

**OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE**  
**DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY**

**CURRICULUM VITAE**

**A. PERSONAL DATA**

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| 1. <b>Name :</b>                                 | ADEWALE, Isaac Olusanjo  |
| 2. <b>Date and Place of Birth:</b>               | Ere-Ijesa, Osun State 18 <sup>th</sup> July, 1964                    |
| 3. <b>Contact Address-</b> (a) Email Address(es) | <b>olusanjo2002@yahoo.co.uk</b> and<br><b>iadewale@oauife.edu.ng</b> |
|  | (b) Mobile Phone Number 08038271013                                  |
| 4. <b>Nationality:</b>                           | Nigerian   |
| 5. <b>State of Origin:</b>                       | Osun   |
| 6. <b>Senatorial District</b>                    | Ife/Ijesa  |
| 7. <b>Local Government Area:</b>                 | Ori-Ade  |
| 8. <b>Permanent Home Address:</b>                | Seminary Rd, Oke-Opa, Ile-Ife  |
| 9. <b>Marital Status:</b>                        | Married  |
| 10. <b>Number of Children and their Ages:</b>    | Four; 21, 24, 25, 27 years   |
| 11. <b>Next of Kin:</b>                          | Mrs. Adewale Omolade   |
| 12. <b>Address of Next of Kin:</b>               | Oke Opa, Ile-Ife.  |
| 13. <b>Date of Assumption of Duty:</b>           | 27 <sup>th</sup> April 1999.   |
| 14. <b>Status of First Appointment:</b>          | Graduate Assistant   |
| 15. <b>Present Status:</b>                       | Professor  |
| 16. <b>Date of Last Promotion:</b>               | 1 <sup>st</sup> October, 2014  |
| 17. <b>Present Salary/Grade Level and Step:</b>  | CON UASS 07 step 10  |
| 18. <b>Date of Confirmation of Appointment:</b>  | February 15, 2005  |
| 19. <b>Faculty:</b>                              | Science  |
| 20. <b>Department:</b>                           | Biochemistry and Molecular Biology                                   |
| 21. <b>Physical Disability/Challenge:</b>        | Not Applicable   |

**B. EDUCATIONAL BACKGROUND:**

1. **Higher Education Institutions attended with dates**

Post Secondary: University of Ife (Now Obafemi Awolowo University Ile- Ife (1983 – 1987)

Postgraduate: (i) Obafemi Awolowo University Ile – Ife, Nov. 1988 – Jan 1992

(ii) Obafemi Awolowo University Ile – Ife, April 1998 –Nov. 2003.

(iii) European Bioinformatics Institute, Hinxton, Cambridge, November, 2011.

2 **Academic and Professional Qualifications (with dates)**

(i) West African General Certificate in Education GCE O/L 1983

(ii) General Certificate in Education GCE A/L 1984

(iii) Bachelor of Science (B.Sc.) in Biochemistry, Second Class Honours (Upper Division), 1987.

(iv) Master of Science (M.Sc) in Biochemistry, 1992.

(v) Ph. D Biochemistry, 2003.

(vi) Certificate in Computational Biology, 2011.

(3) **Other Distinctions and Awards with Dates**

(a) **Scholarships**

- (a) Postgraduate Fellowship Award, Obafemi Awolowo University, Ile – Ife ( 1988/1989).
- (b) Postgraduate Fellowship Award, Obafemi Awolowo University, Ile – Ife (1989/1990).

**(b) Fellowships**

- (a) European Molecular Biology Organization (EMBO) Short-Term Fellowship, Germany (2007).
- (b) Carl-Storm International Diversity Fellowship, USA, (2011).

**(c) Research Grants**

- (a) Obafemi Awolowo University Research Council Grant – Project No. 1425RE: (2000) Structure and mechanism of action of glutathione S-transferase. (Co-researcher)
- (b) Obafemi Awolowo University Research Council Grant – Project No. 11812AWL: 2005) Enzymes from mosquito (*Anopheles spp*) and grasshopper (*Zonocerus spp*) (Principal Investigator)
- (c) Obafemi Awolowo University Research Council Grant (Supplementary)- Project No. 11812AWL: 2007) Enzymes from mosquito (*Anopheles spp*) and grasshopper (*Zonocerus spp*) (Principal Investigator).
- (d) European Molecular Biology Organization (EMBO) award for research work at the University of Bonn, Germany (Value: € 8,8661.30)
- (e) Tertiary Education Trust Fund (Tetfund) Research Project Intervention. Title of project: Purification, kinetics and biotechnological potentials of polyphenol oxidase (tyrosinase) from different species of kolanuts (*Cola nitida* and *Cola acuminata*). (2015). (Principal Investigator; Value: ₦ 1,979,528.00)
- (f) Tertiary Education Trust Fund (Tetfund) Research Project Intervention. Title of project: Studies on *Bulinus globosus* glutathione transferases-target for *Schistosomiasis* elimination.(2015). (Co-researcher; Value: ₦ 1,665,830.00)
- (g) COVID-19 Africa Rapid Grant Fund supported under the auspices of the Science Granting Councils Initiative in Sub-Saharan Africa (SGCI) and administered by South Africa’s National Research Foundation (NRF) in collaboration with Canada’s International Development Research Centre (IDRC), the Swedish International Development Cooperation Agency (Sida), South Africa’s Department of Science and Innovation (DSI), the Fonds de Recherche du Québec (FRQ), the United Kingdom’s Department of International Development (DFID), United Kingdom Research and Innovation (UKRI) through the Newton Fund, and the SGCI participating councils across 15 countries in sub-Saharan Africa. (2021). Title of Project: Development and biochemical characterization of proprotein convertase-furin/TMPRSS2 inhibitor from Nigerian medicinal plants traditionally used in viral infectious diseases management. (Principal Investigator; Value-\$98,124,42).

**(d) Other Main Awards**

- (a) 2004 Prof. Dapo Afolabi Most Productive Science Scholar of the Year Award (Awarded March 2007)
- (b) Obafemi Awolowo University Learned Conferences Grant (2009)
- (c) Tetfund Conference Grant -2013

**(e) International Awards**

- (a) African Network of Scientific and Technological Institution (ANSTI) Travel Award (2009)

- (b) EMBO Bursary Award for EMBO Practical Course in Computational Biology, EBI, Hinxton, Cambridge, UK (2011)

**C WORK EXPERIENCE:**

**1 Work Experience outside the University System with Dates:**

- (a) R& D Officer, Good Hope Industries (W.A) Ltd., Ilaro ,Ogun State, Nigeria (1987 – 1988)  
(b) Assistant Brewer, Nigerian Breweries PLC, Iganmu Lagos 1990 –1996.

