Curriculum Vitae

Name: Prof. Dr. Mohamad Warda

Place of Birth: Alexandria – Egypt **Date of Birth:** 27 March 1967

Current Position: Professor and Director of Biochemistry & Molecular Biology Department

Previous director of Biotechnology Centre for Services and Researches (BCSR)

Faculty of Veterinary Medicine, Cairo University – Giza 12211, Egypt.

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Scopus ID: 11241886500
Scopus *h*-index: 18
Google scholar *h* index: 21
i10- index: 33

Scopus site: https://www.scopus.com/authid/detail.uri?authorId=11241886500
Google scholar: https://scholar.google.com.eg/citations?hl=ar&user=UDTABRUAAAAJ

Employment record		
Period (MM.YY – MM.YY)	**Place**	**Position**
08.19- current	Cairo University – Faculty of Veterinary Medicine Biochemistry & molecular biology Dept.	Director of Biochemistry & Molecular Biology Dept.
08.14 -11.14	Centre for Biotechnology and Interdisciplinary Studies at Rensselaer Polytechnic Institute (RPI), Troy –New York US.	Visiting Professor & expert for isolation and recovery of pure proteoglycans from fine tissues
03. 11- 05.14	Cairo University – Faculty of Veterinary Medicine Biochemistry & molecular biology Dept.	Director of Cairo University Biotechnology Centre for Services and Researches (BCSR)
05.09– 03.11	Cairo University – Faculty of Veterinary Medicine Biochemistry & molecular biology Dept.	Professor of Biochemistry & Molecular Biology
2007 – 2008	Alexander von Humboldt fellow at Chemie und Biotechnologie Department; Technischen Universität München (TUM)- Germany	Alexander von Humboldt fellow
08.05-07.07	Mitochondrial Signalling Laboratory, Department of Physiology and Biophysics, College of Medicine, Inje University, Busan- Korea	Visiting Associate Professor
05.04 – 05.09	Biochemistry Dept. Faculty of Veterinary Medicine– Cairo University	Associate Professor
08.01-11.03	Division of Medicinal and Natural Products Chemistry- College of Pharmacy, University of Iowa- USA	University Iowa Visiting Scholar
08.99-03.00	Bioenergetics and metabolic energy transfer Dept. at Medical Research Council (MRC), Cambridge- UK	Royal Society of Science Postdoctoral Fellow
06.98 -05.99	Gene Transfection Abteilung- Max Delbrueck Centre for Molecular Medicine (MDC) – Berlin, Germany	Visiting Researcher
04.98 – 05.04	Biochemistry Dept. Faculty of Veterinary Medicine– Cairo University	Lecturer
03.95-04.98	Biochemistry & Endocrinology Institute – Justus Liebig University –Giessen - Germany	Ph.D. student Sponsored by German Academic Exchange Services (DAAD)

01.93- 03.95	Biochemistry Dept. Faculty of Veterinary Medicine– Cairo University	Assistant lecturer of biochemistry

Most important achievements in Life Science

Recently, my working team is the first to elucidate the full sequence of Arabian camel (Camelus dromedarius) sodium/potassium-transporting ATPase subunit alpha-1 (ATP1A1), complete cds.

https://www.ncbi.nlm.nih.gov/nuccore/MW628635

We then screened the level of its expression in different dromedary organs to elucidate the connection with osmoregulation in this arid-lived animal:

Molecular characterization and differential tissue expression of alpha subunit 1 of sodium pump (ATP1A1) gene in Camelus dromedarius
Ahmad el Kasas; et al., and Mohamad Warda (Submitted to genomics)

I am the first who had resolved the dromedary camel (Camelus dromedarius) proteome on large scale from different organs

Mohamad Warda, Abdelbary Prince, Hyoung Kyu Kim, Nagwa Khafaga, Tarek Scholkamy, Robert J. Linhardt, Han Jin. Proteomics of old world camelid (**Camelus dromedarius**): Better understanding the interplay between homeostasis and desert environment. **Journal of Advanced Research.** 5 (2), 219-242. http://www.sciencedirect.com/science/article/pii/S2090123213000350

I was the first to resolve heparin as a GAGs candidate from camel intestine and proved its higher quality than that isolated from turkey intestine. The characterization of de-polymerized disaccharides was then investigated

Warda M, Gouda EM, Toida T, Chi L, Linhardt RJ. Isolation and characterization of raw heparin from dromedary intestine: evaluation of a new source of pharmaceutical heparin**.** ***Comp Biochem Physiol.*** 136(4):357-65. 2003.

Warda M, Mao W, Toida T, Linhardt RJ. Turkey intestine as a commercial source of heparin? Comparative structural studies of intestinal avian and mammalian glycosaminoglycans. ***Comp Biochem Physiol B Biochem Mol Biol,*** 134: 189–97. 2003.

I also had isolated and characterized heparan sulfates from various murine tissues

Warda M, Toida T, Zhang F, Sun P, Munoz E, Xie J, Linhardt RJ. Isolation and characterization of heparan sulfate from various murine tissues. ***Glycoconjugate J*** 23(7-8):555-63. 2006.

Our group in Iowa City University was the first to recover and characterize the human liver proteoglycans

Vongchan P, **Warda M**, Toyoda H, Toida T, Marks M, Linhardt RJ. Structural characterization of human liver heparan sulfate. ***Biochimica et Biophysica Acta,*** 1721: 1-8. 2005.

Full resolving the phospholipids of camel red blood cells and the stability of their derived liposomes

In 1998, Zeisig and I resolved the phospholipid structure of camel red blood cell membrane. We examined the stability of its derived liposomes in comparison with others from RBCs of mammals.

We published the following paper:

Warda M, Zeisig R.

Phospholipid- and fatty acid-composition in the erythrocyte membrane of the one-humped camel [Camelus dromedarius] and its influence on vesicle properties prepared from these lipids.

Dtsch Tierarztl Wochenschr. **2000 Sep;107(9):368-73.**

Isolation and characterization of camel milk-derived exosomes:

Dromedary milk exosomes as mammary transcriptome nano-vehicle: Their isolation, vesicular and phospholipidomic characterizations
Yassin, A.M.,Abdel Hamid, M.I.,Farid, O.A.,Amer, H.,**Warda, M.**
Journal of Advanced Research (2016) 7, 749–756

International Collaborators

(The recommendation letters can be send on demand!!)

Prof. Dr. Robert J. Linhardt
Ann and John H. Broadbent, Jr.'59 Senior Constellation Professor,
Biocatalysis and Metabolic Engineering
and Professor of Chemistry and Chemical Biology,
Biology and Chemical and Biological Engineering
Rensselaer Polytechnic Institute
Biotechnology Center 4005
110 8th Street
Troy, NY 12180-3590 USA
Phone: 518-276-3404 Fax : -3405
Website: www-heparin.rpi.edu
Email: linhar@rpi.edu

I am working with Linhardt since almost two decades. We did characterize different types of proteoglycans and tissue polysaccharides from different animals (2001-2003).
The stay was covered by visiting scholar fund of Iowa city (it was in college of Pharmacy –Iowa city at that time). The projects were supported by **NIH grants** from the States.
We still have running projects besides the below publications:

Ahmed-Farid OA, Haredy SA, Niazy RM, Linhardt RJ, **Warda M.**

Dose-dependent neuroprotective effect of oriental phyto-derived glycyrrhizin on experimental neuroterminal norepinephrine depletion in a rat brain model**.** Chem Biol Interact. 2019 May 28. pii: S0009-2797(19)30273-X. doi: 10.1016/j.cbi.2019.05.045. [Epub ahead of print]

Mohamad Warda, Abdelbary Prince, Hyoung Kyu Kim, Nagwa Khafaga, Tarek Scholkamy, Robert J. Linhardt, Han Jin. Proteomics of old world camelid (**Camelus dromedarius**): Better understanding the interplay between homeostasis and desert environment. **Journal of Advanced Research;** In press. Available online 26 March 2013
http://www.sciencedirect.com/science/article/pii/S2090123213000350

Warda M, Zhang F, Radwan M, Zhang Z, Kim N, Kim YN, Linhardt RJ, Han J. Is human placenta proteoglycan remodeling involved in pre-eclampsia? ***Glycoconj J.*** 25(5):441-50. 2008.

Warda M, Toida T, Zhang F, Sun P, Munoz E, Xie J, Linhardt RJ. Isolation and characterization of heparan sulfate from various murine tissues. ***Glycoconjugate J*** 23(7-8):555-63. 2006.

