

Vivekanand College, Kolhapur,
P.G. Department of Biotechnology
M.Sc. I Sem-II
Seminar

21.25/7/2024

Sr No	Roll No.	Student Name	Seminar Topic
1	1001	AWALE MANISHA PRABHAKAR	Properties and function of DNA
2	1002	CHOUGULE AJAY MALAGONDA	Enzyme kinetics
3	1003	GANAP PRADEEP BHIMRAO	Decipheration of genetic code
4	1004	KADAM SURAJ SANTOSH	Hypersensitivity reaction and types
5	1005	KADAM NEHA KRUSHNAT	Transcription in Prokaryotes
6	1006	KAMBLE AMAN SANJAY	De novo synthesis of Purine and Pyrimidine
7	1007	KHANAPURE AMMAR ABDULGAFAR	Purification of enzymes
8	1008	LOHAR PRANJAL PARASHURAM	Biosensors
9	1009	MANE MOHIT SUNIL	Structure and properties of antigens
10	1010	MORE ANKITA SHRIKANT	Active and passive immunization
11	1011	PATIL AISHWARYA SHASHIKANT	Chemical damage of DNA
12	1012	PATIL VAISHNAVI VILAS	Gene therapy
13	1013	PATIL SANIKA GAJANAN	Factors affecting on enzyme activity
14	1014	PATIL PRUTHVIRAJ AMAR	Immobilization of enzymes
15	1015	SALOKHE JANHAVI VIKRANT	Organs of the immune system
16	1016	SANDUGADE PRANAV RAJU	Eukaryotic replication
17	1017	SHINDE PRIYANKA PRAKASH	
18	1018	THOMBARE ANKITA RAJENDRA	Applications of enzymes
19	1019	YADAV SHRUTI SUBHASH	Autoimmunity diseases and treatment
20	1020	ZIRANGE PANKAJ SUNIL	Regulation of gene expression in prokaryote
21	1021	Patil Sonali Nagesh	Bisubstrate reaction catalysing enzymes
22	1022	Kesarkar Omkar Balaso	Immunoglobulin

Follow these topics as per mentioned
in Time-table (Seminar)

S. S. 25/7/24
M. SC. CO-ORDINATOR
DEPARTMENT OF BIOTECHNOLOGY
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

- ▲ Seminar by : 1) Suraj Santosh kadam.
2) Ammar . A. Khanapure
3) Pruthviraj Amar Patil

Sr.No.	Name/	Class	
1.	Ammar . A. Khanapure	MSC-I Biotech	
2.	Ajay . M. Chougule		
3.	Suraj . S. Kadam		
4.	Pankaj . S. Zirange		
5.	Pruthviraj . A. Patil		
6.	Sanket Pandurang Patil	MSC-II - Biotech	
7.	Prathamesh kiran Sarnaik		
8.	Tejaswini Bajirao Chougule		
9.	Sumedha . S. Patil		
10.	Asmita Ananda Patkure		
11.	Vaishnavi Vilas patil	MSC-I - Biotech	
12.	Manisha Prabhakar Awale		
13.	Ankita Shrikant More		
14.	Shruti Subhash Yadav		
15.	Aishwarya Shashikant Patil		
16.	Sanika Gajanan Patil		
17.	Priyanka Prakash Ghinde		
18.	Neha Krushnat Kadam		
19.	Ankita Rajendra Thombare		

▲ Seminar by : 1) Pankaj Sunil Zirange/ : 2) Seminar

Sr No.	Name	Class
1.	Ammar. A. Khanapure	MSc-I Biotech
2.	Suraj S. Kadam	
3.	Ajay M. Chougule	
4.	Pruthviraj A. Patil	
5.	Sanket P. Patil	MSc-II Biotech
6.	Prathamesh K. Tharnailk	
7.	Tejaswini B. Chougule	
8.	Sumedha S. Patil	
9.	Asmita A. Patkure	
10.	Vaishnavi V. Patil	MSc-I Biotech
11.	Manisha P. Awale	
12.	Ankita S. More	
13.	Shruti S. Yadav	
14.	Aishwarya S. Patil	
15.	Sanika G. Patil	
16.	Priyanka P. Shinde	
17.	Neha K. Kadam	
18.	Ankita R. Thombare	