**2 Work Experience in other Universities with dates:**

- (i) Guest Scientist, Institute of Molecular Biology and Biotechnology of plants, (IMBIO), Universitat Bonn, Germany, 1<sup>st</sup> Oct- 31<sup>st</sup> Dec. 2007  
(ii) Senior Lecturer in Biochemistry, College of Natural and Applied Sciences (CNAS), Wesley University of Science and Technology, Ondo, October 2009-September 2010

**3 Work Experience in the Obafemi Awolowo University, Ile-Ife**

- (a) Practical/ Tutorial Instructor (as a recipient of the University Postgraduate Fellowship), 1988 – 1990  
(b) Instructor, Obafemi Awolowo University, Technologist Training Scheme, 1997-1998  
(c) Graduate Assistant, Dept of Biochemistry, Obafemi Awolowo University, Ile-Ife. April 1999- Oct. 2000  
(d) Assistant Lecturer, Dept of Biochemistry, Obafemi Awolowo University, Ile-Ife Nov. 2000-Nov. 2003  
(e) Lecturer II, Dept of Biochemistry, Obafemi Awolowo University, Ile-Ife, Nov. 2003 to Sept. 2005.  
(f) Lecturer 1, Dept of Biochemistry, Obafemi Awolowo University, Ile-Ife, 1<sup>st</sup> Oct. 2005 to Sept. 30, 2007  
(g) Senior Lecturer, Dept of Biochemistry, Obafemi Awolowo University, Ile-Ife, 1<sup>st</sup>Oct.2007 to 2011  
(h) Reader, Department of Biochemistry, Obafemi Awolowo University, Ile-Ife, 1st Oct. 2011- 2014  
(i) Professor, Department of Biochemistry and Molecular Biology, Obafemi Awolowo University, Ile-Ife, 1st Oct. 2014-to date

**4 Courses being taught in the current Academic session.**

- BCH401- Enzymology  
BCH 404- Regulation of Metabolic processes  
BCH 408-Metabolism of drugs and foreign compounds  
BCH 413/414- Research Project I& II  
BCH 604- Advances in enzymology  
BCH 607-Biochemical Toxicology

**5 Graduate Study Supervision:**

- (a) **By Research**

**Completed**

- i) Ejim-Eze, E.E. (2008) The catalytic properties of the isoenzymes of glutathione transferase from African fruit bat, *Eidolon helvum* (Kerr) liver. M.Sc. Biochemistry.

- ii) John, O.O. (2009) Comparative study of the properties of purified  $\alpha$ -amylases from Sorghum (*Sorghum bicolor* (L.) Moench) and Maize (*Zea mays* Linn.).M.Sc. Biochemistry.
- iii) Adefila, O.A. (2011) Studies on sorghum (*Sorghum bicolor*)  $\alpha$ -amylase obtained under optimized conditions, M.Sc. Biochemistry.
- iv) Agunbiade, J.O. (2012) Kinetics of purified glutathione transferase (GST) from albino rats exposed to lethal and sublethal concentrations of lead. M.Sc. Biochemistry.
- v) Ojopagogo, Y.A.,(2012) Refolding of denatured lindane-induced glutathione transferase from juvenile catfish (*Clarias gariepinus*) M.Sc. Biochemistry.
- vi) Bamgbade A.T. (2012) Characterization of a thermostable  $\alpha$ -amylase from a cassava peels dump site M.Sc. Biochemistry.
- vii) Ilesanmi, O.S. (2014) Kinetic characteristics of tyrosinase from different species of *Dioscorea* (yam) in aqueous and non-aqueous systems. M.Sc. Biochemistry.
- viii) Adediran, T.F.(2014) Characterization of starch and cellulose digesting enzymes from the gut of grasshopper, (*Zonocerus variegatus* Linn.). M.Sc. Biochemistry.
- ix) Adekunle A.T.(SCP13/14/H/0582) Studies on Peroxidase from white and red kolanut (*Cola nitida*) Schott & Endl. M.Sc (Biochemistry). 2016.
- x) Ojopagogo, Y.A.( SCP13/14/H/1305) Proteomic analysis of glutathione transferase(s) from *Bulinus globosus* (Morelet 1866) PhD (Biochemistry).2018.
- xi) Adefila, O.A. (SCP12/13/H/0507) Comparative studies on purified amylolytic enzymes from *Digitaria exilis* (Acha) and *Digitaria iburua* (iburu) grains. PhD (Biochemistry).2018.
- xii) Ogunmoyele T. (SCP13/14/H/2302) Structural and catalytic properties of glutathione transferase from *Clarias gariepinus* in dilute and crowded solutions. PhD (Biochemistry).2018.
- xiii) Ilesanmi, O.S. ( SCP14/15/H/0747) Potentials of Purified Tyrosinase from Yam (*Dioscorea* spp) as a Catalyst in the Synthesis of Functional Molecules. PhD (Biochemistry). 2019.
- xiv) ) Agunbiade, O.J. ( SCP13/14/H/1307) Studies on latent and active polyphenol oxidase from *Moringa oleifera* PhD (Biochemistry).2021.
- xv) Famutimi, O.G. (SCP17/18/H/1011) Comparative studies on glutathione transferase from grasshopper, *Zonocerus variegatus*, fed different food plants. M.Sc. (Biochemistry). 2021.
- xvi) Osiebe, O. (SCP18/19/H/1035) Comparative studies on invertase from two different species of yeasts (*Saccharomyces* spp) grown on inexpensive medium. M.Sc. (Biochemistry). 2021.
  
