Submitted

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- Article submitted to Q2 journal. Synergistic effects of the desert truffle *Terfezia boudieri* extract with conventional chemotherapeutics in cancer cell lines. Katia Sawaya, **Ghada Khawaja**, Mahmoud Khalil\*
- Article submitted to Farmacia. Synthesis of Ruthenium Complexes and their Antibacterial and Anticancer Effects. Ali Zeiz, Suzan Chaaya, Akram Hijazi, Eva Hamade, **Ghada Khawaja**, Mohammad H. El-Dakdouki\*
- Article submitted to Bioimpacts, Q2 journal. Molecular properties prediction, Anticancer and Anti-inflammatory Activities of Some Pyrimido[1,2-b]pyridazin-2-one derivatives. Ali Zeiz, Ranin Kawtharani, Mirvat Elmasri, **Ghada Khawaja**, Eva Hamadec,, Mohammad H. El-Dakdouki\*
- Article submitted. Cannabinoid Receptor 2 Gene (CNR2) polymorphism is associated with Rheumatoid Arthritis in Lebanese patients. Morouj Ismail1 & **Ghada Khawaja\***

## CONFERENCES

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- Abou Najem S., **Khawaja G.**, Hodroj H., **Rizk S.\*.** Effect of Adjuvant Epigenetic Therapy on KG-1 Acute Myeloid Leukemia Cells in vitro. *Soho Annual Meeting September 2018, USA*
- Hasan H., Ismail H., El-Orfali Y., **Khawaja G.** Therapeutic Benefits of Indole-3-Carbinol in Adjuvant-Induced Arthritis and its Protective Effect Against Methotrexate Induced-Toxicity. *2019 YOUNG BIOLOGIST SYMPOSIUM: Advances in Biological Sciences. (Best Poster award)*
- Hasan H., Ismail H., El-Orfali Y., **Khawaja G.** Indole-3-Carbinol: Potential therapeutic agent in the treatment of Arthritis. *1st Student Innovation & Research Conference for Arab Universities & Schools, 2018. (Award for best oral presentation)*



- Nsaif M., Yusef H., **Khawaja G.** Isolation of Microorganisms from Endotracheal Tube Biofilms. *22<sup>nd</sup> LAAS International Science Conference, Beirut, Lebanon (2016)*
- Mohammed, G., **Khawaja, G.**, El-Dakdouki, M.H. Assessing the antioxidant activity of the plant *Rubus hedycarpus* *in vitro* and *in vivo*. *22<sup>nd</sup> LAAS International Science Conference, Beirut, Lebanon (2016)*
- Assafiri, O., **Khawaja, G.**, El-Dakdouki, M.H. Assessing the Antibacterial Efficacy of *Rubus hedycarpus* and Qualitative Analysis of the Phytochemical Composition. *22<sup>nd</sup> LAAS International Science Conference, Beirut, Lebanon (2016)*
- Naser Z., **Khawaja G.**, Yusef H. Production of exo-polygalacturonase by microbial species isolated from agro wastes. *22<sup>nd</sup> LAAS International Science Conference, Beirut, Lebanon (2016)*
- **Khawaja G. et al.**, *In vivo* electroporation significantly improves therapeutic potency of a DNA vaccine targeting hepadnaviral proteins. *International congress of the European Association for the Study of the Liver (EASL), Barcelona, SPAIN (2012)*
- **Khawaja G. et al.**, Drastic increase of potency of DNA vaccine targeting hepadnaviral proteins by *in vivo* electroporation. *American Association for the Study of Liver Diseases (AASLD), San Fransisco, USA (2011)*
- **Khawaja G. et al.**, Augmentation de l'efficacité immunothérapeutique du vaccin à ADN par électroporation *in vivo* dans le modèle d'infection chronique du canard par le DHBV. *ANRS meeting, Paris, France (2011)*
- **Khawaja G. et al.**, Dramatic increase in prophylactic and therapeutic efficacy of DNA vaccine targeting DHBV proteins by *in vivo* electroporation. *International HBV meeting, Orlando, USA (2011)*
- **Khawaja G. et al.**, Augmentation de l'efficacité du vaccin à ADN nu, ciblant la protéine d'enveloppe du DHBV, par électroporation *in vivo*. *Journées francophones de virologie, Paris, France (2010)*

## TEACHING EXPERIENCE

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*Beirut Arab University, Faculty of Science*

### Undergraduate courses

- First Level Courses: Introduction to Biology (Freshman program), Biology I, Biology II, Human Physiology
- Second Level Courses: Cell & Molecular Biology, Immunology, Genetics, Cell & Tissue culture
- Third Level Courses: Histology, Virology, Biology Senior Project.

