

## PROFESSOR GAMAL A. EL-HITI

### CURRICULUM VITAE



#### PERSONAL DETAILS

**Current Position:** Professor at King Saud University

**Current Address:** Department of Optometry, College of Applied Medical Sciences, King Saud University, P.O. BOX 10219, Riyadh 11433, Saudi Arabia; <http://fac.ksu.edu.sa/gelhiti>

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**Home Address:** 97 Manor Way, Whitchurch, Cardiff CF14 1RF, United Kingdom

**Tel:** 0044(0)2920195908 (Home); 0044(0)7902394871 (Mobile)

**Date of Birth:** 20<sup>th</sup> July 1964

**Nationality:** British

**Gender:** Male

**Material Status:** Married, two children

#### EDUCATION AND QUALIFICATION

##### Faculty of Science, Tanta University, Egypt

**1991—1996:** Ph.D. Degree in Organic Chemistry from Tanta University, Egypt; February 1996 (included results obtained during two years at Swansea University, United Kingdom working under the supervision of Professor Keith Smith). The Ph.D. thesis title: *"Synthesis and Spectroscopic Studies of Some Quinazolin-4(3H)-one Derivatives and Their Related Heterocyclic Systems"*

**1989—1990:** M.Sc. Degree in Organic Chemistry with Research from Tanta University, Egypt; October 1990 (included several postgraduate courses for one year). The M.Sc. thesis title: *"Synthesis and Spectroscopic Studies of Some N-Glycosides of Aminoquinazolin-4(3H)-one Derivatives"*

**1982—1986:** B. Sc. Degree in Chemistry with grade very good "Honours" from Tanta University, Egypt; June 1986.

#### EMPLOYMENT AND VISITS HISTORY

I have been employed at four universities, one in Saudi Arabia, two in the United Kingdom and the fourth one in Egypt.

## 1— Department of Optometry, College of Applied Medical Sciences, King Saud University, Saudi Arabia

**Professor:** January 2013—Present

## 2— Schools of Biosciences and Chemistry, Cardiff University, UK

**Visiting Professor at the School of Chemistry:** March 2016  
**Visiting Professor at the School of Chemistry:** January 2016  
**Visiting Professor at the School of Chemistry:** June — August 2015  
**Visiting Professor at the School of Chemistry:** April 2014  
**Visiting Professor at the School of Chemistry:** April 2014  
**Visiting Professor at the School of Biosciences (BIOSI 1):** January 2014  
**Visiting Professor at the School of Chemistry:** June — August 2013  
**Teacher in Organic Chemistry at the School of Chemistry:** August 2012 – January 2013  
**Research Fellow at the School of Chemistry:** January — July 2012  
**Research Fellow at the School of Biosciences (BIOSI 1):** July 2010 — December 2011  
**Research Associate at the School of Chemistry:** August 2007 — June 2010

## 3— Department of Chemistry, Swansea University, UK

**Research Officer:** September 2006—July 2007  
**Lecturer in Chemistry:** September 2005—September 2006  
**Research Officer:** August 2003—September 2005  
**Lecturer in Chemistry:** January 2003—July 2003  
**Research Officer:** March 2002—January 2003  
**Academic Visitor:** February 2002—March 2002  
**Academic Visitor:** January 1998—July 1999  
**Visiting Student:** October 1993—September 1995

## 4— Department of Chemistry, Faculty of Science, Tanta University, Egypt

**Professor of Organic Chemistry:** July 2006—February 2013  
**Associate Professor of Organic Chemistry:** June 2001—July 2006  
**Lecturer in Organic Chemistry:** May 1996—June 2001  
**Assistant Lecturer in Organic Chemistry:** October 1990—May 1996  
**Demonstrator:** January 1988—October 1990  
**On sabbatical leave:** From Tanta University; February 2002—February 2013; January 1998—July 1999 and October 1993—September 1995 to the UK

## TEACHING EXPERIENCE

Comprehensive experience in teaching optometric statistics, experimental design and data management in visual science, research methods, organic, bioorganic and biochemistry to both chemistry and non-chemistry undergraduate and postgraduate students. Also, great experience in teaching microbiology, biochemistry, bioorganic chemistry, medical statistics, rules and importance of research ethics, research methods and environmental safety for optometry students.

