KHALED A. M. AL-HOSAINI

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EDUCATION

2007-2011 ***University of Leicester, Leicester, UK***

- PhD, Cell Physiology and Pharmacology
- PhD, Thesis Supervisors:
  - Gary B. Willars
  - R.A.J. Challiss
- PhD, Thesis Title: *Signaling, desensitization and resensitization of Neuromedin U receptors*

1991-1996 ***King Saud University, Riyadh, Saudi Arabia***

- BSc in Pharmaceutical Science, College of Pharmacy, GPA: 4.58/5
- Academic honor list

1999-2001 ***University of Houston, Houston, Texas, U.S.A.***

Graduate Researcher

- Laboratory training and research experience in pharmacology under the guidance/supervision of:
  - ***Karim Al-Kadhi***, PhD, Associate Professor, Brain neurotransmitter action and ganglia, Department of Pharmacology and Pharmaceutics, University of Houston, Houston, Texas, U.S.A.
  - ***Richard Bond***, PhD, Assistant Professor, Innovation of receptor intrinsic agonist activity and inverse agonist theory, Department of Pharmacology and Pharmaceutics, University of Houston, Houston, Texas, U.S.A.
  - ***Brain Knoll***, PhD, Associated Professor, 2 receptor full agonist versus partial agonist desensitization, resensitization and recycling, Department of Pharmacology and Pharmaceutics, University of Houston, Houston, Texas, U.S.A.

1998-1999 ***Medical College of Ohio, Toledo, Ohio, U.S.A.***

Graduate Researcher

- Laboratory training and research experience in pharmacology under the guidance/supervision of:
  - ***Sonia Najjar***, PhD, Professor, Insulin and its yrosine kinase receptor. Department of Pathology and Pharmacology, Medical College of Ohio, Toledo, Ohio, U.S.A.

MISSION

To dedicate several years of knowledge acquisition at a recognized GPCRs-based research laboratory/institute, Postdoc, in order to increase in specialization and experience.

EXPERIENCE

February 2012 - present

King Saud University, Riyadh, Saudi Arabia

Assistant professor of molecular pharmacology, Department of Pharmacology & Toxicology, College of Pharmacy

1. Teaching:
   - CNS pharmacology (undergraduates, BSc),
   - Toxicology of abused drugs (graduate, MSc),
   - Advanced Pharmacology (graduate, MSc),
   - Receptor theory (graduate, MSc),
   - Molecular neuropharmacology (graduate, PhD).
2. Establishing my laboratory for GPCRs/Cell signaling-based research and involvement with like-minded colleagues in our department on other aspects of pharmacological research.

September - November, 2013

Institute of Functional Genomics, Department of Molecular Pharmacology., Montpellier, France

Visiting Researcher and Collaborator

- Measurement of cell signaling events and protein-protein interaction (mainly GPCRs signaling) using BRET, FRET and HTRF
- Research conducted under the supervision of Dr. Laurent Preazeue and Dr. Jean Philippe - PIN team.

1997-1998 and 2002-2006

King Saud University, Riyadh, Saudi Arabia

Teaching Assistant: Department of Pharmacology & Toxicology, College of Pharmacy,

MEMPERSHIPS

- British Pharmacology Society
- IUPHAR subcommittee member, GPCRs database, Neuromedin U receptors

RESEARCH INTEREST

The G protein-coupled receptor (GPCR) superfamily is one of the largest human gene families comprising approximately 800 genes (2% of the human genome). These receptors regulate a wide diversity of patho-physiological processes. As such, they provide excellent drug targets and this is reflected in the fact that approximately 40-50% of currently prescribed drugs target GPCRs. Despite this, a relatively small number (~30) of the approximately 400 non-olfactory receptors are therapeutic targets, highlighting the great potential for the development of novel therapeutics. My PhD project focused on understanding aspects of desensitization, resensitization and trafficking of two GPCRs, both of which are receptors for the neuropeptides neuromedin U and neuromedin S. Through the two Neuromedin U receptors, these peptides regulate a variety of patho-physiological processes including blood pressure, the stress response, pain, cancer, feeding behavior and energy expenditure. For the current time, I'm further investigating these aspects using different endogenous agonists (hNmU-25 and hNmS-33) for these receptors (NMU1/2) to explore the possibilities of biased signaling. As a future interest, following evolution of GPCRs crystallization and generation of nanobodies towards a specific conformation of GPCRs, I am very interested in learning and applying these tools in the CNS Pharmacology and cancer fields. I am also interested to further understand how biased agonism mediate a selective event (signaling/trafficking) that may contribute to the discovery of novel therapeutic agents with a lower incidence of side effects.