Warda M, Linhardt RJ. Dromedary glycosaminoglycans: Molecular characterization of camel lung and liver heparan sulfate. ***Comp Biochem Physiol B Biochem Mol Biol*.** 143(1): 37-43. 2006.

Vongchan P, **Warda M**, Toyoda H, Toida T, Marks M, Linhardt RJ. Structural characterization of human liver heparan sulfate. ***Biochimica et Biophysica Acta,*** 1721: 1-8. 2005.

Warda M, Gouda EM, Toida T, Chi L, Linhardt RJ. Isolation and characterization of raw heparin from dromedary intestine: evaluation of a new source of pharmaceutical heparin**.** ***Comp Biochem Physiol.*** 136(4):357-65. 2003.

Warda M, Mao W, Toida T, Linhardt RJ. Turkey intestine as a commercial source of heparin? Comparative structural studies of intestinal avian and mammalian glycosaminoglycans. ***Comp Biochem Physiol B Biochem Mol Biol,*** 134: 189–97. 2003.

➢ Review articles:

- Patents related to dengue virus infection **Mohamad Warda**, Robert J Linhardt, Rory M Marks Expert Opinion on Therapeutic Patents. 12: 1127-1143. 2002.

Jin Han MD, PhD
Principal Investigator, National Research Laboratory for Mitochondrial Signaling
Professor and Chair, Department of Physiology, College of Medicine,
Inje University
Director, Cardiovascular and Metabolic Disease Center, Inje University
633-165, Gaegeum-Dong, Busanjin-Gu
Busan 614-735, KOREA
Tel: +82 51 890 6727 Fax: +82 51 894 5714 email: phyhanj@inje.ac.kr;
phyhanj@hotmail.com; phyhanj@gmail.com
I worked in Han Jin Lab as visiting Professor for about three years (2005-2008).

The stay and project fund were supported via **Korean Research Fund** (KOSEF). We still have collateral collaboration.
We have published the following papers and patents:

Mohamad Warda, Abdelbary Prince, Hyoung Kyu Kim, Nagwa Khafaga, Tarek Scholkamy, Robert J. Linhardt, Han Jin. Proteomics of old world camelid (**Camelus dromedarius**): Better understanding the interplay between homeostasis and desert environment. **Journal of Advanced Research;** In press. Available online 26 March 2013
http://www.sciencedirect.com/science/article/pii/S2090123213000350

Kim HK, Park WS, **Warda M**, Park SY, Ko EA, Kim MH, Jeong SH, Heo HJ, Choi TH, Hwang YW, Lee SI, Ko KS, Rhee BD, Kim N, Han J. Beta adrenergic overstimulation impaired vascular

contractility via actin-cytoskeleton disorganization in rabbit cerebral artery. ***PLoS One.***7(8):e43884. 2012.

Ko JH, Ibrahim MA, Park WS, Ko EA, Kim N, **Warda M**, Lim I, Bang H, Han J. Cloning of large-conductance Ca(2+)-activated K(+) channel alpha-subunits in mouse cardiomyocytes. ***Biochem Biophys Res Commun.*** Nov 6; 389 (1):74-9. 2009.

Warda M, Zhang F, Radwan M, Zhang Z, Kim N, Kim YN, Linhardt RJ, Han J. Is human placenta proteoglycan remodeling involved in pre-eclampsia? ***Glycoconj J.*** 25(5):441-50. 2008.

Park WS, Ko JH, Kim NR, Son YK, Kang SH, **Warda M**, Jung ID, Park YM, Han J. Increased inhibition of inward rectifier K+ channels by angiotensin II in small-diameter coronary artery of isoproterenol-induced hypertrophied model. ***Arteriscl Throm Vasc Biol*** 27(8):1768-75**,** 2007**.**

Park WS, Son YK, Kim NR, Ko JH, Kang SH, **Warda M,** Earm YE, Jung ID, Park YM, Han J. Acute hypoxia induces vasodilation and increases coronary blood flow by activating inward rectifier K(+) channels. ***Pflugers Arch*** 454(6):1023-30. 2007

Mohamad Warda, Kim HK, Kim N, Youm JB, Kang SH, Park WS, Khoa TM, Kim YH, Han J. Simulated hyperglycemia in rat cardiomyocytes: a proteomics approach for improved analysis of cellular alterations. ***Proteomics***. 7(15):2570-90. 2007

Kim HK, Park WS, Kang SH, Warda M, Kim N, Ko JH, Prince Ael-B, Han J. Mitochondrial alterations in human gastric carcinoma cell line. ***Am J Physiol Cell Physiol.*** 293(2):C761-71. 2007.

Cuong DV, **Warda M,** Kim N, Park WS, Ko JH, Kim E, Han J. Dynamic changes in nitric oxide and mitochondrial oxidative stress with site-dependent differential tissue response during anoxic preconditioning in rat heart. ***Am J Physiol Heart Circ Physiol.*** 293(3):H1457-65. 2007.

Young Nam Kim, Hyoung Kyu Kim, **Mohamad Warda**, Nari Kim, Won Sun Park, Ab del Bary Prince , Dae Hoon Jeong , Dae Shim Lee , Ki Tae Kim, Jin Han, Toward a better understanding of preeclampsia: Comparative proteomic analysis of preeclamptic placentas. ***Proteomics*** Volume 1 Issue 12, Pages 1625 – 1636, 2007

Mitochondrial Ca2+-activated K+ channels more efficiently reduce mitochondrial Ca2+ overload in rat ventricular myocytes. Kang SH, Park WS, Kim N, Youm JB, **Warda M**, Ko JH, Ko EA, Han J. ***Am J Physiol Heart Circ Physiol.*** 293(1):H307-13. 2007.

Park WS, Son YK, Kim N, Youm JB, **Warda M**, Ko JH, Ko EA, Kang SH, Kim E, Earm YE, Han J. Direct modulation of Ca(2+)-activated K(+) current by H-89 in rabbit coronary arterial smooth muscle cells. ***Vascul Pharmacol.*** 46(2):105-13. 2007

Kim N, Kim H, Youm JB, Park WS, **Warda M**, Ko JH, Han J. Site specific differential activation of ras/raf/ERK signaling in rabbit isoproterenol-induced left ventricular hypertrophy. ***Biochim Biophys Acta.*** 1763(10):1067-75. 2006.

Kim NR, Lee YS, Kim HK, Joo H, Youm JB, Park WS, **Warda M**, Han J. Potential biomarkers for ischemic heart damage identified in mitochondrial proteins by comparative proteomics. ***Proteomics.*** 6(4):1237-49. 2006.

Cuong D, Kim NR, Youm JB, Joo H, **Warda M**, Lee JH, Park WS, Kim TH, Kang SH, Kim HK, Han J. Nitric oxide-cGMP-protein kinase G signaling pathway induces anoxic preconditioning through activation of ATP-sensitive K^+ channels in rat hearts. ***Am J Physiol-Heart Circ Physiol.*** 290(5):H1808-17. 2006.

Son YK, Park WS, Kim SJ, Earm YE, Kim NR, Youm JB, **Warda M**, Kim EY, Han J. Direct inhibition of a PKA inhibitor, H-89 on Kv channels in rabbit coronary arterial smooth muscle cells. ***Biochem Biophys Res Commun.*** 341(4): 931-937. 2006.

Park WS**,** Kim NR, Youm JB, **Warda M**, Ko JH, Kim SJ, Earm YE, Han J. Angiotensin II inhibits inward rectifier K^+ channels in rabbit coronary arterial smooth muscle cells through protein kinase Cα. ***Biochem Biophys Res Commun.*** 341(3): 728-735. 2006.

Park WS, Son YK, Kim NR, Youm JB, Joo H, **Warda M**, Ko JH, Earm YE, Han J. The protein kinase A inhibitor, H-89, directly inhibits K_{ATP} and Kir channels in rabbit coronary arterial smooth muscle cells. ***Biochem Biophys Res Commun.*** 340(4): 1104-1110. 2006.

Joon Yong Chung, Nari Kim, Hyun Joo, Joe Boum Youm, Park WS**,** Sang Kyoung Lee, **Warda M**, Han J. Tissue microarrays in biomedical research. **Bioinformatics and Biosystems.** 1, 28-37. 2006.

➢ Review articles:

- A matter of life, death and diseases: Mitochondria from a proteomic perspective. **Mohamad Warda**, Hyoung Kyu Kim, Nari Kim, Kyung Soo Ko, Byoung Doo Rhee and Jin Han. Expert Rev Proteomics. Feb;10(1):97-111. 2013.

