



Marwa Mamdouh Tawfik

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About me:

I am a molecular biologist interested in the role of microbiome and transcriptome mechanisms in the nutritional programming of carnivorous fish (e.g., Atlantic salmon, rainbow trout, etc) by vegetable diet during first feeding. I am currently a PhD research scholar at the University of Aberdeen, UK involved in [NUTRIPROG](#); a collaborative project between the Universities of Stirling and Aberdeen. I am also an associate teaching fellow of AdvanceHE. I advocate for equity in academia via UCU meetings for example. I publish pre-prints before peer-reviewing as support for open science.

● EDUCATION AND TRAINING

22/01/2019 - 31/07/2023 Aberdeen, United Kingdom

PHD IN ZOOLOGY (NUTRIGENOMICS) University of Aberdeen

Address Aberdeen, United Kingdom

12/2014 - 03/2017 Cairo, Egypt

MASTERS'S DEGREE (BY RESEARCH) IN FISH HEALTH Cairo University

Address Cairo, Egypt

10/2015 - 05/2017 Beni-Suef, Egypt

POSTGRADUATE DIPLOMA (BY RESEARCH) IN MATERIAL SCIENCE AND NANOTECHNOLOGY
Beni-Suef University

Address Beni-Suef, Egypt

09/2005 - 07/2010 Zagazig, Egypt

BACHELOR'S DEGREE IN VETERINARY MEDICAL SCIENCES Zagazig University

Address Zagazig, Egypt

● WORK EXPERIENCE

01/05/2023 - 31/07/2023 Storrs, United States

VISITING STUDENT RESEARCHER UNIVERSITY OF CONNECTICUT

Supervisor: Prof. Daniel Bolnick

My aim for this visit is to get feedback on the work I have been doing during PhD on nutritional programming in Atlantic salmon. We planned to work on the network integrative analysis of the gut microbiome and transcriptome to understand the crosstalk between the gut and its microbiota in response to different diets.

22/01/2019 - 07/2023 Aberdeen, United Kingdom

NEWTON-MOSHARAF PHD SCHOLAR AND ASSOCIATE TEACHING FELLOW SCOTTISH FISH IMMUNOLOGY RESEARCH CENTRE, SCHOOL OF BIOLOGICAL SCIENCES, UNIVERSITY OF ABERDEEN

Supervisors: Prof. Sam Martin and Prof. Alex Douglas

My PhD thesis is mainly focusing on nutritional programming in Atlantic salmon trying to program fish (nutritionally and immunologically) from early-stage (first feeding) on a plant-based diet while maintaining the fish performance. Mechanisms behind nutritional programming were investigated via gut microbiome and transcriptome. I was mainly involved in the first feeding trial of the NUTRIPROG project in collaboration with the Institute of Aquaculture, University of Stirling, Scotland, UK, and BioMar, Norway. I reproduced a pipeline to run my analysis using HPC and Ubuntu using Rstudio packages such as DADA2, phyloseq, vegan, ALDEx2, ANOSIM, ANCOM, trimGalore, and others like FASTQC, MULTIQC, LefSe, PCIRUST2, and STAMP. I also used Unix for step-by-step RNAseq analysis from sequences to quantification step. Another reproducible approach for RNAseq analysis where I used Nextflow (nf-core) in a container (singularity) and iDEP & other open-source tools individually and in a pipeline. While I downstream analyzed the count table using SARTools (Deseq2), IPA, DAVID, and ShinyGO for pathway analysis for transcriptome. Wet lab skills include DNA extraction for various sizes of intestines at different fish developmental stages to be sequenced (MiSeq & HiSeq). I was a member of UCU and the Health, Safety, and Wellbeing Committee (student rep). I was a teaching assistant for biology and biostatistics/bioinformatics courses and achieved a teaching certification (Associate Fellowship by [AdvanceHE](#)).

