



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान बरहमपुर  
Indian Institute of Science Education and Research Berhampur  
Established by the Ministry of Education, Govt of India

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## PREVIEW

### BASIC INFORMATION

Name	KHUSHI VERMA	E-mail	kvkushiverma7@gmail.com
Application Number	BIO871183	Gender	Female
Discipline	Biological Sciences	Date Of Birth	07/10/2002
Father's Name	ANAND VERMA	Place Of Birth	Bokaro Steel City
Correspondent Address	Bari Co-operative Colony, Plot no-225, Bokaro Steel City (Jharkhand) 827010	Nationality	INDIAN
Permanent Address	Bari Co-operative Colony, Plot no-225, Bokaro Steel City (Jharkhand) 827010	Physical Disability	No
Contact MobileNo.	9142221670	Category	General
Birth Certificate	Birth Certificate (uploads_docs/BCBIO871183.pdf)	Alternate No.	9304405069



### QUALIFYING DEGREE

#### BACHELOR OF SCIENCE

Institute/ College/ University :	Bokaro Mahila College, Bokaro / Binod Bihari Mahto Koyalanchal University, Dhanbaad
Subjects :	Zoology (Honours) , Botany (Generic) , English (Language)
University :	Bokaro Mahila College, Bokaro / Binod Bihari Mahto Koyalanchal University, Dhanbaad
Exam Date (Month-Year) :	August 2023
Completion/ Expected Completion Date (Month-Year) :	September 2023
Over All - Marks % or CPI/ GPA :	8.51
Over All- Marks % or CPI/GPA obtained in the main subject :	79.4%
View Uploaded Marksheet :	View Marksheet (uploads_docs/LQDBIO871183.pdf)

Semester	Marks % or CPI/GPA
1	9.8
2	9.1
3	8.15
4	8.31
5	8.17
6	8.51

### NATIONAL EXAM

Name of the exam	Subject	Rank	Application/Roll No./Registration No.	Qualif. Year	View Certificate
JGEEBILS	Biological Science	NaN	GS2024BIOIPH001408	2024	View (uploads_docs/NLQE19872BIO871183.pdf)
JAM	Biotechnology (BT)	897	BT626A062	2023	View (uploads_docs/NLQE27139BIO871183.pdf)

### ACADEMIC RECORD

#### HIGHER SECONDARY

Examination Passed :	Passed
Name of Board/University :	Jharkhand Academic Council / +2 High School Gomia, Gomia
Year of Passing :	2019
Subjects :	Biology, Physics, Chemistry, Economics, English
% of Mark CPI/GPA Obtained :	80.6%
Remarks/ Distinction/ Division :	First Division With Distinction

#### SECONDARY

Examination Passed :	Passed
Name of Board/University :	Jharkhand Academic Council / Project Girl's High School, Tenughat
Year of Passing :	2017
Subjects :	Mathematics, Science, English, Hindi, Social-Science, Sanskrit
% of Mark CPI/GPA Obtained :	85%
Remarks/ Distinction/ Division :	First Division With Distinction

### RELEVANT INFORMATION

Internship Detail :	NO
Scholarship/Award Detail :	• I had been awarded 1st prize of district level Science Seminar & also proceeded to state level.&#x2013; I had awarded 1st prize in "Youth Training Programme" organized by Petroleum Conservation Research Association.&#x2013; I was 3rd ranker ( at district level ) of Jawaharlal nehru National Science Exhibition.&#x2013; I have an experience of N.S.S. Camping program.&#x2013; I have received the call letters from Banaras Hindu University in two different subjects for U. G. in the year of 2020.&#x2013; I qualified JGEEBILS 2024 , for iPhD.&#x2013; I qualified IIT jam 2024 ( marks - 53.3

&#x2013; I have also qualified Gat-b 2024 (marks-133 / AIR-115 general)&#x2013; I have scored CUET - PG 2024 in microbiology ( marks 200 ), biochemistry ( marks 191 )

**Extracurricular/Recreational Activities :** • I have 2 year camping experience (N.S.S.)&#x2013; Participate of District level kabadi winning team.&#x2013; school level khokho player.

