

LOAY AWAD

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Assistant Professor of faculty of engendering
University of Dammam
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Saudi Arabia
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Citizenship: passport holder in Switzerland

As a synthetic organic chemist for medical and pharmaceutical applications with extensive research experience in: a) polymer and dendrimer chemistry, heterocyclic and aromatic chemistry; b) biochemistry, carbohydrate chemistry, medicinal chemistry, peptide chemistry, and non-natural amino acid synthesis. Project leader of synthesis of organic compounds for medical applications especially in Cancer and neurodegenerative diseases area.

PRESENT STATUS:

The university of Dammam

Dammam, Saudi Arabia

Assistant Professor

August **2012**- presents

Research domain: Organic Chemistry, polymer and dendrimer chemistry, heterocyclic and aromatic chemistry, Molecular Biology, Peptide Synthesis, non-Natural Amino Acids Synthesis, Proteins Synthesis, Caged Amino Acids, cancer and neurodegenerative diseases research area, Photo-Chemistry, Biophysical Study of Proteins and peptides.

EDUCATION

Swiss Federal Institute of Technology

Lausanne, Switzerland

Doctor in Synthetic Organic Chemistry

October **2001**-October **2005**

Field of Study: Medicinal Chemistry, Glycochemistry

Advisor: Pierre Vogel, Ph.D.

Lausanne University

Lausanne, Switzerland

Institute of Technology

Paris, France

Master of Science, Chemistry (DEA)

October **2000**-October **2001**

Advisor: Pierre Vogel, Ph.D.

Alquds University

Jerusalem, Palestine

Bachelor of Science, Chemistry

October **1995**-Febreuary **1999**

Minor: Chemical Technology

WORK EXPERIENCE

Swiss Federal Institute of Technology, Faculty of Life Science

Lausanne, Switzerland

Senior postdoctoral, Laboratory of Hilal A. Lashuel, Ph.D.

October **2009**- December **2011**

Ludwig Institute for Cancer Research
Senior postdoctoral, Laboratory of Olivier Michielin, Ph.D.

Lausanne, Switzerland
October 2007- 2009

Swiss Federal Institute of Technology, Faculty of Life Science
Senior postdoctoral, Laboratory of Pierre Vogel, Ph.D.

Lausanne, Switzerland
October 2005- 2007

Alquds University
Teacher assistant

Jerusalem, Palestine
February 1999- October 2000

RESEARCH EXPERIENCE

Swiss Federal Institute of Technology, Faculty of Life Science
Senior postdoctoral, Laboratory of Hilal A. Lashuel, Ph.D.

Lausanne, Switzerland
October 2009- present

- Stereoselective synthesis and characterization of non-natural amino acids.
- Synthesis and characterization of a novel photo-cleavable caged amino acids and applied it in peptides sequences and protein.
- Peptide and protein synthesis.
- Biophysical study of peptides and proteins.
- Click chemistry.

Ludwig Institute for Cancer Research
Senior postdoctoral, Laboratory of Olivier Michielin, Ph.D.

Lausanne, Switzerland
October 2007- 2009

- Synthesis and characterization of small molecules as Indoleamine-pyrrole 2,3-dioxygenase (IDO) inhibitors.
- Polymer and dendrimer chemistry.
- Applying homogeneous catalysts in stereoselective synthesis of non-natural amino acids.
- Synthesis and characterization of aromatic and heterocyclic compounds.
- Synthesis, purifications and characterization of cyclic peptides.
- Synthesis and characterization of non-natural amino acids.

Swiss Federal Institute of Technology, Faculty of Life Science
Senior postdoctoral, Laboratory of Pierre Vogel, Ph.D.

Lausanne, Switzerland
October 2000- 2007

- Heterogeneous and homogeneous catalysts.
- Applying homogeneous catalysts in stereoselective synthesis of non-natural amino acids.
- Synthesis and characterization of non-hydrolyzable TF-epitope analogues based on C-disaccharide.
- Synthesis and characterization of new silylating agent based on Silyl methallylsulfonates, and applied it successfully in difficult and very hindered alcohols, phenols and carboxylic acids.
- Designed, preparation and characterization successfully anti-cancer vaccine, based on C-disaccharide.