### **1— KING SAUD UNIVERSITY, KSA**

- Optometric Statistics (OPTO371)
- Microbiology I (OPTO425)
- Microbiology II (OPTO435)
- Optometric Statistics (OPTO442)
- Visual Science Project (OPTO475)
- Final Project I (OPTO498)
- Final Project II (OPTO499)
- Experimental Design and Data Management in Visual Science (OPTO571)
- Research Project (OPTO599)
- M.Sc. Thesis (OPTO600)

### **2— CARDIFF UNIVERSITY, UK**

- Training in Research Methods (CH2301)
  - Environmental Chemistry (CH2312)
  - Current Techniques in Chemical Biology and Modern Applications (CH2417/CHT211)
  - Foundation Organic Chemistry (CH3103)
- Also, helped and assisted Professor Keith Smith in the preparation of the new postgraduate MSc Programme in Sustainable Chemistry that started on October 2009.

### **3— SWANSEA UNIVERSITY, UK**

- Chemistry of Bifunctional Molecules (CH212 and CHB216)
  - Aromatic Chemistry (CH212 and CHB216)
  - Heterocyclic Chemistry (CH212 and CHB216)
  - Chemistry of Waste (CH278, CH328 and CHM28)
  - Chemistry of Polymers and Materials (CH326 and CHM26)
  - Biological Chemistry (CH259, CH359 and CHM59)
- Practical Organic Chemistry for level 2 and 3 students including non-chemistry students (CH218, CH333 and CH334)

### **4— TANTA UNIVERSITY, EGYPT**

- Fundamentals of Organic Chemistry

- Reaction Mechanisms
- Heterocyclic Chemistry
- Chemistry of Natural Products
- Selected Topics in Organic Chemistry
- Chemistry of Polymers
- Organometallic Chemistry
- Petroleum Chemistry
- Biochemistry I (Carbohydrates, Amino Acids and Proteins)
- Biochemistry II (Fats, Oils and Nucleic Acids)
- Practical Organic Chemistry for year 1—4 students including non-chemistry students

## ANALYTICAL TECHNIQUES EXPERIENCE

Great experiences with most advanced spectroscopic and analytical techniques and in particular the ones used in Organic and Bioorganic Chemistry. For example: Nuclear Magnetic Resonance (NMR) such as  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{11}\text{B}$  and  $^{19}\text{F}$  NMR; also, experiences with most advanced NMR techniques such as two dimensional (2D) NMR; Low (LRMS) and High mass spectroscopy (HRMS) such as Electron Impact (EI), Chemical Ionization (CI), Fast Atomic Bombardment (FAB) and Matrix-Assisted Laser Desorption/Ionization (MALDI); Thermal Gravimetric Analysis (TGA); Ultraviolet/Visible Spectroscopy (UV); Infrared Spectroscopy (IR); Fluorescence Spectroscopy; High Performance Liquid Chromatography (HPLC); Gas Chromatography (GC) and CHNSX Micro-analyser. Experience with the use of electronic microscope, TearLab Osmolarity System, which is an objective and quantitative test for diagnosing and managing dry eye patients. We are interested in the use of tear ferning as a valuable tool in the detection of the dryness of the eye. Also, we are investigating the effects of basic tear electrolytes such as monovalent divalent hydrogenated electrolytes on the ferning patterns of artificial tears.

## COMPUTER AND SOFTWARE EXPERIENCE

- Great experiences with most educational software, Power Point and Blackboard (Frequently using both in teaching for most of my teaching organic chemistry courses)
- Familiar with MestRec NMR software
- Extensive use of most chemistry software (*e.g.* ChemWindow, ChemDraw and Isis/Draw)
- Frequently using chemistry search engines (*e.g.* Beilstein, SciFinder, Science Direct)

## TRAINING COURSES

- Workshop in the course specification and course reports new forms released by the National Commission for Academic Accreditation and assessment (NCAAA), The College of Medical Applied Sciences, King Saud University, Riyadh, Saudi Arabia, 14<sup>th</sup> May 2014.
- Training Workshop about the Academic System; Modules Deletion and Addition, The College of Medical Applied Sciences, King Saud University, Riyadh, Saudi Arabia, 1<sup>st</sup> January 2014.
- Wales Spinout Training, an Introduction to being a Company Director Workshop at Wales Spinout Program, Finance Wales Plc, Port Talbot, Wales, UK, 7<sup>th</sup> November 2006.