Seminar by : Ajay. Malgonda. Chougule. : vs seminar

Sl. No.	Name/	Class
1.	Suraj. S. Kadam	MSc-I. Biotech
2.	Pankaj. S. Zirange	
3.	Ajay. M. Chougule	
4.	Ammav. A. Khonapure	
5.	Pruthviraj. A. Patil	
6.	Mohit. S. Mane.	
7.	Omkar. B. Kesarkar	
8.	Sanket. P. Patil	
9.	Prathanesh. K. Sarraik	MSc II Biotech
10.	Tejaswini. B. Chougule	
11.	Sumedha. S. Patil	
12.	Asmita. A. Patkure	
13.	Neha. K. Kadam	MSc-I. Biotech
14.	Ankita. R. Thombare	

VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS INSTITUTE)

PG-Department of Biotechnology

Seminar Attendance

Date: 20/02/2021

Name of the students	Topic of seminar	Sign
Suraj Santosh Kadam	Hypersensitivity reaction and Types	
-	-	-

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Ammar. A. Khanapure	Msc. I	
2	Pankaj. S. Zirange	Msc. I	
3	Ankita R. Thombare	M.Sc. I	
4	Manisha P. Awale	-	
5	Neha K. Kadam	-	
6	Prathamesh K. Sarnaik	MSc. II	
7	Swarnand A. Shinde	Msc. II	
8	Sumedha S. Patil	MSc. II	
9	Ankita Ashok Khol.	MSc. II	
10	Asmita Ananda Patkare	Msc. II	
11	Madhuri Kumar Darvan	Msc. II	
12	Renu Bharat Dhole	-	
13	Sanket Pandurang Patil	-	
14	Sunil Ravindra Patil	MSc. II	
15	Aditya Anil Sonavane	MSc. II	
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(Dr. M. P. More)
 (Mr. A. L. Upadhye)
 (Mr. S. C. Kulkarni)
 (Dr. S. B. Mulla)
 (V. N. More)

VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS INSTITUTE)

PG-Department of Biotechnology

Seminar Attendance

Date: 27/02/25

Name of the students	Topic of seminar	Sign
Sumedha S. Patil	microarray Technology	<i>(Signature)</i>
Vaishnavi V. Patil	Gene Therapy	<i>(Signature)</i>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Tejaswini Bajirao Chougale	MSc II	<i>(Signature)</i>
2	Sumanand Manu Shinde	MSc II	<i>(Signature)</i>
3	Dipali Karbhari Suryawanshi	MSc II	<i>(Signature)</i>
4	Ankita Ashok Khot.	MSc II	<i>(Signature)</i>
5	Sourabh Dattatray Nalawade	MSc II	<i>(Signature)</i>
6	Neha Krushnat Kadam	M.Sc - I	<i>(Signature)</i>
7	Ankita Shrikant More	-II-	<i>(Signature)</i>
8	Manisha prabhakar Awale	-II-	<i>(Signature)</i>
9	Ankita Rajendra Thombare	-II-	<i>(Signature)</i>
10	Pankaj S. Zingir	-II-	<i>(Signature)</i>
11	Ajay M. Chougale	-II-	<i>(Signature)</i>
12	Suraj S. Kadam	-II-	<i>(Signature)</i>
13	Amrta A. Khanapur	-II-	<i>(Signature)</i>
14	Pruthviraj Amal Patil	-II-	<i>(Signature)</i>
15	Janhavi Vikrant Salokhe	MSc-I	<i>(Signature)</i>
16	Vaishnavi Vilas patil	-II-	<i>(Signature)</i>
17	Sumedha S. Patil	m-sc-II	<i>(Signature)</i>
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(Signature)
(Mr. S. G. Kulkarni)

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(Dr. M. P. Mane)

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(Mr. A. L. Upadhye)

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(S. B. Mula)

VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS INSTITUTE)

PG-Department of Biotechnology

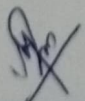
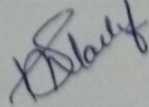
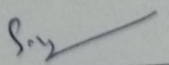
Seminar Attendance

Date: 27/02/2023

Name of the students	Topic of seminar	Sign
Neha Krushnat Kadam	Transcription of Prokaryotes	NKadam
Ammar Abdulgafar Khanapur	Purification of Enzymes	Ammar
Manisha Prabhakar Awale	DNA Properties and functions	MAwale

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Aditya A. Sonavane	MSc. Sy.	Aditya
2	Ankita Ashok Khot.	MSc II	Ankita
3	Dipali Karbhari Suryawanshi	MSc II	Dipali
4	Asmita Ananda Patkare	MSc II	Asmita
5	Sumedha Sudhakar Patil	MSc II	Sumedha
6	Suraj Santosh Kadam	MSc I	Suraj
7	Pankaj Sunil Zirange	MSc I	Pankaj
8	Swarand Arun Shinde.	MSc II	Swarand
9	Sanket Pandurang Patil	MSc II	Sanket
10	Prathamesh Kiran Sarmaik	MSc II	Prathamesh
11	Sunil Ravindra Patil.	MSc. II	Sunil
12	Ankita Rajendra Thombare	M.Sc. I	Ankita
13	Ankita Shrikant More	MSc. II	Ankita
14	Manisha Prabhakar Awale	M.Sc. I	MAwale
15	Voishnavi vilas patil	MSc - I	Vpatil
16	Ammar A. Khanapur	MSc - I	Ammar
17	Neha Krushnat Kadam	M.Sc. I	NKadam
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(Mr. A. L. Upadhye) (Dr. M. P. Mane) (Dr. S. B. Mulla) (Mr. S. G. Kulkarni)

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PG-Department of Biotechnology

Seminar Attendance

Date: 10/03/2025

Name of the students	Topic of seminar	Sign
Asmita. A. Pattare	Advance In Monoclonal Antibody Therapy	<i>[Signature]</i>
Prathamesh K. Sasnaik	Biofortification - Enhancing Nutritional Quality.	<i>[Signature]</i>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Tejaswini Bajirao Chougale.	MSc II	<i>[Signature]</i>
2	Ankita Rajendra Thombare	M.Sc.I	<i>[Signature]</i>
3	Ankita Shrikant More	M.Sc.I	<i>[Signature]</i>
4	Sheuti Subhash Yadav	" - "	<i>[Signature]</i>
5	Neha Krushnat Kadam	M.Sc. I	<i>[Signature]</i>
6	Ajay. M. Chougale	MSc. I	<i>[Signature]</i>
7	Amey. A. Kharchur	MSc. I	<i>[Signature]</i>
8	Suraj. S. Kadam	MSc. I	<i>[Signature]</i>
9	Pankaj. S. Ziwang	MSc. I	<i>[Signature]</i>
10	Swarnand Arun shinde	MSc II	<i>[Signature]</i>
11	Sourabh patatray Nalawade	M - II	<i>[Signature]</i>
12	Miss Meekani Kemon Pawan	MSC-II	<i>[Signature]</i>
13	Dipali Karbhari Surawanshi	MSC II	<i>[Signature]</i>
14	Ankita Ashok Khot.	MSC II	<i>[Signature]</i>
15	Sanket Pandurang Patil	MSC II	<i>[Signature]</i>
16	Prathamesh Kiran Sasnaik	MSc. II	<i>[Signature]</i>
17	Asmita Ananda Pattare	MSc II	<i>[Signature]</i>
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 (Dr. M. P. Mane)
 
 (Mr. A. L. Upadhye)

VIVEKANAND COLLEGE, KOLHAPUR
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PG-Department of Biotechnology