• International Patents :

I- Mitochondrial enoyl coenzyme A hydratase 1 as marker for diagnosing stomach cancer
Inventors: Won Sun Park, Jae-Hong Ko, Na Ri Kim, Jin Han, Hyoung Kyu Kim, **Mohamad Warda.**
United States Patent: USPC Class: 435 25 US
http://www.freshpatents.com/Mitochondrial-enoyl-coenzyme-a-hydratase-1-as-marker-for-diagnosing-stomach-cancer-dt20080904ptan20080213816.php

Importance: The invention relates to mitochondrial protein that can be used as a marker for diagnosing stomach cancer. This comprises mitochondrial enoyl coenzyme A hydratase 1.

II- Biomarker and composition for diagnosis of preeclampsia
United States Patent Application 20090226908
Inventors:
Park Won Sun, Kim Na Ri, **Warda Mohamad,** Han Jin.
Application Number: 12/218218 Publication Date: 09/10/2009
http://www.freepatentsonline.com/y2009/0226908.html

Importance: The invention relates to a biomarker and a composition for diagnosis of preeclampsia. In accordance, it affords a biomarker for diagnosis of preeclampsia using an enzyme selected from the group consisting of placental chondroitin 4-O-sulfotransferase 1 (C4ST), chondroitin 6-sulfotransferase (C6S), heparan sulfate 6-O-sulfotransferase 1 (HS6S), and dermatan/chondroitin sulfate 2-sulfotransferase (CS-2OST), or uronic acid-2-sulfate (UA2S).

Prof. Dr. Hassan Y. Naim
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Department of Physiological Chemistry
University of Veterinary Medicine Hannover
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Germany
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Tel.: +49 511 953 8780 or 8781
Fax: +49 511 953 8585

Prof. Naim and I are currently working in joint project for elucidation of heat shock proteins structure and function in desert-living animals. We have a fund from German Exchange service (DAAD). We also had co-supervised one of my Ph.D. students in a frame of channel system regarding this work. The later collaboration is framed and supported by DAAD (German Exchange Services). We did publish a couple of international publications.

Dr. Bushra Ahmed

PhD, MSc, FHEA, FIBMS
Principal Lecturer in Biochemistry
Biomedical Science Course Director
Faculty of Creative Arts, Technologies & Science,
University of Bedfordshire
Park Square Luton, LU1 3JU Tel: 01582 743097
Email:Bushra.Ahmed@beds.ac.uk

Besides writing a review article exposes the common pathway of the pathogenicity between COVID 19 and Alzheimer's disease, Bushra and I recently submit a joint proposal to get granted by Alzheimer organization and we agreed to collaborate in the frame of research funded by Royal Society of Science. We are waiting for the response.

Dr. Med. Vet. Habil. Amir Abdulmawjood

DVM&S., M.Sc. Microbiology (Virology)
PhD. Mirobiology (Molecular Bacteriology)
med. vet. habil. Food Quality and Safety
Senior Researcher
Division of Molecular Biology
Institute of Food Quality and Food Safety
University of Veterinary Medicine, Hannover Germany

http://www.uni-giessen.de/~gi1146/

amir.abdulmawjood@tiho-hannover.de

Both Amir and I had started our Ph.D. work together in the same Faculty as DAAD fellow students in Justus Liebig university-Germany. We had marched together the first scientific hill footsteps. Since then, we still have an excellent relation even on family level. Until today, he is very ready to collaborate with any joint project or even to contribute in dual training courses.

Old International Collaborators

Prof. Dr. Wilhelm Schoner

Director of Institute for Biochemistry and Endocrinology

Faculty of Veterinary Medicine

Justus Liebig University

Giessen – Germany

Prof. Schoner and I studied the effect of fasting and dehydration on camel osmoregulation parameters. This was during my PhD (**Deutscher Akademischer Austauschdienest (DAAD) fellowship**) at his institute in Germany (1996-1998).

The fellowship was supported by DAAD (German Exchange Services in Egypt).

Dr. Zeisig Reiner

Maxdelbruck Center for Molecular Medicine

Berlin – Germany

In 1998, Zeisig and I resolved the phospholipid structure of camel red blood cell membrane. We examined the stability of its derived liposomes in comparison with others from RBCs of mammals. We published the following paper:

Warda M, Zeisig R.

Phospholipid- and fatty acid-composition in the erythrocyte membrane of the one-humped camel [Camelus dromedarius] and its influence on vesicle properties prepared from these lipids.

Dtsch Tierarztl Wochenschr. **2000 Sep;107(9):368-73.**

Prof. Dr. Martin Brand

MRC Cambridge UK

I worked with Martin in his lab to non-mitochondrial respiration in land snail.

The study was fully supported by Royal Society of Science (2000-2001).

- **Previous fellowships:**

1- Deutscher Akademischer Austauschdienest (DAAD) fellowship (1995 – 1998) to obtain the Ph.D. (Justus-Liebig University – Germany).

2- Max-Delbrueck Centre (MDC) for molecular medicine Post-doctoral fellow (1998 – 1999, Berlin – Germany).

3- Royal Society of Science fellowship at Medical Research Council (Cambridge – United Kingdom, 1999 - 2000).

4- **Iowa University Scholar at College of Pharmacy, University of Iowa – United States (**2001 - 2003) http://www-heparin.rpi.edu/

5- Korean Research Foundation at Mitochondrial Signaling Laboratory, Department of Physiology and Biophysics, College of Medicine, Inje University, Busan-Korea
Visiting Associate Professor **(August 2005 – 2007).**

6- Alexander von Humboldt fellow at Chemie und Biotechnologie Department; Technischen Universität München (TUM)- Germany (August 2007 – 2008).
For decades **TUM** is known place for chemistry pillars, including **Nobel Prize winner** since Hans Fischer (Nobel Prize Laureate in Chemistry 1930). While Alexander von Humboldt fellowship is annually granted for < 250 internationally recognized scientists that especially selected to enrich innovation in German scientific community.

7- Visiting Professor at Rensselaer Polytechnic Institute (RPI) - Center for Biotechnology and Interdisciplinary Studies – Troy New York –US (August 2014 – November 2014).
The stay was supported by the RPI local grant and aimed at establishment of the releable method to isolate the glycosaminoglycans from knocked out mice as preliminary step for their depolymerization and further characterization.

Originally, I had been trained as a **veterinarian** (VMD) with strong background in the field and its related scientific branches.

As a researcher, I have worked with multicultural international biochemical labs with different attributes, exposed to various educational schools that enabled me to teach Biochemistry for students of different nationalities.

- **Education Skills:**

  As a **professor of biochemistry**, it is first priority to get excellent teaching skills. Being updated with recent **educational technology**, attending all possible related topic courses, I always try to disseminate the updated skills how to teach and transmit modern biochemistry to my students. For more than 25 years of teaching several branches of biochemistry to different levels of biochemists, veterinary students, medical students and pharmacists, one should get **state-of-the-art** teaching it. That is why it is not surprising, to find such students with relative poor facilities and limited fund can be accepted as researchers in many recognized world-wide places.

  Fortunately, my school of teaching is currently being dominated not only in my home University, but spreads over to other Egyptian Universities e.g. Alexandria University, & Zagazig University and many other institutions.

- **Current Syllabus** (Credit hours system for Bachelor students **"Molecular Biology &Biochemistry"**): "All courses are including Theoretical & Practical sessions"
  - Molecular Biology and Bioinformatics:
    - Theoretical lectures:
      - Nucleic acids structure and function
      - DNA manipulating enzymes
      - DNA replication & transcription
      - Gene regulation in Eukaryotes, DNA-protein interaction
      - Gene regulation in Prokaryotes
      - Gene transfection and types of vectors

- Protein translation and its regulation
- Post-translation modifications and eukaryote-expression system
- Cloning and biotechnology
- Introduction to bioinformatics

- Practical sessions: including:
  - DNA isolation from blood and tissues
  - Restriction endonucleases activity
  - Agarose and SDS-PAGE electrophoresis,
  - Polymerase chain reaction (PCR),
  - RT-PCR,
  - Web-based "Primers 3" primers designing.
  - Gene cloning in bacteria regulation of translation

- Biochemistry Courses:
  - Theoretical sessions:
    - Biochemistry & metabolism of Carbohydrates
    - Biochemistry & metabolism of Lipids
    - Biochemistry & metabolism of proteins
    - Metabolic diseases
    - Chemistry of Immune system
    - Hormonal structure and function, signal transduction & tumor metabolism
    - Biotransformation of Xenobiotics

  - Practical sessions:
    - Photometry and its use in biochemistry
    - Cell culture techniques
    - Cell disruption techniques (homogenization, French pressure, sonication..etc)
    - Biomolecules separation techniques (Centrifugation, chromatography, electrophoresis)
    - Enzymes isolation and their kinetics measurement
    - Metabolic and inborn errors detection methods
    - Different methods of biomoelcules characterization

PhD in Biochemistry, endocrinology and enzyme kinetics

03.95-04.98	Biochemistry & Endocrinology Institute – Justus Liebig University –Giessen - Germany	Ph.D. student Sponsored by German Academic Exchange Services (DAAD)

Ph.D. at Biochemistry Institute- Justus Liebig University - Germany:

Under supervision of Prof. W. Schoner; the previous director of Biochemistry and Endocrinology Institute – Faculty of Veterinary Medicine at **Justus Liebig University Giessen – Germany,** I had perfected basic techniques in biochemistry and molecular biology, mastered most of spectrophotometric-related techniques, radioactive measurement and *in vitro* affinity binding of different legends, e.g. metabolites, hormones, etc, to their target receptors.