- xvii) Adeleke E.O. (2011) Purification and characterization of thermostable cellulase from bacteria species isolated from cocoa pod and cassava peel dumpsites in Ile-Ife area. M.Sc. Microbiology
- xviii) Omoboye, O.O. (2014). Studies on amylase synthesis by thermophilic *Bacillus* sp isolated from refuse dump and its action on starchy waste materials. M.Sc. Microbiology.
- xix) Aladejana, O. (2014) Screening, isolation and purification of amylase produced by a bacterium from deteriorating yam. M.Sc. Microbiology.
- xx) Olatunji, O.O. (2014) M.Sc. Microbiology.
- xxi) Adedire, S.A. (2014) Studies on purification and characterization of a lipase produced by a bacterium isolated from cocoa processing effluent. M.Sc. Microbiology
- xxii) Oluwarinde, B.O.(SCP12/13/H/1771) Purification and characterization of extracellular  $\alpha$ -amylase secreted by a bacterium isolated from decayed plantain peel. M.Sc. Microbiology.
- xxiii) Ezema, S.A. (SCP11/12/R/0029) Production, purification and characterization of  $\alpha$ -amylase from a bacterium isolated from deteriorating cocoyam. M.Sc. Microbiology.
- xxiv) Akintola, I.A. (SCP12/13/H/0105) Isolation, purification and characterization of extracellular cellulase produced by a bacterium sp isolated from decayed plant leaf litters of *Lagerstroemia indica* Linn. M.Sc.Microbiology.

- xxv) Osunde, M.O. (SCP12/13/H/0104) Production, purification and characterization of cellulase from a cultivated oyster mushroom. M.Sc. Microbiology.
- xxvi) Abiola, E.O. (SCP12/13/H/107) M.Sc. Microbiology.
- xxvii) Philip S.O. (SCP12/13/H/0100) M.Sc. Microbiology.
- xxviii) Famobio, L. K. (SCP13/14/H/0640) M.Sc. (Microbiology)
- xxix) Ekundare, O.M. (SCP13/14/H/0650) M.Sc. (Microbiology)

### On-going

- i) Famutimi, O.G. (2021) P.hD. Biochemistry.
- ii) Osiebe, O. (2021) Ph.D. Biochemistry.
- iii) Akindeji, G.J. (SCP18/19/H/1057) Studies on carbohydrate-digesting enzymes of water snail, *Bulinus globosus* (Morelet) M.Sc. Biochemistry

(b) **By Long Essay** - Nil

**6 Current Undergraduate Supervision (no):** 6 Students

### D MEMBERSHIP OF PROFESSIONAL BODIES:

- (i) Brewers Association of Nigeria (BAN) 1990-1996
- (ii) Nigerian Society of Biochemistry and Molecular Biology (NSBMB) 2001-todate
- (ii) Plantstress Group 2006-to date
- (iii) European Molecular Biology Organization (EMBO) Fellows network 2008-to date
- (iv) European Society for Comparative Physiology and Biochemistry, 2009-to date

### E. PUBLICATIONS

1. Thesis Dissertation
  - (a) B.Sc Degree: Extraction of RNA from lung of mouse (1987)
  - (b) M.Sc Degree: Purification and characterization of Lysozyme from fruit bat liver (1991)
  - (c) Ph.D Degree: Structural and Catalytic Properties of Glutathione transferase from crayfish *Macrobrachium vollehovenii* Herklots. (2003)
2. Book/Monographs:
 

**Isaac Olusanjo Adewale** (2023) An Odyssey into the world of enzymes (Inaugural Lecture series 369). Obafemi Awolowo University Press, Ile-Ife, Nigeria. ISSN 0189-7848.

#### 3 (a) PUBLISHED ARTICLES

- i) **Adewale I.O.** and Ogunbiyi O.A.(2004) Purification and Characterization of Lysozyme from the liver of West African fruit bat (*Eidolon helvum*).Nigerian *J. Biochemistry and Molecular Biology*, (Nigeria), 19 (1),1-9.
- ii) **Adewale I.O.** and A. Afolayan (2004) Purification and catalytic properties of glutathione transferase from the hepatopancreas of freshwater crayfish *Macrobrachium vollehovenii* Herklots. *J. of Biochemical and Molecular Toxicology*, (John Wiley, USA),18 (6), 332-334.
- iii) O. Adedeji and **I.O. Adewale** (2004) Comparative study of the biochemical properties of the fruit of the wild and cultivated cultivars of tomato in Nigeria. *J. Applied Horticulture*, (India), 6 (2),109-111

- iv) **Adewale I.O.** and A. Afolayan (2005) Organ distribution and kinetics of glutathione transferase from African river prawn, *Macrobrachium vollehovenii* (Herklots). *Aquatic Toxicology*, (Elsevier, Netherlands), 71(2),193-202.
- v) O. Ibraheem, **I.O. Adewale** and A. Afolayan (2005) Purification and properties of glucose 6-phosphate dehydrogenase from *Aspergillus aculeatus*. *J. Biochemistry and Molecular Biology*, (South Korea), 38(5), 584-590.
- vi) M.K. Bakare, **I.O. Adewale**, A.I.Okoh, A.O.Ajayi and O.O.Shonukan (2005) Regulatory mutations affecting the synthesis of cellulase in *Pseudomonas fluorescens*. *African J. Biotechnology*, (Kenya). 4(8), 838-843
- vii) M.K.Bakare, **I.O. Adewale**, A.O.Ajayi and O.O.Shonukan (2005) Purification and characterization of cellulase from the wild-type and two improved mutants of *Pseudomonas fluorescens*. *African J. of Biotechnology*, (Kenya), 4(9), 898-904
- viii) **Adewale I.O.** and A. Afolayan (2006) Studies on glutathione transferase from grasshopper, *Zonocerus variegatus*. *Pesticide Biochem. and Physiology*, (Elsevier, USA), 85(1), 52-59
- ix) A.E. Folorunso , O.A. Awelewa and **I.O. Adewale** (2006) Comparative study of protein profiles of the leaves of wild *Manihot glaziovii* Mueller and the cultivated species, *Manihot esculenta* Crantz by SDS-Polyacrylamide Gel Electrophoresis. *International Journal of Agricultural Research*, (USA) 1(1):53-57
- x) **Adewale, I.O.**, E.N. Agumanu and F.I. Oti-Okoronkwo (2006) Comparative studies on  $\alpha$ -amylases from malted maize (*Zea mays*), millet (*Eleusine coracana*) and sorghum (*Sorghum bicolor*). *Carbohydrate Polymers*, (Elsevier, UK), 66 (1) 71-74
- xi) Adedeji, O. and **I.O. Adewale** (2006) An electrophoretic study of crude protein diversity in the seeds of the genus *Emilia cass* in Nigeria. *Science Focus*, (Nigeria), 11 (2), 179-182
- xii) Odekanyin,O.O., F. K. Agboola, **I.O. Adewale**, A. Afolayan (2007) Purification and characterization of glycogen phosphorylase b from the breast muscle of fruit bat, *Eidolon helvum* Kerr. *International Journal of Biological and Chemical Sciences*, (Cameroon) 1( 2), 99-107
- xiii) Iwalewa,E.O., **I.O. Adewale**, B.J. Taiwo, T. Arogundade, A. Osinowo (2008) Effects of *Harungana madagascariensis* stem bark extract on the antioxidant markers in alloxan induced diabetic and carrageenan induced inflammatory disorders in rats. *Journal of Complementary and Integrative Medicine*, (USA). 5(1), 1-18
- xiv) **Adewale I. O.** and Oladejo, A. (2009) Properties of the isoforms of  $\alpha$ -amylase from kilned and unkilned malted sorghum (*Sorghum bicolor*). *Carbohydrate Polymers*, (Elsevier, UK), 77, 105-109
- xv) **Adewale, I.O.** (2010) Freshness assessment of stored meat by specific activity of glutathione transferase, *Emirate Journal of Food and Agriculture*, (UAE) 22 (2):140-146