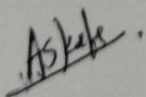
Seminar Attendance

Date: 13/03/2024

Name of the students	Topic of seminar	Sign
Ankita Shrikant More	Active & Passive Immunity	<u>A More</u>
Pouthviraj. A. Patil	CAR-T Cell Therapy	<u>P Patil</u>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Tejaswini Bajirao Chougale	MSC II	<u>Tejaswini</u>
2	Sumedha Sughekar Patil	MSC II	<u>Sumedha</u>
3	Renu Bhavdhisal	MSC II	<u>Renu</u>
4	Ankita Ashok Khot	MSC II	<u>Ankita</u>
5	Dipali Karbhari Suryawanshi	MSC II	<u>Dipali</u>
6	Madhuri Kumar Darvan	MSC II	<u>Madhuri</u>
7	Ankita Rajendra Thombare	M.Sc. I	<u>Ankita</u>
8	Neha Prashnat Kadam		<u>Neha</u>
9	Shruti Subhash Yadav		<u>Shruti</u>
10	Manisha Prabhakar Awale		<u>Manisha</u>
11	Paathamesh Kiran Saongik	MSC II	<u>Paathamesh</u>
12	Janhavi Vikrant Salokhe	M.Sc. I	<u>Janhavi</u>
13	Suraj Santosh Kadam	"	<u>Suraj</u>
14	Ajay Malangonda Chougale	"	<u>Ajay</u>
15	Pouthviraj. A. Patil	MSC I	<u>P Patil</u>
16	Ankita Shrikant More	MSC I	<u>A More</u>
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(Dr. M. P. Mane) (Miss. A. S. Kale) (Mr. A. L. Upadhye)

VIVEKANAND COLLEGE, KOLHAPUR
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PG-Department of Biotechnology

Seminar Attendance

Date: 15/3/25

Name of the students	Topic of seminar	Sign
Miss. madhuri K. Dhanan	Structure and Replication of Retrovirus	<i>Madhuri</i>
Miss. Dipali Karbhari suryawanshi	Advances in organ Transplantation Techniques	<i>Dipali</i>
Mr. Aditya Anil Sonavane	Ethical and Social Considerations of stem cells	<i>Aditya</i>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	sumedha s. Patil	MSc-II	<i>Sumedha</i>
2	Dipali K. Suryawanshi	MSc-II	<i>Dipali</i>
3	Tejswini B. Chaugle	MSc-II	<i>Tejswini</i>
4	Ankita Ashok Khot.	MSc-II	<i>Ankita</i>
5	Prathmesh Kisan Sangaik	MSc-II	<i>Prathmesh</i>
6	Sunil Ravindra Patil Patil	MSc-II	<i>Sunil</i>
7	Aditya - Anil. Sonavane	MSc-II	<i>Aditya</i>
8	Amrta A. Khampure	MSc-I	<i>Amrta</i>
9	Sujai S. Kadam	MSc-I	<i>Sujai</i>
10	Prathviraj A. Patil	MSc-I	<i>Prathviraj</i>
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(Pr. M. P. Mane)

(Ms. V. N. Arekar)

(Mr. A. L. Upadhye)

VIVEKANAND COLLEGE, KOLHAPUR
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PG-Department of Biotechnology

Seminar Attendance Date: 05/03/25

Name of the students	Topic of seminar	Sign
Ankita Ashok khot	Extremophiles : Adaptation & Application	<u>Ankita</u>
Sourabh Dattatray Nalawade	Biotechnology for rare diseases	<u>Sourabh</u>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Sumedha S. Patil	MSC-II	<u>Sumedha</u>
2	Asmita A. Patilkar	"	<u>Asmita</u>
3	Renu B. Dhisol	"	<u>Renu</u>
4	madhuri Damvan	"	<u>madhuri</u>
5	Dipati suryavanshi	"	<u>Dipati</u>
6	Maunali kamble	"	<u>Maunali</u>
7	Ankita A. khot	"	<u>Ankita</u>
8	swanand A. shinde	"	<u>swanand</u>
9	sourabh D. Nalawade	"	<u>Sourabh</u>
10	Sankep P. Patil	"	<u>Sankep</u>
11	Prathmesh K. Sarnaike	"	<u>Prathmesh</u>
12	Su		
13	Sheuti Subhash Yadav	MSC-I	<u>Sheuti</u>
14	Ankita Shrikant more	"	<u>Ankita</u>
15	Manisha peabhakkar Awale	"	<u>Manisha</u>
16	Ankita Rajendra Thombare	"	<u>Ankita</u>
17	Neelha krushnat kadam	"	<u>Neelha</u>
18	Pruthviraj Amar Patil	11	<u>Pruthviraj</u>
19	Ammar A. Khanapure	MSC-I	<u>Ammar</u>

