# Dr. Muhammad Rashid

# Deputy Chief Scientist

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1. **EDUCATION**

### Ph.D. Biochemistry and Molecular Biology; Huazhong University of Science and Technology (HUST), Wuhan, China

*Huazhong University of Science and Technology is ranked 275 in QS WUR 2024 (<http://english.hust.edu.cn/>)*

**Individual Thesis**:

(2009-2012) PhD Thesis; *Collinearity predictions of the AP2/ERF gene function across wheat (Triticum aestivum* L.*) and rice (Oryza sativa* L.*) genomes* from School of Life Sciences and Technology, Huazhong University of Science and Technology, Wuhan, China.

(1995-1997) M.Sc (Hons) Agriculture Thesis;*Path coefficient analysis of some yield and quality influencing characters in linseed (Linum usitatissimum* L.*)* from Department of Plant Breeding and Genetics, University of Agriculture, Faisalabad, Pakistan.

(1990-1995) B.Sc (Hons) Agriculture with Major subject of Plant Breeding and Genetics from University of Agriculture Faisalabad, Pakistan.

*University of Agriculture, Faisalabad is one of the top universities in Pakistan and is ranked* **#741-750** in QS WUR 2024 *(<https://web.uaf.edu.pk/>)*

**HONOURS AND AWARDS**

* + - Research Productivity Award 2017 in category A+ from Pakistan Council for Science and Technology (PCST), Islamabad.
		- China Scholarship Council Award for pursuing Ph.D. studies from 2009-2012.
1. **PROFESSIONAL CARRIER**

**CARRIER HISTORY**

### Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad (2001- Present)

*NIAB is a top ranked public sector fast-growing research-organization in Agriculture and Biology field and also offered Ph.D. and M.Phil. Degree programme through affiliation with Pakistan Institute of Engineering and Applied Sciences (PIEAS), Islamabad.*

*PIEAS ranked # 390 in QS World University Rankings 2024 (*<http://www.pieas.edu.pk/>*)*

* **Deputy Chief Scientist (1st December, 2021- Present)**

*Planning future R&D activities, Generating research ideas from literature and group discussions, Training team members for lab and field experiments, Organizing material resources, Guiding team members in experiment sampling and data collection, Analyzing results and sharing findings, Facilitating technology transfer and dissemination of achievements, Drafting reports, research papers, and presentations, Managing tasks delegated by higher authorities, Supervising graduate and post-graduate students and research fellows in the group's research endeavors.*

* **Principal Scientist:** 1st December, 2011 to 30th November 2021
* **Senior Scientist:** 1st December, 2003 to 30th November 2011)
* **Junior Scientist:** 31st October, 2001 to 30th November 2003)

**PROFESSIONAL R & D EXPERIENCE**

*More than 23 years of R & D experience in rice crop improvement against natural ambiances through induced mutation, hybridization and other related techniques. Bioinformatics (data mining, comparative mapping, motif analysis, phylogenesis analysis, chromosomal localization, gene function prediction across genomes), molecular biology (gene cloning, vector construction and plant transformation, tissue culture, GUS-staining), molecular approaches using simple sequence repeats (SSR) and amplified fragment length polymorphism (AFLP), conventional breeding including biometrical approaches such as diallel mating design, path coefficient analysis, line x tester mating design and metroglyph analysis, multivariate statistics including principal component analysis, single linkage cluster analysis.*

**AS GROUP LEADER RICE, PLANT BREEDING AND GENETICS DIVISION, NIAB SINCE 2011, PROVIDED FACILITATION TO RICE GROUP TEAM AND ACHIEVED THE FOLLOWING GOALS:**

**Varieties: 07:** **As Principal breed**er (NIAB-Super)

**As Collaborating scientist** (NIAB Basmati-2016, Noor Basmati) NIAB S-39, NIAB-HT-18, NIAB RC-195 and NIAB ST-9

**As Maintainer of old approved variety** (Niab-Irri-9)

**Patent: 01:** First Basmati patent entitled “Development of low phytate basmati rice” vide application No. 667/2013 with accepted date 19-09-2017

