

# Areej Mashhour Assaf, M.Sc PhD, Assistant Professor

## Personal details

University of Jordan

Faculty of pharmacy

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## Education

04/2005 –05/2008: University of Leicester, School of Medicine, Department of Infection, Immunity and Inflammation.

**PhD in Molecular and cellular Immunology in relation to cancer therapy. (Short listed for the excellent PhD performance in the School of Medicine, 2008).**

- **Title:** *Human Toll-like receptor 9 expression and function in haematological and non-haematological malignancies.*
- **Supervisor:** Dr. M J. Browning Senior Clinical Lecturer in Immunology
- **Project:** To investigate the expression of human Toll-like receptor (TLR) 9 in a panel of haematological and non-haematological tumour cells (*ex vivo* PBMCs and CLL B-cells, B cell lines and solid tumour cell lines) using RT-PCR, qRT-PCR, flow cytometry, IP/WB and confocal microscopy. Also, to address the relationship between TLR9 expression and immune response to its agonist, CpG ODN, by determining the upregulation of the immunologically relevant surface markers (CD54, CD80, CD86 and MHC II), cellular proliferation, cytokine release and the activation of the signalling pathways (MAPK, PI3K/AKT and NFκB)

Furthermore, I have investigated CpG-ODN/TLR9 ability to induce a refractory state in tumour B-cells that might be developed in cells after their preexposure to a low dose of CpG-ODN, and investigated the duration and nature of such state. Finally I have determined some of the molecular mechanisms that had a role in TLR9-intracellular signalling on the different aspects of B cell responses to CpG-ODN, by using specific inhibitors for the signaling pathways.

To accomplish these tasks, I investigated TLR9 expression by several methods such as PCR and qRT-PCR, confocal microscopy, flow cytometry, and immunoprecipitation/western blotting techniques. In addition to those, several molecular and immunological techniques such as reporter gene assay, gene transfection and cytokine assay were used to determine the function and immune responses indicated by the activation of TLR9 via CpG-ODN stimulation.

This study will provide valuable information on the response of tumour cells, as opposed to cells of the immune system, to CpG ODN as a potential immunotherapeutic agent. In addition, they should shed new light on the mechanisms of action of CpG activation of TLR9 signalling in immune and non-immune cells.

1991-1994 University of Jordan, School of Science. Jordan

**M.Sc Biological Sciences, Very good.**

**Dissertation:** *studies on antimicrobial resistant patterns and plasmid profiles of Enterobacteriaceae isolates in Jordan.*

1986-1991 Jordan University of Science and Technology, School of Medicine. Jordan

**B.Sc Allied Medical Sciences, Very good.**

## Publications and scientific posters:

- Areej M. Assaf, Randa N. Hadaddin, Nedhal A. Aldouri, Reem Alabbassi, Sundus Mashallah, Mohammad Mohammad, Yasser Bustanji. Anti-cancer, anti-inflammatory and anti-microbial activities of plant extracts used against hematological tumors in traditional medicine of Jordan. *Journal of Ethnopharmacology*. 2013;145(3):728-36.
- Yasser Bustanji, Nedhal AlDouri, Ala Issa, Sundus Mashallah, Areej Assaf, Talal Aburjai and Mohammad Mohammad. Cytotoxic effect of *Mercurialis annua* L methanolic extract on human solid cancer cell line. *Scientific Research and Essays*. 2012. Vol. 7(37), pp. 3218-3222, (<http://www.academicjournals.org/sre/PDF/pdf2012/20Sept/Bustanji%20et%20al.pdf>)
- Areej M. Assaf. Stress-Induced Immune-Related Diseases and Health Outcomes of Pharmacy Students: A pilot study. *Saudi Pharmaceutical Journal*. Areej M. Assaf. Stress-Induced Immune-Related Diseases and Health Outcomes of Pharmacy Students: A pilot study. *Saudi Pharmaceutical Journal*. 2013; Jan.21 (1): 35-44.
- Hudaib MM, Tawaha KA, Mohammad MK, Assaf AM, Issa AY, Alali FQ, Aburjai TA, Bustanji YK. Xanthine oxidase inhibitory activity of the methanolic extracts of selected Jordanian medicinal plants. *Pharmacogn Mag*. 2011 Oct;7(28):320-4.
- Assaf A. Esteves H. Curnow SJ and Browning MJ. A threshold level of TLR9 mRNA predicts cellular responsiveness to CpG-ODN in haematological and non-haematological cell lines. *Cell Immunol*. 2009; 259 (1):90-9.
- Assaf Areej and Michael Browning. CpG-Oligodeoxynucleotide (ODN): Breaking Down the Barriers to Cancer Immunotherapy. 2008. Al-Zaytuna University.

