



Dr Youssra Al-Hilaly

(FHEA, MRSB)

Assistant Professor

PROFILE

Scientist in neurodegenerative diseases, with over 12 years' experience working on understanding the pathogenesis and treatment of Alzheimer's Disease and Dementia. My research uses a wide range of Biochemical and Biophysical techniques to:

1. Study mechanisms underlying protein assembly and misfolding
2. Investigate protein assembly inhibition using small molecules as a therapeutic strategy for Alzheimer's Disease
3. Investigate the role of oxidative stress in the pathogenesis of Alzheimer's Disease
4. Investigate the role of metal ions in Alzheimer's Disease pathogenesis and studying their effect on the assembly of different proteins (including amyloid beta, tau and alpha synuclein)
5. Identify a new CSF biomarker for Alzheimer's Disease at early stages

CONTACT

PHONE NUMBER:
009647722679107

WEBSITE:
<https://uomustansiriyah.edu.iq/e-learn/profile.php?id=4056>

EMAIL ADDRESS:
yousra.alhilaly@uomustansiriyah.edu.iq

EDUCATION

Mustansiriyah University/College of Science/ IRAQ (1996-2000)
BSc in Chemistry (1st class)

Mustansiriyah University/College of Science/ IRAQ (2000-2003)
MSc in Clinical Biochemistry (1st class): *Isolation and kinetic study of AChE enzyme in brains from patients with glioma tumors.*

University of Sussex/School of Life Sciences/ UK (2010-2014)
PhD in Biochemistry and Structural Biology: *Chemical and biochemical studies of dityrosine cross-link formation in amyloidogenic peptides.*

University of Sussex/ School of Higher Education/ UK (2020-2022)
Postgraduate Certificate in Higher Education

WORK EXPERIENCE

Mustansiriyah University, Iraq, Research and Teaching Lecturer
2002-2015

University of Sussex, UK, Postdoctoral Research Fellow
2015-2018

Mustansiriyah University, Iraq, Assistant Professor
2018-2023

PROFESSIONAL QUALIFICATIONS

Associate Fellow of the Higher Education Academy, UK, 2020

Fellow of the Higher Education Academy (FHEA), UK, 2022

ATTENDED WORKSHOPS AND COURSES

1. Management skills and leadership course, Iraqi Centre for Innovation and development 2008, Erbil, Iraq.
2. Circular and linear dichroism course at Warwick University, UK, 2011
3. QA Level 2 Award in Emergency First Aid at Work (QCF), Posturite Ltd. UK, 2015
4. Creating Moments of Joy for People with Alzheimer's course (online), Purdue university and Purdue university press, USA, 2018
5. Publons Academy Practical Peer Review course, online course, 2020
6. Certified peer reviewer course, Research Academy, Elsevier, 2020
7. Journal Selection Process, Clarivate Analytics company, 2020
8. Structuring your manuscript to impress journal editors, by editage, 2020

RECOGNITIONS AND AWARDS

1. Science Award for the best published research paper in a journal with highest impact factor, **2020**, Mustansiriyah University, Iraq
2. Science award for the author who has the highest number of publications in Scopus database, **2020**, Mustansiriyah University, Iraq
3. Science Award for the best published research paper in a journal with highest impact factor, **2021**, Mustansiriyah University, Iraq
4. Prize for the best published research paper, Al-Sibd centre for research and scholarly, **2021**, Iraq
5. Science Award for the best published research paper in a journal with highest impact factor, **2022**, Mustansiriyah University, Iraq
6. Warith Al-Anbiyaa award for the scientific research excellence, **2022**, University of Warith Al-Anbiyaa, Iraq
7. Young Investigator research award, **2022**, Women in Neurosciences Symposium, Tbilisi, Georgia

NOTABLE MEMBERSHIPS AND NETWORKS

1. Alzheimer Research UK south coast network membership since 2012
2. Member of Dementia research group, University of Sussex, 2013
3. Alzheimer's society UK membership since 2013
4. Member of Biochemical society since 1st April 2018
5. Dementia Researcher a network for early career researchers, National Hospital For Neurology & Neurosurgery, Queen Square, London, WC1N 3BG, since 12th April 2018
6. Member of Middle East Molecular Biology Sources (MEMBS) since 1st June 2018
7. Member of Royal Society of Biology (**MRSB**) since 1st October 2018
8. Member of Organization for Women in Science for the Developing World (OWSD), since 19th December 2018
9. Associate Fellow of the Higher Education Academy, UK, 2020.
10. Fellow of the Higher Education Academy (**FHEA**), UK, 2022.
11. Member of Alzheimer's association, USA, since 2022.

