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Centre for GENETICS & GENOMICS

2020-25

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CENTRE FOR GENETICS AND GENOMICS

Message from the CEO

The Centre for Genetics and Genomics was established with an aim to inculcate the desired traits in the breeding programs and generate new plant varieties with modified traits. The centre focuses on understanding the basics of genotyping and next generation sequencing strategies and perform sequencing experiments and data analysis. It is actively involved in conducting workshops and internship programs to give hands-on-training to students on molecular biology, plant tissue culture and genetic engineering techniques. The laboratories are well equipped with State-of-the-art laboratory instruments required for plant biotechnology, genetic engineering and genomics research. The group is working on several externally funded projects where they are focusing on cutting edge technologies like Gene editing using CRISPR, Gene Sequencing, Speed breeding and Plant tissue culture techniques. I congratulate the whole team for successfully compiling this document. I would like to convey my gratitude to the Genomics team for their dedication and commitment towards the growth and success of the Centre.

Rukmini Mishra

Dr Rukmini Mishra
Centre for Genetics and Genomics

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CENTRE FOR GENETICS AND GENOMICS

1. Introduction

The Centre focuses on improving traits in crops and vegetables and make them climate resilient by using advanced molecular breeding tools. The Centre focuses on improving traits in crops and vegetables and making them climate resilient using advanced molecular breeding tools. It also focuses on giving hands-on training to students on molecular biology, plant tissue culture and genetic engineering techniques. The Centre is working on a SERB, DST, Govt. of India funded project to work on vegetable crops towards disease resistance.

It is also working on a start-up grant project to identify candidate effectors from the Indian brown plant hopper (BPH) Biotype 4 via comparative transcriptomics and proteomics approach funded by SERB, DST, Govt. of India. The group is actively involved in whole genome and metagenome sequencing and data analysis.There are 25 members in the Centre from different branches of science like Botany, Zoology, Biotechnology and Plant breeding.