**Courses offered to Medical Faculties:** Microbiology & Immunology for Dentistry 1<sup>st</sup> level students, Clinical Immunology for Health Science students, and Molecular Biology & Genetics for Medicine students.

### General Elective Course offered to all University students:

Work Ready Now Course (Spring 2020\_2021): Taught a **new University elective** as part of the Higher Education Capacity Development (HECD) Program, supported by the United States Agency for International Development (USAID), and implemented by the Education Development Center (EDC).

### Graduate courses

MS courses: Advanced Immunology, Advanced Topics in Molecular Biology, Advanced Cell Biology, Research Techniques, Tissue Culture Techniques, and Individual Directed Studies.

PhD course: Seminar in Immunogenetics

## AWARDS AND HONOURS

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- **Doctoral Fellowship** awarded from Rhône-Alpes Regional Council Doctoral Research (Infectiology, Immunology, Cancerology cluster) 10/2008 - 09/2011.
- **Valedictorian MS graduate 2008**, Claude Bernard Lyon1 University.
- **B.Sc. graduate with high distinction**, Lebanese University.

## SERVICE

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- Member of Faculty Council Committee

- Head of Community Service & Alumni Committee 2019- present
- Head of BAU 3<sup>rd</sup> Annual Science Fair organizing committee 2022/2023
- Member of BAU Institutional Review Board committee 2022/2023
- Head of student activities committee 2017/2018
- Member of BAU Financial Aid Committee
- Member of Student Activities committee 2013-present
- Member of Quality Assurance Committee 2015/2016
- Head of the organizing committee of BAU 2<sup>nd</sup> Annual Science Fair event for High School Students 2021/2022
- Head of the organizing committee of BAU Virtual Science Fair event for High School Students (April 12 & 24, 2021).
- Managed the organizing committee of "Radiation in Everyday Life" Webinar (December 11, 2020)
- Member of the organizing committee of "Harmless use of nuclear and radiation energy" workshop organized in collaboration with the Lebanese Atomic Energy Commission (March 28, 2019)
- Member of the organizing committee of the first Student Innovation & Research Conference for Arab Universities & Schools (March 27 & 28, 2018).
- Member of the organizing committee of the first International Youth Leadership Camps at BAU (August 1st to August 12th, 2018).
- Member of the organizing committee of New Trends in Cancer Research workshop (November, 8 2016)
- Lebanese Association for Advanced Research (LAAS) reviewer, 2016

## **PROFESSIONAL MEMBERSHIP**

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Member of the Inter-University Cooperation Committee of UAOL (Universities Association of Lebanon)

## **Additional ACTIVITIES**

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- Attended HECD Grant Writing Webinar series (June 6-8, June 17- 24, 2022)
- Attended "Inspiring and motivating people" online course as part of leading people and teams specialization delivered by experts from University of Michigan (April 2022)
- Attended "Introduction to Project Management by ClickUp (March 2022)
- Attended "Grant Writing in Higher Education" workshop delivered by international experts from Florida State University as part of the Higher Education Capacity Development (HECD) Program funded by the United States Agency for International Development (USAID) (July 1st, 2021)
- Certified instructor for Work Ready Now Course, attended HECD WRN Virtual Training of Trainers workshop (Dec, 7-11, 2020)
- Invited Speaker at "Dardacha Talks" event, an initiative by the Dynamic Actions for Women in Research and Knowledge observatory (DAWREK'N) that aims to highlight the scientific research carried out by the female researchers in Lebanon (October 14, 2020).
- Attended Enhancement of Staff-members Teaching Skills workshops, BAU (2012, 2013 & 2018)
- Attended Radiation and Safe handling of radioisotopes training, IRSN, France (2009)
- Attended Tissue Culture training, Lyon Cancer Research Center, France (2008)

## **LANGUAGES**

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Full proficiency in **English and French**, Arabic (native language)

## **REFERENCES Available upon request**