



**BIOCHEMICAL
SOCIETY**

**REPORT OF THE WOMEN'S BIOMEDICAL RESEARCH ADVANCEMENT PROJECT (WRAP) AT
THE DROSOPHILA RESEARCH AND TRAINING CENTRE FUNDED BY THE BIOCHEMICAL
SOCIETY**

<http://www.drosophilartc.org/>



About DRTC

Drosophila Research and Training Centre (DRTC) is the foremost not-for-profit biomedical research and training hub using *Drosophila melanogaster* (Fruit fly) as a model organism in Nigeria and Sub-Saharan Africa. Over the years, we have trained and equipped many young budding scientists with hands-on research skills and exposed them to biomedical research methods. Our vision is to serve as a hub for research and training biomedical scientists in Nigeria and Sub-Saharan Africa using *Drosophila melanogaster* as an alternative to animal models in biomedical research. Our mission is to promote the use of *Drosophila melanogaster* at different educational levels, including schools,

universities, research institutes, and clinics, and to ensure the availability of different *Drosophila* stocks and conducive workspaces for scientists in Nigeria and Sub-Saharan Africa.

Overview of the WRAP Project funded by the Biochemical Society

Representation of women in science has been historically low, and this is far worse in low- and middle-income countries (3), including Nigeria, where fewer women are represented in science, particularly scientific research, including biomedical sciences (4). The Women's Biomedical Research Advancement Project (WRAP) was a five-day hybrid event to equip women with hands-on biomedical research skills and mentorship funded by the Biochemical Society through the Diversity in Science Grant 2024. *Drosophila* has been used as a model organism by about six world-acclaimed researchers who have won Nobel prizes in medicine and physiology (6).

The training aimed to provide participants with hands-on experience using *Drosophila melanogaster* as a model organism and enhance their knowledge of molecular biology techniques. By providing hands-on training and mentorships to young women in Nigeria, we are raising the next generation of women in science who will continue to impact their various research areas. The training also emphasised networking opportunities and professional skill development for participants. Through this project, over 420 women were exposed to mentorship through virtual programs, and 19 were present on-site and received hands-on training and exposure to biomedical research techniques. The webinars featuring successful women in science, such as **Prof. Olayinka Olusola Omigbodun (University of Ibadan)**, **Prof. Cassandra Extavour (Harvard University)**, **Dr Yumi Kasai (University of Glasgow)**, **Prof. Isabel M. Palacios (Queen Mary University of London)**, and **Dr Stephanie E. Mohr (Harvard University)**, were a highlight for many participants equipping them with information about navigating the biomedical career as a woman.

DROSOPHILA RESEARCH AND TRAINING CENTRE SUPPORTED BY: **BIOCHEMICAL SOCIETY**

WOMEN'S BIOMEDICAL RESEARCH ADVANCEMENT PROJECT (WRAP)

PRESENTS

A 5-DAY WEBINAR SERIES FOR WOMEN IN BIOMEDICAL RESEARCH

THEME

Navigating Biomedical Research Landscape as a woman: Practical Tips and Impact Stories

Prof. Olayinka Olusola Omigbodun
FAS
Professor of Population & Founding
Director, Centre for Child &
Adolescent Mental Health (CAMH)
College of Medicine, University of
Ibadan

Prof. Cassandra Extavour
Investigator, Howard Hughes
Medical Institute and Emery
Harvard University

Dr. Yumi Kasai
Head, Clinical Genomics at the
Genomics Innovation Alliance,
University of Glasgow

Prof. Isabel M. Palacios
Dept. of Biochemistry, School of
Biological and Behavioral Sciences,
Queen Mary University of London
Member, Omniafrica

Dr. Stephanie E. Mohr
Director, OBEI/NIH Functional
Genomics Research & ERIC Center
Dept. of Genetics | The Warren Institute
Harvard Medical School, USA