2. Aim and Objectives

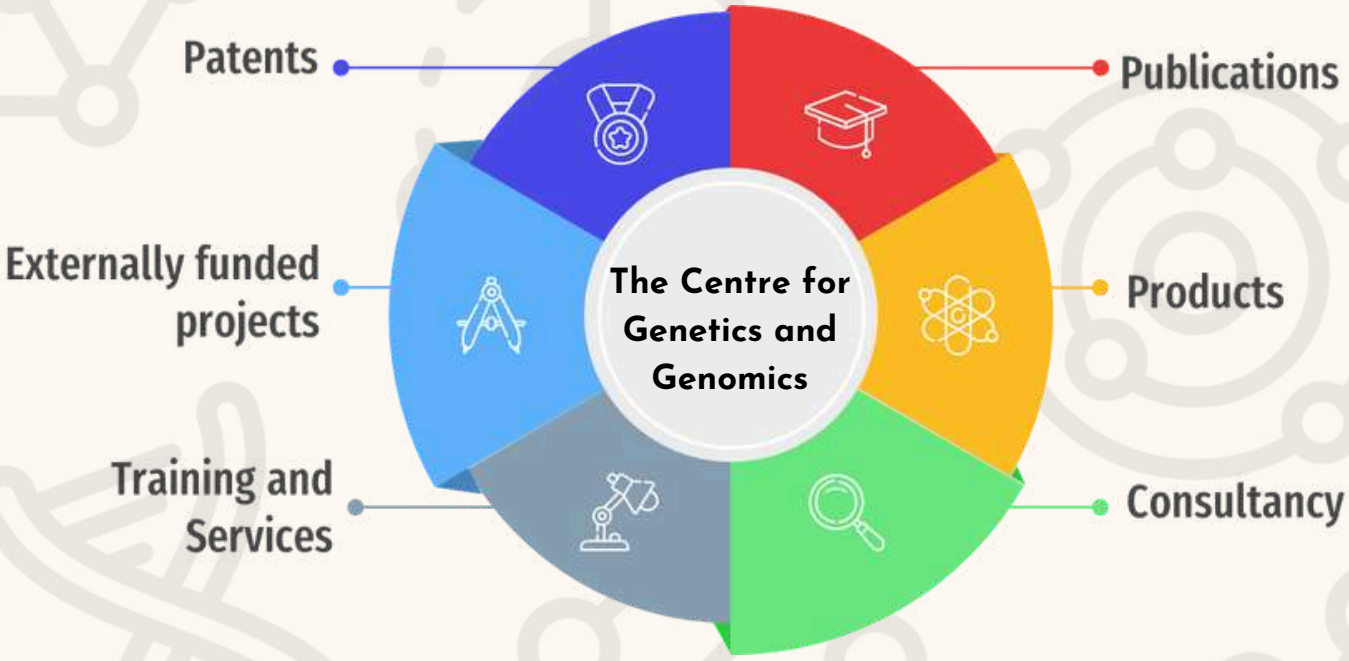
Aim

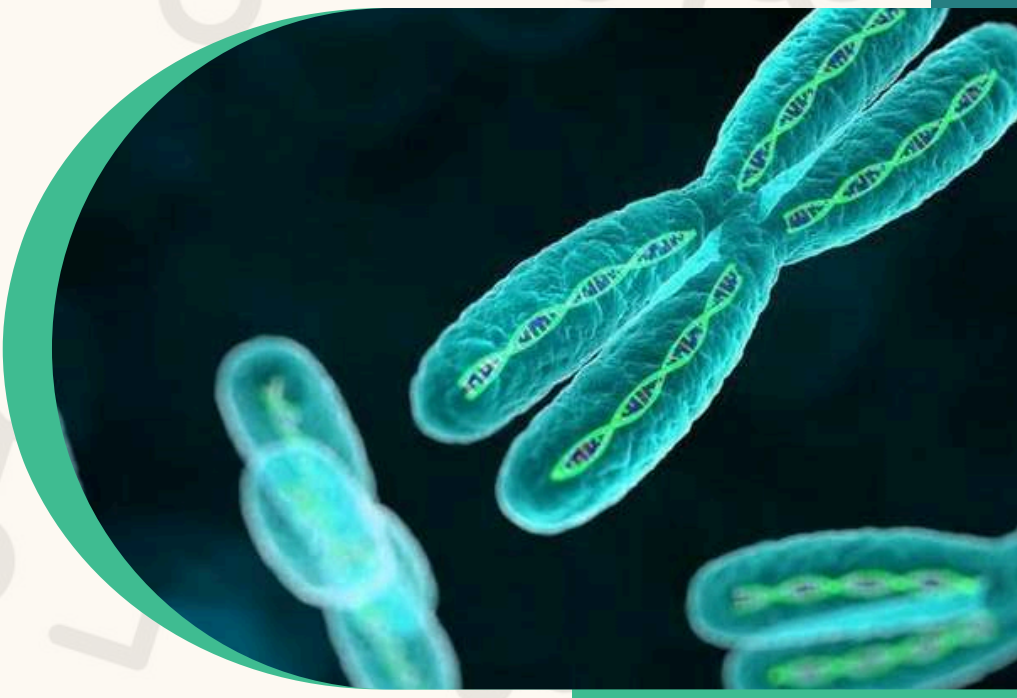
The Centre for Genetics and Genomics aims to investigate gene functions, inculcate the desired traits in the breeding programs, and generate plants with modified traits that confer resistance to biotic and abiotic stresses. It also aims to provide support of genomics related studies and research projects by student through supplying cutting-edge technology and an opportunity for first-hand application in order to dive for the in depth knowledge in molecular biology & genetics.

OBJECTIVES

- To give hands-on-training to students on molecular biology, plant tissue culture and genetic engineering techniques.
- To understand the basics of genotyping and sequencing strategies and perform sequencing experiments and data analysis.

EXPECTED OUTCOMES:





3. TEAM MEMBERS

Dr. Rukmini Mishra
Dr Ranjan Kumar Sahoo
Dr Jayakishan Meher
Dr. Pratibha Rani Deep
Dr. Pradip Kumar Prusty
Dr Niranjan Chaurasia
Dr Naga Kothakota
Dr. Debanjana Saha
Dr. Koustava Kumar Panda
Mr. Srimay Pradhan
Mrs Bhagyeswari Behera
Dr. Gagan Kumar Panigrahi
Dr Satyabrata Nanda
Ms Sunanya Das
Ms Debasmita Das
Ms Sonupriya Sahu
Ms Archita Sahu
Dr Goutam Dash
Dr Shampa Purkaystha
Dr Jatindranath Mohanty
Dr Madhusmita Barik
Animesh Pattanaik
Dr Reena Jhamtani

4. CENTRE ACTIVITIES

1. Genomics lab set up at BBSR Campus

The Genetic Engineering and Genomics Laboratory is a research lab of Dept. of Botany, school of applied sciences which was inaugurated on 4th of February 2021. The goal of this lab is to understand the basics of genotyping and sequencing strategies and perform sequencing experiments and data analysis. give hands-on-training to students on molecular biology, plant tissue culture and genetic engineering techniques. The lab is actively involved in whole genome and metagenome sequencing and data analysis. It also provide hands-on training to students on advanced molecular techniques in form of workshops, training programs and internships.

Genetic Engineering and Genomics laboratory, , BBSR

2. Biotechnology lab Set up at BBSR Campus

The Biotechnology Laboratory of the Department of Biotechnology, Bhubaneswar was set up in 2022 with an aim to provide facilities for inquiry-based laboratory investigations and hands-on activities to help students better appreciate the promise of biotechnology and understand its tools and techniques. The laboratory is commited to giving industry-oriented teaching and in-depth experience to students in various fields such as Plant Biotechnology, animal biotechnology, and Nano-biotechnology so that our students can be competent & confident enough to strive in national and international platforms.

Biotechnology Laboratory, BBSR

3. NABL Accreditation of Labs at PKD campus

The Plant Molecular Biology lab of the Department of Biotechnology, MSSSoA, CUTM Paralakhemundi campus have participated in the NABL accreditation process along with the Phytopharma Lab from the Centre of Phytopharma research Centre. There are three research/technical personnel are involved in the lab. Dr. Satyabrata Nanda, Associate Professor is the Technical Manager, Dr. Panchashree Das, Assistant Professor is the Deputy Technical Manager, and Ms. Swapna Rani Nag is the Technician for the lab. The lab offers a scope of Rice genotyping using specific microsatellite markers. The lab infrastructure has been developed according to the norms of the NABL, which has already been approved by the NABL. Also, NABL has approved the lab SOP and personnel for the scope. The lab is positive towards the accreditation process after which it will start handling commercial samples.





Department of Biotechnology, PKD

5. ON-GOING RESEARCH PROJECTS

1. Development of diagnostic markers for early detection of plant disease.

Single nucleotide polymorphisms (SNPs) are the most common type of genetic variation in the genome, and can be used as molecular markers to identify specific genes or regions associated with desirable traits. With the help of reliable linked sequence-based SNP markers associated with the genetic sequences responsible for resistance against various plant diseases, one can easily screen and establish resistant and susceptible lines with more accuracy while requiring less time, before the disease has a chance to spread. This saves time and resources compared to traditional breeding methods.