ACQUIRED TECHNIQUES AND SKILLS

- ***Cell Signaling Events:***
  - Measurement of intracellular Ca^{2+} ($[Ca^{2+}]_i$) using Ca^{2+}-sensitive fluorescent dyes either in single cells using confocal microscopy or in cell populations using a plate-reader
  - Radioreceptor assay for measurement of cyclic AMP (cAMP)
  - Phospholipase C activity through measurement of inositol phosphate generation
  - Western blotting of phospho-ERK (extracellular signal-regulated kinase) as an index of ERK activation
  - Measurement of IP_1, cAMP and pERK using Homogeneous Time Resolved Fluorescence (HTRF) (Cisbio kits)
- ***Receptor Desensitization/Resensitization; Ligand and Receptor Trafficking:***
  - Functional assessment of signaling
  - Subcellular localization and real-time assessment of the trafficking of fluorescent ligand and fluorescently-tagged receptors in live cells using confocal microscopy
  - Measurement of receptor activation, β-arrestins recruitment and G-protein activation using Bioluminescence Resonance Energy Transfer (BRET) technique
- ***Cell Culture:***
  - Establishment and maintenance of different cell lines and primary cells
  - Isolation of primary cells by enzymatic digestion including
    - Rat and mouse colonic smooth muscle cells
    - Rat aortic smooth muscle cells
    - Porcine coronary artery smooth muscle cells
- ***Organ-bath experiments***
- ***Molecular biology techniques including: polymerase chain reaction (PCR); DNA purification; ligation; transformation; transient and stable transfection; RNA isolation and reverse-transcription (preparation of cDNA library from RNA)***
- ***Data analysis using GraphPad prism software. Descriptive and comparative statistics***
- ***Bibliographic citation using Endnote software***
- ***Supervision of project students***

PUBLICATIONS

Accepted/Peer Reviewed:

1. Abdulrasheed O. Abdulrahman, Mohammad A. Ismael, **Khaled A. Alhosaini**, Christelle Rame, Abdulrahman M. Al-Senaidy, Joëlle Dupont & Mohammed Akli AYOUB (13, January 2016). Differential Effects of Camel Milk on Insulin Receptor Signaling Towards Understanding the Insulin-like Properties of Camel Milk. Frontiers in Endocrinology, section Molecular and Structural Endocrinology.

Published/Peer Reviewed:

1. Abdulrahman AO, Ismael MA, **Al-Hosaini K**, Rame C, Al-Senaidy AM, Dupont J, Ayoub MA (2015). Differential Effects of Camel Milk on Insulin Receptor Signaling - Toward Understanding the Insulin-Like Properties of Camel Milk. Front Endocrinol (Lausanne). 2016 Jan 27;7:4.
2. Nadeem, A., Al-Harbi, N. O., Al-Harbi, M. M., El-Sherbeeny, A. M., Ahmad, S. F., Siddiqui, N., Ansari M. A., Zoheir K. M. A., Attia, S. M., **Al-Hosaini, K. A.** & Al-Sharary, S. D. (2015). Imiquimod-induced psoriasis-like skin inflammation is suppressed by BET bromodomain inhibitor in mice through RORC/IL-17A pathway modulation. *Pharmacological Research*, 99, 248-257.

