



Metabolic engineering of high-value nutraceuticals and bioactive compound

FACULTY DEVELOPMENT PROGRAMME, BOLANGIR, CUTM

Resource Person

Dr. Sangram

Lenka

TERI-Deakin Nanobiotechnology Centre, The Energy and Resources Institute,
Haryana

No. of Participants: 175

Date: 13th June 2020

About the session:

The session focuses on different works in the field of metabolic engineering in plant cells. Metabolic engineering combines systematic analysis of metabolic and other pathways with molecular biological techniques to improve cellular properties by designing and implementing rational genetic modifications. Metabolic engineering allows for the rewiring of basic metabolism to overproduce both native and non-native metabolites. Among these biomolecules, nutraceuticals have received considerable interest due to their health-promoting or disease-preventing properties.

Objective:

- To discuss Next-generation metabolic engineering approaches toward the development of plant cell suspension cultures.
- Plant cell suspension culture technology
- Genome editing
- Chloroplast transformation technology

Outcome: The session discusses metabolic engineering; Classical Strain Improvement, Rational metabolic engineering, and Bioprocessing applications. A large array of nutraceutical products is being explored through the use of metabolic engineering. This approach bypasses the traditional challenges of direct extraction from animals and plants and provides an environmentally-friendly and sustainable platform for industrial production. As demand for these products continuously increases along with population growth, the use of metabolic engineering becomes more important.

Today's talk will focus on....

Hundreds fold enhancement of Viniferin, Resveratrol and Flavonoid in Grape cell culture

Paclitaxel metabolic engineering in *Taxus* suspension cell culture

CRISPR Canola ASTA Tobacco LAZ Tomato Vanillin Rice Cells

THE ENERGY AND RESOURCES INSTITUTE
 ENERGY AGRICULTURE ENVIRONMENT HABITAT RESOURCE SECURITY CLIMATE HEALTH & NUTRITION

**From 1800 to the present:
 Quest for active compounds**

1820s - Salicin was isolated from willow bark eventually to become "aspirin"

1820 - Quinine purified from Cinchona tree (*Cinchona* spp)

1805 - Morphine purified from opium poppy (*Papaver somniferum*)

1966 - Taxol purified from Pacific yew (*Taxus brevifolia*)

Taxus brevifolia
 Pacific yew

Screenshot of the online FDP



WEBINAR ON

Metabolic engineering of Nutraceuticals and Bioactive compounds

Resource Person

Dr. Sangram Lenka
TERI-Deakin Nanobiotechnology Centre
The Energy and Resources Institute,
Haryana

Organized by :

**Centurion University of Technology and
Management**

Date: 13-06-2020

PARTICIPANT LIST :

