REPORT - MEDICAL EDUCATION

Postgraduate Training on Research Tools & Techniques, Department of Biochemistry, Ziauddin University

A new approach for training postgraduate students for conducting hands on course work

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Key Words: *Postgraduate Training, Biomedical Research, Medical Education*.

Introduction

Hands-on postgraduate training on techniques are the foundation of professional development in research. The medical professionals generally show resistance towards learning laboratory techniques especially related to molecular biology. A hands-on workshop was designed for post graduate candidates, to overcome their inhibitions and develop proficiency at research based molecular techniques.

Scope

A series of nine days basic/beginners Molecular Biotechnology and HPLC workshop with practical hands-on training was organized on the topics from recombinant DNA technology to PCR and HPLC. The workshop was conducted by the Department of Biochemistry, during February 24th to March 04th, 2014.

This workshop was designed, for postgraduate candidates, provide them with an opportunity to become skilled at research-quality equipment. This could aid them in studying their own samples, overcoming apprehension and inhibition of molecular techniques. A fundamental part of the workshop was utilized for extracting DNA from both blood and oral rinse, running a polymerase chain reaction (PCR), and then visualizing DNA on an agarose electrophoresis gel.

The second session of this workshop was to study biomolecules purification, identification and quantification through HPLC. The practical work was structured around a successive round of interactive explanations and discussion activities.

Experts in this field were employed as resource persons. Experiments were conducted in small groups of six persons under the expert supervision.

A workshop flyer (Annexure 1&2) was designed for a 9 day workshop and mailed to all postgraduate students before conducting workshop.

Program

The candidates selected at least 25 samples of their own MPhil/ Ph.D projects.

Table 1: Hands on analytical techniques

Course Number	Research Techniques	Credit Hours

ZU 9-804	• PCR
	  ○ Gel Electrophoresis
	  ○ RFLP
	  ○ RT PCR
	• HPLC
		4

Eligibility

Eighteen candidates were selected and divided into 3 groups of 6 each having 6 candidates. They were assigned projects based on the above mentioned molecular techniques (Table 1). Candidates for the workshop were selected based on their lack of exposure to the molecular biology practicum and hands on workshops. These candidates were best suited for this

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workshop as having completed sampling, they required the hands on skills and confidence to commence their bench work. The schedule for the workshop is provided in Table 2.

Table 2: Workshop Program and Schedule

Monday February 24th, 2014	
09:00 – 9:30	Introductory Lecture 1 by Dr. Saeeda Baig
09:30 – 10:00	Lab Briefing (DNA Extraction): ➢ Sample collection ➢ Sample handling and storage ➢ DNA extraction different sources
10:00 – 13:00	LAB ✓ DNA extraction from saliva and whole blood using: ➢ Chloroform or Isopropanol
13:00– 14:00	Lunch & Prayer break
14:00 – 17:00	✓ Results analysis/ lab discussion Result Analysis: ➢ Checking quality of DNA ➢ Checking quantity of DNA
Tuesday February 25th, 2014	
9:00-13:00	Introductory Lecture 2 by Dr.Saeeda baig Lab Briefing (RNA Extraction) ✓ Lab: RNA Extraction ➢ Colum based RNA extraction
13:00 – 14:00	Lunch & Prayer break
14:00 – 17:00	Results/Lab Discussion Result Analysis: ➢ Checking quality of RNA ➢ Checking quantity of RNA
Wednesday February 26th, 2014	
9:00 – 10:00	Lab Briefing (PCR/RT-PCR)
10:00 – 13:00	PCR/RT-PCR ➢ Amplification of Beta globin gene ➢ Amplification of Fok-1 gene ➢ cDNA synthesis ➢ RFLP
13:00– 14:00	Lunch & Prayer break
14:00- 17:00	LAB/ Lab Discussion ➢ Gel-Electrophoresis ➢ Analysis on Gel DOC
Thursday February 27th, 2014	
9:00 – 10:00	Introductory Lecture on HPLC by Dr Shamim Mushtaq
10:00 – 13:00	Lab briefing (Quantitative Estimation of Aceclophenic in Plasma by HPLC) ➢ Sample Preparation ➢ Mobile Phase ➢ Validation of Method ➢ System Suitability
13:00– 14:00	Lunch & Prayer Break
14:00- 17:00	Lab Discussion
Friday February 28th, 2014	
9:00 – 17:00	DNA extraction, PCR & gel electrophoresis
Saturday & Sunday March 01st & March 2nd, 2014	
9:00– 17:00	Assignments e.g. data analysis, abstract writing, presentation preparation.
Monday March 03rd, 2014	
9:00– 17:00	Candidates Presentations
Tuesday March 04th, 2014	
Test, Course Evaluation & Certificate Distribution	

Course Evaluation Report: Survey by *Quality Enhancement Cell*, ZU

The survey was conducted among the participants of the course "Research Tools & Techniques.