- xvi) **Adewale I.O.** and Y.A. Ojopagogo (2010) Alteration in the status of glutathione transferase of the water snail, *Bulinus globosus*, during aestivation and recovery. *Animal Biology*, (Brill, Netherlands). 60: 145-155
- xvii) Stiti, N., **Adewale, I.O.**, Petersen, J., Bartels, D., Kirch, H.H (2011) Engineering the nucleotide coenzyme specificity and sulfhydryl redox sensitivity of two stress-responsive aldehyde dehydrogenase isoenzymes of *Arabidopsis thaliana*. *Biochem. J.* (Portland, London) 434, 459–471
- xviii) **Adewale, I.O.** (2011) Synthetic antioxidants as in-vivo detoxication catalyst. *Journal of Biology & Life Sciences* (Turkey), 2(3): 14-17
- xix) Adeleke, E.O., B. O. Omafuvbe, **I.O. Adewale**, M. K. Bakare (2011) Screening and isolation of thermophilic cellulolytic bacteria from cocoa pod and cassava peel dumpsites in Ile-Ife, Southwest Nigeria. *Ife Journal of Science* (Nigeria), 13(2): 381-387
- xx) Adeleke, E.O., B. O. Omafuvbe, **I.O. Adewale**, M. K. Bakare (2012) Purification and characterisation of a cellulase obtained from cocoa (*Theobroma cacao*) pod-degrading *Bacillus coagulans* Co4. *Turkish Journal of Biochemistry* (Turkey). 37 (2); 222–230
- xxi) **Adewale, I.O.**, O.R. Akinseye and A. I.Odutayo (2012) Protein quantitation using dyes obtained from plant materials. *Advances in Bioscience and Biotechnology* (China). 3, 227-230.
- xxii) Adefila, O.A., M. K. Bakare and **I. O. Adewale** (2012) Characterization of an  $\alpha$ -amylase from sorghum (*Sorghum bicolor*) obtained under optimized conditions. *Journal of the Institute of Brewing* (John Wiley, Canada), 118: 63-69
- xxiii) Ojopagogo, Y.A., **I.O. Adewale** and A. Afolayan (2013) Preliminary studies on the renaturation of denatured catfish (*Clarias gariepinus*) glutathione transferase. *Fish Physiology and Biochemistry* (Springer, Netherlands) 39:1657-1663
- xxiv) **Adewale, I .O.**, A. Adefila and T. B. Adewale (2013) Changes in Amylase Activity, Soluble Sugars and Proteins of Unripe Banana and Plantain During Ripening. *Annual Review & Research in Biology* (INDIA), 3 (4): 678-685
- xxv) Ojopagogo, Y.A., **Adewale, I.O.**, Adeyemi, J.A. and Afolayan, A. (2015) Some novel features of glutathione transferase from juvenile catfish (*Clarias gariepinus*) exposed to lindane-contaminated water. *Perspectives in Science* (Elsevier, Germany), 4, 62–65
- xxvi) Olutosin Samuel Ilesanmi, O.S., Ojopagogo, Y.A. **Adewale, I.O.** (2014) Kinetic characteristics of purified tyrosinase from different species of *Dioscorea* (yam) in aqueous and non-aqueous systems. *Journal of Molecular Catalysis B: Enzymatic* (Elsevier, Netherlands) 108: 111–117
- xxvii) Bamigbade, A.T., **Adewale, I.O.** and Bakare, M.K. (2014) Characterization of a novel  $\alpha$ -amylase from *Bacillus macquariensis* isolated from cassava peels dump site. *American Journal of Biochemistry*, (USA) 4(4): 84-92
- xxviii) Agunbiade, J.O., Adewale, I.O. and Afolayan, A. (2014) Kinetic Analysis of Glutathione Transferase from Rats Exposed to Sub-Lethal and Lethal Concentrations of Lead Acetate. *Ife Journal of Science*. 16, (3):417-423