- Faculty and Leadership Development Project (FLDP) Workshops at Tanta University, Tanta, Egypt, 2005.
- Introduction to University Teaching Workshop at Swansea University, Swansea, UK, 2004.
- Living Safely with your Fume Cupboard Workshop at Swansea University, Swansea, UK, 1995.
- Teaching University Students and Improving Teaching Skills Workshop at Tanta University, Tanta, Egypt, 1993.

## ACTIVITIES

- Reviewer for BSc programme in Chemistry at the Department of Chemistry, Collage of Sciences and Humanities, Shaqra University, Duwadimi, Saudi Arabia.
- Reviewer for BSc programme in Industrial Chemistry at the Department of Chemistry, Collage of Applied Sciences, Umm Al-Qura, Makkah, Saudi Arabia.
- Reviewer for BSc programme in Pure Chemistry at the Department of Chemistry, Collage of Applied Sciences, Umm Al-Qura, Makkah, Saudi Arabia.
- Reviewer for BSc programme in Chemistry at the Department of Chemistry, Collage of Sciences and Humanities, Salman bin Abdulaziz University, Alkharij, Saudi Arabia.
- The head of the Ethics Committee at the College of Applied Medical Sciences, King Saud University, Saudi Arabia
- The head of the Postgraduate Studies and Research Committee at Optometry Department, College of Applied Medical Sciences, King Saud University, Saudi Arabia
- Examiner for the Research Centre at the College of Applied Medical Sciences, King Saud University, Saudi Arabia
- Carried out full duties as a member of the Optometry Department, College of Applied Medical Sciences, King Saud University, Saudi Arabia
- Carried out full duties as the head for the Postgraduates Committee at Optometry Department, College of Applied Medical Science, King Saud University
- Carried out full duties as a member of the Ethics Committee at the College of Applied Medical Science, King Saud University
- Consultant for the College of Applied Medical Sciences Research Centre from 2014
- Technical Director (ID: 911429371) for CatCelt Limited (Research and Development on Natural sciences and Engineering; Registration Number: 05798881), Swansea, UK; August 2006—Present
- Consultant for Swansea University Ventures, Swansea, UK, 2004—2007
- Safety Advisor at Department of Chemistry, Swansea University, Swansea, UK, 2003—2004
- Chemical Expert for Department of Chemistry, Swansea University, Swansea, UK, 2002
- Consultant for the Egyptian TV; Channel 6, 1996—1997
- Consultant for Environment Centre and Youth Chemistry Program, Tanta University, Egypt, 1997
- Carried out full duties as a member of the Department of Chemistry, Swansea University, Cardiff University in the UK and Tanta University in Egypt plus involvement in cross-disciplinary Committees at the Faculty level in Egypt and Saudi Arabia (e.g. developing collaborations with Cornea Research group, Physics, Dentistry, Biological Science and Mechanical Engineering)

- Carried out full duties as Director of Teaching at the Department of Chemistry, University of Tanta, Egypt
- Carried out full duties as a member of the Scheduling and Time Table Committee Service at Department of Chemistry, University of Tanta, Egypt
- Carried out full duties as a member of Undergraduate Students Liaison Committee at the Department of Chemistry, University of Tanta, Egypt

## MEMBERSHIP OF PROFESSIONAL ORGANISATION

- Royal Society of Chemistry in 2013 and 2014
- Senior Member of the Egyptian Heterocyclic Chemical Society since October 1995

## AWARDS

- International Author Grant from the Royal Society of Chemistry, 2001
- International Author Grant from the Royal Society of Chemistry, 1997
- Scholarship from the Egyptian Government to Swansea University, UK for two years as a part of the PhD study, 1993—1995