Candidate's Remarks Regarding Different Attributes

Course Content & Organization: A candidate stated that it was very precise with clear course objectives.

Student Contribution: Most of the candidate stated that they learnt a lot and the session was very informative and helpful in clearing basic concepts.

Learning Environment and Teaching Methods: A candidate suggested that laboratory should be spacious. Another candidate commented that he enjoyed working with classmates and colleagues.

Learning Resources: Everything was up to the mark

Assessment: Test was very well made

Overall Evaluation:

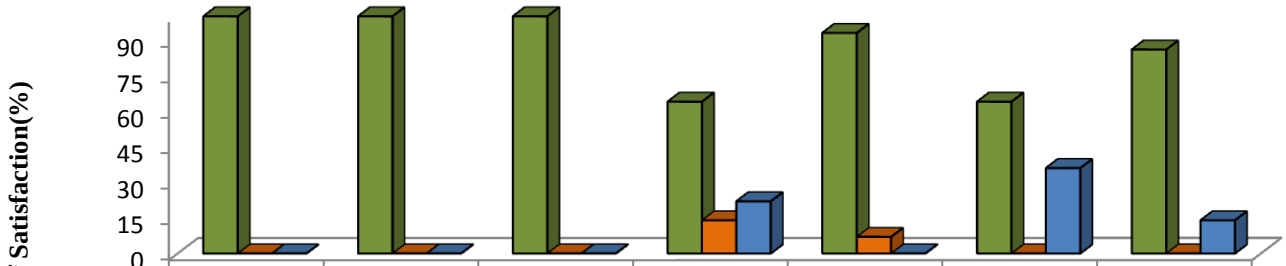
Best Features Observed by Students:

- Schedule
- Teachers, lab facility, hands on experience, facilitations
- Lectures by Dr. Saeeda Baig and Dr. Shamim Mushtaq were very helpful for understanding the tools and innovation in the field of research

Suggestions made by Students:

- Number of lab sessions should be increased and lab space as well.
- Making small groups
- More time allotted for HPLC
- Inviting guest speakers from other institutions

Figure 1: Average percentage of student's satisfaction over different attributes



	Course Content & Organization	Students Contribution and Quality of Delivery	Learning Environment and Teaching Methods	Learning Resources	Assessment	Tutorial	Practical
Satisfied	100	100	100	64	93	64	86
Dissatisfied	0	0	0	14	7	0	0
Uncertain	0	0	0	22	0	36	14

Conclusion

Upon completion of this course, the candidates not only had understanding of techniques that are currently being utilized in the biotechnology and allied areas, but were gained technical skills to commence the bench work of their MPhil/PhD projects independently. More specifically, the candidates acquired skills in basic genetic techniques required for their projects.

Annexure 1

RESEARCH TOOLS & TECHNIQUES

24th February to March 04th 2014

ORGANIZED BY

Department of Biochemistry,
Ziauddin University

VENUE

Post Graduate research Lab,
Ziauddin University

TOPICS TO BE COVERED

- RNA/DNA Extraction,
- PCR
- RT-PCR
- RFLP
- Electrophoresis
- HPLC

DEADLINES TO MEET

Last date for Registration (Limited to 15 seats):	21-02-14

Registration Fee:
Rs. 500/ for MPhil Student
Rs. 1,000/ for PhD students/Faculty

Duly Registration form along with fee will be submitted to Ms. Sana Ahmed in Department of Biochemistry, Ziauddin University

Annexure 2

Application Form

Name: _____

Father's / Husband's Name: _____

Organization: _____

Address: _____

_____

Position: _____

Phone: **Office / Institute:** _____

Residence: _____

Fax: _____

E-mail: _____

Highest Qualification: _____

Research / Training Experience: _____

_____

_____

Particular Interests: _____

_____

_____

ENDORSEMENT BY HEAD OF DEPARTMENT

Signature, Date and Seal: _____

Address: _____

Phone: _____

Fax: _____

Email: _____