- xxix) Adediran, T.F. and **Adewale, I.O.** (2015) Purification, kinetics and inhibition studies on co-existing starch and cellulose digesting- enzymes from the gut of variegated grasshopper (*Zonocerus variegatus* Linn.). *Acta Entomologica Sinica*. (China), 58(7):739-749
- xxx) **Adewale, I.O.** and Adekunle, A.T. (2018) Biochemical properties of peroxidase from white and red cultivars of kolanut (*Cola nitida*). *Biocatalysis and Agricultural Biotechnology*, (Elsevier), 14: 1-9
- xxxi) Ojopagogo, Y.A., **Adewale, I.O.** (2019) Proteomic identification of an alpha class glutathione S-transferase in freshwater snails (*Bulinus globosus*). *Animal Biology*, (Brill, Netherlands), 69: 377–390
- xxxii) Ogunmoyole, T., Fodeke, A.A., **Adewale, I.O.** (2019) Denaturation studies of *Clarias gariepinus* glutathione transferase in dilute and crowded solutions. *European Biophysics Journal* (Springer), 48(8): 789-801. <https://doi.org/10.1007/s00249-019-01405-z>
- xxxiii) Ogunmoyole, T., **Adewale, I.O.**, Fodeke, A.A., Afolayan, A. (2020) Catalytic studies of glutathione transferase from *Clarias gariepinus* (Burchell) in dilute and crowded solutions. *Comparative Biochemistry and Physiology, Part C (Elsevier)*, 228: 108648. <https://doi.org/10.1016/j.cbpc.2019.108648>.
- xxxiv) Ilesanmi, O.S. and **Adewale, I.O.** (2020) Physicochemical properties of free and immobilized tyrosinase from different species of yam (*Dioscorea* spp). *Biotechnology Reports, (Elsevier)*, 27: e00499. <https://doi.org/10.1016/j.btre.2020.e00499>.
- xxxv) Famutimi, O.G. and **Adewale, I.O.** (2021) Induction and catalytic properties of grasshopper (*Zonocerus variegatus*) glutathione transferase fed on different food plants. *Comparative Biochemistry and Physiology, Part C (Elsevier)*, 241: 108970. <https://doi.org/10.1016/j.cbpc.2020.108970>.
- xxxvi) Agunbiade, O.J., Famutimi, O.G. , Kadiri, F.A., Kolapo, O.A., **Adewale, I.O.** (2021) Studies on peroxidase from *Moringa oleifera* Lam leaves. *Heliyon*, 7(1): e06032. <https://doi.org/10.1016/j.heliyon.2021.e06032>
- xxxvii) Ilesanmi, O.S., Adedugbe, O.F., Adewale, I.O. (2021) Potentials of purified tyrosinase from yam (*Dioscorea* spp) as a biocatalyst in the synthesis of cross-linked protein networks. *Heliyon*, 7(8), <https://doi.org/10.1016/j.heliyon.2021.e07831>
- xxxviii) Famutimi, O.G. and **Adewale, I.O.** (2021) Assessment of serine protease inhibitory activities of phytoconstituents of four medicinal plants traditionally used in viral diseases management. SSRN (Social Science Research Network) 28 Pages. <http://dx.doi.org/10.2139/ssrn.3894863>
- xxxix) Agunbiade, J.O., **Adewale, I.O.** (2022) Studies on latent and soluble polyphenol oxidase from *Moringa oleifera* Lam. Leaves. *Biocatalysis and Agricultural Biotechnology*, <https://doi.org/10.1016/j.bcab.2022.102515>.
- xl **Adewale, I. O.**, Adebisi, V. G., Famutimi, O. G., and Dada, O. V. (2023). Kinetics of trypsin inhibition by methanolic and solvent-partitioned fractions of two medicinal plants – *Momordica charantia* and *Xylopiya aethiopica*. *South African Journal of Botany*, 152, 174 – 181.
- xli Osiebe, O., Adewale, I.O. and Omafuvbe, B.O. (2023) Intracellular invertase hyperproducing strain of *Saccharomyces cerevisiae* isolated from Abagboro palm wine. *Scientific Reports*, 13:4937. <https://doi.org/10.1038/s41598-023-32289-x>.



**Patent:** Adewale, I. O., Osiebe, O., and Omafuvbe, B.O.(2022). Nigerian Patent No. NG/P/2022/1)Trademarks, Patents and Designs Registry, Commercial Law Department, Federal Ministry of Trade and Investment, Abuja. A method for starch hydrolysis and conversion to biofuel and crude invertase.

## Other Published Works

### 3 (b) Published Refereed Conference Book of Abstract

- i) **Adewale I.O.** and A. Afolayan (2001) Properties of glutathione S- transferase from hepatopancreas of freshwater crayfish, *Macrobrachium vollenhovenii*. Nigerian Society of Biochemistry and Molecular Biology (NSBMB) conference, Nsukka, Nigeria
- ii) **Adewale, I.O.** and A. Afolayan (2005) Studies on glutathione transferase from grasshopper, *Zonocerus variegatus* . Nigerian Society of Biochemistry and Molecular Biology (NSBMB) conference, Lagos, Nigeria
- iii) **Adewale I.O.** and A. Afolayan (2005) Studies on glutathione transferase from grasshopper , *Zonocerus variegatus* . Federation of African Society of Biochemistry and Molecular Biology (FASBMB) conference, Abuja, Nigeria
- iv) **Adewale I.O.** and A. Afolayan (2006) Studies on glutathione transferase from grasshopper, *Zonocerus variegatus* European society for Comparative Biochemistry and Physiology (ESCPB) Antwerp, Belgium. Abstract ID:U79N158
- v) **Adewale I.O.** (2007) The probable dawn of enzymatic detoxication. OAU Faculty of Science July 3-5,2007, Conference, Ile-Ife
- vi) **Adewale, I.O.** and D. Bartels (2008) Overexpression of stress-associated aldehyde dehydrogenase in *Arabidopsis thaliana* and drought tolerance: biotechnological application to tropical food crops for improved adaptation to drought Faculty of Science 25<sup>th</sup>-27<sup>th</sup> November, 2008 Conference, Ile-Ife
- vii) **Adewale, I.O.** and Y.A. Ojopagogo (2009) Alteration in the status of glutathione transferase of the water snail, *Bulinus globosus*, during aestivation and recover.European society for Comparative Biochemistry and Physiology (ESCPB), September 6-9,2009, Innsbruck, Austria
- viii) A. Adefila and **I.O. Adewale** (2009) Studies on Sorghum (*Sorghum bicolor*) starch-digesting enzymes obtained under optimized condition. Nigerian Society of Biochemistry and Molecular Biology Conference, Federal University of Technology, Akure, 6-9<sup>th</sup> Dec., 2009
- ix) **Adewale I.O.** and A. Afolayan (2011) Kinetic analysis of enzymes as a tool in understanding mechanisms of adaptation. Enzymes, coenzymes and metabolic pathways GRC conference. Waterville Valley, NH, USA (Poster Presentation)
- x) Y. A.Ojopagogo , **I.O. Adewale**, Adeyemi, J.A., A. Afolayan., (2013) Some Novel Features of Glutathione Transferase from Juvenile Catfish (*Clarias gariepinus*) Exposed to Lindane contaminated Water. Beilstein-Institut zur Förderung der Chemischen Wissenschaften Symposium on Experimental Standard Conditions of Enzyme Characterizations (ESCEC)...Celebrating the 100th Anniversary of Michaelis-Menten Kinetics. September 16th – 20th, Rüdeshheim/Rhein, Germany

- xi) Adedayo A. Fodeke, **Olusanjo I. Adewale**, Temidayo Ogumoyole (2019) High Concentration of Inert Solutes (Ficol 70 and Polyethelene Glycol 6000) Stabilize the Native form of *Clarias gariepianus* GST (cgGST). *Biophysical Journal*, 116 (3) 49a (Elsevier)
- xii) Famutimi, O. G., **Adewale, I. O.**, Oghenesivwe, O., Aderogba, M.A. (2022). Bioassay-guided isolation of furin inhibitors from leaf extract of *Momordica charantia*. International Malatya Gastronomy Culture and Tourism, September 16-17-18, 2022 Malatya, Turkey. Page 525.
- xiii) . Oghenesivwe, O., **Adewale, I.O.**, Famutimi, O.G., Aderogba, M.A. (2022). Isolation of phytochemicals from a traditional medicinal plant (*Momordica charantia L*) potentially useful for TMPRSS2 modulation for the management of viral infections. Biltek-Vi International Symposium on Current Developments in Science, Technology and Social Sciences September 16-18, 2022 / Malatya, Türkiye. Page 355.