SUPERVISION AND MENTORING EXPERIENCE

- I have supervised 4 undergraduate students at Mustansiriyah University/Iraq (2020-2023).
- I have supervised/mentoring many postgraduate and undergraduate students at Prof Louise Serpell's lab/Sussex University, UK (2013-2018):
 1. Nine final year undergraduate project students.
 2. Two Master students.
 3. Three PhD students.
 4. One A level (sixth form) student as part of Nuffield research placement.
 5. Three summer research internship students at University of Sussex.

PUBLIC ENGAGEMENT ACTIVITIES

1. Public Events: I have been actively participating in public events to explain Alzheimer's disease to general public, by presenting posters and also by using a simple game to explain the differences between healthy and Alzheimer's brain.
2. I participated in London to Brighton marathon 2016 to raise fund for Alzheimer's society to support people with Alzheimer's disease.
3. I participated in Brighton memory walk 2017 to support people affected by dementia.
4. I was a volunteer in Soapbox Science in Brighton event, 2017 to support women in STEM.
5. I awarded fund from Alzheimer's Research UK South-coast to conduct an activity to explain Alzheimer's disease and protein misfolding for public, Brighton, UK.
6. Publishing short articles in Science for All Platform, Sibd centre for research and scholarly, **Iraq, 2020-2022**. Helping people to understand the differences between dementia and Alzheimer's disease and highlighting the possible causes for Alzheimer's disease.

PEER-REVIEWING AND EDITORIAL ROLE

- I am a **reviewer** in many national and international peer-reviewed journals, for example:
 1. Nature Communication, Nature.
 2. Scientific reports, Nature.
 3. Analyst, Royal society of Chemistry, UK.
 4. PLOS ONE, Public Library of Science.
 5. Journal of Molecular Biology, Elsevier.
 6. Baghdad Journal of Biochemistry and applied Sciences, Iraq.
 7. All life, Taylor and Francis.
 8. Biochemistry and Biophysics reports, Elsevier.
 9. Advances in Therapy, Springer Nature
 10. Many journals in MDPI, including IJMB, Biomolecules, Brain Sciences, Antioxidants, Biology, and Biomedicines.
- **Editor** in Iraqi journal of nanotechnology.
- **Section editor** (Neurochemistry) in NeuroLife, MedSci Publications Group, LLC.
- **Review editor** for Structural Biology in Frontiers in Molecular Biosciences.

CONFERENCES AND SYMPOISUMS CONTRIBUTIONS

1. School of Science Conference, Mustansiriyah University, Iraq	2002	Attendance
2. Ageing Research Symposium, Brighton, UK	2011	Poster
3. Alzheimer's Research UK Conference, Birmingham, UK	2012	Poster
4. Alzheimer's Research UK Conference in Belfast, UK	2013	Poster
5. The Biochemistry and Molecular Biology research meeting, UK	2013	Talk
6. Protein misfolding in disease: molecular processes and translational research toward therapy, Roscoff, France	2013	Poster
7. Alzheimer's Research UK Conference, Oxford, UK	2014	Poster
8. Biochemistry and Molecular Biology Research Retreat, UK	2014	Talk
9. Alzheimer's Research UK Conference, Manchester, UK	2016	Attendance
10. Alzheimer's disease Mini Symposium. ApoE genotype across the lifespan and as a risk factor for Alzheimer's disease, UK	2016	Poster
11. The 2016 Alzheimer's Disease Congress-London, UK	2016	Poster
12. CNRS - Jacques Monod Conference "Protein misfolding in disease - Toxic aggregation-prone proteins in aging and age-related diseases: from structure to pathology and spreading" - Roscoff, France	2016	Poster
13. Alzheimer's Research UK Conference, Aberdeen, UK	2017	Attendance
14. The second conference in forensic & medical in Iraq	2017	Study Case
15. Annual ARUK South Coast Network Conference, Brighton, UK	2017	Attendance
16. 2 nd Euro tau meeting (conference) Lille, France.	2018	Poster
17. Early Career Researcher (ECR) Dementia Symposium at Bramber House Conference Centre, University of Sussex, UK	2018	Talk and poster
18. Biochemistry and Biomedicine Research Retreat, UK.	2018	Talk
19. Protein disulphide bonds: biochemistry, biotechnology and biomedical impact, Kent. Biochemistry Society UK	2018	Talk and poster
20. 2 nd International Science Conference, University of Qadisiyah, Iraq	2019	Talk
21. 1 st International Conference on Pure Science, University of Qadisiyah, Iraq	2020	Poster
22. OWSD 6 th general assembly and international conference, online	2021	Attendance
23. The 9th World Sustainability Forum, MDPI. Online	2021	Attendance
24. 3 rd international conference of biotechnology research center, Iraq	2022	Attendance
25. Women in Neuroscience Symposium, Tbilisi, Georgia	2022	Talk