## RECOGNITION

- Marquis Who's Who in the World, 33<sup>rd</sup> Edition, 2015
- Marquis Who's Who in the World, 32<sup>nd</sup> Edition, 2014
- Marquis Who's Who in the World, 31<sup>st</sup> Edition, 2013
- Marquis Who's Who in the World, 30<sup>th</sup> Edition, 2012
- Dictionary of International Biography since the 34<sup>th</sup> Edition, 2008
- Marquis Who's Who in Science and Engineering, 10<sup>th</sup> Edition, 2007
- Marquis Who's Who in Science and Engineering, 9<sup>th</sup> Edition, 2006
- Marquis Who's Who in the World 24<sup>th</sup> Edition, 2006
- Marquis Who's Who in the World 23<sup>rd</sup> Edition, 2005

## EDITORIAL BOARDS AND REFEREEING FOR JOURNALS

- Member of the Editorial Board of *the Journal of Drug Design and Medicinal Chemistry*
- Member of the Editorial Board of the *BAOJ Chemistry*
- Member of the Editorial Board of the *EC Chemistry*
- Member of the Editorial Board of the *Iraqi National Journal of Chemistry*
- Member of the Editorial Board of the *Athens Journal of Sciences*
- Member of the Editorial Board of the *World Journal of Organic Chemistry*
- Member of the Editorial Board of the *Journal of Organic Chemistry Research*
- Facilitator of the Arkivoc Commemorative Issue in Honour of Professor Keith Smith, 2012, Volume (vii)
- Referee for John Wiley and Sons books "Heteroaromatics in Advanced Materials"

- Referee for *European Journal of Medicinal Chemistry*, *European Journal of Chemistry*, *Current Organic Synthesis*, *Current Organic Chemistry*, *Journal of Molecular Catalysis A: Chemical*, *New Journal of Chemistry*, *Mini-Reviews in Medicinal Chemistry*, *Mini-Reviews in Organic Chemistry*, *International Journal of Molecular Sciences*, *Molecules*, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, *Archiv der Pharmazie*, *Dyes and Pigments*, *Medicinal Chemistry Research*, *Journal of Heterocyclic Chemistry*, *Reports in Organic Chemistry*, *Journal of Sulfur Chemistry*, *Letters in Drug Design and Discovery*, *Synthetic Communications*, *Phosphorus, Sulfur, and Silicon and the Related Elements*, *Journal of Modern Medicinal Chemistry*, *International Journal of Organic Chemistry*, *Research on Chemical Intermediates*, *Polish Journal of Chemical Technology*, *Research Journal of Textile and Apparel*, *Macedonian Journal of Chemistry and Chemical Engineering*, *Heterocyclic Communications*, *Egyptian Journal of Chemistry*, *Journal of Organic Chemistry Research*, *Journal of Saudi Chemical Society*, *The Journal of the Association of Arab Universities for Basic and Applied Research*, *Iranian Journal of Chemistry and Chemical Engineering*, *Issues in Biological Sciences and Pharmaceutical Research*, *Polimery*, *World Journal of Organic Chemistry*, *ProJournal of Physical Science Research (PPSR)*, *Green and Sustainable Chemistry*, *Journal of Environment Pollution and Human Health* and *Clinical and Experimental Optometry and the Bulletin of the Chemical Society of Ethiopia*.
- Reviewer for the Deanship of Scientific Research, Taif University, Saudi Arabia since 2016.
- Reviewer for the Research Centre at the College of Applied Medical Sciences, King Saud University, Saudi Arabia since 2014.
- Reviewer for the undergraduate programme plan for the Chemistry Department, College of Sciences and Humanities, Salman bin Abdulaziz University, Saudi Arabia, 2014.
- Referee for *Trans-European Mobility Programme for University Studies (TEMPUS)*, the European Community Programme for the Development of Higher Education Systems, Egypt Office, 2012.
- External referee for *the Max F. Perutz Laboratories (MFPL) International PhD Program*, University of Vienna, Austria, 2012.
- Referee for *the 6<sup>th</sup> Saudi International Conference (SIC 2012)*, Brunel University, Middlesex, United Kingdom, 11—14 October 2012
- Referee for *the 5<sup>th</sup> Saudi International Conference (SIC 2011)*, University of Warwick, Coventry, United Kingdom, 23—26 June 2011
- Referee for *the 4<sup>th</sup> Saudi International Conference (SIC 2010)*, University of Manchester, United Kingdom, 30—31 July 2010
- Referee for *the Academy of Sciences for the Developing World (TWAS — Prizes)* in Basic Science, 2010
- Referee for *the 3<sup>rd</sup> Saudi International Conference (SIC 2009)*, University of Surrey, United Kingdom, 5—6 June 2009