1	Dr.Aswini Kumar Rath	Prof. Dept. of Botany
2	Mrs.Namita Panda	Asst.Prof
3	Dr.Jyotiprakash Rath	Asst.Prof
4	Dr.Shanatanu Bhattacharya	Asst.Prof & HOD, Dept. of Botany
5	Dr.Pratibha Rani Deep	Asst.Prof
6	Mr.Debashish Trpathy	Asst.Prof & HOD, Dept. of Zoology
7	Mr.Pankaj Meher	Asst.Prof
8	Mr.Sujit Kumar Mishra	Asst.Prof
9	Mr.Chinmayee Tripathy	Asst.Prof
10	Swapna nanda Rath	Professor
11	G. N. Inndresha	Professor
12	Firoz Ahmed	Professor
13	Dr.Aditya Kumar Purohit	Asst.Prof
14	Dr.Srikanta Moharana	Asst.Prof
15	Dr.Ashish Kumar Sarangi	Asst.Prof
16	Mr.Rajguru Rajesh Raman Mishra	Asst.Prof
17	Dr.Bhairaba Kumar Majhi	Asst.Prof & HOD, Dept. Of Mathematics
18	Mr.Satyabrata Sadangi	Asst.Prof
19	Dr.Jayakishan Meher	Prof. & HOD, Dept. Of IT & BCA
20	Mrs.Monalisha Joshi	Asst.Prof
21	Ms. Asharani Dalei	Asst. Prof
22	Dr.Nilaya Kumar Mohanty	Asst.Prof & HOD, Dept. Physics
23	Mr.Gyanendra Kumar Mishra	Asst.Prof
24	Mrs.Meena Kumari Sahu	Asst.Prof
25	Mrs.Sasmita Pradhan	Asst.Prof
26	Dr. Prafulla Kumar Sahu	Prof.
27	Mr.Vijaya Kumar Meher	Asst.Prof
28	Mr. Dinesh Kumar Sharma	Asst.Prof
29	Mr.Ashish Kumar Meher	Asst.Prof
30	Mrs.Binapani Barik	Asst.Prof
31	Mr. Biswajeet Acharya	Asst.Prof
32	Mr.Swarnajeet Tripathy	Asst.Prof
33	Dr. Rabindra Nath Pradhan	Assistant Professor
34	Mr. I. Rama Koti	Assistant Professor
35	Dr. Ashok Misra	Professor
36	Dr. Banitamani Mallik	Professor
37	Dr. Balaji Padhy	Assistant Professor
38	Dr. Santosh Kumar Bhal	Assistant Professor
39	Dr. Vijaya Muditana	Associate Professor
40	Dr. Prajna Pani	Professor
41	Dr. Girish Prasad Rath	Assistant Professor
42	Dr. Susanta Kumar Patnaik	Assistant Professor
43	Dr. Amir Prasad Behera	Assistant Professor

44	Dr. Subhendu Kumar Mishra	Associate Professor
45	Mr. Sharmistha Sahu	Assistant Professor
46	Dr.Soma Maji	Assistant Professor
47	Dr. Mayank Singh	Assistant Professor
48	Dr. Satya Prakash Nanda	Professor cum Dean
49	Dr. M. Devender Reddy	Professor cum Dean Acad
50	Mr. Anil Kumar J.	Associate Dean
51	Mr. B. Chakrapani	Professor
52	Dr. Chitrasena Padhy	Assistant Professor
53	Dr. Ajay Kumar Prusty	Assistant Professor
54	Dr. Satarupa Modak	Assistant Professor
55	Dr. Akkammadevi Naik	Assistant Professor
56	Dr. Ashok Kumar	Assistant Professor
57	Dr. M. Chandra Surya Rao	Assistant Professor
58	Dr. Nilanjana Datta	Assistant Professor
59	Dr. Samapika Dalai	Assistant Professor
60	Dr. Anindita Roy	Assistant Professor
61	Dr. Barsha Tripathy	Assistant Professor
62	Dr. Smaranika Mohanta	Assistant Professor
63	Dr. Subhrajyoti Chatterjee	Assistant Professor
64	Dr. Archana Mishra	Assistant Professor
65	Dr. Sunna Deepthi	Assistant Professor
66	Dr. Vangapandu Thriveni	Assistant Professor
67	Dr. M. Viswanath	Assistant Professor
68	Mr. I. Rama Koti	Assistant Professor
69	Dr. Ashok Misra	Professor
70	Dr. Banitamani Mallik	Professor
71	Dr. Balaji Padhy	Assistant Professor
72	Dr. Santosh Kumar Bhal	Assistant Professor
73	Dr. Vijaya Miditana	Associate Professor
74	Dr. Prajna Pani	Professor
75	Dr. Girish Prasad Rath	Assistant Professor
76	Dr. Susanta Kumar Patnaik	Assistant Professor
77	Dr. Amir Prasad Behera	Assistant Professor
78	Dr. Subhendu Kumar Mishra	Associate Professor
79	Mr. Sharmistha Sahu	Assistant Professor
80	Dr.Soma Maji	Assistant Professor
81	Dr. Mayank Singh	Assistant Professor
82	Dr. Satya Prakash Nanda	Professor cum Dean
83	Dr. M. Devender Reddy	Professor cum Dean Acad
84	Mr. Anil Kumar J.	Associate Dean
85	Mr. B. Chakrapani	Professor
86	Dr. Chitrasena Padhy	Assistant Professor
87	Dr. Ajay Kumar Prusty	Assistant Professor
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113	Dr. Archana Mishra	Assistant Professor
114	Dr. Praveen Boddna	Professor
115	Dr. Ria Mukhopadhyay	Assistant Professor
116	Dr. Gagan Kumar	Assistant Professor
117	Ms. Abhinandita Sahoo	Assistant Professor
118	Dr. Praveen Kumar	Assistant Professor
119	Prof.(Dr) V. Narsimha Reddy	Professor
120	Dr. Kalidindi Krishnam Raju	Associate Professor
121	Dr. Hari Ram Kumar Bandi	Assistant Professor
122	Mr. Durgadatta Mehera	Assistant Professor
123	Dr. Niranjana Kumar Chaurasia	Assistant Professor
124	Dr. Sudhanshu Bala Nayak	Assistant Professor
125	Mr. Ajit Kumar Sahu	Assistant Professor
126	Ms. Lipsa Dash	Assistant Professor
127	Mr. Manisankar Bera	Assistant Professor
128	Mr. Chandrasekhar Sahu	Assistant Professor
129	Prof.(Dr) K. Satya Krishna Prasad	Professor cum Dean
130	Dr. Devanand T. N.	Assistant Professor
131	Dr. Sambid Swain	Assistant Professor
132	Dr. Amrutha Gopan	Assistant Professor
133	Mr. Biswajit Mohanty	Assistant Professor
134	Mr. Avijit Biswas	Assistant Professor
135	Ms. Hauzoukim	Assistant Professor
136	Dr. Anita Patra	Professor
137	Dr. Subhendu Kumar Mishra	Associate Professor
138	Dr. Durga Prasad Padhi	Associate Professor
139	Dr. Parle Kalyan Chakravarty	Assistant Professor
140	Dr. S. Kameswar Rao	Assistant Professor
141	Mr. Kalee Prasanna Patnaik	Assistant Professor
142	Dr. Debi Prasad Satapathy	Assistant Professor
143	Mr. Amit Kumar	Assistant Professor
144	Dr. Prajna Pani	Professor
145	Dr. Susanta Kumar Patnaik	Assistant Professor