3(c) Manuscripts Accepted for Publication: Nil

4 Published Nonrefereed Conference Proceedings: Nil

**5 Manuscripts Submitted for Publication: nil**

**6 Creative work:** A short story entitled “ The giant-leap”. (Available at <http://mobility.embo.org>)

**7 Technical Reports:** Nil

**8 Papers and Works in Preparation:** Adewale, I.O., Famutimi, O.G. and Aderogba, M.A.

(2023) Activities of Purified Fractions of *Momordica charantia* and *Lawsonia inermis* on Serine Proteases-Furin and TMPRSS2

## **F PROFESSIONAL ACCOMPLISHMENT:**

There is much excitement and ferment in biochemistry of recent because of the increasing awareness that many life processes have underlying molecular principles. Understanding such principles will lead to a profound advancement in medicine, agriculture and biotechnology. My teaching, research and community service efforts can be viewed from this axiom. And as such, in my professional accomplishment, I have, in collaboration with other researchers, being using the power of proteomics in general and enzymology in particular to study the functional diversity of some housekeeping and inducible enzymes in various organisms that are of interest to man, from medical or economical perspectives. One of such proteins is glutathione transferase (GST). We have gathered extensive data on the contribution of this partly inducible and partly house-keeping enzyme to survival of African river prawn, grasshopper, water snail and catfish in their various habitats which contain varied levels of xenobiotics. The data we have generated over the years have provided insights into mechanisms of adaptation in the organisms. We have published the results of the studies in foremost scientific journals such as , *Aquatic Toxicology* (Elsevier), *Comparative Biochemistry and Physiology* (Elsevier), *Fish Physiology and Biochemistry* (Springer), *Pesticide Biochemistry and Physiology* (Elsevier) and *Journal of Molecular Toxicology* (John Wiley) all of which have high impact factors. And the works have continued to be cited across the world. In the same vein, our

work on regulatory mutations affecting the synthesis of cellulase in *Pseudomonas fluorescens* has also received commendable citation across the scientific world.

An aspect of my research work has been devoted to searching for alternative ways of sourcing enzymes of industrial/ biotechnological importance (e.g. amylase, invertase, peroxidase and tyrosinase). We have shown that sorghum grains can be a good source of amylolytic enzymes; and yam a good source of tyrosinase for various applications particularly in chemical synthesis and in biotechnology. Our work shows that peroxidase could also be obtained in commercial quantities from kolanut (*Cola nitida*). We have sourced for cellulase and lipase from bacteria isolated from diverse habitats and have established conditions for maximal enzyme production.

Drug discovery- most of the agents which are available as drugs, pesticides, herbicides etc are actually enzyme inhibitors targeting one or more enzymes. To design such chemical agents, the mechanism of catalysis of such enzymes are needed. Part of my research work has been devoted to inhibition of enzymes and their mechanism of catalysis and how they fold into active three-dimensional proteins. I have provided information on the possibility of using African medicinal plants such as *Mormodica charantia*, *Lawsonia inermis*, *Xylopiya aethiopyca* and *Hymenocardia acida* as sources of drugs for management of viral diseases such as Covid-19 and HIV.

In collaboration with Institute of Molecular Biology and Biotechnology of Plants, (IMBIO), University of Bonn, Germany, I have provided pieces of information that are useful for the development of transgenic plants that could withstand abiotic stress. My research efforts in all these aspects have been richly rewarded with a number of prestigious international fellowships such as European Molecular Biology Organization (EMBO) short-term fellowship and Carl-Storm International Diversity Fellowship (USA) as well as support from various international funding agencies.

I am a Reviewer for many foremost high impact scientific journals published by reputable institutions such as Elsevier, Springer, Taylor and Francis etc. I have served as Editor-in-Chief of Ife Journal of Science during which time, the journal became truly international.

#### **G CONFERENCE/WORKSHOP ATTENDED:**

- 1) Nigeria Society of Biochemistry and Molecular Biology, 21<sup>st</sup> Annual Conference, 19<sup>th</sup> September 2001, University of Nigeria, Nsukka,
- 2) GeneSifter webinar - microarray analysis: from raw data to biological significance, August, 2006, March 2007 (web based seminar)
- 3) ETF Capacity building workshop for lecturers in Nigerian Universities, Conference Centre, Ile-Ife, Nigeria. Sept 11<sup>th</sup>-15<sup>th</sup>, 2006
- 4) Faculty of Science Conference, July 3-5, 2007, Obafemi Awolowo University, Ile-Ife.
- 5) Faculty of Science Conference, 2008, Obafemi Awolowo Univ., Ile-Ife
- 6) 26<sup>th</sup> Congress of the European society for Comparative Physiology and Biochemistry (ESCPB), September 6-9, 2009, Innsbruck, Austria
- 7) Faculty of Science Conference, 2010, Obafemi Awolowo Univ., Ile-Ife
- 8) Enzymes, coenzymes and metabolic pathways Gordon Research Conference. July 10-15, 2011, Waterville Valley, NH, USA
- 9) European molecular biology laboratory Practical Course in Computational Biology, EBI, Hinxton, Cambridge, UK (2011)
- 10) Faculty of Science Conference, 2012, Conference Centre, Obafemi Awolowo Univ., Ile-Ife
- 11) 6<sup>th</sup> Beilstein-Institut zur Förderung der Chemischen Wissenschaften Symposium on Experimental Standard Conditions of Enzyme Characterizations (ESCEC)...Celebrating the 100th Anniversary of Michaelis-Menten Kinetics. September 16th – 20th, 2013, Rudesheim/Rhein, Germany.