As a member of my supervisor research team, I had been well-trained on different enzymes isolation and their kinetic measurements (*e.g.* double reciprocal Linweaver-Burk plot, Hill plot, Scatchard plot analysis).

After successful purification of rabbit-raised polyclonal antibodies against naturally found cardiac glycosides (Strophanthine / Ouabain), I had developed a simple and reliable method to clean up the serum endogenous cardiac glycosides. Then the method had been used to isolate the endogenous cardiac glycosides. On completion of my Ph.D. work, I had used the produced antibodies in developing a highly sensitive ELISA method to detect and measure serum titer of endogenous cardiac glycosides (after being extracted from animal serum). During optimization of this method, I had used the radioactive cardiac glycosides analogue to standardize the technique to meet with high fidelity HPLC standard method.

Other gained skills:

- Protein, nucleic acids separation techniques (including gradient centrifugation, protein and nucleic acid separation by electrophoresis).
- Immunobloting (Western, Southern, Northern blots).
- Organs (liver, heart) perfusion techniques and kinetic tracing of infused drug.
- Different chromatographic methods for natural product separation,

- **Teaching skills during Ph.D.:**

I had worked as TA during my stay in Germany. I had been assigned to address the practical sessions, solving biochemical calculation problems, helping in practical exam designing and evaluation for veterinary and faculty of science students with biochemistry major.

- **Work accomplished at Department Chemie - Lehrstuhl fuer Biotechnologie; Technischen Universität München- Germany (August 2007 – 2008) as an Alexander von Humboldt fellow:**

I had being enrolled in the teaching team for biochemistry major students. I did train the students for practical course entitled “Die Zelle und ihre molekularen Bausteine” which concerned with nearly all molecular biology techniques related to the cells.

- **National and international theses supervision:**

  I had supervised many (> 40) national and international students for their master and Ph.D. Currently, I am supervising many students. Some of them with shared international co-supervisors from European or Middle East recognized professors.

- **Selected National awards:**
  - National Incentive Reward for Biotechnology and Agricultural Sciences (2004). The award is granted yearly for the most recognized distinguished National scientists in their field of research.
  - The best master thesis supervision among Cairo University (many years)
  - The best doctoral thesis supervision among Cairo University (many years)
  - The Egyptian Universities Honored Incentive for recognized international publications (every year since 2009).

- **IMPORTANT MEMBERSHIPS:**
  - Arabian Molecular Biotechnology Association **(FOUNDER)**
  - Egyptian Society of Biochemistry and Molecular Biology
  - Arabian association of stem cell **(FOUNDER)**
  - American Society for Matrix Biology (Previous membership)
  - Korean Proteomics Association

- **Books:**

As a director of the Department, I contributed to disseminate all internationally gained knowledge on behalf of upgrading student's books as well as the Laboratory Manual and skill work for under- as well as graduate students.

Together with my skilled Department members, we upgraded the Molecular Biology book to meet international standard and the livestock industry global market.

I also upgraded the main syllabus of biochemistry for other national veterinary faculties (Alexandria, Menoufia and Zagazig Universities) to be compatible with international.

I have written many reports, book chapters or books related to the field of biotechnology and industrial biochemistry (in Arabic).

- **Software and computer skills:**

With considerable skills in most basic software used by scientific communities, I mastered the following software:

- ✓ **GraphPad** Prism for scientific graphing, comprehensive curve fitting (nonlinear regression), understandable statistics, and data organization.
- ✓ **Ultra ChemDraw** for stereochemistry, atom numbering, structure & style templates and full color drawing,
- ✓ Free available software related to **drug discovery and designing in silico and Virtual Screening**
- ✓ **Mendeley** software tool for publishing and managing bibliographies
- ✓ **EndNote** software tool for publishing and managing bibliographies
- ✓ **BioEdit** for sequence alignment
- ✓ **MEGA** integrated software tool for conducting sequence alignment
- ✓ **PyElph** software for gel images analysis and phylogenetics

Many other software tools for data analyses, gene sequence alignment, primer designing e.g. **Pubmed-based** & other free available software.

I was the **director of Biotechnology Center of Services and Researches at Cairo University**.

I had upgraded all equipments and facilities in the center by self raising fund. I installed a cold room (3x5 msq) at the center. I also developed a collateral collaboration with multidisciplinary (national and international collaborations).
The Center with highly equipped Molecular Biology Facilities is mainly dependent on its own resources and neither funded by University nor governmental aids. The genomics and Bioinformatics issues are among the pillars of sustenance of the Center. I have couple of National projects beside offering consultation and performing experiments for graduate or post-graduate students. Here, I depend mainly on the workshops and training course beside the running projects to support my Center. Recently, I have introduced Nanotechnology, as supportive branch to enforce the Center by short courses and workshops.

Moreover, we have been teaching the Molecular Biology course at my Department more than 10 years ago. The course includes all Molecular Biological techniques for nucleic acid separation and characterization, different types of PCR, DNA fingerprint, RFLP, gene cloning and expression, gene expression in prokaryotes and eukaryotes, gene sequence alignment by different web-based software, primer designing (e.g. Blast Primer3, at NCBI), protein structure and function, protein translation, protein and footprinting separation by SDS-PAGE, immunoblotting and Bioinformatics.

I have some publications related to the selected issue:
Evaluation of global expression of divergent genes as potential candidates for internal normalizing control during transcriptome analysis in dromedary camel (Camelus dromedarius) Ibrahim et al., (currently submitted paper).

Differential Glycosylation and Modulation of Camel and Human HSP Isoforms in Response to Thermal and Hypoxic StressesInternational Journal of Molecular Sciences
2018-01 | journal-article

DOI: 10.3390/ijms19020402

Molecular cloning, cellular expression and characterization of Arabian camel (Camelus dromedarius) endoplasminInternational Journal of Biological Macromolecules
2018 | journal-article

DOI: 10.1016/j.ijbiomac.2018.05.196

Warda M, Gouda EM, El-Behairy AM, Mousa SZ. Conserved and non-conserved loci of the glucagon gene in old ruminating ungulates. ***Z Naturforsch [C].*** 61(1-2):135-41. 2006.

Joon Yong Chung, Nari Kim, Hyun Joo, Joe Boum Youm, Park WS**,** Sang Kyoung Lee, **Warda M**, Han J. Tissue microarrays in biomedical research. **Bioinformatics and Biosystems.** 1, 28-37. 2006

- **Gene Discovery and New Sequence citation in Gene bank:**

Resolving the full sequence of mRNA of alpha subunit of Na/K ATPase enzyme in dromedary camel https://www.ncbi.nlm.nih.gov/nuccore/MW628635

In frame of one of my previous project, I have the below citation in gene bank that related to novel discovery of dromedary GAPD gene:
The resolved cDNA sequence of Camelus dromedarius glyceraldehyde-3-phosphate dehydrogenase gene had been installed by our team group.
ACCESSION EU331417 VERSION EU331417.1 GI:163961166
http://www.ncbi.nlm.nih.gov/entrez/viewer.fcgi?db=nuccore&id=163961166

I have an experience to work with broadly multinational team works:

In Master thesis, I had traced the kinetic of elimination of glucagon hormone from camel blood. The study also had followed the short term regulation of carbohydrate intermediary metabolites after parenteral extra-energy loading with various energy rich substrates. This novel study was mostly designed and done by myself. The full paper work for publication was mostly my effort:

Abdel-Fattah M, Amer H, Ghoneim MA, **Warda M**, Megahed Y. Response of one-humped **camel** (Camelus dromedarius) to intravenous glucagon injection and to infusion of glucose and volatile fatty acids, and the kinetics of glucagon disappearance from the blood. ***Zentralbl Veterinarmed A.*** Oct;46(8):473-81. 1999.