PUBLICATIONS

Research Articles:

1. Maina, M. B., **Al-Hilaly, Y. K.**, and Serpell, L. C., (2023) Dityrosine cross-linking and its potential roles in Alzheimer's diseases. *Front Neurosci-Switz* **17**, 418
2. Essien, N. B., Galvácsi, A., Kállay, C., **Al-Hilaly, Y.**, González-Méndez, R., Akien, G. R., Tizzard, G. J., Coles, S. J., Besora, M., and Kostakis, G. E. (2023) Fluorine-based Zn salan complexes. *Dalton T*
3. Audsley, G., Carpenter, H., Essien, N. B., Lai-Morrice, J., **Al-Hilaly, Y.**, Serpell, L. C., Akien, G. R., Tizzard, G. J., Coles, S. J., Ulldemolins, C. P., and Kostakis, G. E. (2023)

Chiral Co(3)Y Propeller-Shaped Chemosensory Platforms Based on (19)F-NMR. *Inorganic chemistry* **62**, 2680-2693

4. Mengham, K., **Al-Hilaly, Y.**, Oakley, S., Kasbi, K., Maina, M. B., and Serpell, L. C. (2022) Shapeshifting tau: from intrinsically disordered to paired-helical filaments. *Essays Biochem* **66**, 1001-1011
5. Maina, M. B., **Al-Hilaly, Y. K.**, Oakley, S., Burra, G., Khanom, T., Biasetti, L., Mengham, K., Marshall, K., Harrington, C. R., Wischik, C. M., and Serpell, L. C. (2022) Dityrosine Cross-links are Present in Alzheimer's Disease-derived Tau Oligomers and Paired Helical Filaments (PHF) which Promotes the Stability of the PHF-core Tau (297-391) In Vitro. *J Mol Biol* **434**, 167785
6. Lutter, L., **Al-Hilaly, Y. K.**, Serpell, C. J., Tuite, M. F., Wischik, C. M., Serpell, L. C., and Xue, W.-F. (2022) Structural Identification of Individual Helical Amyloid Filaments by Integration of Cryo-Electron Microscopy-Derived Maps in Comparative Morphometric Atomic Force Microscopy Image Analysis. *Journal of Molecular Biology* **434**, 167466
7. Huang, R., McDowall, D., Ng, H., Thomson, L., **Al-Hilaly, Y. K.**, Douch, J., Burholt, S., Serpell, L. C., Poole, R. J., and Adams, D. J. (2022) Charge screening wormlike micelles affects extensional relaxation time and noodle formation. *Chem Commun (Camb)* **58**, 10388-10391
8. **Al-Hilaly, Y. K.**, Hurt, C., Rickard, J. E., Harrington, C. R., Storey, J. M. D., Wischik, C. M., Serpell, L. C., and Siemer, A. B. (2022) Solid-state NMR of paired helical filaments formed by the core tau fragment tau(297-391). *Front Neurosci-Switz* **16**