## Teaching Experience

09/08 – present . University of Jordan. Jordan

### **Assistant professor. School of Pharmacy, Dept. of Biopharmaceutics and Clinical Pharmacy.**

Teaching Immunology, Medical genetics, Clinical Chemistry, Biochemistry, Seminar in Clinical pharmacy courses and lab.

09/04 –12/07 University of Leicester, UK

### **Postgraduate Demonstrator**

- Whilst taking my PhD I have constantly been involved with the supervision of undergraduates in their practical classes. At any one time I have been personally responsible for as many as sixty students.

09/01-09/04 University of Sharjah , UAE

### **Lecturer, School of health Sciences-Medical Laboratory Technology**

- Teaching laboratory courses in molecular genetics lab., immunology and serology lab, general microbiology lab, medical bacteriology lab, and clinical diagnostic bacteriology labs.
- Clinical training supervision.
- I have established the Immunology and serology lab., general microbiology lab, medical bacteriology lab, and clinical diagnostic bacteriology labs.
- I have written the manuals for the general microbiology lab, medical bacteriology lab, and clinical diagnostic bacteriology labs.

09/97-09/00 Applied Science University , Jordan

### **Teacher, School of Pharmacy**

- Teaching taught courses and laboratory sessions of Biochemistry (I & II), Clinical Chemistry (I & II), Clinical Nutrition, Immunology, Research methods, and Microbiology lab. (I & II).

09/95-09/97 Ahlia Amman University , Jordan.

**Teacher, School of Pharmacy and Medical Sciences.**

- Teaching taught courses and laboratory sessions of Hematology, Blood Banking, Immunology and Urinalysis and body fluids.
- Training the fifth year students of Medical Technology at the Jordanian hospital laboratories.
- I have established the Hematology, Blood Banking, Immunology and Urinalysis and body fluids labs.
- I have written the manual for Immunology lab.

09/94-09/95 Applied Science University , Jordan

**Lecturer, School of Medical Sciences.**

- Teaching laboratory courses of Hematology, Blood Banking and General Biology.
- I have established the Hematology, and Blood Banking labs.
- I have written the manuals for the Hematology, and Blood Banking labs.

01/93-01/04 University of Jordan, Jordan

**Teaching assistance, School of Science-Biological Sciences**

- Teaching laboratory courses of Hematology, Microbiology and General Biology

## **Professional Experience**

12/09-12/12. External examiner.

**External examiner for five M.Sc students at the Faculty of Pharmacy, and Biotechnology. Jordan University of Science and Technology.**

05/08- 08/08 University of Leicester,

**Fellow visitor at Department of Infection, Immunity and Inflammation.**

09/04-09/01 Assaf Medical laboratory

**A medical technologist and Director Assistant.**

- Assisted in the establishment of " Assaf Medical Laboratories", in 1994.
- Supervision on Immunology and Microbiology departments .

01/92-07/04 Medical Establishment for Middle East. Jordan

**Medical Laboratory Technologist advisor**

- I worked part time as an advisor and responsible for the external communications and affairs.
- I used to order kits and to prepare reagents for laboratory use.
- Selling medical equipments.