REGISTER HERE
bit.ly/VIRTUALPROJECTWRAP

25TH -29TH
NOVEMBER, 2024

ZOOM

1 HOUR 30 MINS
DAILY

SPECIFIC DETAILS AND TIME WILL BE PROVIDED UPON REGISTRATION

ELIGIBILITY : ALL WOMEN GLOBALLY

For more information, contact us at: info@drosophilartc.org

Participants' Characteristics and Training Details

Selection Process

Over 500 participants applied for the training and were screened by a selection panel of women who scored them based on performance, availability, qualifications, and interest. We received applications from different countries within and outside Nigeria, and 20 women were eventually shortlisted for physical participation. At the same time, the virtual session was opened to all applicants, and 420 participated in at least one virtual session. Participants who applied outside Nigeria were allowed to participate virtually.

Mode of delivery

The training was delivered in **3 modes**: **Onsite** hands-on training on biomedical research techniques, **hybrid** sessions on data analysis and 5-day **virtual** webinars.

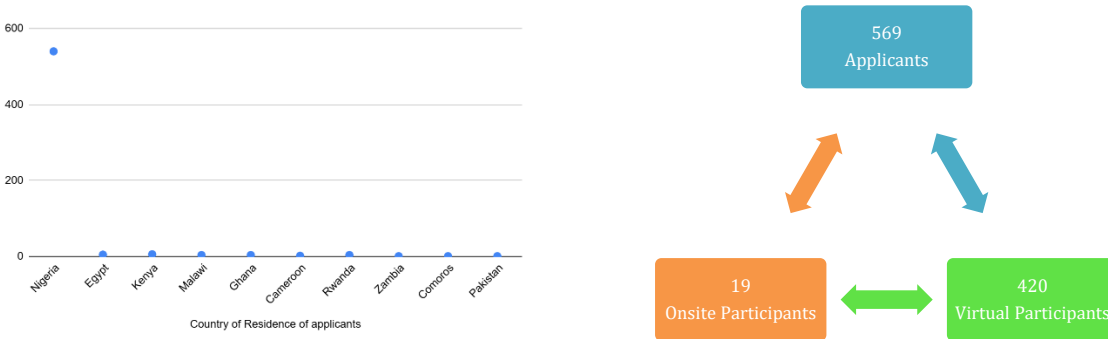


Fig 1.0

As shown in the figures below, most *on-site participants were young women from different fields in the biomedical sciences, from different parts of Nigeria, with diverse qualifications ranging from undergraduate studies to PhD.*

Participants were from different biomedical research fields with diverse qualifications.

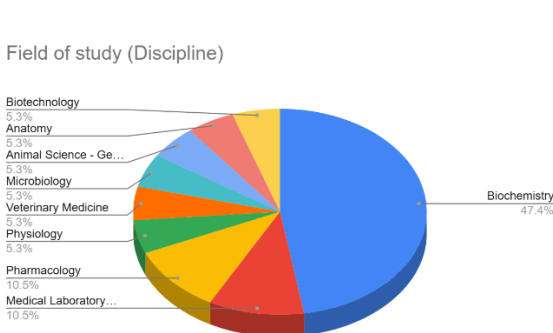


Fig 2.0: Field of study

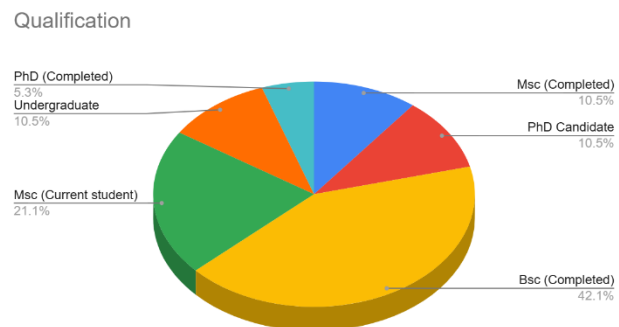


Fig 3.0: Qualification

All the participants are young women, as shown below.