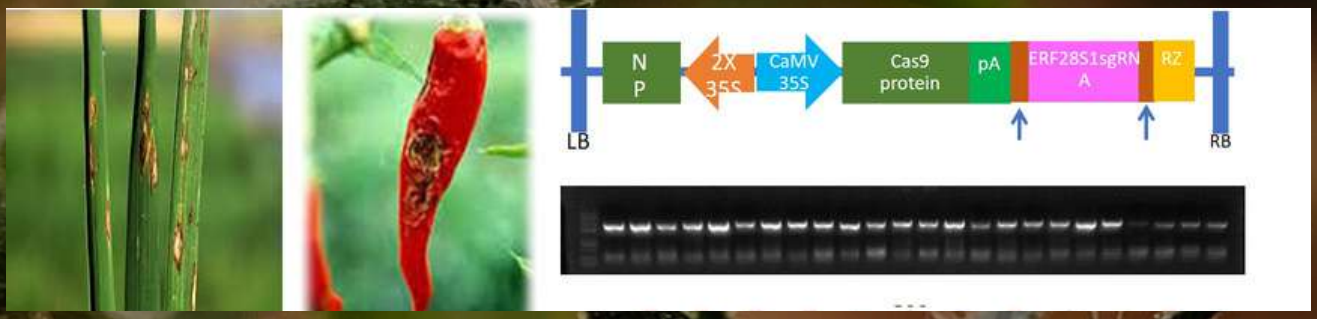
Development of such tightly linked SNP markers allows early detection of response towards such aliments and might open up great prospects for breeders and agriculturists.

2. Plant Tissue Culture: Standardization of transformation protocols

Standardization of plant transforamation protocols of chili and tomato for gene editing is the major focus of the Genetics and Genomics laboratory. The laboratory is also focusing on standardization of micropropagation protocols of orchid, chrysanthemum and other ornamental plants for student domain projects. Besides this, it also aims to aims to promote academics, research and training for skill development.

Standardization of plant transforamtion in chili and tomato

3. CRISPR/Cas9 Genome Editing towards trait improvement in Chili and Tomato



Traditional plant breeding methods have produced several notable crop cultivars, this process is laborious, time-consuming and lead to the integration of undesired traits from donor organism. Limitations from this technique can be overcome through genetic engineering and transgenic breeding. Cultivars produced by these technologies, need to pass through regulatory concerns as there is a chance of random gene insertion, disruption of endogenous gene function and possible gene transfer to other living systems. In the current advancement in precise editing technology, CRISPR/Cas9 system is the most efficient one for getting a desirable transgene-free plant. This editing approach has succeeded in both down-regulation and up-regulation of genes. we aim to establish a stable CRISPR/Cas9-mediated genome editing platform to engineer the crop genome for trait enhancement. Also, the developed cultivars can further be used in breeding programmes and variety releases.

4. Gene Sequencing & Data Analysis

Next-generation sequencing (NGS), also known as high-throughput sequencing, represents a groundbreaking advancement in DNA sequencing technology. Nanopore sequencing is a DNA sequencing technology developed by Oxford Nanopore Technologies. It is a portable and real-time sequencing platform that uses a protein nanopore embedded in a synthetic membrane to directly analyze DNA molecules. Using the long read sequencing platform, WE PERFORM THE BASIC WORK OF Data Analysis through MinION and Commander Software. In our analysis, we utilized data obtained from the NCBI Sequence Read Archive (SRA) database. Specifically, we retrieved whole genome sequencing (WGS) data and mRNA sequencing data from this database. These datasets provided us with a comprehensive view of the genetic information present in the 13 multidrug-resistant (MDR) bacteria that were the focus of our study.

The Commander software empowers us with an expansive platform for data analysis in the realm of Next Generation Sequencing (NGS). Furthermore, mRNA sequencing data proved instrumental in analyzing the gene expression patterns within these MDR bacteria. By capturing and sequencing the messenger RNA molecules, we gained insights into which genes were actively being transcribed and expressed in response to various conditions. It allowed us to identify specific genes and pathways that might be responsible for their resistance and potentially develop strategies to overcome or mitigate it.

5. Identification and characterization of candidate effectors from Indian brown planthopper.

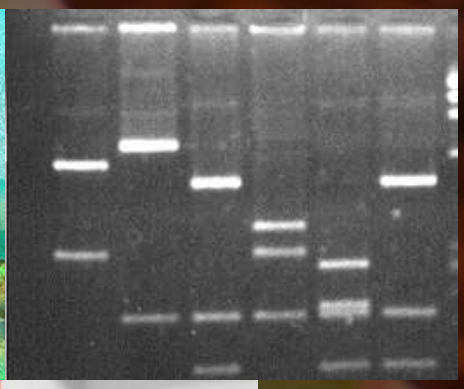
Brown planthopper (Nilaparvata lugens Stal, commonly known as BPH) is a monophagous hemipteran rice pest causing enormous crop losses. Infestation of BPH causes severe damage to rice plants by both feeding on the phloem sap and by transmitting two rice viruses, including the rice grassy and the ragged stunt viruses. Out of the four reported BPH biotypes (Biotype 1, 2, 3, and 4), Biotype 4 is exclusive to the Indian subcontinent and the most destructive of all. In India, BPH (Biotype 4) is the number one rice pest and its infestation is the most serious problem, affecting more than 50,000 ha of rice lands. To counter the BPH infestations, 39 BPH-resistance (Bph/bph) genes have been identified in rice and selected varieties carrying Bph genes have been released (Nanda et al. 2020). However, the rapid evolution of the BPH biotypes and effective host adaptations outrun the rice defences making them susceptible to BPH infestations.