22/06/2017 - 07/01/2019 Giza, Egypt

ASSISTANT RESEARCHER NATIONAL RESEARCH CENTRE

Supervisors: Prof. Iman M. K. Abumourad and Prof. Taghreed B. Ibrahim

As a visiting researcher at Beni-Suef University, I was responsible for the green synthesis of Selenium nanoparticles to enhance the immunity of fish. During this project, I fed *Tilapia nilotica* (*Oreochromis niloticus*) with novel selenium nano-mineral and investigated growth performance, immune gene expression, and DNA degradation (COMET assay) in response to nano-selenium compared to conventional selenium source. I was involved in the practical demonstration of nanomaterials synthesis and fabrication at the Faculty of Postgraduate Studies of Advanced Sciences (PSAS), Beni-Suef University for graduate students. I was invited as a trainer in the "Molecular Biology and Biotechnology" summer course for Faculty of Science (Biology Minor) Students. Seminars on "Molecular Biology and Nano-Biotechnology" at Veterinary Research Division, National Research Centre were delivered.

02/2016 - 01/2019 Giza, Egypt

ASSISTANT LAB MANAGER NATIONAL RESEARCH CENTRE

Supervisors: Prof. Mona S. Mahmoud

I was in charge of managing different equipment and reporting directly to the institute Head. I helped with scheduling the time for researchers to carry on their experiments in the lab and arranging instruments company specialists' visits for technical training and ensuring the maintenance of equipment. I helped in training on DNA isolation, RNA Extraction, cDNA Synthesis, qPCR, Thermocycler, UV Transilluminator, Nanodrop Spectrophotometry, UV-Vis Spectrophotometry, for Postdoctoral, PhD, and Master students.

10/12/2014 - 21/06/2017 Giza, Egypt

RESEARCHER ASSISTANT NATIONAL RESEARCH CENTRE

Supervisors: Prof. Wafaa Tawfik Abbas and Prof. Iman M. K. Abumourad

My master's thesis is focused on learning how to synthesize Zinc oxide nanomineral to evaluate its impacts on growth performance and immune response in *Tilapia nilotica* and responsible for taking care of the fish throughout the experiment. Wet lab skill set including RNA isolation, cDNA synthesis, probe and primer design, and using qPCR (Qiagen Rotor-Gene).

09/02/2012 - 09/12/2014 Giza, Egypt

VETERINARY LAB TECHNICIAN NATIONAL RESEARCH CENTRE

Supervisors: Prof. Iman M. K. Abumourad

I was entitled to take care of the aquarium fish and run periodic health checks for different experiments in addition to maintaining good records/data. I was involved in sampling from different fish farms in Egyptian governorates (mainly Fayoum and Beheira).

HONOURS AND AWARDS

Academic awards/grants

- Santander Mobility Award (£1000) - to visit USA university, 2023.
- 3-month internship (January-March 2023), Matis Aquaculture Research Station (MARS), Iceland (internship not utilized), 2023.
- "The most active participant award", Fish Nutrition Workshop, Wageningen University and Research, Wageningen, Netherlands, October 17-20, 2022.
- Sustainable Aquaculture Innovation Centre (SAIC) travel award (£800) - conference award, 2022.
- Charles Sutherland Scholarship fund (£1150) - conference award, 2022.
- Abdo Samy travel grant (emonovo co-founder) (\$500) - conference/workshop award, 2022.
- "Second best poster presentation", 20 (Zebra)Fish Immunology/ Vaccination Workshop, Wageningen University and Research, Wageningen, Netherlands, April 28 - May 2, 2019.
- Fully funded course "Genomic Data Science Specialization", Coursera, online, 2019.
- Newton-Mosharafa PhD Programme Scholarship, Fully Funded PhD in the UK for 2019 intake, 2018.
- 6-month Erasmus+ visiting student from the University of Vigo, Spain, and Beni-Suef University partnership (not utilized), 2018.
- Fully funded (by Ministry of Higher Education & Scientific Research, Egypt) 6-month visiting student researcher, USA (not utilized), 2018.
- Best Master's Thesis at Veterinary Research Division in 2017 Recognition from National Research Centre, Egypt, 2018.
- First Cohort, Data Analysis Track, One Million Arab Coders Program Scholarship, Udacity (Online Platform), Online, 2018.
- Masters Student Recognition from Veterinaries Syndicate, Egypt, 2017.
- Nominee for "USAID; The Cairo Initiative" 4-month training in the USA by National Research Centre, Egypt, 2017.
- Al Ghurair Open Learning Scholars Program Award, Al Ghurair Foundation for Education (AGFE), UAE, 2016
- Misr Elkheir (MEK) Qualifying Program Award, Misr Elkheir Foundation (MEK), Egypt, 2015
- BVM with Honors, Veterinary Medical Sciences, Faculty of Veterinary Medicine, Zagazig University, Egypt, 2010
- "Top Student" Recognition Award (4th academic year), Social Committee, Faculty of Veterinary Medicine, Zagazig University, 2009
- Honor and Appreciation Award, Pharmacology Department, Faculty of Veterinary Medicine, Zagazig University, 2008

PUBLICATIONS

PhD chapters/manuscripts in prep.