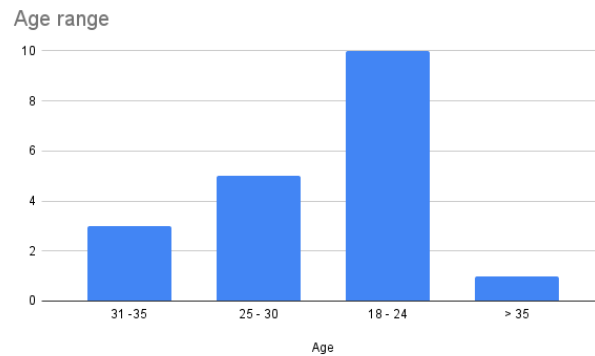


Fig 4.0 - Age Range

Participants' Welfare

- Accommodation was provided for 10 selected participants from outside the project state.
- Meals (tea break and lunch) were provided daily for all participants
- Transportation to and from the venue to the nearest bus stop was provided daily for all on-site participants
- Basic amenities like free internet were also provided to streamline their learning processes.

Training Schedule

On Day 1, the workshop started with an introduction to general ethics and plagiarism in research and academic writing facilitated by **Ms. Halimat Olaniyan**. Participants had the opportunity to brainstorm and proffer solutions to common ethical issues in research.



Picture 1

This was followed by a session on Fly Handling facilitated by **Mr Abdulwasiu**, where the participants had theoretical and practical sessions on handling *Drosophila melanogaster* in a laboratory setting.

Fly handling is crucial because *Drosophila* are small and delicate, requiring precision and care to avoid injury or contamination to the flies.



Picture 2

The on-site sessions on Day 1 ended with a theoretical and practical session on microscopy facilitated by **Dr Onaara Ashaolu**, and the participants were able to dissect the fruit flies under a microscope, followed by viewing them under a Fluorescent Microscope. The participants examined the guts, brain, and ovary of *D. melanogaster* under the Fluorescent microscope. Anaesthetizing and dissecting the *Drosophila melanogaster*, particularly the brain and tissues, proved to be a delicate and challenging task due to the tiny size of the flies, requiring a high level of precision and expertise.



Picture 3

The session for the day ended with the first virtual webinar on "Navigating the Biomedical Research Landscape as a Woman" facilitated by **Dr Stephanie Mohr**, *Lecturer on Genetics at Harvard Medical School, Director of DRSC/TRiP Functional Genomic Resources*, who presented a few research slides and brief remarks about her career, followed by a Q&A session with the participants.



Picture 4

On Day 2, we started the day with a session on **buffer preparation** facilitated by Mr. Festus Oyeniyi, he took the participants through the theoretical calculations and guided them during the practical session to prepare the Phosphate Buffer Solution.



Picture 5

This was followed by a session on **Primer Design** facilitated by **Ms. Favour Oladokun**. In this session, participants were equipped to design DNA-specific primers. The participants were taken through the step-by-step process and given an assignment to design the primers, which they submitted the following day.



Picture 6

The third session on Day 2 started with a micro pipetting skills lesson, followed by theoretical and practical sessions on **DNA extraction** processes using selected *Drosophila melanogaster* samples facilitated by **Mrs. Ruth Aladeloye**.