**TEACHING ASSIGNMENTS**

**PH.D. and MSc (HONS)/M.Phil RESEARCH SUPERVISIONS**

*Supervised Ph.D. thesis includes;*

* Enriching grain of rice genotypes with zinc through bio-fortification techniques to combat malnutrition.
* Improving resilience to disease and water stress in rice (*Oryza sativa* L.) through induced mutation.
* Development of new plant type in rice (*Oryza sativa* L.) through induced mutation, biochemical and molecular approaches suitable for direct seeded rice.

*Supervised M.Phil thesis includes;*

* Growth and Yield Response of Basmati Rice Genotypes under Varying Irrigation Water Regimes
* *In-silico* characterization and comparative analysis of bacterial leaf blight disease resistance Xa genes in *Oryza sativa* L.
* *In-silico* analysis of R-genes in rice for new insights of partial and complete resistance against bacterial leaf blight disease.

**TEACHING ACTIVITIES AT NIAB-C, PIEAS:** Bio-608 ‘Genetic improvement of autogamous species’

**HEC RECOGNIZE SUPERVISOR:** <http://sc.hec.gov.pk/aphds/submit.asp?supid=6347>

**PROFESSIONAL MEMBERSHIP:** Lifetime Membership of Pakistan Botanical Society since 2003

**HUMAN RESOURCE DEVELOPMENT**

**NIAB IAEA COLLABORATING CENTRE:** Technical Liaison Officer since 29.03.2024for organizing Regional Training Courses (RTCs), workshops and training

### FOREIGNER

* **Mr. Harun Abdul Rahim Malaysian** was trained in the field of induced mutation and screening for rice diseases at NIAB from 02-07 December, 2019 under IAEA project MAL 5031.

### LOCAL

As Project counterpart, Five NIAB scientists got trained under IAEA RAS5073 in the different training course as;

* *IAEA regional training course on ‘Interpreting 15N results under flooded rice conditions from 03-14 December, 2018 at Manila, Philippines.*
* *IAEA regional workshop on ‘Disseminating technologies packages on improved varieties as well as nutrient and water saving technologies’ from 29 April to 03 May 2019 at Kajang, Malaysia.*
* *IAEA regional training course on ‘Enhancing agricultural water management practices’ from 09-13 December, 2019 at Vientiane, Laos.*

**WORKSHOPS AND FIELD DAY ORGANIZED AND COORDINATED: 05**

**INTERNATIONAL**:

* *Sponsored by IAEA-RAS-5094* for IAEA Regional training course on “Experimental design and data analysis for the advancement of mutant populations” from November 20-24, 2023 at Faisalabad. In the training course 14 foreign participants from 09 countries (Colombia, Indonesia, Papua New Guinea, Samoa, Cambodia, Malaysia, Mynmar, Lap, P.D.R, ad Thailand) participated in the event.

**NATIONAL**:

* *Sponsored by NIAB* for training workshop on “Scientific data analysis using R-package” at NIAB, Faisalabad from *26-29 February, 2024.* The four days training workshop has been designed to acquaint the participants with R and RStudio that plays pivotal role in agriculture, offering powerful tools for data analysis, visualization, and modeling, thereby enhancing research efficiency and productivity.
* *Sponsored by IAEA-CRP-23080* for training workshop on “Breeding for bacterial leaf blight disease resistance in rice” on June 09, 2022.

**FARMER FIELD DAY**:

* *Sponsored by PARB ADB-II under ADB-TA-8578* دھان کی بذریعہ ڈرل کاشت اور بیماریوں کا تدارک at district Gujranwala on 4th December, 2018. To provide farmers and other stakeholders with information on mechanized rice sowing techniques and the monitoring of various rice diseases.
* *Sponsored by PARB ADB-I under ADB-TA-8578* دھان کی بذریعہ ڈرل کاشت at district Hafizabad on 5th December, 2018. The farmer day aimed to inform farmers about Direct Seeded Rice (DSR) using mechanized sowing techniques, addressing associated challenges, and discussing future prospects.