- 12) 2014 Faculty of Science Conference, Theme: Quest for Renewable Energy and Sustainable Development: The role of Pure and Applied Sciences. 8 -10<sup>th</sup> October, 2014. Conference Centre, Obafemi Awolowo University, Ile-Ife
- 13) 2016 Faculty of Science Conference, Theme- Science: a tool for diversification and sustainability of the economy & health. 4th - 8th, September, 2016. National Centre for Technology Management (NACETEM) Obafemi Awolowo University, Ile-Ife
- 14) 2018 Faculty of Science Conference, Theme- Harnessing Scientific Innovations for a Safer Planet. 1<sup>st</sup> - 5<sup>th</sup> October, 2018. National Centre for Technology Management (NACETEM), Obafemi Awolowo University, Ile-Ife.
- 15) 2021 Faculty of Science Conference, Theme- Building Partnership for Achieving Sustainable Development through Scientific Interventions. 8 – 9th June, 2021 (physical and virtual contact), INTECU/Faculty of Science Board Room/ Northwest University, South Africa.
- 16) International Conference on "Natural Products and COVID-19, Liverpool Conference 2021, the second annual conference of the Centre for Natural Products Discovery (CNPD)" at Liverpool John Moores University, Liverpool, UK. (Virtual) May 13-14, 2021.
- 17) CARGF MEL Workshop Mid-Term Monitoring and Evaluation and Impact Assessment of COVID-19 Africa Rapid Grant Projects 14-15 June 2022., NRF, South Africa (Virtual) Paper Presented: Development and biochemical characterization of proprotein convertase-furin/TMPRSS2 inhibitor from Nigerian medicinal plants traditionally used in viral infectious diseases.
- 18) France-South Africa-Nigeria Trilateral Symposium involving the University De Lorraine, University of Johannesburg and Obafemi Awolowo University at the University of Johannesburg, Doornfontein Campus, South Africa, 27-29<sup>th</sup> July, 2022
- 19) Perspectives of enzymology as a tool for discoveries in chemical and biological sciences. Maximizing potential in scientific collaboration towards building world-class institutions. Faculty of Science, University of Johannesburg, South Africa. 16th November, 2022.
- 20) Maximizing potential in scientific collaboration towards building world-class institutions. Vaal University of Technology (VUT), Southern Gauteng Science and Technology Park, South Africa, 17<sup>th</sup> November, 2022. <https://www.vut.ac.za/vut-hostsleading-nanotechnology-scientists/>.

## **H CURRENT RESEARCH ACTIVITIES:**

- (a) Current research activities focus on purifying and characterizing inhibitors from African medicinal plants which could be useful in the management of viral diseases such a COVID-19 and HIV.
- (b) Unraveling mechanisms of drought tolerance in *Bulinus globosus*. We are working towards the design of potent environment-friendly molluscides for the eradication of the water snail.
- (c) Production of biofuel from cassava using wholly indigenous enzymes and other locally-sourced materials.

## **I OTHER RELEVANT INFORMATION:**

### **1 Service within the Department:**

- (a) Departmental Secretary (2002-2006)
- (b) Time Table coordinator (2002 to 2009)

- (c) Chairman, Staff Welfare Committee (2004-to 2009)
- (d) Examination Coordinator 2006/2007 Session
- (e) Member, Departmental Procurement Committee, 2006/2007 session
- (f) Chairman, Departmental Reagent and Chemical Committee (2013-to date)
- (g) Chairman, Committee on New Programmes (2014-2016)
- (h) Acting Head, Department of Biochemistry and Molecular Biology (2017-2019)
- (i) Head, Department of Biochemistry and Molecular Biology (2019-2021).

## **2 Service within the Faculty:**

- (a) Departmental representative in the Faculty Time Table committee (2002- 2009)
- (b) Elected Member, Faculty of Science Review Panel (2006-2008)
- (c) Member, Faculty committee on Relationship with other institution (2006-to 2021)
- (d) Secretary, Faculty of Science 2006/2007 Admission committee
- (e) Member, Faculty Time Table committee (2002-2009)
- (f) Chairman, Local Organizing Committee, Faculty of Science 2004 conference
- (g) Chairman, Technical sub-committee Faculty of Science Conference 2005 to 2014
- (h) Member Faculty Committee on Accreditation of Journals and Textbooks 2009 to 2011
- (i) Member, 2010 Faculty of Science Week Committee
- (j) Member, Dapo Afolabi Most Productive Scholar of the Year award committee (2010-2017)
- (k) Chairman, Local Organizing Committee, Faculty of Science 2016 conference
- (l) Chairman, Local Organizing Committee, Faculty of Science 2018 conference
- (m) Editor-in-Chief, Ife Journal of Science (Biological Science), 2017-2021.
- (n) Dean, Faculty of Science, 2021-to Date.

## **3 Services within the University:**

- (i) Staff Adviser, Adams Old Students Association 2006-2007
- (ii) University examiner for the award of M.Sc/Ph.D degree in the Departments of  
Biochemistry and Molecular Biology (Faculty of Science),  
Chemistry (Faculty of Science),  
Pharmaceutical Chemistry (Faculty of Pharmacy),  
Zoology (Faculty of Science),  
Microbiology (Faculty of Science),  
Botany (Faculty of Science),  
Animal Sciences (Faculty of Agriculture),,  
Pharmaceutics (Faculty of Pharmacy),,  
Chemical Engineering (Faculty of Technology),  
Immunology and Hematology ((Faculty of Clinical Sciences),  
Food Science and Technology (Faculty of Technology),  
Crop Production and Protection (Faculty of Agriculture).
- (iii) Member of Senate of the Obafemi Awolowo University (Representative of the Faculty of Science): 2008 to 2010; and 2019 to date as a full professor.
- (iv) Representative of Head, Department of Biochemistry to Faculty Board of Technology (2014-2017)
- (v) Internal Assessor for Promotion to Professorship, Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife.
- (vi) Representative of Dean, Faculty of Science to Faculty Review Panel, Faculty of Pharmacy, OAU, Ile-Ife (2014-2016).