9. Maina, M. B., **Al-Hilaly, Y. K.**, Burra, G., Rickard, J. E., Harrington, C. R., Wischik, C. M., and Serpell, L. C. (2021) Oxidative Stress Conditions Result in Trapping of PHF-Core Tau (297-391) Intermediates. *Cells-Basel* **10**
10. Lyu, C., Pollack, S. J., **Al-Hilaly, Y. k.**, Da Vela, S., Serpell, L., Svergun, D., Pastore, A., and Hanger, D. P. (2021) Self-assembly and cellular effect of tau35, a disease-associated tau fragment. *Alzheimer's & Dementia* **17**, e052072
11. Lyu, C., Da Vela, S., **Al-Hilaly, Y.**, Marshall, K. E., Thorogate, R., Svergun, D., Serpell, L. C., Pastore, A., and Hanger, D. P. (2021) The Disease Associated Tau35 Fragment has an Increased Propensity to Aggregate Compared to Full-Length Tau. *Front Mol Biosci* **8**
12. Pollack, S. J., Trigg, J. M., Khanom, T., Biasetti, L., Marshall, K. E., **Al-Hilaly, Y. K.**, Rickard, J. E., Harrington, C. R., Wischik, C. M., and Serpell, L. C. (2020) Paired Helical Filament-Forming Region of Tau (297-391) Influences Endogenous Tau Protein and Accumulates in Acidic Compartments in Human Neuronal Cells. *Journal of Molecular Biology* **432**, 4891-4907
13. Oakley, S. S., Maina, M. B., Marshall, K. E., **Al-Hilaly, Y. K.**, Harrington, C. R., Wischik, C. M., and Serpell, L. C. (2020) Tau Filament Self-Assembly and Structure: Tau as a Therapeutic Target. *Front Neurol* **11**
14. Maina, M. B., Burra, G., **Al-Hilaly, Y. K.**, Mengham, K., Fennell, K., and Serpell, L. C. (2020) Metal- and UV- Catalyzed Oxidation Results in Trapped Amyloid-beta Intermediates Revealing that Self-Assembly Is Required for Abeta-Induced Cytotoxicity. *Iscience* **23**, 101537
15. **Al-Hilaly, Y. M.**, M.; Abdul-Sada, A.; Serpell, L. (2020) Dityrosine Crossed-linked Amyloid-like Fibrils as Bionanomaterials. *Iraqi Journal of Nanotechnology* **1**, 31-43
16. **Al-Hilaly, Y. K.**, Foster, B. E., Biasetti, L., Lutter, L., Pollack, S. J., Rickard, J. E., Storey, J. M. D., Harrington, C. R., Xue, W. F., Wischik, C. M., and Serpell, L. C. (2020) Tau (297-391) forms filaments that structurally mimic the core of paired helical filaments in Alzheimer's disease brain. *FEBS letters* **594**, 944-950
17. Sampani, S. I., **Al-Hilaly, Y. K.**, Malik, S., Serpell, L. C., and Kostakis, G. E. (2019) Zinc-dysprosium functionalized amyloid fibrils. *Dalton T* **48**, 15371-15375