SPECIALIZED SKILLS

Analytical: proficient with HPLC & LC-MS; react IR; ¹H, ¹³C, ¹⁹F, ³¹P NMR; programming of liquid handling robotics; automated solid-phase peptide synthesis.

PUBLICATIONS & PATENTS

Sara Butterfield, Mirva Hejjaoui, Bruno Fauvet, **Loay Awad**, and Hilal A. Lashuel "Chemical approaches to elucidate the molecular mechanisms of amyloid formation and toxicity" *J. Mol. Biol.* **2012**, 421, 204–236

Loay Awad^{*}, Rime Madani, Annabelle Gillig, Maria Kolympadi, Maria Pihlgren, Andreas Muhs, Catherine Gérard, and Pierre Vogel "C-Linked disaccharide analogue of TF epitope induces a strong immune response in mice" *Chem. Eur. J.* **2012**, 28, 8578–8582. *I am the corresponding author*).

Loay Awad; Nino Jejelava; Ashraf Brik and Hilal A. Lashuel: A novel caged-glutamine derivative as a tool to control the assembly of glutamine-containing amyloidogenic peptides (manuscript *accepted to be published in Angewandte Chemie International Edition*).

Awad, L.; Vogel, P. in collaboration with the group of prof. Jimenez-Barbero, J. (conformational studying of a C-linked Disaccharide Analogue of the Thomsen Friedenreich (TF)-Epitope α -O-Conjugated to L-Serine (manuscript in preparation).

Loay Awad; Nino Jejelava; Ashraf Brik and Hilal A. Lashuel: Application of novel chemical tools to improve the solubility of highly aggregated peptide (Ac-VQIVYKG) and control folding and amyloid formation.

Loay Awad; Nino Jejelava; Ashraf Brik and Hilal A. Lashuel: The effect of using sugar linked to photo cleavable switches as solubilizing group (GNNQQ*NYG).

Loay Awad; Nino Jejelava; Ashraf Brik and Hilal A. Lashuel: Design of novel photo cleavable switches elements on the backbone chain peptides, and the application on highly aggregated peptides (GLMVGGVVIA).

Ute F. Rohrig, **Loay Awad**, Aurelien Grosdidier, Pierre Larrieu, Vincent Stroobant, Didier Colau, Vincenzo Cerundolo, Andrew J. G. Simpson, Pierre Vogel, Benoit J. Van den Eynde, Vincent Zoete and Olivier Michielin; Rational Design of Indoleamine 2,3-Dioxygenase Inhibitors, *J. Med. Chem.* **2010**, 53, 1172–1189.

Roehrig, Ute; **Awad, Loay**; Michielin, Olivier; Van Den Eynde, Benoit; Pilotte, Luc; Stroobant, Vincent; Larrieu, Pierre. IDO inhibitors and therapeutic uses thereof. *PCT Int. Appl.* (2009), 35pp. CODEN: PIXXD2 WO 2009127669 A2 20091022 AN 2009:1296802 CAPLUS.

Awad, L.; Vogel, P. The Use of Levoglucosenone and Isolevoglucosenone as Templates for the Construction of C-linked Disaccharides, *Carbohydrate research*, 2006, 341. 1235-1252.

Awad, L.; Riedner, J.; Vogel, P.; C-Linked Disaccharide Analog of the Thomsen- Friedenreich (T)-Epitope α -O-Conjugated to L-Serine. *Chem. Eur. J.* **2005**, 11, 3565-3573.

Huang, X.; Craita, C.; **Awad, L.**; Vogel, P. Silyl methallylsulfonates-as efficient and powerful agents for the silylation of alcohols, phenols and carboxylic acids. *Chem. Commun.* **2005**, 1297-1299. Accepted as a hot paper.