1. Modulation of Atlantic salmon (*Salmo salar*) gut microbiota composition and predicted metabolic capacity after nutritional programming with a plant-rich diet: insights across developmental stages. https://github.com/marwa38/NP_devStages_ampliseq (currently private).
2. The impact of nutritional programming on the gut microbiota of Atlantic salmon (*Salmo salar*) parr. https://github.com/marwa38/NP_intesParts_ampliseq (currently private).
3. Gut transcriptome in Atlantic salmon (*Salmo salar*) after nutritional programming with a plant-rich diet. https://github.com/marwa38/NP_devStages_RNAseq (currently private).
4. Gut regions transcriptome after nutritional programming in Atlantic salmon (*Salmo salar*) with plant-rich diet. https://github.com/marwa38/NP_intesParts_RNAseq (currently private).
5. Microbiome-transcriptome gut interactions after nutritional programming in Atlantic salmon (*Salmo salar*) with plant-rich diet. https://github.com/marwa38/NP_devStages_integrative (currently private).
6. Host-microbiome interactions in gut regions after nutritional programming in Atlantic salmon (*Salmo salar*) with a plant-rich diet. https://github.com/marwa38/NP_intesParts_integrative (currently private).

Masters publications

1. Zaki, A. H., El-Shafey, A., Moatmed, S. M., Abdelhay, R. A., Rashdan, E. F., Saleh, R. M., Abd-El Fatah, M., **Tawfik, M.M.**, Esmat, M. & El-dek, S. I. (2018). Morphology transformation from titanate nanotubes to TiO₂ microspheres. *Materials Science in Semiconductor Processing*, 75, 10-17. <https://www.sciencedirect.com/science/article/pii/S1369800117319194>.
 2. **Tawfik, M.**, Moustafa, M., Abumourad, I. M. K., El-Meliegy, E., & Refai, M. (2017, August). Evaluation of Nano Zinc Oxide feed additive on tilapia Growth and Immunity. In *15th International Conference on Environmental Science and Technology, Rhodes, Greece* (Vol. 1342, No. 1, pp. 1-9). https://cest2017.gnest.org/sites/default/files/presentation_file_list/cest2017_01342_oral_paper.pdf.
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Presentations

1. **Marwa M. Tawfik.** Gut microbiota in Atlantic salmon after nutritional programming with a vegetable-based diet across developmental stages and intestinal regions. *Bolnick Lab, Ecology and Evolutionary Biology Department*, University of Connecticut, Connecticut, USA, May 2, 2023.
 2. **Marwa M. Tawfik.** Gut transcriptome in Atlantic salmon (*Salmo salar*) after nutritional programming with a plant-rich diet. *4th International Conference of Fish & Shellfish Immunology conference (ISFSI)*, Bodø, Norway, December 12-15, 2022.
 3. **Marwa M. Tawfik.** Differentially expressed genes and enriched pathways after nutritional programming in Atlantic salmon (*Salmo salar* L.) with plant-rich diet. *Fish Nutrition Workshop*, Wageningen University and Research, Wageningen, Netherlands, October 17-20, 2022.
 4. **Invited: Marwa M. Tawfik.** Gut microbiota in Atlantic salmon after nutritional programming with a vegetable-based diet. *Mucosal Health in Aquaculture 2022 conference (MHA2022)*, Madrid, Spain, October 3-6, 2022.
 5. **Marwa M. Tawfik.** Gut microbiota in Atlantic salmon after nutritional programming with a vegetable-based diet. *Aquaculture Europe 2022 Conference, European Aquaculture Society (EAS)*, Rimini, Italy, September 27 - 30, 2022, Rimini, Italy, September 27 - 30, 2022.
 6. **Marwa M. Tawfik.** Characterization of microbial profile of marine-based diet fed Atlantic salmon at first feeding: does plant-based diet cause dysbiosis at this critical period? *4th European Association of Fish Pathologists (EAFP) UK and Ireland branch meeting*, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Weymouth, Dorset, UK, September 14 - 15 2022.
 7. **Marwa M. Tawfik.** Evaluation of early nutritional programming effect on fish performance, intestinal transcriptome and microbiome in Atlantic salmon fry (*Salmo salar*). *20th (Zebra)Fish Immunology/Vaccination Workshop*, Wageningen University and Research, Wageningen, Netherlands, April 28 - May 2, 2019.
 8. **Invited: Marwa M. Tawfik.** Cell Cycle Lecture, Nano-Biotechnology Course, Faculty of Postgraduate Studies of Advanced Sciences (PSAS), Beni-Suef University, spring semester, 2017.
 9. **Invited: Marwa M. Tawfik.** Molecular Biology & Gene Therapy Lecture, Biomedical Applications of Nanomaterials Course, Faculty of Postgraduate Studies of Advanced Sciences, Beni-Suef University, fall semester, 2015.
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Talks/Posters Abstracts