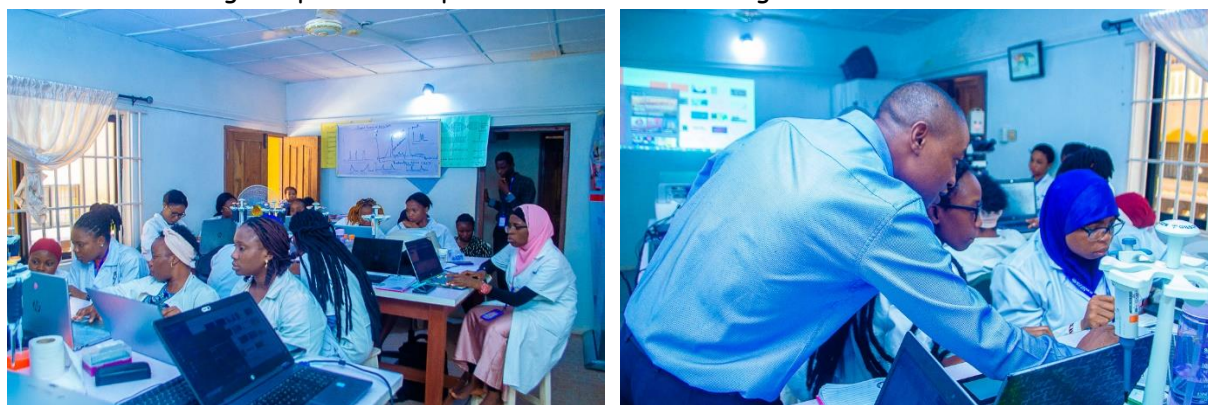
Picture 7

The sessions on Day 2 ended with an inspiring virtual webinar session on "Navigating the Biomedical Research Landscape as a Woman," Facilitated by **Professor Cassandra Extavour**, *Investigator, Howard Hughes Medical Institute Timken Professor of Organismic and Evolutionary Biology and of Molecular and Cellular Biology Harvard College Professor*. During this session, she narrated her experiences as a black woman in biomedical research, after which she answered questions from both on-site and virtual participants.



Picture 8

On Day 3, The training started with a practical bioinformatics session on **molecular docking for protein-ligand interactions** by Dr. Michael Ogunyemi. For many of the participants, this was their first time handling the practical aspects of molecular docking.



Picture 9

The session was immediately followed by a virtual webinar with **Professor Yumi Kasai, Head of Cancer Genomics Genomics Innovation Alliance Level 3, Teaching and Learning Centre Queen Elizabeth University Hospital University of Glasgow** on "Navigating the Biomedical Research Landscape as a Woman," where she shared practical experiences working and moving between countries and she answered questions from the participants.



Picture 10

The last session on **Day 3** focused on **Agarose Gel Electrophoresis and PCR**, which **Mrs Ruth Aladeloye** facilitated.



Picture 11

On Day 4, the training started with a session on **accessing Global Opportunities and CV writing**, which was facilitated by **Ms. Haliamat Olaniyan** where the participants learned about grant writing and searched various websites for eligible grant applications and how to tailor their CVs for various opportunities.



Picture 12

This was followed by a session on the *Use of Drosophila melanogaster* in Biomedical Research by Professor Amos Abolaji through Mr. Festus Oyeniyi.



Picture 13

After this, we held a hybrid session on biostatistics and data analysis for online and on-site participants facilitated by Mr. Oluwasegun Olatomide.



Picture 14



The sessions for Day 4 closed with the training and practical on **Reactive Oxygen and Nitrogen Species (RONS) assay** by **Mr. Festus Oyeniyi**.



Picture 15



On Day 5, the participants worked in different groups to analyse their data using Graph Pad Prism. After this, we had a group presentation session where the participants presented an overview of the skills and knowledge gained during the one-week training.



Picture 16



This was followed by an insightful virtual webinar by **Professor Isabel M. Palacios, Prof. Isabel M. Palacios, Department of Biochemistry, SBBS, Queen Mary University of London**. She shared her personal and professional experience in Navigating the Biomedical Research Landscape, followed by an interactive Q&A session.