18. Ruiz-Zamora, R. A., Guillaume, S., **Al-Hilaly, Y. K.**, Al-Garawi, Z., Rodriguez-Alvarez, F. J., Zavala-Padilla, G., Perez-Carreón, J. I., Rodríguez-Ambríz, S. L., Herrera, G. A., Becerril-Lujan, B., Ochoa-Leyva, A., Melendez-Zajgla, J., Serpell, L., and del Pozo-Yauner, L. (2019) The CDR1 and Other Regions of Immunoglobulin Light Chains are Hot Spots for Amyloid Aggregation. *Sci Rep-Uk* **9**
19. Raulin, A. C., Kraft, L., **Al-Hilaly, Y. K.**, Xue, W. F., McGeehan, J. E., Atack, J. R., and Serpell, L. (2019) The Molecular Basis for Apolipoprotein E4 as the Major Risk Factor for Late-Onset Alzheimer's Disease. *Journal of Molecular Biology* **431**, 2248-2265
20. McAulay, K., Dietrich, B., Su, H., Scott, M. T., Rogers, S., **Al-Hilaly, Y. K.**, Cui, H. G., Serpell, L. C., Seddon, A. M., Draper, E. R., and Adams, D. J. (2019) Using chirality to influence supramolecular gelation. *Chem Sci* **10**, 7801-7806
21. Fichou, Y., **Al-Hilaly, Y. K.**, Devred, F., Smet-Nocca, C., Tsvetkov, P. O., Verelst, J., Winderickx, J., Geukens, N., Vanmechelen, E., Perrotin, A., Serpell, L., Hanseeuw, B. J., Medina, M., Buee, L., and Landrieu, I. (2019) The elusive tau molecular structures: can we translate the recent breakthroughs into new targets for intervention? *Acta Neuropathologica Communications* **7**
22. **Al-Hilaly, Y. K.**, Mohammed, A. H., Thorpe, J. R., and Serpell, L. C. (2019) The involvement of dityrosine crosslinks in lipofuscin accumulation in Alzheimer's disease. *Journal of Physics: Conference Series* **1294**, 062107
23. **Al-Hilaly, Y. K.**, Pollack, S. J., Rickard, J. E., Simpson, M., Raulin, A. C., Baddeley, T., Schellenberger, P., Storey, J. M. D., Harrington, C. R., Wischik, C. M., and Serpell, L. C. (2018) Cysteine-Independent Inhibition of Alzheimer's Disease-like Paired Helical Filament Assembly by Leuco-Methylthionium (LMT). *Journal of Molecular Biology* **430**, 4119-4131
24. **Al-Hilaly, Y. K.**, Pollack, S. J., Vadukul, D. M., Citossi, F., Rickard, J. E., Simpson, M., Storey, J. M. D., Harrington, C. R., Wischik, C. M., and Serpell, L. C. (2017) Alzheimer's Disease-like Paired Helical Filament Assembly from Truncated Tau Protein Is Independent of Disulfide Crosslinking. *Journal of Molecular Biology* **429**, 3650-3665
25. Marshall, K. E., Vadukul, D. M., Dahal, L., Theisen, A., Fowler, M. W., **Al-Hilaly, Y.**, Ford, L., Kemenes, G., Day, I. J., Staras, K., and Serpell, L. C. (2016) A critical role for the self-assembly of Amyloid-beta 1-42 in neurodegeneration. *Sci Rep-Uk* **6**
26. Maina, M. B., **Al-Hilaly, Y. K.**, and Serpell, L. C. (2016) Nuclear Tau and Its Potential Role in Alzheimer's Disease. *Biomolecules* **6**
27. **Al-Hilaly, Y. K.**, Biasseti, L., Blakeman, B. J. F., Pollack, S. J., Zibae, S., Abdul-Sada, A., Thorpe, J. R., Xue, W. F., and Serpell, L. C. (2016) The involvement of dityrosine crosslinking in alpha-synuclein assembly and deposition in Lewy Bodies in Parkinson's disease. *Sci Rep-Uk* **6**
28. **Al-Hilaly, Y. K.**, Williams, T. L., Stewart-Parker, M., Ford, L., Skaria, E., Cole, M., Bucher, W. G., Morris, K. L., Sada, A. A., Thorpe, J. R., and Serpell, L. C. (2013) A central role for dityrosine crosslinking of Amyloid-beta in Alzheimer's disease. *Acta Neuropathologica Communications* **1**
29. **Al-Hilaly, Y. A.-K.**, F.; Raad, K. M. (2012) Separation and Study Isoenzymes of Soluble Acetyl Cholineesterase in Normal Human Brain and Gliomas Tumors. *Journal of al-qadisiyah for pure science* **12**, 112-120

Book Section:

1. **Al-Hilaly, Y. K.**, Marshall, K. E., Lutter, L., Biasseti, L., Mengham, K., Harrington, C. R., . . . Serpell, L. C. (2023). An Additive-Free Model for Tau Self-Assembly. In A. S. Cieplak (Ed.), *Protein Aggregation: Methods and Protocols* (pp. 163-188). New York, NY: Springer US.

2. Vadukul, D. M., **Al-Hilaly, Y. K.**, & Serpell, L. C. (2019). Methods for Structural Analysis of Amyloid Fibrils in Misfolding Diseases. In C. M. Gomes (Ed.), *Protein Misfolding Diseases: Methods and Protocols* (pp. 109-122). New York, NY: Springer New York.

Thesis and dissertation:

Al-Hilaly, Youssra Kareem (2014) Chemical and biochemical studies of dityrosine cross-link formation in amyloidogenic peptides. **Doctoral thesis (PhD)**, University of Sussex, UK.

Al-Hilaly, Youssra Kareem (2003) Isolation and kinetic study of AChE enzyme in brains from patients with glioma tumors. **MSc dissertation**, Mustansiriyah University, Iraq.