In Germany, during my Ph.D. I had integrated completely with my Institute team members, worked in the frame of their main project. I had perfected their daily work, being a training member for their practical sessions.

My first Post-doctoral work in Max-delbrueck Center was aimed to prepare liposomes from camel red blood cells' phospholipids and studying their characterization. I had convinced Dr. Zeisig there about the unique nature of camel RBCs that potentially could have special phospholipid characters in comparison with other mammalian models. In the work we have resolved for the first time the phospholipids structure in camel RBCs and then we studied their stability after integrated into different size liposomes:

Warda M, Zeisig R. Phospholipid- and fatty acid-composition in the erythrocyte membrane of the one-humped camel [Camelus dromedarius] and its influence on vesicle properties prepared from these lipids. ***Dtsch Tierarztl Wochenschr*** Jan;108(1):36, 2001.

After we failed to find a new good source of physiological heparin, I turned Linhardt eyes to look for camel intestine as new source. My idea at his lab (Visiting scholar at College of Pharmacy – University Iowa, USA) resulted in finding a new pharmaceutical source of heparin competitive in bioassay with that derived from porcine intestine and potentially safe from prion-based infectious material that may contaminate the bovine or ovine –derived heparin:

Warda M, Mao W, Toida T, Linhardt RJ. Turkey intestine as a commercial source of heparin? Comparative structural studies of intestinal avian and mammalian glycosaminoglycans. ***Comp Biochem Physiol B Biochem Mol Biol,*** 134: 189–97. 2003.

Warda M, Gouda EM, Toida T, Chi L, Linhardt RJ. Isolation and characterization of raw heparin from dromedary intestine: evaluation of a new source of pharmaceutical heparin**.** ***Comp Biochem Physiol.*** 136(4):357-65. 2003.

At College of Pharmacy, I was assigned by Linhardt to be the Biology group leader at his Department, training new graduate students, help in TA activities.. etc.
In the time, Vougchan and I were taking the full responsibility to prepare and characterize the Heparan Sulfate Proteoglycans from human cadavers:

Vongchan P, **Warda M**, Toyoda H, Toida T, Marks M, Linhardt RJ. Structural characterization of human liver heparan sulfate. ***Biochimica et Biophysica Acta,*** 1721: 1-8. 2005.

While I was doing all these responsibilities at University of Iowa, I was the one that had heavy duty to completely resolve heparan sulfates from various murine tissues:

Warda M, Toida T, Zhang F, Sun P, Munoz E, Xie J, Linhardt RJ. Isolation and characterization of heparan sulfate from various murine tissues. ***Glycoconjugate J*** 23(7-8):555-63. 2006.

To test whether Pre-eclampsia contributes in proteoglycans remodeling in the affected placenta I had made a multinational teamwork comprises Korean Research Team at Physiology Department, The Gynecology Department at Medical School and Linhardt's group at Biotechnology Center, Rensselaer Polytechnic USA:
Warda M, Zhang F, Radwan M, Zhang Z, Kim N, Kim YN, Linhardt RJ, Han J. Is human placenta proteoglycan remodeling involved in pre-eclampsia? ***Glycoconj J.*** 25(5):441-50. 2008.

As a biochemist I noticed significant over-expression in **enoyl Co-enzyme A hydratase** in gastric carcinoma cell linewhen compared with the normal gastric cell line during our proteomic study.

Kim HK, Park WS, Kang SH, **Warda M**, Kim N, Ko JH, Prince Ael-B, Han J. Mitochondrial alterations in human gastric carcinoma cell line. ***Am J Physiol Cell Physiol.*** 293(2):C761-71. 2007.

This finding motivated our Korean research team to further develop an international patent that could afford a new biomarker for detection of Gastric carcinoma in man.

As a professor of biochemistry I have a continuous connection with my undergraduate, graduate and post-graduate students via current ways of internet connections as WhatsApp, facebook and others (please see some selected recent groups:

Veterinary Students 2021

https://chat.whatsapp.com/CVZdzp9n9RwJ7h0YvwGsoM

Veterinary students 2019:

https://www.facebook.com/groups/345385132893334/

Biochemistry #202:

https://www.facebook.com/groups/172998600184627/

Molecular biology 2017 – 2018 :

https://www.facebook.com/groups/224914964646538/

Veterinary Biochemistry Diplome 2017

https://www.facebook.com/groups/1979996395547511/

Veterinary Biochemistry 2017/2018

https://www.facebook.com/groups/159606988116504/

2016 - 2017-الكيمياء الحيوية

https://www.facebook.com/groups/956218461127233/

- **International Patents :**

I- Mitochondrial enoyl coenzyme A hydratase 1 as marker for diagnosing stomach cancer
Inventors: Won Sun Park, Jae-Hong Ko, Na Ri Kim, Jin Han, Hyoung Kyu Kim, **Mohamad Warda.**
United States Patent: USPC Class: 435 25 US
http://www.freshpatents.com/Mitochondrial-enoyl-coenzyme-a-hydratase-1-as-marker-for-diagnosing-stomach-cancer-dt20080904ptan20080213816.php

Importance: The invention relates to mitochondrial protein that can be used as a marker for diagnosing stomach cancer. This comprises mitochondrial enoyl coenzyme A hydratase 1.

II- Biomarker and composition for diagnosis of preeclampsia
United States Patent Application 20090226908
Inventors:
Park Won Sun, Kim Na Ri, **Warda Mohamad,** Han Jin.
Application Number: 12/218218 Publication Date: 09/10/2009
http://www.freepatentsonline.com/y2009/0226908.html

Importance: The invention relates to a biomarker and a composition for diagnosis of preeclampsia. In accordance, it affords a biomarker for diagnosis of preeclampsia using an enzyme selected from the group consisting of placental chondroitin 4-O-sulfotransferase 1 (C4ST), chondroitin 6-sulfotransferase (C6S), heparan sulfate 6-O-sulfotransferase 1 (HS6S), and dermatan/chondroitin sulfate 2-sulfotransferase (CS-2OST), or uronic acid-2-sulfate (UA2S).

One of my recent projects is characterization of cloned heat shock proteins (HSPs) in dromedary camel.

The molecular characterization of camel HSPs and their role in regulation of cellular mechanisms and physiological functions can open an avenue for the development of novel biomaterial for treatment of the problems results from folding/stability disorders of protein such as commonly seen in Alzheimer's disease.

In this respect the collaboration with our colleagues (Faculty of Veterinary Medicine – Hannover –Germany) we had succeeded in cloning the cDNA encoding three HSPs from camel and their counterparts in human. Two cytosolic HSP members; camel HspA6 and camel CRYAB with 70 kDa and 20 kDa respectively and one member located in the endoplasmic reticulum, camel Hsp90B1 about 90kDa were cloned in Myc or Flag tagged mammalian expression vectors. We further analyzed the biosynthetic forms of target camel/human HSPs by Western blotting after their protein expression in COS.1 cells expression system. Cellular localization of the studied HSPs by confocal microscopy revealed their localization in cytosol and ER. Given that HSPs are stress responsive proteins, we designed experiments to study the influence of variant stress conditions like heat stress and oxygen tension on their cellular localization or arrangement. Because HSPs are known to play a key role in refolding of mis-folded or defective proteins, we aimed through co-expression and co-immunoprecipitation

experiments to study the ability of camel/human HSPs in rescuing the folding of “sucrase isomaltase”

- as a mutant protein model. The outcome of this work was published in the below papers:

Differential Glycosylation and Modulation of Camel and Human HSP Isoforms in Response to Thermal and Hypoxic Stresses

International Journal of Molecular Sciences
2018-01 | journal-article

DOI: 10.3390/ijms19020402

Molecular cloning, cellular expression and characterization of Arabian camel (Camelus dromedarius) endoplasmin**International Journal of Biological**

Macromolecules
2018 | journal-article

DOI: 10.1016/j.ijbiomac.2018.05.196

For the Molecular Biology I not stop at DNA and genome but I have many publications related to Proteomcis, Glycomics, Genomics as well as cell signaling (please check my publications).