3. Fatani, A. J., **Al-Hosaini, K. A.**, Ahmed, M. M., Abuohashish, H. M., Parmar, M. Y., & Al-Rejaie, S. S. (2015). Carvedilol Attenuates Inflammatory Biomarkers and Oxidative Stress in a Rat Model of Ulcerative Colitis. *Drug Development Research*, 2015 Jun; 76(4): 204-14
4. Hafez, M. M., Al-Harbi, N. O., Al-Hoshani, A. R., **Al-Hosaini, K. A.**, Al Shrari, S. D., Al Rejaie, S. S., ... & Al-Shabanah, O. A. (2015). Hepato-protective effect of rutin via IL-6/STAT3 pathway in CCl4-induced hepatotoxicity in rats. *Biological Research*, 2015 11; 48:30. Epub 2015 Jun 11.
5. Hafez, M. M., Alhoshani, A. R., **Al-Hosaini, K. A.**, Alsharari, S. D., Al Rejaie, S. S., Sayed-Ahmed, M. M., & Al-Shabanah, O. A. (2014). SKP2/P27Kip1 pathway is associated with Advanced Ovarian Cancer in Saudi Patients. *Asian Pacific Journal of Cancer Prevention: (APJCP)*, 16(14), 5807-5815.
6. Ayoub, M. A., Trebaux, J., Vallaghe, J., Charrier-Savournin, F., **Al-Hosaini, K.**, Moya, A. G., Pin, J. P., Pfleger, K. D. G. & Trinquet, E. (2014). Homogeneous time-resolved fluorescence-based assay to monitor extracellular signal-regulated kinase signalling in a high-throughput format. *Frontiers In Endocrinology*, 2014 23; 5:94. Epub 2014 Jun 23.
7. Mansour, M. A., Aljoufi, M. A., **Al-Hosaini, K.**, Al-Rikabi, A. C., & Nagi, M. N. (2014). A Possible Antineoplastic Potential of Selective, Irreversible Proteasome Inhibitor, Carfilzomib on Chemically Induced Hepatocarcinogenesis in Rats. *Journal of Biochemical and Molecular Toxicology*, 2014 Sep 27; 28(9):400-6. Epub 2014 May 27.
8. Mansour, M. A., Aljoufi, M. A., **Al-Hosaini, K.**, Al-Rikabi, A. C., & Nagi, M. N. (2014). Possible role of selective, irreversible, proteasome inhibitor (carfilzomib) in the treatment of rat hepatocellular carcinoma. *Chemico-biological Interactions*, 2014 May 13; 215:17-24. Epub 2014 Mar 13.
9. Al-Rejaie, S. S., Aleisa, A. M., Sayed-Ahmed, M. M., AL-Shabanah, O. A., Abuohashish, H. M., Ahmed, M. M., Al-Shabanah, O. A., Abuohashish, H. M., Ahmed, M. M., **Al-Hosaini, K. A.** & Hafez, M. M. (2013). Protective effect of rutin on the antioxidant genes expression in hypercholestrolemic male Westar rat. *BMC Complementary and Alternative Medicine*, 2013 17; 13:136. Epub 2013, Jun 17.
10. Gary B. Willars, **Khaled Al-hosaini**, Stephen R. Bloom, Joseph Hedrick, Andrew Howard, Preeti Jethwa, Simon Luckman, Rita Raddatz, Nina Semjonous. Neuromedin U receptors. Last modified on 04/03/2013. Accessed on 29/12/2013. IUPHAR database (IUPHAR-DB), [Link].
11. Abuohashish, H. M., Al-Rejaie, S. S., **Al-Hosaini, K. A.**, Parmar, M. Y., & Ahmed, M. M. (2013). Alleviating effects of morin against experimentally-induced diabetic osteopenia. *Diabetol Metabolism Syndrome*, 2013 6; 5(1). Epub 2013 Feb 6.
12. Sayed-Ahmed, M. M., Hafez, M. M., Aldelemy, M. L., Aleisa, A. M., Al-Rejaie, S. S., **Al-Hosaini, K. A.**, Al-Harbi, N. O., Al-Harbi, M. M. & Al-Shabanah, O. A. (2012). Downregulation of oxidative and nitrosative apoptotic signalling by L-carnitine in ifosfamide-induced fanconi syndrome rat model. *Oxidative Medicine and Cellular Longevity*, 2012 13; 2012:696704. Epub 2012 Nov 13.
13. Soni, P., **Al-Hosaini, K. A.**, Fernström, M. A., & Najjar, S. M. (1999). Cell adhesion properties and effects on receptor-mediated insulin endocytosis are independent properties of pp120, a substrate of the insulin receptor tyrosine kinase. *Molecular Cell Biology Research Communications*, 1(2), 102-108.