1. **Marwa Mamdouh Tawfik,** Marlene Lorgen-Ritchie, Monica Betancor, Stuart McMillan, Elżbieta Król, Alex Douglas, and Samuel A. M. Martin. Gut transcriptome in Atlantic salmon (*Salmo salar*) after nutritional programming with a plant-rich diet, *4th International Conference of Fish & Shellfish Immunology conference (ISFSI)*, Bodø, Norway, December 12-15, 2022.
 2. **Mamdouh Tawfik, M. M.,** Lorgen-Ritchie, M., Betancor, M., McMillan, S., Król, E., Douglas, A., and Martin, S. A. M. Differentially expressed genes and enriched pathways after nutritional programming in Atlantic salmon (*Salmo salar* L.) with plant-rich diet, *Fish Nutrition Workshop*, Wageningen University and Research, Wageningen, Netherlands, October 17-20, 2022.
 3. **Mamdouh Tawfik, M. M.,** Lorgen-Ritchie, M., Betancor, M., McMillan, S., Król, E., Douglas, A., and Martin, S. A. M. Gut microbiota in Atlantic salmon after nutritional programming with a vegetable-based diet, *Mucosal Health in Aquaculture 2022 conference (MHA2022)*, Madrid, Spain, October 3-6, 2022.
 4. **Mamdouh Tawfik, M. M.,** Lorgen-Ritchie, M., Betancor, M., McMillan, S., Król, E., Douglas, A., and Martin, S. A. M. Differences between intestinal regions in microbial profiles of Atlantic salmon parr (*Salmo salar* L.), *Mucosal Health in Aquaculture 2022 conference (MHA2022)*, Madrid, Spain, October 3-6, 2022.
 5. **Marwa Mamdouh Tawfik,** Marlene Lorgen-Ritchie, Monica Betancor, Stuart McMillan, Elżbieta Król, Alex Douglas, and Samuel A. M. Martin. Gut microbiota in Atlantic salmon after nutritional programming with a vegetable-based diet, *Aquaculture Europe 2022 Conference, European Aquaculture Society (EAS)*, Rimini, Italy, September 27 - 30, 2022, Rimini, Italy, September 27 - 30, 2022.
 6. **Marwa Mamdouh Tawfik,** Marlene Lorgen-Ritchie, Monica Betancor, Stuart McMillan, Elżbieta Król, Alex Douglas, and Samuel A. M. Martin. Characterization of microbial profile of marine-based diet fed Atlantic salmon at first feeding: does plant-based diet cause dysbiosis at this critical period?, *4th European Association of Fish Pathologists (EAFP) UK and Ireland branch meeting*, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Weymouth, Dorset, UK, September 14 - 15 2022.
 7. **Marwa Mamdouh Tawfik,** Marlene Lorgen-Ritchie, Monica Betancor, Stuart McMillan, Elżbieta Król, Alex Douglas, and Samuel A. M. Martin. Gut microbiota in Atlantic salmon (*Salmo salar*) at different developmental stages, *Aquaculture Canada and (World Aquaculture Society) WAS North America 2022 conference*, St Johns, Newfoundland, Canada, August 15-18, 2022.
 8. **Tawfik, M,** Douglas, A, Tocher, D.R. & Martin, S.A.M. Evaluation of early nutritional programming effect on fish performance, intestinal transcriptome and microbiome in Atlantic salmon fry (*Salmo salar*), *20th (Zebra)Fish Immunology/Vaccination Workshop*, Wageningen University and Research, Wageningen, Netherlands, April 28 - May 2, 2019.
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NETWORKS AND MEMBERSHIPS

01/03/2023 - ongoing Aberdeen

Aberdeen Computational Biology Forum

Talks and networking hub for interdisciplinary researchers across the University of Aberdeen using computational algorithms and statistics in their research to solve biological and medical problems.

