

Dr. Abu Nasar Siddique

PhD - Germany, Postdoc - China

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Department of Biotechnology, Bacha Khan University, Charsadda

HONORS and AWARDS

- 1) Best Researcher Award certificate - **Chinese Academy of Sciences (CAS)**
- 2) President's International Fellowship Initiative (PIFI) for Postdoctoral Researchers - **Chinese Academy of Sciences (CAS)**
- 3) Overseas Scholarship for MS/MPhil Leading to PhD in Selected fields PHASE-II - **Higher Education Commission**

ACADEMIC QUALIFICATION

Postdoctoral Research (2017): Kunming Institute of Botany, China

PhD in Biotechnology (2011): Jacobs University Bremen, Germany

MPhil in Biotechnology (2003): IBGE, Agricultural University, Peshawar, Pakistan.

M.Sc. Botany (2000): University of Peshawar, Pakistan.

B.Sc. (1997): University of Peshawar, Pakistan.

F.Sc. (1995): Board of intermediate and Secondary Education Peshawar

SSc. (1995): Board of intermediate and Secondary Education Peshawar

EMPLOYMENT RECORD

Assistant Professor of Biotechnology:

Department of Biotechnology, Bacha Khan University Charsadda, KP, Pakistan. September 2012 till date.

Assistant Professor of Biotechnology:

Department of Biotechnology, Abdul Wali Khan University Mardan, KP, Pakistan. May 2012- September 2012.

Assistant Professor of Biotechnology:

Institute of Biotechnology and Genetic Engineering (IBGE), KP, Agricultural University Peshawar. August - May 2012

Lecturer in Biotechnology:

Centre of Biotechnology, University of Peshawar. Feb, 2004 - 2007.

Lecturer in Botany:

Govt. Degree College Ladha. April, 2003 - Feb, 2004.

Lecturer in Biology:

Oriental Degree College, Peshawar. 2000 - 2003.

EXPERIENCE OF TECHNIQUES

- 1) Phylogenetic Analysis and Maximum Likelihood (PAML), 2) Polymerase chain reaction (PCR), 3) Gene cloning, 4) Protein purification, 5) Directed evolution, 6) Site directed mutagenesis, 7) Protein engineering