The project is envisaged to identify and characterize the candidate effector(s) in the Indian BPH biotype by employing the comparative transcriptomic and proteomic approaches. The outcomes of this study will provide new insights into rice-BPH interactions and facilitate the rice molecular breeding programs for improving BPH-tolerance and development of appropriate insecticides.

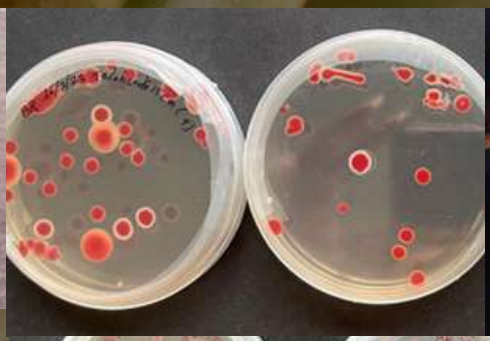
Characterization of candidate effectors from Indian brown planthopper

6. DOMAIN PROJECTS





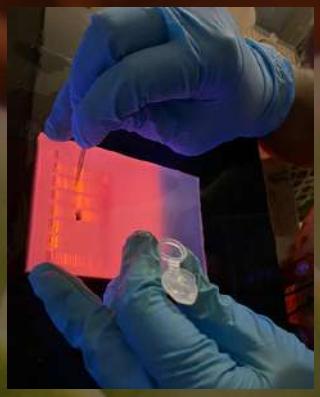
Phenotypic characterization of *Solanum lycopersicum* against Bacterial Wilt & Marker assisted validation.

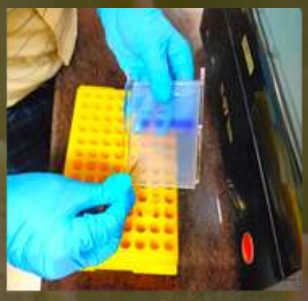




Identification of phylotypes of *Ralstonia Solanacearum* prevalent in Odisha.

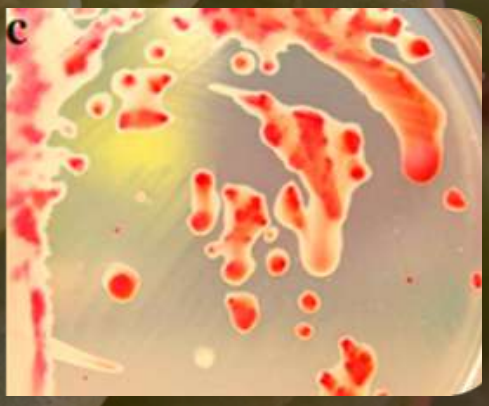
Physiological , biochemical changes and molecular study in rice varieties (*Oryza sativa*) under drought conditions at vegetative stage

Molecular cloning and characterization of NBS-LRR gene towards bacterial wilt resistance in tomato.


Molecular cloning and characterization of NBS-LRR gene towards bacterial wilt resistance in brinjal.

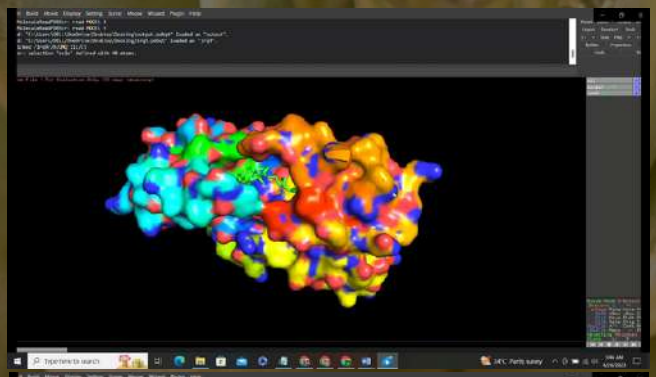
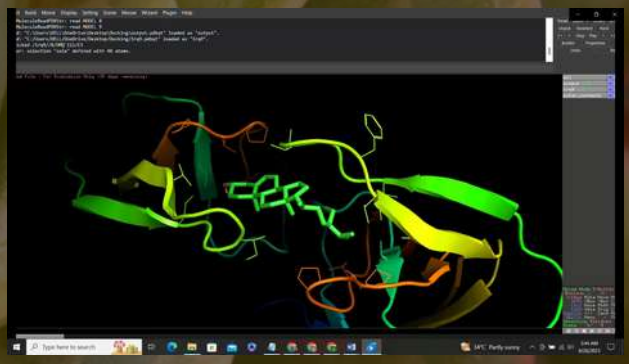
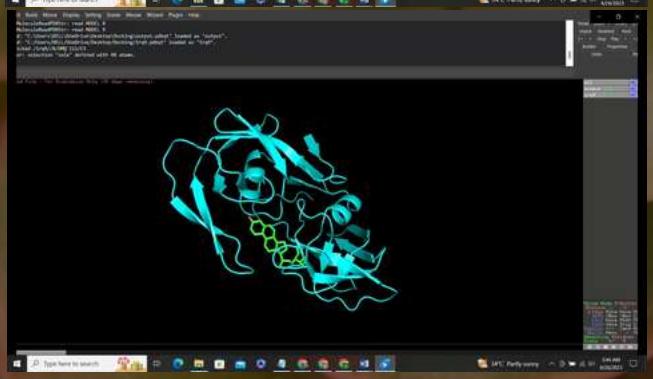
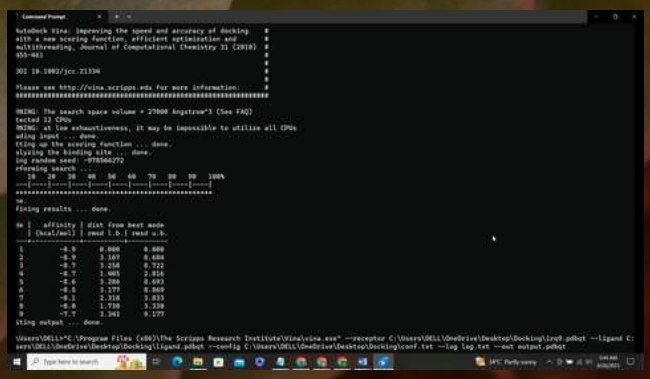