Demange, R.; **Awad, L.**; Vogel, P. Synthesis of C-linked analogues of β -D-galactopyranosyl-(1 \rightarrow 3)-D-galactopyranosides and of β -D-galactopyranosyl-(1 \rightarrow 3)-D-galactal. *Tetrahedron: Asymmetry* **2004**, 15, 22, 3573-3585.

POSTERS

Loay Awad, Nino Jejelava, Ashraf Brik and Hilal A. Lashuel, Novel chemical tools to facilitate the synthesis and control the folding and Self-assembly of amyloid-forming polypeptides. The 22nd American Peptide Symposium, 2011.

Awad, L.; Vogel, P. Toward an Anti-cancer Vaccine: Clusters Synthesis of C-disaccharide Mimetics of the Thomsen-Friedenreich Antigen *Chimia*, 2005, 59, (Fall Meeting of the Swiss Chemical Society, Lausanne, Switzerland, 2005).

Awad, L.; Riedner, J.; Vogel, P. Synthesis of a C-linked Disaccharide Analog of the Thomsen Friedenreich (T)-Epitope α -O-Conjugated to L-Serine and Formation a Cluster as Potential Anticancer Vaccine. *Chimia*, 2004, 58, 468. (Fall Meeting of the Swiss Chemical Society, Zürich, Switzerland, 2004).

Awad, L.; Riedner, J.; Vogel, P. Synthesis of C-glycosides Analogues of the Thomsen-Friedenreich (T) Antigen and of Non-hydrolyzable Sugar Epitopes for Conjugation with Nanoparticles. Proceedings of Tailored Nanoparticles: (The Challenge in Diagnostics and Therapeutics", Lausanne, Switzerland, October 16 -17, 2003).

Awad, L.; Riedner, J.; Vogel, P. Towards the Synthesis of Anticancer Vaccine *Chimia*, 2003, 57, 402. (Fall Meeting of the Swiss Chemical Society, Lausanne, Switzerland, 2003).

Awad, L.; Riedner, J.; Vogel, P. Towards the Synthesis of Non-Hydrolysable Analogues of The T-antigen. (Proceedings of "Molécules du futur: les défis de la synthèse organique", Lyon, France, December 9-11, 2002).

ORAL PRESENTATIONS:

Awad, L.; Vogel, P. "Synthesis of a C-linked Disaccharide Analogues of the Thomsen- Friedenreich (TF) Epitope α -O-Conjugated to L-Serine and L-Threonine. Formation of Clusters and their Conjugation to KLH as Potential Anticancer Vaccine" at the Conférence Universitaire de Suisse Occidentale for Chemical Biology, Villars, Switzerland, September 3-7 **2006**. (**Prize for the best presentation**).

Awad, L.; Vogel, P. Synthesis of a C-linked Disaccharide Analog of the Thomsen Friedenreich (T)-Epitope α -O-Conjugated to L-Serine and Formation a Cluster as Potential Anticancer Vaccine. Fall Meeting of the Swiss Chemical Society, Zürich, Switzerland, 2004. *Chimia*, **2004**, 58, 462. (**Prize for the best presentation**).

Vogel, P.; **Awad, L.**; Riedner, J.; Demange, R. C-Linked disaccharides analogues of the T epitope: Toward an artificial anti-cancer vaccine. Abstracts of Papers, 228th ACS National Meeting, Philadelphia, PA, United States, August 22-26, **2004** (2004). Presented orally by Prof. P. Vogel.

INVITED LECTURE:

April 8, 2005 lecture entitled "Synthesis of a C-linked Disaccharide Analog of the Thomsen Friedenreich (T)-Epitope α -O-Conjugated to L-Serine and Formation a Cluster as Potential Anticancer Vaccine" Laboratorium für Organische Chemie, ETH, Hönggerberg, HCI F 315, Wolfgang-Pauli-Strasse 10, 8093 Zürich.