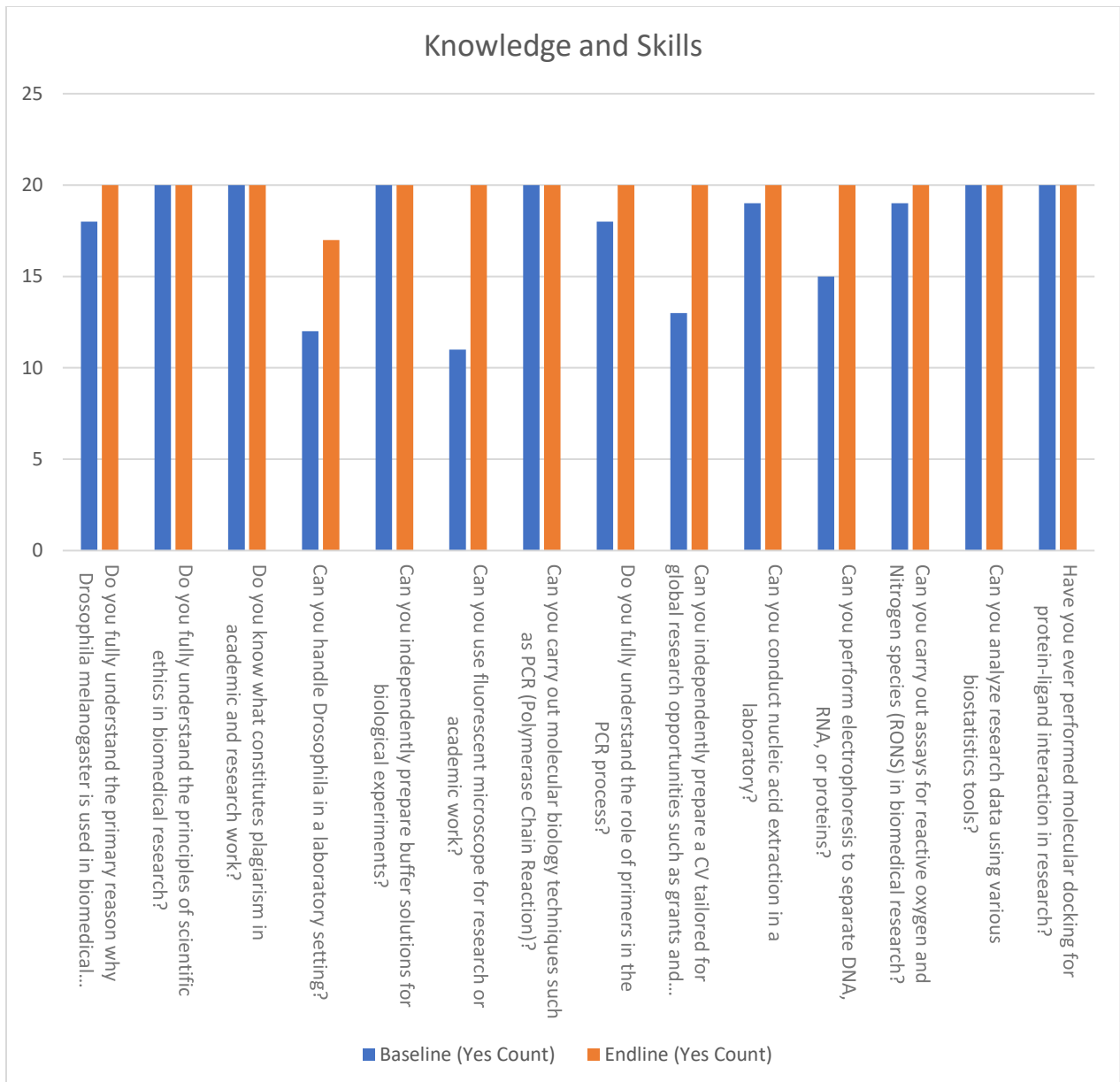
Picture 17

The last virtual webinar was held immediately after by **Professor Olayinka Omigbodun**. This was in the form of questions and answers session moderated by **Ms. Halimat Olaniyan**. Professor Omigbodun shared her personal and professional experiences and gave relatable insights as a woman in Biomedical Research.



Picture 18

After the training, the participants had an opportunity to showcase all they had learned through group presentations. **Professor Amos Abolaji, Team Lead of the Drosophila Research and Training Centre**, presented them with their certificates of participation.