06/90-09/90 Hussein Medical Center. Jordan

**Senior undergraduate Medical laboratory trainee**

- Training in the different medical laboratory departments and instruments

09/90-01/91 Jordan University Hospital. Jordan

**Senior undergraduate Medical laboratory trainee**

- Training in the different medical laboratory departments and instruments

## Conferences and Scientific Meetings

- A talk participation at the 15th Scientific Congress of the Association of Pharmacy Colleges in the Arab World & The 3rd International Conference of the Faculty of Pharmacy / The University of Jordan. held in Amman on October 9-11, 2012.
- A member of the execution committee for the 15th Scientific Congress of the Association of Pharmacy Colleges in the Arab World & The 3rd International Conference of the Faculty of Pharmacy / The University of Jordan. held in Amman on October 9-11, 2012.
- A talk participation at the 4<sup>th</sup> international conference for Allergy and Immunity. 19-21 September, 2012. Amman-Jordan
- A member of the execution committee for the 4<sup>th</sup> international conference for Allergy and Immunity. 19-21 September, 2012. Amman-Jordan
- A poster participation at the Seventh Palestinian Conference For Laboratory Medicine. Bethlehem, Palestine in March 15-17, 2012.
- A member of the execution committee for the third international conference for Allergy and Immunity. 13-15 October, 2010. Amman-Jordan.
- A talk participation at the Sixth Palestinian Conference For Laboratory Medicine. Al-Quds University, Jerusalem, Palestine in March 12-13, 2010.
- Attended the second AACR Dead Sea Conference in Jordan entitled “Advances in Cancer Research: From the laboratory to the clinic” March 7-10, 2010.
- Poster participation at the Second Middle East and North Africa (MENA) Cancer Research Conference. Amman- Jordan. October 2-3, 2009.
- Participated at the Targeting toll-like receptors - a new approach in the treatment of cancer, infection and autoimmunity meeting. The Royal Society of Medicine, London , UK. 9 Feb, 2009.
- Poster participation at the Jordanian International Pharmaceutical Conference, Alzaytoonah private University, Amman- Jordan. 15-17, Oct. 2008.
- Attended and participated the Leicester GRADschool 2007. 5-8.11.07. UK
- Represented the University of Leicester at the regional poster competition 2007 organised by UK GRAD Midlands Hub. 11.07.07. UK
- Poster participation and winner in the postgraduate festival 29.06.07. University of Leicester. UK
- Participation in the Second International JSP Conference ( [www.JSPLM.org](http://www.JSPLM.org) ) *Le Royal Hotel – Amman, Jordan. August 31 to September 3, 2006.*  
*Title of the talk :* The expression and function of human toll like receptor (TLR) 9
- The Robert Baldwin Symposium, 29-30, June 2005. Nottingham , UK.
- The Career symposium. Jan. 2005 ,2006 and 2007. University of Leicester , UK.
- Applied Molecular Biology in Medical Diagnosis and Forensic Medicine .Al-Amal Medical Center, Jordan, 19-20 May 1998

## Funded projects:

- Oct. 2009 – present: Molecular, cellular and *in vivo* approaches toward the treatment of colon cancer. Funded by the Deanship of Academic Research, University of Jordan. P.I
- Oct. 2010 – present: The impact of a brief naturalistic stressor (academic study and examination) on responsive cytokines in University of Jordan medical students (Pharmacy) during the fall semester 2010/2011. Funded by the Deanship of Academic Research, University of Jordan. P.I

## Courses and workshops

- Train of Trainers (TOT) Workshop. Certified by the Business Development Center and the British Embassy in Amman, Jordan. 6-10/12/2012.
- Competing Globally in Higher Education: Training on QA and Accreditation. A joint event between the Higher Education Accreditation Commission, Columbia University Middle East Research Center, Petra University , the American University of Madaba and al-Hussein Fund for Excellence. Jordan. June 19 - 20 , 2011
- Creative researcher workshop. University of Leicester , UK Feb. 2007