**VISITS ABROAD**

**RESEARCH FELLOWSHIP**

* Six month fellowship at Zhejiang Academy of Agricultural Sciences, Hangzhou, **China** from 01-03-2006 to 31-08-2006 under IAEA project RAS/7/014.

Research included;

Marker Assisted selection (AFLP, SSR)

Hybrid rice seed production using CMS system

Induced mutation for creation of genetic variability

Comparison of gamma sources for radio sensitivity studies

**INTERNATIONAL TRAININGS**

* Training course on “Molecular characterization of *Xanthomonas oryzae* pv. *oryzae* *(Xoo)* populations into races through DNA Markers” at IRRI, **The Philippines** from 09-30 August 2017.
* Utilization of marker assisted selection (MAS) technology of molecular characterization of induced L.P. mutants at Hangzhou, **China**, June 2004.

**INTERNATIONAL RESEARCH COLLABORATIVE MEETINGS**

* Research Coordination Meeting of the (IAEA-CRP-23032) entitled “Disease resistance in rice and wheat for better adaptation to climate change” on 10-14 December, 2018 at **Vienna, Austria.**
* Participated in IAEA 3rd Research Coordination Meeting on “Disease resistance in rice and wheat for better adaptation to climate change” from 25-29 July, 2022 at **Kuala Lumpu, Malaysia** under IARA-CRP-23080.
* RAS/5/073 Mid-term review meeting on “Climate proofing rice production system (CRIPS) based on nuclear applications, Phase-II” held at **kota kina balu, Malaysia** from 06-10th February, 2017.
* Attended and presented NIAB in IAEA Mutation Breeding Network Workshop from 22-26 July, 2024 at **Vienna, Austria** under TC Project RAS-5088.

**INTERNATIONAL RICE CONGRESS**

* Participated and presented paper in the 5th International Rice Congress (IRC-2018), **Marian Bay Sands, Singapore** from 14-17 October, 2018.

**NATIONAL TRAININGS/WORKSHOPS/MEETINGS AVAILED** (29)

**RESEARCH PUBLICATIONS**

* + *Peer-reviewed international journal papers* = 39 (*International*: 32 *National:* 06
		- Cumulative Impact Factor >62
		- Cumulative citation: 1299; h-index: 17; i10-index: 19 Dr. Muhammad Rashid - Google Scholar
	+ Conferences/posters/Abstracts: 25

**RESEARCH CONTRIBUTION - INTERNATIONAL AND NATIONAL PROJECTS**

* + IAEA CRP-23080 (2018-2023) as Chief Scientific Investigator worth Euro 47560; *Integrated genomics, pathology and mutation breeding approaches for improving disease resistance in rice.*
	+ IAEA-RAS-5073 (2016-19) as National Project Coordinator worth (in-kind); *Climate proofing rice production system (CRIPS) based on nuclear applications, Phase-II*
	+ Asian Development Bank TA-6663 (2021-2023) as Principal investigator worth US$ 20050; *Development of DSR and drought tolerant Basmati rice lines and their testing for DSR, mechanized transplanting and harvesting for climate adaptive agriculture.*
	+ PARB-ADB-1 under ADB TA-8578 (2015-2018) as Team Leader of breeding component worth PKR 2.4 Million; *Development broad spectrum bacterial leaf blight (BLB) resistant Basmati variety carrying multiple genes pyramids through marker assisted back cross breeding* .
	+ PARB-ADB-II under ADB TA-8578 (2015-2018) as Team Member worth PKR 4.3 Million; *Refining and demonstrating a direct seeded method for better seed usage.*
	+ ALP-PARC (2004-07) as Co-PI worth PKR 1.696; *Development of high yielding, long grain varieties of rice for parboiling purpose*