Phenotypic Characterization of *Solanum melongena* L. against Bacterial Wilt and Marker Assisted Validation





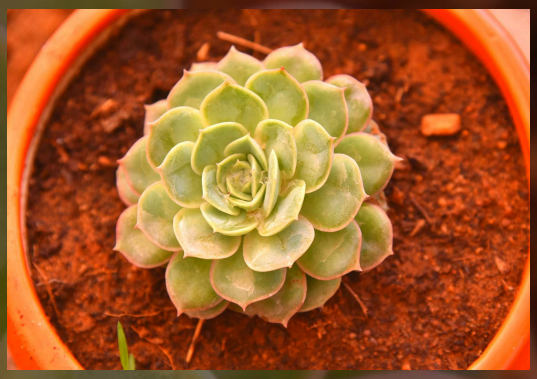
Molecular cloning and characterization of NBS-LRR gene towards bacterial wilt resistance in Chili.

Genome-wide identification and characterization of Dof transcription factors in tomato for both development & stress.

7. STUDENT INTERNSHIPS

1.Cactus & Succulent propagation and cultivation


Cacti and succulents are two of the unique plants you can grow inside. They are renowned for their tolerance and toughness. In addition to their stunning appearance, cactus plants have several advantages. One of the benefits of having cacti in-house is that they can improve the air's oxygen content and remove some VOCs from it. The cactus and succulent grafting practice has started as a 4-month certificate training programme for undergraduates and Postgraduates students where they will involve in different research activities for their dissertation work. The students are now involved in the development of an online portal for the euphorbia plant outlet where cacti as well as other ornamental plants will be ready to be sold for plant lovers. The sessions aim to train students in different methods of grafting techniques as well as their growth and maintenance.

2. Mushroom Cultivation

Mushroom Farming is the business of growing fungi for commercial use. The benefits of mushrooms vary from high nutritional food to its medicinal effects on tumor, hepatitis B, diabetes and various other diseases. Paddy mushroom, also known as straw mushroom cultivation, is a popular, sustainable and profitable practice that has gained popularity among farmers and hobbyists alike. With the right techniques and knowledge, one can grow high-quality mushrooms in own backyard or farm. The mushroom cultivation practice has started as 4-month certificate training programme for undergraduates and Post graduates' students where they will involve in different research activities for their dissertation work.

8. Certificate/Diploma courses/ Question banks developed

The centre has developed a certificate course, a domain course, a diploma course and three question banks.

Certificate course:

- Introduction to Computational Biology

Domain course:

- Genetics and Genomics

Diploma course:

- Seed Production using manual and molecular breeding methods

Question banks:

- Plant tissue culture technician
- Seed Analyst
- Seed Production

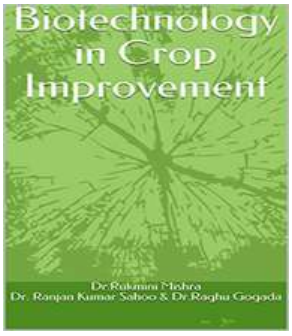
9. SANCTIONED PROJECTS & PATENTS

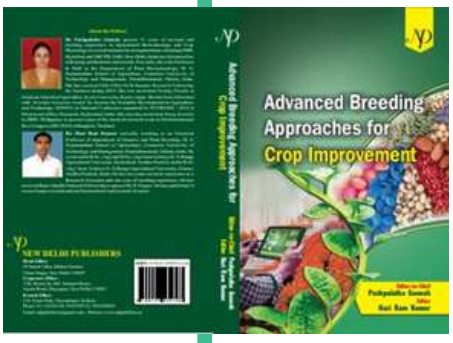
Sl.no	Title of the Project	Funding agency	Amount	Duration
1	Engineering anthracnose resistance in chili pepper (Capsicum annuum L) using a single transcript CRISPR/Cas9 genome editing system (SERB-POWER grant) PI: Dr. Rukmini Mishra	SERB, Govt. of India	Rs. 30 Lakhs	September 2021 (Three Years)
2.	Chemo typing and genotyping of Embelia ribes Brum F. for authentic identification, selection of conservation of elites. PI: Dr. Rukmini Mishra	DBT-NMPB, Govt. of India	26.66 Lakhs	Under Consideration (Three Years)
3	Dissecting the molecular NMD events occurring in Arabidopsis thaliana post pathogen infection	Centurion University of Technology and Management, Odisha	1.5 lakhs	August, 2021- July, 2023
4	Identification and characterization of candidate effectors from Indian brown planthopper (Nilaparvata lugens Stal) biotype	SERB	26,545,20/-	2 years (2021-2023)
05	Forensic Molecular Markers for Selected Indian Wild Animal Species Protecting them from Illegal Trading and Breeding Development In to Natural Habitat	SERB-SURE-2022	30 Lacs	Submitted