02/2022 - 08/2022 Scotland (Aberdeen and Edinburgh)

The Data Lab

Mentor: Brian Hills (CEO, The Data Lab)

As part of being accepted into the "Career Mentoring Programme" by the University of Aberdeen, I was mentored by an industry leader in data science and bioinformatics. It was helpful for networking and being informed about funding opportunities for academia and industry. I hosted and organized a session that was delivered by Brian Hills as part of the "Datafest" event across Scotland.

2021 - 2022 Europe (UK and Italy)

European Aquaculture Society (EAS)

I helped in organising Aquaculture Europe 2022 in Rimini, Italy and was member of EAS meetings.

01/2012 - 01/2016 Egypt

Nakaa Nanotechnology Network (NNN)

I mainly helped in practical demonstration of nanomaterials synthesis and fabrication and organising NNN conferences.

02/2016 - 01/2017 Cairo and Luxor

INTEL ISEF Egypt

I was accepted as a volunteer for helping in judging molecular biology and biotechnology projects of high school students in Luxor and Cairo.

CONFERENCES (FOR NETWORKING)

- Aquaculture UK, Aviemore, Scotland, UK, May 3-5, 2022.
- A3 Scotland, a conference for the Animal Health, Agritech, and Aquaculture (AAA) sectors, Edinburgh & Highlands, Scotland, UK, April 25-29, 2022.
- The 4th Annual Bioinformatics Networking Event, online, Cranfield University, England, UK, June 17, 2021.
- European Aquaculture 2020 (EAS), Virtual Meeting, April 12-15, 2021.
- 4th International Conference on Integrative Salmonid Biology, Edinburgh, Scotland, UK, November 17-20, 2019.
- 2nd Egyptian Bioinformatics Workshop, Nile University, Egypt, December 26, 2017.
- BioKMT Masterclass in "OMICS and Bioinformatics", Academy of Scientific Research and Technology (ASRT), Egypt, December 23, 2017
- Development of Animal Wealth: Challenges and Solutions, National Research Centre, Cairo, Egypt, December 5-7, 2017.
- Applications of Proteomics in Animal Sciences and Dairy Food Workshop, NRC, Egypt, December 13, 2017.
- The Fourth International Conference on Advanced Sciences (ICAS4), Hurghada, Egypt, November 7-10, 2017.
- International Conference of Nanotechnology, Biotechnology, and Spectroscopy by Naqaa Foundation for Research and Nanotech Network (NNN), Cairo, Egypt, March 27-29, 2015.
- 4th International Workshop & Conference: Nanomaterial and Nanodevices, National Research Centre, December 8-9, 2014.
- BioVisionAlexandria 2014 Conference, Bibliotheca Alexandria, April 7-9, 2014, Alexandria, Egypt
- Transfer of Biomaterials' Knowledge into Technology by Egyptian Society for Science & Technology of Biomaterials (ESSTB), NRC, March 1-2, 2015.
- Common Aquaculture Systems in Egypt Course, The Fish Research Unit and Fish Diseases & Management Department, Faculty of Veterinary Medicine, Zagazig University, April 22, 2014.
- Practical Pharmaceutical Nanotechnology Workshop, Faculty of Pharmacy, Cairo University, April 28, 2012.
- Applications of Nanotechnology Science in Medicine Workshop, Animal Health Research Institute and Material Science Lab, Physics Department, Faculty of Science, Cairo University, March 4-8, 2012.

REFEREES

- Prof. Samuel Martin (sam.martin@abdn.ac.uk)
- Prof. Alex Douglas (a.douglas@abdn.ac.uk)
- Prof. Daniel Bolnick (daniel.bolnick@uconn.edu)