## SUPERVISION OF POSTGRADUATE STUDENTS

I have supervised and assisted Professor Smith's postgraduate (PhD, MPhil and MChem) students working in the field of synthetic organic chemistry at both Cardiff and Swansea Universities, UK during my stay in the UK. I also supervised and assisted Professor Smith's students with techniques and interpretation of their results. Several postgraduate students conducted their MPhil and PhD research studies under my supervision at Tanta University, Egypt and have already graduated.



## RESEARCH GRANT APPLICATIONS

I have contributed to the preparation of eight grant applications along with Professor Keith Smith (2002–2011). These grant applications have been submitted to the Leverhulme Trust (two applications), Knowledge Exploitation Funds (KEF), the Engineering and Physical Sciences Research Council (EPSRC), Molecular Light Technology (MLT), the American Chemical Society, the Welsh Government (WG) and the Advanced Sustainable Manufacturing Technologies (ASTUTE). Five grants (Leverhulme Trust, KEF, MLT, WG and ASTUTE) have already been awarded.

- Several grants have been awarded from Saudi Universities and chemical industry.
- June 2013: A research grant for 150,000 SAR was awarded, along with others, from the Deanship for Science Research, King Saud University, Saudi Arabia (RGP-VPP-239).
- April 2014: A research grant for 67,000 SAR was awarded, along with others, from Deanship for Science Research, Salman Bin Abdulaziz University, Saudi Arabia (2013/01/08).
- April 2014: A research grant for 80,000 SAR was awarded, along with others, from Deanship for Science Research, Salman Bin Abdulaziz University in association with SIBC, Saudi Arabia (2013/01/134).
- June 2014: A research grant for 150,000 SAR was awarded, along with others, from the Deanship for Science Research, King Saud University, Saudi Arabia (RGP-VPP-239).
- June 2015: A research grant for 150,000 SAR was awarded, along with others, from the Deanship for Science Research, King Saud University, Saudi Arabia (RGP-VPP-239).
- October 2015: A research grant for 75,000 SAR was awarded, along with others, from Deanship for Science Research, Prince Sattam Bin Abdulaziz University in association with SIBC, Saudi Arabia (2015/01/5162).

## RESEARCH INTERESTS

- Synthesis of substituted aromatics and heterocycles through greener synthetic routes rather than traditional ones
- Synthesis and application of chemiluminescent and photochromic materials with interesting properties
- Use of organometallic compounds, especially of lithium and boron, as intermediates in synthetic organic chemistry
- Use of zeolites, solid-supported reagents and polymeric materials as catalysts in highly regioselective reactions
- Synthesis of polymeric materials with interesting applications
- Study of tear ferning and osmolarity
- Nanosecond time resolved laser-spectroscopy study of dynamic interfacial charge transfers of organic dyes

Our research interests are primarily in the development of novel organic synthetic methods, especially ones that are “greener” than traditionally and synthesis of compounds with interesting properties. Particular current research projects involve use of zeolites and solid-supported reagents and catalysts to gain selectivity in organic reactions; lithiation reactions which we have used to devise novel heterocyclic ring syntheses and to introduce selectivity into aromatic and heterocyclic substitution reactions; heterocyclic chemistry and design and



synthesis of novel compounds with interesting chemiluminescent or other photoactive properties.

Most of our novel synthetic methods research has been oriented towards reactions and products rather than reagents and in particular we are developing new more eco-friendly "green" approaches for the synthesis of commercially important products, especially in the area of selective electrophilic aromatic substitution reactions, which are of major industrial importance but are traditionally often very unselective reactions.