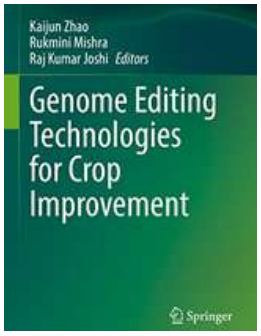
Patent no	Title of the patent	Year of award
2021104155	Methods for Molecular Mapping and Developing Diagnostic Markers for Detecting Anthracnose Resistance in Chili Pepper. Mishra Rukmini, Joshi Raj Kumar, Rout Elojita, Mohanty Jatindranath	2021
2021105189	A Method for Creating Novel Anthracnose Resistant Pepper Plants Using Genome Modification Technique. Joshi Raj Kumar, Mishra Rukmini, Mohanty Jatindranath, Mahanty Bijaylaxmi.	2021
202331010527	A liquid bio fertilizer with antibacterial properties for enhancing soil fertility and method	2023
2021/10562	A system for enhancing plant immunity and plant growth by using fabricated $ZnO–ZnFe_2O_4$ nanoparticles	2022
202022107272	A system for analyzing infection with Pseudomonas syringae by targeting cochaperones containing a J-domain	2023
202241065523 A	Nano-Drug Delivery System of Anti-Cancer drug and Method thereof	2022

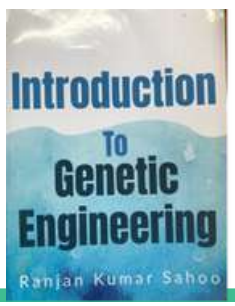
10. BOOKS PUBLISHED:

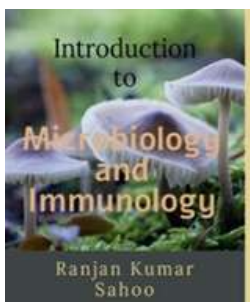
Sl. No	Title of the Book	Publishers	Year of Publication
ISBN 978-981-19-0599-5	Genome Editing Technologies for Crop Improvement	Springer Nature Singapore Pvt Ltd.	2022
ASIN: B08M46ZVVS	Biotechnology in Crop Improvement	Amazon Publishers.	2020
ISBN-978-1-68487-334-0	Introduction to Genetic Engineering	Notion Press	
ISBN-979-8-88641-431-8	Introduction to Microbiology and Immunology	Notion Press	
ISSN:2662-4052	Phytomolecules: A prospective approach to combat SARS CoV-2	LAP Lambert Academic Publishing	2021
	Biotechnology in crop improvement	Amazon Publishers	2021
	Advanced Breeding Approaches for crop improvement	New Delhi Publishers	2021
978-981-16-9221-5	Computational Intelligence in Oncology	Springer	2022
ISBN: 978-81-950351-6-8	Approaches for Crop Improvement	NEW DELHI PUBLISHERS NEW DELHI, INDIA	2021











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- T Mallick, R Mishra, S Mohanty, RK Joshi (2022) Genome Wide Analysis of the Potato Soft Rot Pathogen Pectobacterium carotovorum Strain ICMP 5702 to Predict Novel Insights into Its Genetic Features. The Plant Pathology Journal 38 (2), 102-114. (IF: 1.73).
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- Rukmini Mishra, Wei Zheng, Raj Kumar Joshi, Zhao Kaijun (2021) Genome Editing Strategies Towards Enhancement of Rice Disease Resistance, Rice Science, 28 (2), 133-145. (IF: 3.31).
- Satyabrata Nanda, Rukmini Mishra, Raj Kumar Joshi (2021) Molecular basis of insect resistance in plants: Current updates and future prospects. Research Journal of Biotechnology 16(3):194-205. (IF: 0.3).
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- Sahoo RK, Tuteja R, Gill R, Jiménez Bremont JF, Gill SS, Tuteja N (2022) Marker-Free Rice (Oryza sativa L. cv. IR 64) Overexpressing PDH45 Gene Confers Salinity Tolerance by Maintaining Photosynthesis and Antioxidant Machinery. Antioxidants 11, 770. https://doi.org/10.3390/ antiox11040770. Impact factor: 7.6
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- Prusty S, Sahoo RK (2022) PEPCK Gene for Enhanced Photosynthesis and Salinity Stress Tolerance in Rice: A Review. Agricultural Reviews. 1-9(0) Issue no-R-2494.

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- A Sahoo, J Sethi, KB Satapathy, SK Sahoo, GK Panigrahi* (2022) Nanotechnology for precision and sustainable agriculture: recent advances, challenges and future implications. Nanotechnology for Environmental Engineering (IF: 3.7). https://doi.org/10.1007/s41204-022-00277-7
- SK Sahoo, GK Panigrahi*, A Sahoo, AK Pradhan, A Dalbehera (2021) Biohydrothermal synthesis of ZnO-ZnFe2O4 nanoparticles using Psidium guajava leaf extract: Role in waste water remediation and plant immunity. Journal of Cleaner Production 318, 128522. (IF: 11.07). https://doi.org/10.1016/j.jclepro.2021.128522
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12. AWARDS/RECOGNITIONS