I have resolved the proteome of one humped camel for the first time:
Proteomics of old world camelid (Camelus dromedarius): Better understanding the interplay between homeostasis and desert environment**Journal of Advanced Research**
2014 | journal-article
DOI: 10.1016/j.jare.2013.03.004

For the first time, I addressed the effect of extra-energy stress- in the form of high glucose load- on proteomic changes in separated beating heart animal model:

Mohamad Warda, Kim HK, Kim N, Youm JB, Kang SH, Park WS, Khoa TM, Kim YH, Han J. Simulated hyperglycemia in rat cardiomyocytes: a proteomics approach for improved analysis of cellular alterations. ***Proteomics***. 7(15):2570-90. 2007

In our publication of cell signaling, I addressed in the discussion section the upper value of using Western blot to trace protein expression than the use of real-time PCR.

Kim N, Kim H, Youm JB, Park WS, **Warda M**, Ko JH, Han J. Site specific differential activation of ras/raf/ERK signaling in rabbit isoproterenol-induced left ventricular hypertrophy. ***Biochim Biophys Acta.*** 1763(10):1067-75. 2006.

My previous work in Korea, I supervised my Egyptian student to clone a newly discovered gene

Cloning of large-conductance Ca(2+)-activated K(+) channel alpha-subunits in mouse cardiomyocytes. Ko JH, Ibrahim MA, Park WS, Ko EA, Kim N, **Warda M**, Lim I, Bang H, Han J. Biochem Biophys Res Commun. 2009 Nov 6;389 (1):74-9.

In tracing the expression level of some sulfate-adding enzymes during pre-eclamspia illness I designed the real time PCR primers:

Warda M, Zhang F, Radwan M, Zhang Z, Kim N, Kim YN, Linhardt RJ, Han J. Is human placenta proteoglycan remodeling involved in pre-eclampsia? ***Glycoconj J.*** 25(5):441-50. 2008.

Publications:

For full publications please visit my Google scholar site:

https://scholar.google.com.eg/citations?hl=ar&user=UDTABRUAAAAJ

- **Selected publications:**
- **Recent Publications:**

Dose-dependent neuroprotective effect of oriental phyto-derived glycyrrhizin on experimental neuroterminal norepinephrine depletion in a rat brain model.

Ahmed-Farid OA[1], Haredy SA[1], Niazy RM[1], Linhardt RJ[2], Warda M[3]. Chem Biol Interact. 2019 May 28. pii: S0009-2797(19)30273-X. doi: 10.1016/j.cbi.2019.05.045. [Epub ahead of print]

Molecular cloning, cellular expression and characterization of Arabian camel (Camelus dromedarius) endoplasmin.

Hoter A, Amiri M, Warda M[3], Naim HY. Int J Biol Macromol. 2018 Oct 1;117:574-585.
doi: 10.1016/j.ijbiomac.2018.05.196. Epub 2018 May 27.

Differential Glycosylation and Modulation of Camel and Human HSP Isoforms in Response to Thermal and Hypoxic Stresses.
Hoter A, Amiri M, Prince A, Amer H, Warda M, Naim HY.
Int J Mol Sci. 2018 Jan 30;19(2). pii: E402. doi: 10.3390/ijms19020402.

Development and validation of a simple solid-phase extraction method coupled with liquid chromatography-triple quadrupole tandem mass spectrometry for simultaneous determination of lincomycin, tylosin A and tylosin B in royal jelly.
Zheng W, Park JA, Abd El-Aty AM, Kim SK, Cho SH, Choi JM, Warda M, Wang J, Shim JH, Shin HC.
Biomed Chromatogr. 2018 Apr;32(4). doi: 10.1002/bmc.4145. Epub 2017 Dec 11.

A study on IL8RB gene polymorphism as a potential immuno-compromised adherent in exaggeration of parenteral and mammo-crine oxidative stress during mastitis in buffalo.
El Nahas SM, El Kasas AH, Abou Mossallem AA, Abdelhamid MI, Warda M.
J Adv Res. 2017 Nov;8(6):617-625. doi: 10.1016/j.jare.2017.07.002. Epub 2017 Jul 20.

LC-MS/MS characterization, anti-inflammatory effects and antioxidant activities of polyphenols from different tissues of Korean Petasites japonicus (Meowi).

Choi JY, Desta KT, Saralamma VVG, Lee SJ, Lee SJ, Kim SM, Paramanantham A, Lee HJ, Kim YH, Shin HC, Shim JH, Warda M, Hacımüftüoğlu A, Jeong JH, Shin SC, Kim GS, Abd El-Aty AM.
Biomed Chromatogr. 2017 Dec;31(12). doi: 10.1002/bmc.4033. Epub 2017 Jul 11.

Flavone polyphenols dominate in Thymus schimperi Ronniger: LC-ESI-MS/MS characterization and study of anti-proliferative effects of plant extract on AGS and HepG2 cancer cells.
Desta KT, Kim GS, Abd El-Aty AM, Raha S, Kim MB, Jeong JH, Warda M, Hacımüftüoğlu A, Shin HC, Shim JH, Shin SC.
J Chromatogr B Analyt Technol Biomed Life Sci. 2017 May 15;1053:1-8. doi: 10.1016/j.jchromb.2017.03.035. Epub

Dromedary milk exosomes as mammary transcriptome nano-vehicle: Their isolation, vesicular and phospholipidomic characterizations
Yassin, A.M.,Abdel Hamid, M.I.,Farid, O.A.,Amer, H.,**Warda, M.**
Journal of Advanced Research (2016) 7, 749–756

Potential Therapeutic role of Mesenchymal Stem Cell in Delayed Wound Healing of Diabetic Rats
Abdelbary Prince, Mostafa Abdalla Gad, Ibrahim W. Hasani, **Mohamad Warda** and Adel Elbehairy
Der Pharmacia Lettre, 2016, 8 (15):62-68
http://scholarsresearchlibrary.com/dpl-vol8-iss15/index.html

Oxidative stress during erythropoietin hyporesponsiveness anemia at end stage renal disease: Molecular and biochemical studies.

Khalil SK, Amer HA, El Behairy AM, Warda M.
J Adv Res. 2016 May;7(3):348-58. doi: 10.1016/j.jare.2016.02.004.

Morphological, molecular and pathological appraisal of Callitetrarhynchus gracilis plerocerci (Lacistorhynchidae) infecting Atlantic little tunny (Euthynnus alletteratus) in Southeastern Mediterranean.
Abdelsalam M, Abdel-Gaber R, Mahmoud MA, Mahdy OA, Khafaga NI, Warda M.
J Adv Res. 2016 Mar;7(2):317-26. doi: 10.1016/j.jare.2015.07.004.

Antioxidant activities and liquid chromatography with electrospray ionization tandem mass spectrometry characterization and quantification of the polyphenolic contents of Rumex nervosus Vahl leaves and stems.
Desta KT, Lee WS, Lee SJ, Kim YH, Kim GS, Lee SJ, Kim ST, Abd El-Aty AM, **Warda M**, Shin HC, Shim JH, Shin SC.
J Sep Sci. 2016 Apr;39(8):1433-41. doi: 10.1002/jssc.201600018.

Proteomics of old world camelid (Camelus dromedarius): Better understanding the interplay between homeostasis and desert environment.
Warda M, Prince A, Kim HK, Khafaga N, Scholkamy T, Linhardt RJ, Jin H.
J Adv Res. 2014 Mar;5(2):219-42. doi: 10.1016/j.jare.2013.03.004.

A matter of life, death and diseases: mitochondria from a proteomic perspective. **Warda** M, Kim HK, Kim N, Ko KS, Rhee BD, Han J. Expert Rev Proteomics. 2013 Feb;10(1):97-111..

Beta adrenergic overstimulation impaired vascular contractility via actin-cytoskeleton disorganization in rabbit cerebral artery.
Kim HK, Park WS, **Warda M**, Park SY, Ko EA, Kim MH, Jeong SH, Heo HJ, Choi TH, Hwang YW, Lee SI, Ko KS, Rhee BD, Kim N, Han J.
PLOS One. 2012;7(8):e43884

Glycoconj J. 2008 ;25(5):441-50.

Old Publications

Cloning of large-conductance Ca(2+)-activated K(+) channel alpha-subunits in mouse cardiomyocytes Ko JH, Ibrahim MA, Park WS, Ko EA, Kim N, **Warda M**, Lim I, Bang H, Han J.
. **Biochem Biophys Res Commun.** 2009,6;389(1):74-9

Warda M, Zhang F, Radwan M, Zhang Z, Kim N, Kim YN, Linhardt RJ, Han J.
Is human placenta proteoglycan remodeling involved in pre-eclampsia?
Glycoconj J. 2008 ;25(5):441-50.