- Supervising undergraduates and master students. University of Leicester, UK. March. 2007
- Targeting cancer RAF. University of Leicester , UK Feb. 2007
- Protein electrophoresis workshop University of Leicester , UK Oct. 2006
- Legal and Ethical issues in research, University of Leicester, UK. May 2005.
- Pub med upgrade, University of Leicester , UK. Feb. 2005.
- Protein bioinformatics, University of Leicester , UK.. Dec. 2004
- Use of radiochemical in life science research, University of Leicester , UK. Nov. 2004.
- Powerful presentation, University of Leicester , UK. Nov. 2004
- Team working, University of Leicester , UK. Nov. 2004
- Endnote , University of Leicester , UK.. Nov. 2004
- Radiation safety and genetic modification regulations, University of Leicester , UK Oct. 2004
- Risk assessment, biological and chemical hazards, University of Leicester , UK.,Oct.2004
- Safety induction program, University of Leicester , UK. Oct. 2004
- University Library and information retrieval, University of Leicester , UK.. Oct. 2004

## Scientific skills:

### Molecular Biology:

Western blotting, Immunoprecipitation. Gene transfections (stable and transients), Southern blotting, DNA and RNA preparations, Reverse transcriptase PCR, Real Time PCR. Competent cell and transformation.

### Cell Biology:

Tissue culture (Adherent and suspension cells *ex vivo* and transformed cells), CD19+ cell separation, PBMCs cell separation, Cellular proliferation (<sup>3</sup>H-thymidine incorporation), Cell Signalling assays, cell transfection, Luciferase assay, Cytokines release assays, Cell Activation assays.

### Immunological assays:

Immunofluorescence staining (Flow cytometry (FACs) and Confocal Microscopy), ELISA, Ag-Ab reactions, Direct & Indirect agglutination, double and single radial immunodiffusion, Enzyme immuno assay, Immunochromatography, Immunoelectrophoresis, Serum protein electrophoresis, MLR.

### Microbiology:

Bacterial Culture, diagnostic and clinical microbiology techniques.

## Other skills:

1. Knowledge of Computer and Internet. Most of my work and analysis is by the use of computers and internet.
2. Team working; I have worked within a team in my lab. in addition to that I have worked in a team for three days at the Leicester GRADschool 2007.
3. Problem solving; I have solved most of the technique's problems involved in my research and helped to solve those involved in my colleague's work.
4. Communications; I have contacted lots of researchers in UK and USA working in relative projects for their help and discussed that with them
5. Decisions maker.
6. Independent; I used to read more and try different ways to decide for the best methods used.

## Awards/Honors:

- Short listed for the School of Medicine Lauder Doctoral Prize for Excellent MD or PhD performance. June , 2008, University of Leicester, UK
- Winner in the poster festival of the postgraduate research 2007. University of Leicester, UK

- Commended Certificate for the postgraduate presentation, 2005, University of Leicester, UK
- Professional Women's Advisory Board / American Biographical Institute, 2000

**Interests:**

Traveling and exploring countries, social activities reading, surfing internet, Sports and fine arts.

**General Skills:**

- Fluent Arabic Language (Native Language)
- Excellent: English Language .
- General Computer Skills: MS Word, MS Excel, MS Power Point, Internet Surfing.

**Affiliations:**

- Jordanian Society for Allergy and Immunity (*Member*).
- British Society for Immunology. (*Member*)
- Jordan Society for Medical Laboratory Sciences. (*Member*)
- Jordanian Biological Society (*Member*)
- International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) (*Member*).

**Professional Services:**

- A member of the execution committee for the fourth international conference for Allergy and Immunity. 19-21 September, 2012. Amman-Jordan
- A member of the execution committee for the third international conference for Allergy and Immunity. 13-15 October, 2010. Amman-Jordan.
- Member of the organizing committee of the 8<sup>th</sup> Arab Conference of Clinical Biology.
- Member of the organizing committee of the 1<sup>st</sup> Jordanian Conference of Medical Laboratory Sciences. Amman, Jordan, April 28<sup>th</sup>, 1997