20	Tankaj Sunil Zmange	MSc-I	Amkar
21	Ajay. M. chougale	MSc I	VK
22	Suraj. S. Kadam	MSc I	Amkar
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~~Amkar~~ ~~Amkar~~
(Mr A. L. Upadhye)

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(Miss. A. S. Kale)

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(Dr. M. P. Mane) (Mr. S. G. Kulkarni)

V. N. More
(Ms. V. N. More)

VIVEKANAND COLLEGE, KOLHAPUR
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PG-Department of Biotechnology

Seminar Attendance Date: 5/3/25

Name of the students	Topic of seminar	Sign
Mrunali Shahaji Kamble	Bioinformatics in disease prediction.	

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Aditya Anil Sonavane	Msc. II	
2	Santosh Dattatray Malawade	M.Sc II	
3	Teras Bajirao Ombase	M.sc II	
4	Aman Sanjay Kamble	M.sc. I	
5	Sunand Anand Shinde	Msc II	
6	Pradeep Bhimrao Ganap	Msc I	
7	Parthomesh Kisan Sarnaik	Msc. II	
8	Ajay. Malagonda. Chougule	Msc- I	
9	Sunil Ravindra Patil	MBC-II	
10	Janhavi Vikrant Salokhe.	M.SC-I	
11	Vaishnavi Vilas Patil.	M. SC I	
12	Neha Krushnat Kadam	Msc. I	
13	Ankita Rajendra Thombare	M.Sc. I	
14	Ankita Shailkant More	Msc I	
15	Manisha Prabhakar Awale	H-I	
16	Shrouti Subhash Yadav	H-I	
17	Poethviraj Anant Patil	MSC-I	
18	Pranav Raju Sandugade	MSC. I	
19	Suraj Santosh Kadam	Msc II	
20	Amrta A. Khanapure	Msc. I	
21	Renu Bharat Dhisal	MSC II	
22	pranjal. P. Lohar	MSC I	
23	sumedha s. Patil	m. sc II	
24	Tejswini B. chougale	"	
25	Asmita A. Patilkar	"	
26	Ankita Khos	"	
27	Dipati suryavanshi	"	
28	Mrunali Shahaji Kamble	Msc II	
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(Mr. S. G. Kulkarni)

(Mr. A. L. Upadhye)

VIVEKANAND COLLEGE, KOLHAPUR
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PG-Department of Biotechnology