- Dr Rukmini Mishra is a recipient of Eminent achiever award Provost conclave, Centurion University of Technology and Management.
- Dr Rukmini Mishra is a recipient of Certificate of Excellence for publications and patents, Centurion University of Technology and Management, 2022.
- Dr Gagan Kumar Panigrahi is a recipient of Eminent achiever award, Provost conclave, Centurion University of Technology and Management, 2022.
- Dr Gagan Kumar Panigrahi is a recipient of Certificate of Excellence for publications and patents, Centurion University of Technology and Management, 2022.
- Dr Gagan Kumar Panigrahi is a recipient of Best Researcher Award, DK International Research Foundation, 2021.
- Young Scientist Award to Dr. Satyabrata Nanda at the International Conference on Advances in Agricultural, Veterinary, and Allied Sciences for Improving Livelihood and Environmental Security (AAVASILES) 2022 organized by ICAR-IGFRI, ICAR-NAHEP, NADCL, and Birsa Agricultural University, India.
- Best Paper Presentation award to Dr. Satyabrata Nanda at the International Conference on Advances in Agricultural, Veterinary, and Allied Sciences for Improving Livelihood and Environmental Security (AAVASILES) 2022.
- Eminent Achiever's Award Dr. Satyabrata Nanda at the Provost's Research Conclave 2022 held at Centurion University of Technology and Management, Odisha.
- Certificate of Excellence Award Dr. Satyabrata Nanda for research by Centurion University of Technology and Management in 2022.
- Best Ph.D. thesis award, From Bihar Agricultural University, Sabour, Bhagalpur, 2022.
- ·Dr Naga Jogayya.K , Awarded 3rd Prize in best Oral presentation at the International Conference on Bioresources of Environment and Conservation (ICBEUC-2022), School of Applied Sciences, Centurion University, Bhubaneswar.

AWARDS/RECOGNITIONS

- Dr Rukmini Mishra is a Review editor in Frontiers in Plant Science journal (Specialty section: Plant genomics)
- **Invited as a keynote speaker** for the International Conference on Agriculture for Sustainable Future "Agri Vision-2022", March 06-08, 2022 at Ravenshaw University, Cuttack, Odisha.
- **Review editor** in Frontiers in Plant Science journal (Specialty section: Plant genomics)
- **Review editor** in Frontier in Genetics journal (Specialty section: Plant genomics) 2021.
- **Invited speaker** under the Young Investigator Lecture Forum of LifeTech-2020 for National Conference on "Advance in Life Science and Biotechnology (LifeTech-2020)" by the Dept. of Biotechnology and the Dept. of Life Science under the onus of Rama Devi Women's University were during 27th-28th February, 2020.
- Dr Gagan Kumar Panigrahi has received faculty incentive (Performer category) from Centurion University of Technology and Management, 2025.
- Dr Gagan Kumar Panigrahi has reviewed research articles in Elsevier SCI Journals (Journal of Herbal Medicine; Environmental and Experimental Botany), 2021-2025.
- Dr Gagan Kumar Panigrahi has received DBT-Skill Vigyan Recognition from DBT-Institute of Life Sciences, Bhubaneswar, 2021.
- Dr. Bhagyeswari Behera is a Review editor in Plant Science Today journal (Scopus) (Specialty section: Phytochemistry)
- Dr. Satyabrata Nanda is a Review editor in Frontiers in Plant Science journal (Specialty section: Plant Biotechnology, Plant Abiotic Stress)
- Dr. Goutam Kumar Dash is a Review editor in Frontiers in Plant Science journal (Specialty section: Plant Biotechnology)
- Dr Naga Jogayya.K got CUTM-2022 Year Incentive Award

RECOGNITIONS RECOGNITIONS

13. AWARDS/RECOGNITIONS

Eminent Achiever Award 2022

Eminent Achiever Award 2022

Recognition for research 2022

Eminent Achiever award 2022

Recognition for research 2024

CENOMICS

TRAININGS & SERVICES

" INSPIRING YOUNG MINDS FOR A BETTER FUTURE .....

CenOmics is an initiative of the Genetics & Genomics centre, Centurion University of Technology & Management, Bhubaneswar to reduce the gap between knowing & doing by making genomics & metagenomics solutions & expertise more accessible for students, individuals, researchers or anyone who aims to seek knowledge.

CenOmics provides hands-on trainings, internships, genomics & metagenomics services to students, individuals & institutions on molecular biology, plant tissue culture & genetic engineering techniques.

OUR SERVICES:

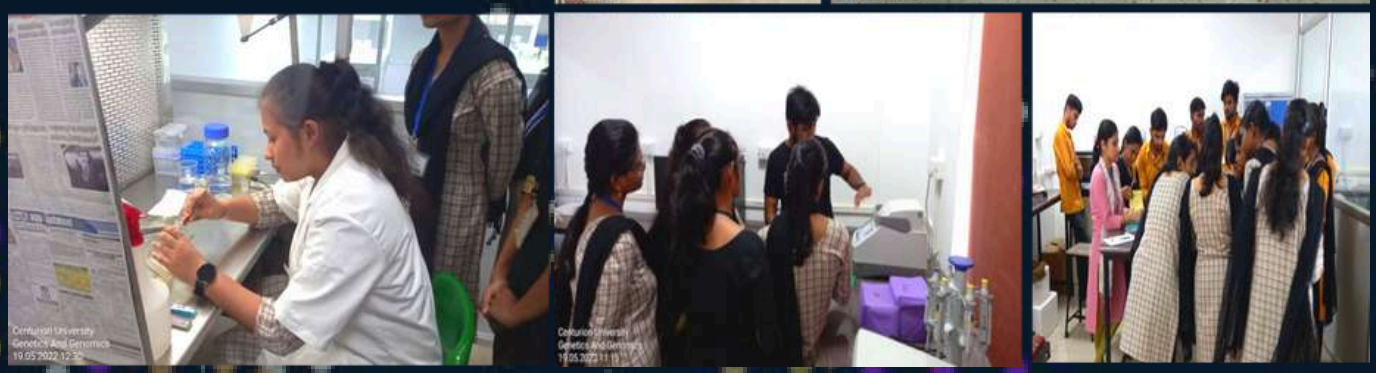
- Genetics & Genomics Solutions
- Dissertations & Projects
- Trainings & Workshops
- Industry Exposure & Exhibition

TRAINING AND WORKSHOPS CONDUCTED

14. Workshops & Trainings

6 days hands-on training on techniques and tools of molecular biology

Summer Internship 2022



Workshops & Trainings

3 Days workshop and training on plant tissue culture.

One day workshop and hands-on training on pcr & its applications.