146	Dr. Girish Prasad Rath	Assistant Professor
147	Dr. Amir Prasad Behera	Assistant Professor
148	Nandakishore Ray	Asst. Professor
149	Smita Jana	Asst. Professor
150	Jagannath Padhy	Assistant Professor
151	Tofan Kumar Nahak	Assistant Professor
152	Dr. Santosh Kumar Nanda	Assistant Professor
153	Dr. Sivala Kumar	Professor
154	Dr. Gitanjali Behera	Assistant Professor
155	Dr. Shekhar Kumar Sahu	Assistant Professor
156	Dr. Santosh D.T.	Assistant Professor
157	Dr. Mitali Madhumita	Assistant Professor
158	Dr. Ruby Pandey	Assistant Professor
159	Dr. Sonam Sandeep Dash	Assistant Professor
160	Dr. Rajashree Jena	Assistant Professor
161	Dr. Prasanta Kumar Choudhury	Assistant Professor
162	Dr. Bhisma Narayan Rath	Assistant Professor
163	Dr. Satyabrata Nanda	Assistant Professor
164	Dr. Ashish Ranjan Dash	Associate Professor
165	Dr. Trilochan Penthia	Assistant Professor
166	Nanda Kishore Ray	Assistant Professor
167	Mr. Satyanarayan Padhy	Assistant Professor
168	Mr. Rajesh Kumar Misra	Assistant Professor
169	Ms. N. Jeevaratnam	Assistant Professor
170	Dr. Prafulla Kumar Panda	Associate Professor
171	Mr. Vignesh M.	Assistant Professor
172	Dr. Rajib Kumar Majhi	Assistant Professor
173	Dr. P. Srinivasa Rao	Professor
174	Mr. Mir Sadat Ali	Associate Professor
175	Dr. Sujit Mishra	Assistant Professor



Dr. Prasanta Ku. Mohanty
Dean Academic



Prabhat K. Pattnaik
FDP Coordinator