I have joined Professor Keith Smith's research group at Swansea University United Kingdom in 1993 while enrolled for a PhD in Egypt. I was awarded a scholarship to allow me to spend two years in the UK to take advantage of the availability of advanced facilities. Keith and I decided to apply some of the techniques used in lithiation chemistry to 3*H*-quinazalin-4-ones, which I had already been studying in Egypt. We were able to elaborate various 3*H*-quinazolin-4-ones into more complex derivatives and this formed the basis of my PhD thesis when I returned to Egypt to resume my job as a lecturer. As soon as Tanta University would permit it, Keith invited me back to the UK as a postdoctoral researcher and found support funding. He did the same on two more occasions and the latter has been continuous for the last 11 years, including a move to Cardiff University when Keith transferred to there in 2007. During these periods I acted as a laboratory/group leader for Professor Smith's group and assisted his students with techniques and interpretation of their results. I therefore gained a very extensive knowledge of the work they were doing and of the techniques they were using. We have collaborated extensively and especially in the area of green chemistry (for which Professor Smith was the first winner of the RSC Green Chemistry Award in 2001). We have together over 90 joint publications, including ones in all of the major areas of research in which Keith's group is involved.

Our research has been particularly focused on six areas: the synthesis of substituted aromatics and heterocycles *via* use of lithium intermediates; the use of zeolites or other solids in *para*-selective electrophilic aromatic substitution reactions of simple aromatics; the regioselective *para*-chlorination of phenols using novel polymeric sulfur-containing catalysts; the design and synthesis of polymeric materials with potential industrial applications; the design and synthesis of novel chemiluminescent compounds for use as biological probes and the design of novel materials with potentially interesting optical properties. The chlorination project was funded by Knowledge Exploitation Funds (KEF) and Leverhulme Trust. The results obtained demonstrate that these new catalysts possess broader applicability than any other known catalysts for *para*-selective phenol chlorination reactions. These catalysts are being commercially exploited through CatCelt, a company we started for this purpose and I am acting as the Technical Director for such company since August 2006. The chemiluminescent project was funded by both Molecular Light Technology (MLT) and Welsh Government (WG). Such project involved use of acridinium ester biological probes in molecular assays enabling "animal-free" toxicology tests.

In recent years our research concentrated on the design and synthesis of novel optical materials by careful attention to the design of the chemical entities. The ultimate aim of the project was the development of smart materials that can be used for counterfeit-proof security marking of documents, packaging, products or commodities, together with a system for detecting such materials in a highly sophisticated manner. The materials in question would be highly complex chemical entities having multiple features that respond differently to stimulation by light of different wavelengths. As a result, the materials would emit light following specific pulse sequences of stimulating light, and specifically not emit light under other pulse sequences. Repetition of the original pulse sequence would again cause emission of

light. The detection system would consist of a device for generating the particular sequences of light pulses and detecting the emission of light in a highly sensitive manner. The project has been funded by Welsh Government (WG) and Advanced Sustainable Manufacturing Technologies (ASTUTE).

In 2013, I have joined the Department of Optometry, College of Applied Medical Sciences at King Saud University, Saudi Arabia. The current research focuses on the chemistry of tear ferning which is a valuable tool in the detection of dryness of eye. We are investigating the dryness of the eye using by the evaluation of tear osmolarity with the TearLab™ system and various other techniques. Also, we are investigating the ocular tear film in diabetic subjects and examine the correlation between dryness of the eye and diabetes disease. Current attention is paid to the development of new artificial tear and improves the tear ferning of the most common ones in market.

Active collaborations exist with Professor Keith Smith, Professor Peter Kille, Dr Benson M. Kariuki and Dr Ceri Morris, Cardiff University, United Kingdom, Dr Ali Masmali and Dr Saud Alanazi, King Saud University, Saudi Arabia, Dr Mohammed B. Alshammari, Prince Sattam Bin Abdulaziz University, Saudi Arabia, Dr Mohammad H. Alotaibi, King Abdulaziz City for Science and Technology, Saudi Arabia, Dr Mansour Ajarim, Ministry of Interior, Riyadh, Saudi Arabia, Dr Mohammed Baashen and Dr Bakr F. Abdel-Wahab, Shaqra University, Al-Dawadmi, Saudi Arabia, Professor Emad Yousif, Department of Chemistry, College of Science, Al-Nahrain University, Baghdad 64021, Iraq, Dr Asim A. Balakit, College of Pharmacy, Babylon University, Babylon, Iraq and Dr Yusuf Sert, Department of Physics, Faculty of Art & Sciences, Bozok University, Yozgat 66100, Turkey.