Workshops & Trainings

Two day workshop on basics of bioinformatics.

Workshop on Basics of Molecular Biology.

Workshops & Trainings

Workshop on DNA Fingerprinting

Workshop on SDS-PAGE electrophoresis

Workshops & Trainings

One day workshop on Gene sequencing, (FCRI), Hyderabad, Telangana

Revenue generated

Name of the workshops/Trainings	Number of participants	Revenue generated
6 DAYS HANDS-ON TRAINING ON TECHNIQUES AND TOOLS OF MOLECULAR BIOLOGY	07	42,000
Summer Internship - 2022	28	84,000
3 DAYS WORKSHOP AND TRAINING ON PLANT TISSUE CULTURE	15	37,500
ONE DAY WORKSHOP AND Hands-on TRAINING ON PCR & ITS APPLICATIONS	10	10000
TWO DAY WORKSHOP ON BASICS OF BIOINFORMATICS	04	2400
Protein Purification and SDG-PAGE	20	20000
DNA FINGERPRINTING	35	22750
ONE DAY WORKSHOP RS-GIS and its Applications using QGIS	23	6900
Basic Molecular Biology Techniques	20	20000
7-Days Hands on training on Agricultural Data Analysis using statistical Tools(ADAST-2023) (Virtual Mode)	139	113700
Internship (2023)	10	30000
Two days' workshop on Forensic Photography	96	nil
	Total revenue generated-	389250 + Accommodations extra.

15. COLLABORATIONS & MoUS

- Clue4 Evidence Forensic Lab, Bangalore, India
- Sherlock Institute of Forensic Science, India Pvt. Ltd., New Delhi, India.
- CI, Legal Desire Media & amp; Insights, India.
- Hawk Eye Forensic, Noida, UP, India.
- Bio Forensics Research Centre, Italy
- Spylens Forensic Investigation, Navi Mumbai, Maharashtra, India.
- ICS ASSURE SERVICES PVT. LTD. (FORENSIC UNIT), Mumbai, MS, India
- Mahen Technologies Pvt. Ltd, Borivali West, Mumbai, MS, India
- International Forensic Sciences (IFS), Pune, Maharashtra, India.
- Forest College and Research Institute (FCRI), Hyderabad, Telangana

<u>International</u>

University of Kentucky, USA

South China Agricultural University, Guangzhou, China.

Guangdong Academy of Agricultural Sciences, Guangzhou, China.

<u>National</u>

DBT-National Agri-Biotechnology Institute (NABI), Mohali, India.

ICAR-Directorate of Onion and Garlic Research (DOGR), Pune, India.

COLLABORATIONS & MoUS

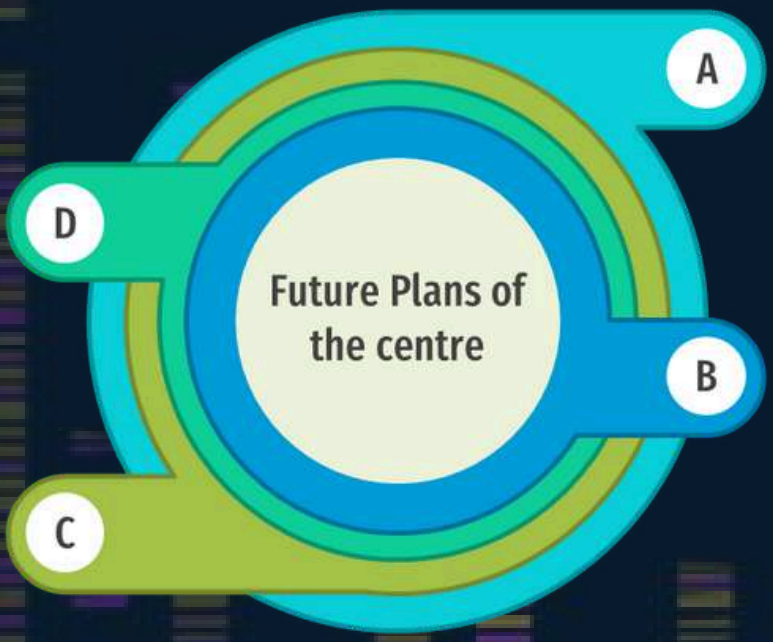
Signing of MoU with Forest College and Research Institute (FCRI), Hyderabad, Telangana

Signing of MoU with National Rice Research Institute Cuttack, Odisha

Signing of MoU with Genotypic Technology Pvt. Ltd., Bangalore, India

16. Webinars and conferences

Future Plans of the centre



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA

CAMPUSES:

Paralakhemundi Campus
Village Alluri Nagar
P.O. – R Sitapur, Via- Uppalada
Paralakhemundi, Dist.- Gajapati
Odisha, India. PIN– 761211

Bhubaneswar Campus
Ramchandrapur
P.O. – Jatni, Bhubaneswar
Dist.- Khurda, Odisha,
India, PIN– 752050

Balangir Campus
Behind BSNL Office
IDCO land, Rajib Nagar
Dist.- Balangir, Odisha
India, PIN-767001

Rayagada Campus
IDCO Industrial Area
Pitamahal, Rayagada
Dist.-Rayagada, Odisha
India, PIN-765001

Balasore Campus
Gopalpur,
P.O.-Balasore
Dist.-Balasore, Odisha
India, PIN-756044

Chatrapur Campus
Ramchandrapur,
Kaliabali Chhak,
P.O-Chatrapur, Dist.-Ganjam
Odisha, India, PIN-761020