INTERVIEW WITH NATIONAL TELEVISION

The Scope of Biotechnology by Prof. Dr. Abu Nasar Siddique

<https://www.youtube.com/watch?v=Q1e-ki5WgaQ&t=2s>

RESEARCH PUBLICATIONS

- 1) **Abu Nasar Siddique**, Yaping Li, Guihua Jin, Yong Shi, Abdullah Jalal, Tariq Mahmood, Yanting Hu, Daping Gui, Zhili Zuo, Chengjun Zhang. A new meta method to guide directed evolution - using Caspase-7 gene as an example. **In progress**
- 2) Muhammad Nauman Khan, Sajjad Ali, Hina Akram, Farmanullah Jan, Inzimum ul Haq, Syed Mukaram Shah, Muhammad Adnan, Sayyed Muhammad Hanif and **Abu Nasar Siddique**. Elemental analysis of five selected grasses of sub family Pooideae from University of Peshawar Campus, KP, Pakistan. *Pure Appl. Biol.*, 8(2): 1296-1306, June, 2019.
- 3) Fawad MAHMOOD, Rahmat ALI, Muhammad S. JAN, Kamran A. CHISHTI, Sajjad AHMAD, Anwar ZEB, Sajjad AHMAD, Muhammad AYAZ, Farhat ULLAH, Muhammad AASIM, Nadir Z. KHAN, Haroon RAHIM, Muafia JABEEN, **Abu N. SIDDIQUE** & Abdul SADIQ. Chemical Characterization and Analgesic Potential of *Notholirion thomsonianum* Extract. *Lat. Am. J. Pharm.* 38 (4): 807-12 (2019). **Impact factor 0.4**
- 4) Yong Shi, Zechun Su, Hong Yang, Wenzhi Wang, Guihua Jin, Guiqing He, **Abu Nasar Siddique**, Liangsheng Zhang, Andan Zhu, Runguang Xue, Chengjun Zhang. Alternative splicing coupled to nonsense-mediated mRNA decay contributes to the high-altitude adaptation of maca (*Lepidium meyenii*). *Gene*. 694 (2019) 7-18. **Impact factor 2.6.**
- 5) Yaping Li, Jiale Peng, Yeheng Zhou, Penghua Li, Yingying Li, Xingyong Liu, **Abu Nasar Siddique**, Li Zhang, Zhili Zuo. Pharmacophore modeling, molecular docking and molecular dynamics simulations toward identifying lead compounds for Chk1. *Computational Biology and Chemistry*. 76:53-60 (2018). **Impact factor 1.3.**
- 6) Shenchong Li, Qinli Shan, Rongpei Yu, **Abu Nasar Siddique**, Xia Li, Chunmei Yang, Jiwei Ruan, Mingyang Li. Comparative transcriptome analysis of two *Gerbera hybrida* cultivars revealed cold tolerance mechanism. *Plant Omics Journal*. 11(01):10-19 (2018). **Impact factor 1.**
- 7) Nayab Haleem, **Abu Nasar Siddique**, Ibrar Alam, Wali Muhammad, Muhammad Haroon, Sifatullah and Fazal Umer. Assessment of liver function in malaria, typhoid and dengue diseases in Peshawar, Pakistan. *Journal of Entomology and Zoology Studies*. 2017; 5(5):983-986.
- 8) Sifatulla, **Abu Nasar Siddique**, Noor Rehman, Wali Muhammad, Muhammad Asad Ullah, Nayab Haleem and Shah Faisal. Study of Anemia and its co-relation with Hematological parameters and aging in Peshawar, Pakistan. *Journal of Entomology and Zoology Studies*. 2017; 5(5): 31-34.
- 9) Muhammad Junaid, **Abu Nasar Siddique**, Muhammad Tariq Masood Khan, Ibrar Alam, Muhammad Waqas, Saba, Safia Hameed and Wali Muhammad. Detection and prevalence of Hepatitis B, C and HIV viral infections among Hemophilia patients in Peshawar, Pakistan. *Journal of Entomology and Zoology Studies*. 2017; 5(2): 180-184.
- 10) Abdul Sadiq, Sadiq Ahmad, Rahmat Ali, Fawad Ahmad, Sajjad Ahmad, Anwar Zeb, Muhammad Ayaz, Farhat Ullah and **Abu Nasar Siddique**. Antibacterial and antifungal potentials of the solvents extracts from *Eryngium caeruleum*, *Notholirion thomsonianum* and *Allium consanguineum*. *BMC Complementary and Alternative Medicine*. 2016. 16:478. **Impact factor 2.2.**
- 11) Fawad Karim, **Abu Nasar**, Ibrar Alam, Iftikhar Alam, Said Hassan, Rahmat Gul, Sana Ullah and Muhammad Rizwan. Incidence of Active HCV infection amongst Blood Donors of

Mardan District, Pakistan. *Asian Pacific Journal of Cancer Prevention*. 2016 Feb. 17 (1); 235-238. **Impact factor 2.5**

- 12) **Abu Nasar Siddique**, Suneetha Nunna, Arumugam Rajavelu, Yingying Zhang, Renata Z. Jurkowska, Richard Reinhardt, Marianne G. Rots, Sergey Ragozin, Tomasz P. Jurkowski and Albert Jeltsch. Targeted methylation and gene silencing of VEGF-A in human cells by using a designed Dnmt3a-Dnmt3L single-chain fusion protein with increased DNA methylation activity. *Journal of Molecular Biology*. 2013 Feb 8;425(3):479-91. **Impact factor 3.95**
- 13) Sajid Ali Khan Bangash, Muhammad Sayyar Khan, Ambreen, Sahir Hameed Khattak and **Abu Nasar Siddique**. Genetic transformation of *Brassica juncea* with antimicrobial Wasabi defensin gene. *Pakistan Journal of Botany*. 2013. 45(3): 993-998. **Impact factor 0.9**
- 14) **Abu Nasar Siddique**, Renata Z. Jurkowska, Tomasz P. Jurkowski and Albert Jeltsch. Auto-methylation of the mouse DNA-(cytosine C5)-methyltransferase Dnmt3a at its active site cysteine residue. *FEBS Journal*. 2011. 278(12): 2055-63. **Impact factor 3.79**
- 15) Renata Z. Jurkowska*, **Abu Nasar Siddique***, Tomasz P. Jurkowski and Albert Jeltsch. Approaches to Enzyme and Substrate Design of the Murine Dnmt3a DNA Methyltransferase. *ChembioChem*. 2011 Jul 4; 12(10): 1589-94. **Impact factor 3.94 * Both authors contributed equally to this work**
- 16) **Abu Nasar Siddique**, Abdur Rashid, Naveed Akhtar and Jehandar Shah. (2005). Taxonomic description of thorny plants of district Hangu, NWFP, Pakistan. *Scientific Khyber*. 18(1): 31-35.
- 17) Abdur Rashid, **Abu Nasar Siddique** and Farooq Jan. (2004). Parasitic range and distribution of Cuscutaceae in Swat, NWFP, Pakistan. *Scientific Khyber*. 17(2): 185-187.
- 18) **Abu Nasar Siddique**., Abdur Rashid, Naveed Akhtar and Jehandar Shah. (2004). Taxonomic description of spiny plants of district Hangu, NWFP, Pakistan. *Scientific Khyber*. 17(1): 45-54.