Feedbacks

" I must say that this training has been one of a kind; from the people, the facilitators, the hands-on sessions, and the webinars, every single bit of it was interesting, and it inspired me. I leave here a better biomedical researcher than I was before. I leave here refreshed and remotivated. I have learnt from the women who have gone before me, and I hope to be a light to the ones coming after me. Thank you, all." Mercy Bella-Omunagbe, On-site participant

"This was a phenomenal experience and opportunity. As a graduate student, I have always sought opportunities to gain skills and knowledge beyond the theoretical science I've learnt. This training exceeded those expectations and impacted me. Additionally, I had the privilege

to Network and interact with other amazing women in biomedical science. My eyes were open to broader trajectories and opportunities within my field and beyond my immediate ecosystem. Ultimately, this is an experience to remember for a long time. And I am super grateful to the organisers."

Challenges And Lessons Learned

Due to resource constraints, many exceptional candidates could not be selected for physical participation. This was mitigated by creating 10 additional slots funded by the Drosophila Research and Training Centre outside the planned 10 slots funded by the Biochemical Society. However, some of the shortlisted candidates could not attend physically for various reasons, and this was mitigated by promptly selecting the next best candidates, resulting in only 19 of the 20 physical slots being filled.

There were many theoretical and practical sessions to cover daily within the 9 am to 6 pm time schedule; however, additional timeslots had to be scheduled to cover outstanding sessions. Finally, technical concerns such as lack of access to a computer for personal practice, network disruptions, and software installation issues emerged. Some participants also found the molecular docking session difficult, especially those who lacked access to a computer at home for hands-on practice, making it harder to follow along with the session.

"The most challenging session for me was the molecular docking training; let me just say all the sessions that required the use of a laptop because I couldn't lay hands on the system at home to practice molecular docking."

"Although I tried using my phone to practice primer design, it wasn't smooth and easy."

This issue was mitigated by pairing participants on a laptop during the training, and it underscores the need to install the software ahead of time for future training and provide computers where possible.

Recommendations

A recurring theme among participants was the need for an extended training duration. Many suggested increasing the program to two weeks for sufficient time to learn better, practice, and assimilate the delicate and time-intensive techniques introduced during the training. Additionally, there were suggestions to address logistical challenges, such as installing an exit door to minimise distractions during sessions and ensuring facilitators have a stable network for the practical aspects.

Finally, participants highlighted the need for mentorship and collaboration opportunities as an integral part of the program. They expressed interest in continued support from the facilitators and the organisation post-training to foster career growth and application of skills.

Facilitators

The facilitators demonstrated exceptional knowledge, professionalism, and dedication throughout the training.

Partnership and support

The proposal accounted for 10 participants, but the Drosophila Research and Training Centre supported the project with an additional 10 slots for on-site participation. We also received 15 jotters and pens with laboratory coats from **Inqaba Biotech in Ibadan, Nigeria**.

Conclusion

The training was highly successful in bridging a pressing gap in skills and training opportunities for women in biomedical research. A standout highlight was the opportunity to learn from accomplished women in science through insightful webinars. These sessions not only provided expert knowledge but also served as a source of inspiration, reinforcing participants' belief in the potential of women in research. Participants described the networking opportunities as invaluable, promoting community and encouragement among women in research.

Sustainability

A WhatsApp group was created for the participants to provide continuous mentorship and support and share opportunities. One of the on-site participants has also resumed in the lab for an internship, with internship spots reserved for some virtual participants.

The Drosophila Research and Training Centre is also open to collaboration and sponsorship to scale the project's impact and continue the program yearly so that many more women can benefit. The target is for at least 100 women to participate physically by the end of 2025.

Acknowledgement

We acknowledge the support and funding received from the Biochemical Society, and we remain resolute in our commitment to promoting inclusion and diversity in our research and project endeavours.