In Progress:

1. **Al-Hosaini, K.**, Challiss, R.A.J. and Willars, G.B. *Involvement of ECE-1 in type 2 Neuromedin U receptor trafficking*.
2. **Al-Hosaini, K.**, Challiss, R.A.J. and Willars, G.B. *Ligand dependent resensitization profile of type 2 Neuromedin U receptor.*

Abstracts and Posters Presentations:

1. **Al-Hosaini, K.**, Challiss, R.A.J. and Willars, G.B (2010) *Irreversible binding of neuromedin U to its type 2 receptor (NMU2): relationship to loss and recovery of agonist-mediated Ca2+ signalling*. British Pharmacological Society, 3rd Focused Meeting on Cell Signalling, Leicester, UK. April 2009. Poster presentation.
2. **Al-Hosaini, K.**, Challiss, R.A.J. and Willars, G.B (2010) *Role of receptor recycling in the recovery of Ca2+ signalling by recombinantly expressed neuromedin U 2 receptors (NMU2)*. 16th World Congress of Basic and Clinical Pharmacology, Copenhagen, Denmark. July 2010. Poster presentation.
3. **Al-Hosaini, K.**, Challiss, R.A.J. and Willars, G.B (2012) *Endothelin-converting enzyme-1 (ECE-1) regulates the recycling and resensitisation of the neuromedin U 2 receptor (NMU2) following activation by neuromedin U-25 but not neuromedin*. S. British Pharmacological Society, 4th Focused Meeting on Cell Signalling, Leicester, UK. April 2012. Oral presentation.
4. **Al-Hosaini, K.**, Challiss, R.A.J. and Willars, G.B (2012) *Ligand-specific profiles and mechanisms of re-sensitisation of the neuromedin U 2 receptor*. Monash University, 7th Molecular Pharmacology of GPCR meeting, Melbourne, Australia. December, 2012. Oral and poster presentation.
5. **Al-Hosaini K.**, Challiss, R.A.J., Willars G.B. (2013), *A role for endothelin converting enzyme-1 activity in the regulation of neuromedin U receptor re-sensitization and ERK signalling*. Experimental Biology meeting 2013 and 4th GPCRs Colloquium, Boston, MA, USA. 20-25 April, 2013. Poster presentation.

WORKSHOPS ATTENDED

International Workshops

- 25th April 2012, Fluorescence approaches for examining GPCR biology, CellAura, Nottingham, UK.
- 24-28 June 2012, Faculty development workshop, Faculty of Medicine, Ottawa, Ontario, Canada
- 1-6 June 2013, Recombinant DNA Methodology I, The Foundation for Advanced Education in the Sciences (FAES), The National Institutes of Health, Bethesda, MD, USA
- 16-20 February 2015, Molecular biology for professionals, AMBL, Michael Smith Laboratories, The University of British Columbia, Vancouver, BC, Canada

National University Workshops

- 13-15 November 2012, Incorporating technology into teaching blackboard, King Saud University, Riyadh, Saudi Arabia
- 9 February 2013, evaluation of learning outcomes, King Saud University, Riyadh, Saudi Arabia
- 11 February 2013, E-Portfolio as a tool for students learning outcomes assessment, King Saud University, Riyadh, Saudi Arabia

CONFERENCES AND WORKSHOPS PARTICIPATION

- Oral presentation in "Imaging in Cell Biology and Molecular Science" workshop at College of Dentistry, King Saud University, Riyadh, Saudi Arabia, 8 & 9th of December, 2015
- 23-24 September 2009, Young Physiologists' Symposium - Ion Channels and Receptors in Cell Physiology organization at Stamford Hall, University of Leicester, Leicester, UK

TECHNICAL & NATURAL LANGUAGE SKILLS

- **Operating Systems:** Windows and Mac.

- **Computers Programs:** Microsoft Office GraphPad prism, Endnote and image J
- **Fluent in:** English, Arabic.

REFERENCES

- ***Gary Willars, Ph.D.***
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  P.O. Box 138, Leicester LE1 9HN
  Tel: +44 (116) 229 7147
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- ***John Challiss, Prof.***
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- ***Mohammed Akli Ayoub, Ph.D.***
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