- (vii) Representative of Dean, Faculty of Science to Faculty Board, Faculty of Social Sciences, OAU, Ile-Ife (2017-2019).
- (viii) Representative of Dean, Faculty of Science to Faculty Review Panel, Faculty of Basic Medical Sciences, OAU, Ile-Ife (2019-2021).
- (ix) Senate representative in Library Committee (2019-2020).
- (x) Member, Appointment and Promotions Committee (2021-to Date)
- (xi) Member, Development Committee (2021-to Date)
- (xii) Member, Finance and General Purpose Committee (2021-to Date)

#### **4 Services Outside the University:**

- (a) Reviewer for
  - (i) African Journal of Agricultural Research (AJAR)
  - (ii) Environtropica.
  - (iii) Applied Microbiology and Biotechnology (Taylor and Francis)
  - (iv) International Journal of Biological and Chemical Sciences (Cameroon)
  - (v) Analytical Letters (Taylor and Francis)
  - (vi) Fish Biochemistry and Physiology (Springer verlag)
  - (vii) Ife Journal of Science
  - (viii) Preparative Biochemistry and Physiology (Taylor and Francis)
  - (ix) Bioactive Carbohydrates and Dietary Fibre (Elsevier)
  - (x) Ecotoxicology and Environmental Safety (Elsevier).
  - (xi) Comparative Biochemistry and Physiology (Elsevier)
  - (x) Plos One
  
- (b) Resource person, National Board for Technical Education Kaduna for the resource inspection and accreditation of ND/HND Science (Chemistry/Biochemistry) programmes at
  - (1) Niger State Polytechnic, Zungeru, Niger State (2009)
  - (2) Technical Colleges in Osogbo and Ile-Ife (2009-2010)
  - (2) Federal College of Freshwater Fisheries Technology, New Bussa, Niger State (2011)
  - (3) Nigerian Army School of Military Engineering, Makurdi, Benue State (2014)
  - (4) Abubakar Tatari Ali Polytechnic, Bauchi, Bauchi State (2016)
  - (5) Ibarapa Polytechnic Eruwa, Oyo State (2016)
  - (6) Delta State Polytechnic, Otefe Oghara, Delta State. (2016)
  - (7) Heritage Polytechnic, Ikot Udota, Eket, Akwa Ibom State (2019)
  
- (c)
  - (i) External Examiner for B.Sc. (Biochemistry programme), Department of Biochemistry, Federal University, Oye-Ekiti (2018-2021)
  - (ii) External Examiner (M.Sc.), Department of Biochemistry, Federal University of Technology, Akure (2020).
  - (iii) External Examiner (M.Sc.), Department of Biochemistry, Osun State University, Osogbo.
  - (iv) External Assessor for Readership Position, University of Medical Sciences, (UNIMED) Ondo (2019, 2020).
  - (v) External Examiner, Department of Chemistry, University of Ibadan Degree Programme, Osun State College of Education, Ilesa (2020-to date).
  - (vi) External Examiner, Department of Integrated Science, University of Ibadan Degree Programme, Osun State College of Education, Ilesa (2020-to date).

- (vii) Ilaje Local Government Collation Officer for 2020 Ondo State Governorship Election.
- (d) I have been involved in research collaboration with some research Institutes in German Universities (University of Bonn and University of Tübingen), and South Africa (University of Johannesburg). As Dean, I have further intensified and extended these collaborations to other Universities.

#### **5 Extra Curriculum Activities:** Gardening, swimming, Reading etc.

#### **J CONTRIBUTION TO KNOWLEDGE:**

In an attempt to correlate protein structure with function, main part of my research work has focused on the study of functional diversity of metabolic and detoxication enzyme proteins, in diverse organisms, with a view to providing useful information about such enzymes. Findings from such investigation have led to an understanding of mechanisms of adaptation in some of the organisms. In addition, this approach has revealed novel features in the catalytic mechanism of enzymes (e.g. glutathione transferase) in organisms.

One of such organisms is African river prawn (*Macrobrachium vollehovenii*) which is quite abundant in some rivers such as Asejire (Ikire, Osun State), and not in others. We showed that the organism has more efficient detoxication enzymes (glutathione transferase, catalase, and peroxidase) capable of eliminating toxic chemicals that are produced endogenously by the organism or encountered by the organism in its habitat. Variegated grasshopper, *Zonocerus variegatus*, is a pest that feeds on crops of economic importance. Such crops include cassava leaves and stems as well as other cash crops. Cassava leaves contain toxic allelochemicals including linamarin. We have established the presence of glutathione transferase in the gut of this insect which has a flexible kinetic mechanism thus assisting the organism to convert the toxic chemicals in such plant food into harmless derivatives. The information provided in this study has been found useful in many aspects, eg in the design of a more effective pesticide.

In general, our work on glutathione transferase has provided a biochemical basis of how organisms could become resistant to drugs, insecticides, herbicides after a while upon exposure to such agents. We have provided sufficient information for the design of a more potent molluscicide for the elimination of water snail, *Bulinus globosus*, the vector for *Schistosomiasis*

Thermostable amylases are used a lot in food processing industries, breweries etc. These amylases are of bacterial/fungal sources and are imported into the country thus depleting Nigerian economy of scarce foreign exchange. We have established that the amylases from local cereals such as sorghum or millet have similar properties to the imported type and could be used as a substitute. My laboratory has provided conditions for maximal amylolytic enzyme production in sorghum grains. We have used the amylolytic enzymes to break down cassava starch into soluble sugars. We have shown that invertase could be produced in copious quantities by yeasts from Abagboro, a community within OAU campus. We have used the yeast to ferment the soluble sugars obtained from cassava to produce ethanol at a higher concentration than previously recorded.

We have extended this study to sourcing amylases and cellulases from fungi and bacteria that were isolated from our local environment and grown in an inexpensive media. Our work on aldehyde dehydrogenase from *Arabidopsis thaliana* has provided a molecular mechanism to drought tolerance in plants.

Again, I have also attempted to extend the frontiers of enzymology by devising new ways for its application. A good example of my work in this regard is the possible use of glutathione transferase profile to probe storage history/freshness of frozen fish or meat samples. We have been able to show that

enzymes such as tyrosinase (polyphenol oxidase) from yam, *Dioscorea* species, could catalyse reactions in non-aqueous systems, and this has great promise in synthetic organic chemical reactions. We have extended this study to peroxidase and have shown that kolanut could be a rich source of this enzyme, which are components of diagnostic kits.

My laboratory has established that extracts of some African medicinal plants such as *Mormodica charantia* and *Lawsonia inermis* contain both inhibitors and activators of serine proteases such as furin and TMPRSS2, for the first time. Both the inhibitors and activators have promising applications and could be developed into clinical drugs for the management of viral diseases such as Covid-19 and HIV

Date: February 2023

Signature: 