RESEARCH EXPERIENCE

Postdoctoral Research: Evaluation of different Gene/Gene Families for positive selection

PhD Research: Protein Design of the Mammalian DNA methyltransferase Dnmt3a

MPhil Research: Isolation, characterization and cloning of coat protein gene of potato leaf roll virus (plrv).

MSc Research: Taxonomic study of armed plants of district Hangu.

PhD THESIS ABSTRACT

The catalytic domain of the Dnmt3a DNA-(cytosine C5)-methyltransferase (Dnmt3a-C) is active in isolated form but like full-length Dnmt3a it shows only weak DNA methylation activity. To improve this activity by directed evolution, we set up a selection system in which Dnmt3a-C methylate its own expression plasmid in *E. coli* and protect it from cleavage with methylation specific restriction enzymes. However, despite screening about 400 clones which were selected in 3 rounds from a library of 60000 clones, we were not able to isolate a variant with improved activity, most likely because of a background of uncleaved plasmids and plasmids which have lost the restriction site.

We also showed that the catalytic domain of mouse Dnmt3a DNA methyltransferase is able to transfer the methyl group from S-adenosyl-L-methionine (AdoMet) to a cysteine residue in its catalytic centre. This reaction is reversible and slow. The yield of auto-methylation is increased by addition of Dnmt3L, which functions as a stimulator of Dnmt3a AdoMet complexes. In the presence of CpG containing double stranded DNA, the transfer of the methyl group from AdoMet to the flipped target base was preferred and auto-methylation was not detected. This reaction might constitute a regulatory mechanism which could inactivate unused Dnmt3a in the cell.

POST DOCTORATE EXPERIENCE

I had been awarded a one-year scholarship by Chinese Academy of Sciences (CAS) under PIFI programme in Kunming Institute of Botany (KIB) where I worked on Directed evolution (Prediction and evaluation of Positive selection site) of specific Gene Families in Prof. Dr. Zhang Chengjun's Bioinformatics Lab. Results were achieved by following stable steps:

1. Choosing a Gene Family
2. Collection and Alignment of Sequences (using NCBI-BLAST and MEGA softwares)
3. Calculation of dN/dS and P value (using OBSM and PAML softwares)
4. Protein 3D structure evaluation (using Discovery Studio and GOLD softwares)

MPhil BIOTECHNOLOGY STUDENTS SUPERVISED

Name	Reg. No. in BKUC	Title
Wagma Chatan	2014-BK-2044	Levels of follicle stimulating hormone, lutenizing hormone and prolactin in infertile females
Shehla Khalid	2014-BK-2045	Co-relation between levels of Thyroid Stimulating Hormone (TSH), Thyroxin (T4) and Triiodothyronine (T3) with different disorders

BS BIOTECHNOLOGY STUDENTS SUPERVISED

Name	Reg. No. in BKUC	Title
Fawad Karim	2011-BKA-88	Incidence of active HCV infection amongst blood donors of District Mardan
Taimoor Khan	2011-BKA-104	Antibiotic resistance and susceptibility pattern of Pseudomonas aeruginosa, isolated at KTH, Peshawar, Pakistan
Nayab	2012-BK-666	Assessment of Liver function in Malaria, Typhoid and Dengue diseases
Abdul Khaliq	2012-BK-670	Frequency of Rifampicin primary and acquired resistant Tuberculosis
Sifat Ullah	2012-BK-672	Study of Anemia and its co-infection with Hematological parameters and Aging
Muhammad Waqas	2012-BK-675	Serum Fasting Lipid profile of children with β -Thalassemia major
Muhammad Junaid	2012-BK-676	Detection and prevalence of Hepatitis B, C and HIV viral infections among Hemophilia patients in Peshawar, Pakistan
Iqbal Hussain	2012-BK-677	Antimicrobial susceptibility of Methicillin resistance Staphylococcus aureus from skin infected patients
Ali Rehman	2012-BK-680	
Fazal Umar	2012-BK-682	Isolation of Carbapenemase producing bacteria in KTH, Peshawar, Pakistan
Ibrahim Khan	2012-BK-683	
Muhammad Afaq Johar	2012-BK-689	Antimicrobial susceptibility pattern of antibiotic resistance E. coli from skin and urine infected patients