### STATEMENT OF PURPOSE (SOP)

#### Statement of Purpose :

TITLE &#x2013;The CRISPR Cas9 ~ A Journey from Bacterial adaptive &#x2013;immune response to a future world with zero hunger. &#x2013;  
 BACKGROUND &#x2013;CRISPR - Clustered Regularly Interspaced Short Palindromic &#x2013;Repeats, 1st discovered in E.Coli by Ishino et al (1987) having a &#x2013;function of natural adaptive immune response of bacteria against &#x2013;invaders. &#x2013;Its 1st experimental expression in plant gene editing came in 2013. &#x2013;CRISPR Cas9 technique is mainly used to modify genes for curing &#x2013;diseases, improving plant productivity, correcting mutations in &#x2013;organism. &#x2013;The FAQ estimates, the global food demand rise 60% more till &#x2013;2050[1] . and under current circumstances of climate change and by &#x2013;sticking with conventional agricultural techniques, it is impossible to &#x2013;fulfill this vast demand. &#x2013;By regulating this technique wisely we can overcome &#x2013;the major issues of global food crisis with higher nutritious quality &#x2013;yield under such adverse climatic changes. &#x2013;We can also reduce the global warming by performing zero use of &#x2013;chemicals in agriculture that also increases the age of Earth as well. &#x2013;EXPERIMENT &#x2013;STEP-1Recognition &#x2013;Cas9 nuclease(makes DSB - Double stranded Break of target &#x2013;DNA). &#x2013;The single guide RNA(sgRNA) - Directs Cas9 &#x2013;recognizes &#x2013;target complementary sequence via PAM(Protospacer Adjacent &#x2013;Motif) sequence 5'-NGG-3' downstream to cut site, &#x2013;sgRNA = crRNA+tracrRNA &#x2013;Step-2Cleavage &#x2013;Cas 9 + srRNA = RNP(Ribonucleo Protein) &#x2013;(Inactive) (Active) &#x2013;Delivery of RNP to cell via Electroporation, lipofection, &#x2013;Microinjection. &#x2013;Formation of RNA-DNA hybrid takes place&#x2013;active RNP makesDSB. &#x2013;Step-3Repair &#x2013;Either by NHEJ(Non-Homologous End Joining ) - Knock out or, &#x2013;By HDR(homology Directed Repair) knock-In&#x2013;ANALYSIS OF RESULT &#x2013;"Blue white screening"/N.G.S.(Next Generation Sequencing) is performed for the analysis of result. &#x2013;REASON FOR CHOICING CRISPR Cas9 TECHNIQUE &#x2013;Higher specific gene editing efficiency than any other &#x2013;conventional technique. &#x2013;Both Economically&#x2013;Ecologically more favourable. &#x2013;Less time consuming&#x2013;more convenient to perform (since Cas9 has its own restriction activity). &#x2013;Lower off - target effect. &#x2013;Achievements &#x2013;"A world with zero hunger" is possible through this diverse &#x2013;technique as we have already proof our success in this technique by &#x2013;making abiotic factors tolerant crops( drought, extreme heat, cold, &#x2013;high CO2 level etc), more nutritious, high yield , disease resistant &#x2013;plants. &#x2013;IF I PERFORM THIS EXPERIMENT FORWARD~I will &#x2013;connect this brilliant technique to modify the allergens in tree &#x2013;nuts(nuts contributes 30% of total protein of our food) from which a major part of population is not concerned due to hyperallergic response towards nuts. If we suppress or remove such allergen from nuts without affecting the gene responsible for its nutrient quality and taste by selective/inactivating transcription of allergen(Ara h1-3..) under CRISPR Cas9 then everyone will be able to consume such a major source of nutrient(nuts). &#x2013;As statistical data confirms~10% of total world population will be &#x2013;malnourished till 2030 [2]. Through my idea we can provide protein to &#x2013;each plate &#x2013;by following this to the field level along with nuts, a no. &#x2013;Of crops can be improved , which will result into a world with zero &#x2013;hunger. &#x2013;REFERENCES &#x2013;[1]-UN Cronicle &#x2013;[2]-Pub Med

### CONTACT DETAILS OF THE REFEREES

Name	Designation	Affiliation/Address	Contact No.	E-mail Address
USHA RANI	Professor	Bokaro Mahila College, Bokaro Science Block Sector-03, Bokaro Steel City Jharkhand (827003)	8210700445	usharanisb02@gmail.com

### WHERE DID YOU FIRST COME TO KNOW ABOUT THE PH.D. ADMISSION JAN.-2020 AT IISER BERHAMPUR

- ☐ IISER Berhampur Website
- ☐ Newspaper advertisement
- ☐ Newspaper News Item
- ☐ Employment News
- ☐ Internet Search
- ☐ Job Website
- ☐ Word of Mouth
- ☐ Other

**Declaration :** Certified, that all information provided by me in this form is correct to the best of my knowledge and belief. I understand that any willful misrepresentation of fact will result in my dismissal from the Institute. If admitted, I shall abide by all the rules and regulations of the Institute.

Place :

Place

Signature of the Applicant

Date : 21-06-2024

Класси версия

CHECK LIST