## NATIONAL AND INTERNATIONAL DELEGATIONS

* + MoUs with international universities of CAAS, China,

**CONTINUING EDUCATION/ SPECIALIZED COURSES/MEETINGS ATTENDED (2004- 2024)**

* BTWC Familiarization and Bio-Safety Course 22-24 January, 2024 at DESTO, Islamabad
* IAEA Regional training course on “Experimental design and data analysis for enhancement of mutant population” from 20-24 November, 2023 at Serena Hotel, Faisalabad.
* Awareness session on “Nomination procedures of international trainings” at NIBGE, Faisalabad on 27.11.2023.
* Technical session for “Management of rice crop insect pest and diseases” on 03.08.2023 held at RRI, Kala Shah Kaku
* Seminar on “Importance of maximum residues levels (MRL) of pesticides in rice in global markets on 22 June, 2021 organized by National rural support programme (NRSP) at RRI, KSK.
* Attended Annual Rice Research Review and Planning Meeting” at Community Centre, NARC, Islamabad on 9-10 July 2020 organized by the National Coordinator Rice, Islamabad.
* Workshop on “GNSS observation for accurate positioning and water vapor estimation’ a COMSATS, Islamabad from 7-9 November, 2019.
* Attended two days’ workshop under TA 8578 PAK: Punjab Basmati Rice Value Chain Projects and PARB project partner’s meeting” organized by PARB and ADB held at PC Hotel and PARB office, Lahore on 27-28 February, 2018.
* Participated and presented paper in the 5th International Rice Congress (IRC-2018), Marian Bay Sands, Singapore from 14-17 October, 2018.
* Crawford fund training course on “Phenotyping of cereals in variably saline landscapes in Pakistan” from 16-20th January, 2017.
* Workshop on “Strengthening Punjab Basmati rice value chain” organized by PARB-ADB on 02-03rd February, 2017.
* Attend workshop on “Expert elicitation on rice and gram varietal adaptation in Pakistan” held on February 10-11, 2015 at NARC, Islamabad, Pakistan.
* Attended 02 days training on Phase-3 Quality policy implementation Program (QPIP) conducted by Directorate of Assurance (DQA), PAEC, HQ at NIBGE on October, 26-27, 2015.
* Basic Management Training Course from 27th January to 14th February, 2014 at PIEAS, Islamabad.
* Training course on ‘Writing of technical proposals for grants” from 02-06 June, 2014 at University of Agriculture, Faisalabad
* Attended IAEA TC Project design workshop from 02-05th December, 2014 at NORI, Islamabad.
* Attended 33rd Post-graduate training course on “Nuclear and other advanced techniques in agricultural and biological research” on 05-16 December, 2005 at NIAB, Faisalabad.
* Attended workshop on “Advanced biometrical techniques for agricultural research in Pakistan” held at University of Agriculture, Faisalabad on 20-25th June, 2005.
* Attended RWC-PRISM National Workshop at NARC, Islamabad from 11-13th October, 2004.
1. **ADMINISTRATIVE SERVICES TO NIAB**
* **Convener of various committees at NIAB: 05** (Inspection committee of technical and non-technical store, tender opening and evaluation committee, medical affairs and social welfare (PAEC Foundation cases) committee, allotment of accommodation in NIAB colony (out of turn basis) and departmental promotion committee (DPC).
* **Team member in NIAB committees: 03** (NIAB exhibition, review of projects, QAT member under ISO 9001:2008)
* **Other committees: 02** (Focal person of PB&GD for unserviceable/condom items deposited to NIAB and officer in-charge cordon party)

**UP-GRADATION OF THE RICE LAB AT NIAB:**

* Through International Atomic Energy Agency (IAEA) RAS 5073and IAEC-CRP-23080 **(€= 41737/-)** and
* Asian Development Bank (ADB) TA-6663 **(US$=7500/-)**

## LANGUAGES

## English (Fluent), Urdu (Native) and Punjabi (Fluent).