TEACHING EXPERIENCE

Swiss Federal Institute of Technology, Faculty of Life Science

supervisor for master and Ph D student

Advising diploma, master, and PhD students.

Lausanne, Switzerland

October 2009- present

Ludwig Institute for Cancer Research

supervisor for master and Ph D student

Advising diploma, Master, and PhD students. Advance organic chemistry lab for pharmacy and chemistry students.

Lausanne, Switzerland

October 2007- 2009

Swiss Federal Institute of Technology, Faculty of Life Science

Organic chemistry teaching and supervisor for master student

- Advance organic chemistry lab for pharmacy and chemistry students.
- Responsible for laboratory instruction, including concepts, techniques, safety, and connection to classroom material
- In charge of evaluating student lab material, including lab reports, pre-lab questions, and assignments
- Charged with writing and grading laboratory quizzes and final exams

Lausanne, Switzerland

October 2001- 2007

Alquds University

Teacher assistant

- Three semesters of general chemistry lab teaching assistant
- Responsible for laboratory instruction, including concepts, techniques, safety, and connection to classroom material
- In charge of evaluating student lab material, including lab reports, pre-lab questions, and assignments
- Charged with writing and grading laboratory quizzes

Jerusalem, Palestine

February 1999- October 2000

AWARDS / CERTIFICATIONS / HONORS

"Conférence universitaire de Suisse occidentale" for Chemical Biology,

Villars, Switzerland

Prize for the best oral presentation

September 3-7, 2006.

Swiss Federal Institute of Technology, Faculty of Life Science**Lausanne, Switzerland**

Ph D with Distinction (Excellent).

October, 2005.

The Fallmeeting of the Swiss Chemical Society**Zürich, Switzerland**

Prize for the best poster presentation in Medicinal Chemistry section

October 7, 2004

Swiss National Science Foundation scholarship**Berne, Switzerland**

Scholarship

2001-2007**Peace Program scholarship****Lausanne, Switzerland**

Scholarship

2000-2001**Alquds University****Jerusalem, Palestine**Stood First Position in the Faculty of Science and chemistry department
(B.Sc. with Distinction (89.5 %))**1995-1999**

ADDITIONAL KNOWLEDGE

Languages

| | |
|---------|---------------|
| Arabic | Mother tongue |
| English | Fluent |
| French | Very good |

Computing

Detailed knowledge of MS Word, Excel, PowerPoint, Photoshop, Beilstein & SciFinder on PC & Mac, ChemDraw, ISIS Draw.

REFERENCES

Prof. Pierre Vogel, Laboratory of Glycochemistry and Asymmetric Synthesis, ISIC, Swiss Institute of Technology Lausanne, CH-1015, Lausanne-Dorigny, Switzerland, E-mail: pierre.vogel@epfl.ch; Tel: +41 21 693 93 71; Fax: +41 21 693 93 75.

Prof. Hilal A. Lashuel, Laboratory of Molecular Neurobiology and Functional Neuroproteomics EPFL, SV-IGBB–AAB045 Station 15, Ecublens, CH-1015 Lausanne, Switzerland. Tel: + 41 21 693 96 91. hilal.lashuel@epfl.ch

Prof. Olivier Michielin, University of Lausanne, Medical Faculty; Swiss Institute of Bioinformatics; and the Ludwig Institute for Cancer Research, Lausanne Branch
Quartier UNIL-Sorge, Bâtiment Génopode, CH-1015 Lausanne, Switzerland, Tel: +41 21 692 40 53, Fax: +41 21 692 40 65, Email: olivier.michielin@isb-sib.ch

Prof. Jean-Marie Beau, Laboratoire de synthèse de Biomolécules, Institut de Chimie Moléculaire et des Matériaux (ICMMO), Université Paris-Sud, 91405 Orsay, France. Tel +33 1 69 15 79 60, +33 1 69 85 37 15. jmbeau@icmo.u-psud.fr