Park WS, Ko JH, Kim NR, Son YK, Kang SH, **Warda M**, Jung ID, Park YM, Han J. Increased inhibition of inward rectifier K+ channels by angiotensin II in small-diameter coronary artery of isoproterenol-induced hypertrophied model.
Arteriscl Throm Vasc Biol 27(8):1768-75**,** 2007**.**

Park WS, Son YK, Kim NR, Ko JH, Kang SH, **Warda M,** Earm YE, Jung ID, Park YM, Han J. Acute hypoxia induces vasodilation and increases coronary blood flow by activating inward rectifier K(+) channels. ***Pflugers Arch*** 454(6):1023-30. 2007.

Mohamad Warda, Kim HK, Kim N, Youm JB, Kang SH, Park WS, Khoa TM, Kim YH, Han J. Simulated hyperglycemia in rat cardiomyocytes: a proteomics approach for improved analysis of cellular alterations. ***Proteomics***. 7(15):2570-90. 2007.

Kim HK, Park WS, Kang SH, Warda M, Kim N, Ko JH, Prince Ael-B, Han J. Mitochondrial alterations in human gastric carcinoma cell line. ***Am J Physiol Cell Physiol.*** 293(2):C761-71. 2007.

Cuong DV, **Warda M,** Kim N, Park WS, Ko JH, Kim E, Han J. Dynamic changes in nitric oxide and mitochondrial oxidative stress with site-dependent differential tissue response during anoxic preconditioning in rat heart. ***Am J Physiol Heart Circ Physiol.*** 293(3):H1457-65. 2007.

Young Nam Kim, Hyoung Kyu Kim, **Mohamad Warda,** Nari Kim, Won Sun Park, Ab del Bary Prince , Dae Hoon Jeong , Dae Shim Lee , Ki Tae Kim, Jin Han, Toward a better understanding of preeclampsia: Comparative proteomic analysis of preeclamptic placentas. ***Proteomics*** Volume 1 Issue 12, Pages 1625 – 1636 2007.

Kang SH, Park WS, Kim N, Youm JB, **Warda M**, Ko JH, Ko EA, Han Mitochondrial Ca2+-activated K+ channels more efficiently reduce mitochondrial Ca2+ overload in rat ventricular myocytes. J. ***Am J Physiol Heart Circ Physiol.*** 293(1):H307-13. 2007.

Park WS, Son YK, Kim N, Youm JB, **Warda M**, Ko JH, Ko EA, Kang SH, Kim E, Earm YE, Han J. Direct modulation of Ca(2+)-activated K(+) current by H-89 in rabbit coronary arterial smooth muscle cells. ***Vascul Pharmacol.*** 46(2):105-13. 2007

Warda M, Gouda EM, El-Behairy AM, Mousa SZ. Conserved and non-conserved loci of the glucagon gene in old world ruminating ungulates. **Z Naturforsch [C].** 2006 61(1-2):135-41.

Warda M, Toida T, Zhang F, Sun P, Munoz E, Xie J, Linhardt RJ. Isolation and characterization of heparan sulfate from various murine tissues. ***Glycoconjugate J*** 23(7-8):555-63. 2006

Kim N, Kim H, Youm JB, Park WS, **Warda M**, Ko JH, Han J. Site specific differential activation of ras/raf/ERK signaling in rabbit isoproterenol-induced left ventricular hypertrophy. ***Biochim Biophys Acta.*** 2006 1763(10):1067-75.

Kim NR, Lee YS, Kim HK, Joo H, Youm JB, Park WS, **Warda M**, Han J. Potential biomarkers for ischemic heart damage identified in mitochondrial proteins by comparative proteomics. ***Proteomics*.** 2006 6(4):1237-49.

Cuong D, Kim NR, Youm JB, Joo H, **Warda M**, Lee JH, Park WS, Kim TH, Kang SH, Kim HK, Han J. Nitric oxide-cGMP-protein kinase G signaling pathway induces anoxic preconditioning through activation of ATP-sensitive K^+ channels in rat hearts. ***Am J Physiol-Heart Circ Physiol*.** 2006, 290(5):H1808-17.

Warda M, Linhardt RJ. Dromedary glycosaminoglycans: Molecular characterization of camel lung and liver heparan sulfate. ***Comp Biochem Physiol B Biochem Mol Biol*.** 2006, 143(1): 37-43.

Son YK, Park WS, Kim SJ, Earm YE, Kim NR, Youm JB, **Warda M**, Kim EY, Han J. Direct inhibition of a PKA inhibitor, H-89 on Kv channels in rabbit coronary arterial smooth muscle cells. ***Biochem Biophys Res Commun.*** 2006, 341(4): 931-937.
Park WS**,** Kim NR, Youm JB, **Warda M**, Ko JH, Kim SJ, Earm YE, Han J. Angiotensin II inhibits inward rectifier K^+ channels in rabbit coronary arterial smooth muscle cells through protein kinase Cα. ***Biochem Biophys Res Commun.*** 2006, 341(3): 728-735.

Park WS, Son YK, Kim NR, Youm JB, Joo H, **Warda M**, Ko JH, Earm YE, Han J. The protein kinase A inhibitor, H-89, directly inhibits K_{ATP} and Kir channels in rabbit coronary arterial smooth muscle cells. ***Biochem Biophys Res Commun.*** 2006, 340(4): 1104-1110.

Joon Yong Chung, Nari Kim, Hyun Joo, Joe Boum Youm, Park WS**,** Sang Kyoung Lee, **Warda M**, Han J. Tissue microarrays in biomedical research. Bioinformatics and Biosystems 2006, vol.1, 28-37.

Vongchan P, **Warda M**, Toyoda H, Toida T, Marks M, Linhardt RJ. Structural characterization of human liver heparan sulfate. ***Biochimica et Biophysica Acta,*** 2005, 1721: 1-8.

Mohamad Warda, Robert J Linhardt & Rory M Marks**.** ***Patents related to dengue virus infection*** Expert Opinion on Therapeutic Patents Volume 12, 2002 - Issue 8.

Warda M, Zeisig R.
Phospholipid- and fatty acid-composition in the erythrocyte membrane of the one-humped **camel**[Camelus dromedarius] and its influence on vesicle properties prepared from these lipids.
Dtsch Tierarztl Wochenschr. 2000 Sep;107(9):368-73. Erratum in: Dtsch Tierarztl Wochenschr 2001 Jan;108(1):36.

Abdel-Fattah M, Amer H, Ghoneim MA, **Warda** M, Megahed Y.
Response of one-humped **camel** (Camelus dromedarius) to intravenous glucagon injection and to infusion of glucose and volatile fatty acids, and the kinetics of glucagon disappearance from the blood.
Zentralbl Veterinarmed A. 1999 Oct;46(8):473-81. **Demonstrated competence in molecular biological techniques.**

- ***Production of Genetically inactive PLD gene from Corynebacterium ovis (C. ovis).***

The project was sponsored by Academy of Scientific Research. It aimed at obtaining a recombinant living attenuated vaccine against corynebacterium ovis (*C. ovis*) bacteria. C. ovis causes pseudotuberclosis in domestic farm animals (from 1999 to 2001). The work had been published in Middle East Journal and patented later on for vaccine production at my center (BCSR):

Ghoneim MA, Amin AS, Ibrahim AK, Khafaga A, **Warda M**, Selim SA. Cloning and expression of phospholipase D gene from three different isolates of *C. pseudotuberclosis*. ***Arab J. Biotech.*** 2001, **4:** 37–48).

Demonstrated ability to engage in high quality independent research, with an established record of scholarly publications.

I recently published many paper with my international colleagues:

Dose-dependent neuroprotective effect of oriental phyto-derived glycyrrhizin on experimental neuroterminal norepinephrine depletion in a rat brain model

Chemico-Biological Interactions (accepted paper)

Development and validation of a simple solid-phase extraction method coupled with liquid chromatography–triple quadrupole tandem mass spectrometry for simultaneous determination of lincomycin, tylosin A and tylosin B in royal jelly

Biomedical Chromatography
2018 | journal-article

DOI: 10.1002/bmc.4145

Flavone polyphenols dominate in Thymus schimperi Ronniger: LC–ESI–MS/MS characterization and study of anti-proliferative effects of plant extract on AGS and HepG2 cancer cells

Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences
2017 | journal-article

DOI: 10.1016/j.jchromb.2017.03.035

LC–MS/MS characterization, anti-inflammatory effects and antioxidant activities of polyphenols from different tissues of Korean Petasites japonicus (Meowi)

Biomedical Chromatography
2017 | journal-article

DOI: 10.1002/bmc.4033

Antioxidant activities and liquid chromatography with electrospray ionization tandem mass spectrometry characterization and quantification of the polyphenolic contents of Rumex nervosus Vahl leaves and stems

Journal of Separation Science
2016 | journal-article

DOI: 10.1002/jssc.201600018

Previously at Faculty of Medicine, Korea I have integrated with Proteomics Research team, designed, written and published several research projects. I also supervised many graduate students there (please see the publications!).

Publications:

Warda M, Kim HK, Kim N, Youm JB, Kang SH, Park WS, Khoa TM, Kim YH, Han J. Simulated hyperglycemia in rat cardiomyocytes: a proteomics approach for improved analysis of cellular alterations. ***Proteomics***. 7(15):2570-90. 2007

Kim NR, Lee YS, Kim HK, Joo H, Youm JB, Park WS, **Warda M**, Han J. Potential biomarkers for ischemic heart damage identified in mitochondrial proteins by comparative proteomics. ***Proteomics*.** 6(4):1237-49. 2006

Demonstrated ability and commitment to successfully supervise honors, postgraduate and HDR students.

- **National and international theses supervision:**

  I had supervised many (> 25) national and international students for their master and Ph.D. Currently, the supervision of 6 students is running. Some of them with shared international co-supervisors from European or Middle East recognized professors.

- **Selected National awards:**
  - National Incentive Reward for Biotechnology and Agricultural Sciences (2004). The award is granted yearly for the most recognized distinguished National scientists in their field of research.
  - The best master thesis supervision among Cairo University at 2010
  - The best doctoral thesis supervision among Cairo University 2013
  - The Egyptian Universities Honored Incentive for recognized international publications (every year).

- **IMPORTANT MEMBERSHIPS:**
  - Arabian Molecular Biotechnology Association **(FOUNDER)**
  - Arabian Stem Cell and Molecular Biology Association

- Egyptian Society of Biochemistry and Molecular Biology
- American Society for Matrix Biology (Previous membership)
- Korean Proteomics Association

- **Assignment:**

I was selected by Cairo University to represent our Faculty for Cairo University Central laboratories. This official assignment enabled me to know all the equipments and instrumentations not only in our Faculty (including the Biotechnology Center) correspondent for central lab.

- **Social activities:**
  - The **founder** of **Arabian Molecular Biotechnology Association.**
  - The **founder** of Al-Deyaa family league social and scientific activities among Middle East Students.
  - The **founder** of Molecular Biology Students Workshop. This annual activity is held every year in March since 2005. It aims at screening and selecting the talent students among the native community in the field with giving them the chance to improve their practical and communication skills. The workshop motivates the future scientist to prove their creativity and enthusiasm to solve scientific problems.
  - The **initiator** and main organizer of faculty journal club since 2003.

    The Journal club is now half-monthly held in Cairo University Staff members club to discuss with junior researchers and young faculty staffs their possible facing problems and choice the best way of solution.

Prof. Dr. Mohamad Warda September 2021

Professor and Director of Biochemistry and Molecular Biology

Faculty of Veterinary Medicine

Cairo University

Previous DAAD fellow

Previous Royal Society of Science fellow (UK)

Previous Visiting Scholar – Iowa City University (US)

Previous Medical School, Inje University Fellow (South Korea)

Previous Alexander von Humboldt fellow (Germany)

Previous visiting professor at Biotechnology and Biochemistry Dept. TUM (Germany)

Here below an old recommendation letter from international Professor

Prof. Dr. Robert J. Linhardt
Ann and John H. Broadbent, Jr.'59 Senior Constellation Professor,
Biocatalysis and Metabolic Engineering
and Professor of Chemistry and Chemical Biology,
Biology and Chemical and Biological Engineering
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Rensselaer

May 30, 2019

Re: Dr. Mohamad Warda

To whom it may concern:

I am writing in support of Dr. Mohamad Warda, currently Professor of Biochemistry and Molecular Biology and previous Director of Biotechnology Center for Services and Research (BCSR) at Cairo University, who has applied for a faculty position at your university. Professor Warda worked with me as a visiting scholar from August 28, 2001 until August 14, 2003. His stay was supported from our side by Iowa Visiting Scholar program and a grant from the United States National Institutes of Health. After 21 years on the faculty at the University of Iowa, I relocated to Rensselaer Polytechnic Institute (RPI) in New York to head the Biocatalysis and Metabolic Engineering Constellation in the Biotechnology Center.

The main area of Dr. Warda's research was the characterization of different glycosaminoglycans (GAGs) originating from a variety of sources. Dr. Warda succeeded in isolating and characterizing different GAGs from various sources (turkey intestine, porcine intestine, camel intestine and human heart and human liver). Of major interest was the isolation and characterization of heparan sulfate (HS) from different organs of mice. This is first Glycomics approach to matrix GAGs and may facilitate the interpretation of Genomic and/or Proteomic information available for the mouse. This study begins to solve many questions arising from posttranslation modification of glycoproteins and/or proteoglycans. A second focus of this study was to compare HS isolated from the tissues of normal mice with HS originating from the same tissues of knock-out mice missing single enzymes involved in the HS biosynthetic pathway. This will help us to relate genotype and glycotype to phenotype and may ultimately help explain birth defects in humans deficient in these same biosynthetic enzymes. The results of our studies on normal mice were published in *Glycoconjugate Journal* 23, (2006) 553-561. Dr. Warda's publications on the search for alternative commercial sources of heparin, also accomplished while in my lab, were published in *Comparative Biochemistry and Physiology B* 134 (2003) 189-197 and 136 (2004) 357-365. Dr. Warda isolated I-IS from the human liver and characterized this molecule and published this study in *Biochimica Biophysica Acta* 1721, (2005) 1-8. Together, Dr. Warda and I also published review article entitled "Patents related to dengue virus infection" that published in *Expert Opinions on Therapeutic Patents* 12, (2002) 1127-1143. The infectivity of Dengue virus as well as a number of other pathogens begins with the interaction of surface proteins in a pathogen with a HS proteoglycan receptor in the human liver. In addition to mastering the techniques used in our labs for isolation and purification of different GAGs, Dr. Warda has used different modern techniques in our lab related to glycobiology, including various chromatographic separations and structural analysis and interpretation by ^{1}H NMR spectroscopy. He also has gained skills using polysaccharide lyase enzymes for the depolymerization of GAGs prior to their structural analysis by CE, FIPLC and gradient PAGE. He also performed bioassays on these HS samples using an antithrombin mediated anti-factor Xa amidolytic activity assay. In addition to his research contributions, Dr. Warda served as the leader of the Biology Subgroup in my laboratories.

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After leaving my laboratory, Professor Warda returned home to Egypt for a time and then had a very productive period as a visiting scholar at Inje University in Korea where we collaborated on a nice paper on the glycomics of pre-eclampsia, published in *Glycoconjugate Journal* 25. (2008) 441-450. He also received a prestigious Humboldt fellowship at the University of Munich from 2007-2008. He subsequently returned to the University of Cairo to continue to build his program.

My personal opinion of Dr. Warda is that he is an excellent, knowledgeable and skilled scientist. He worked very long hours while in my laboratory and has been incredibly productive. He served as a teacher, instructing many of the chemists and engineers in my laboratory in the principals of animal biology. He was a friendly member of our lab and has gotten along very well with all his coworkers. He served as a fine example of his culture and nation while in the U.S. and I have been delighted to continue my scientific relationship with Dr. Warda after his return to Egypt. This collaboration continues to this day and has resulted in manuscripts on glycosaminoglycans in molluses (*Our Nature* 7, (2009) 10-17), the camel proteome (*Journal of Advanced Research* 5, (2013) 219-242), and on the neuroprotective effect of glycyrrhizin (*Chemio-Biological Interactions* (2019) in press).

I intend to continue to support Dr. Warda with research materials and biochemicals to enable him to continue his research in glycobiology. We plan further cooperation between our laboratories and a long-term relationship. Having him in an excellent faculty position should lead to further productive collaborations between our laboratories and those of his new colleagues. I believe that he would make an excellent faculty member at your university and I give my strongest recommendation.

Sincerely,

Robert J. Linhardt, Ph.D.
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