Seminar Attendance Date: 5/3/25

Name of the students	Topic of seminar	Sign
Renu Bharat Dhisal	CRISPR-Cas 9 Gene Editing:- Mechanism and Application	<i>[Signature]</i>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Mrumali shahaji Kamble.	MSc II	<i>[Signature]</i>
2	pranjal. P. Lohar	MSC I	<i>[Signature]</i>
3	sumedha S. Patil	MSc-II	<i>[Signature]</i>
4	Tejaswini B. chougale	MSC-II	<i>[Signature]</i>
5	Asmita A. Pattakare	"	<i>[Signature]</i>
6	Dipali K. Suryawanshi	"	<i>[Signature]</i>
7	Ankita Ashok Khot.	MSc. II	<i>[Signature]</i>
8	Prathamesh Kisan Sarnaik	MSc. II	<i>[Signature]</i>
9	Ajoy. M. chougale	MSc I	<i>[Signature]</i>
10	Patil Sunil Ravindra	MSc II	<i>[Signature]</i>
11	Salokhe Janhavi Vikrant	MSc-I	<i>[Signature]</i>
12	Patil Vaishnavi Vilas	MSc-I	<i>[Signature]</i>
13	Neha Koushnat Kadam	M.Sc.-I	<i>[Signature]</i>
14	Ankita Rajendra Thombare	M.Sc. I	<i>[Signature]</i>
15	Ankita Shrikant more	M.Sc. I	<i>[Signature]</i>
16	Manisha Prabhakar Awale	"	<i>[Signature]</i>
17	Sheuti Subhash Yadav	"	<i>[Signature]</i>
18	Pruthviraj Amar Patil	MSc. I	<i>[Signature]</i>
19	Anav Raju Sandugade	MSc I	<i>[Signature]</i>
20	suraj Santosh Kadam	MSc. I	<i>[Signature]</i>
21	Ammar. A. Khanapure	MSc-I	<i>[Signature]</i>
22	Aman S. Kamble	M.Sc. I	<i>[Signature]</i>
23	Aditya. A. Sonavane	MSc II	<i>[Signature]</i>
24	Tejas Bajirao Ombase	MSc II	<i>[Signature]</i>
25	Sovrabh Pattaraj Ahalawade	MSc II	<i>[Signature]</i>
26	Swarand Arun Shinde	MSc II	<i>[Signature]</i>
27	Pradeep Bhimrao Gonap	MSc-I	<i>[Signature]</i>
28	Renu Bharat Dhisal	MSc II	<i>[Signature]</i>
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Sr
(Mr. S.G. Kulkarni)

[Signature]
(Mr. A.L. Upadhye)

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PG-Department of Biotechnology

Seminar Attendance Date: 6/3/25

Name of the students	Topic of seminar	Sign
Tejaswini Bajirao Chougale.	Multi Drug Resistance	<u>Tejaswini</u>

Attendance of the students

Sr No.	Name of students	Class	Signature
1	Neelha Krushnat Kadam	M.Sc-I	<u>NKadam</u>
2	Ankita Rajendra Thombare	— " —	<u>AKD</u>
3	Ankita Shrikant More	— " —	<u>AKmore</u>
4	Shruti Subhash Tadav	— " —	<u>Shruti</u>
5	Manisha by Peabhakkar Awele	— " —	<u>MAwele</u>
6	P. Sonali, Naresh Patil	— " —	<u>Sonali</u>
7	Vaishnavi Vitas Patil	— " —	<u>Vpatil</u>
8	Pranjal Parashuram. Lohar	— " —	<u>PLohar</u>
9	Sumedha Sudhakar Patil	M.Sc-II	<u>SPatil</u>
10	Amrita Ananda Pattare	M.Sc-II	<u>APattare</u>
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12	Aman Sanjay Tamble	M.Sc I	<u>ATamble</u>
13	Tejas Bajirao Dombase	M.Sc II	<u>TJombase</u>
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22	Pranav Raju Sandugade	M.Sc. I	<u>PSandugade</u>
23	Pruthviraj. A. Patil	M.Sc. I	<u>PPatil</u>
24	Pradeep Bhimrao Ganap	M.Sc I	<u>PGanap</u>
25	Ajay. Malayonda. Chougale	M.Sc - 2	<u>ACougale</u>
26	Ankita Ashok Khat	M.Sc - II	<u>AKhat</u>
27	Dipali Karbhari Suryawanshi	M.Sc - II	<u>DKarbhari</u>
28			
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30			

(Mr A.L. Upadhye) (Mr. S.G. Kulkarni)

(Dr. M.P. Mame)

Seminar Synopsis

Methods of enzyme purification

1. salt precipitation

2. Chromatographic methods

i. ion exchange (cationic or anionic)

separation based on charge; the greater the net charge, the more strong the interaction ; elute by increasing ionic strength of buffer or altering pH

ii. gel permeation (size exclusion) chromatography:

separation based on size; larger proteins elute first

iii. Hydrophobic interaction chromatography:

separation based on hydrophobicity of protein surface; elute by decreasing polarity of buffer ; more hydrophobic bind more strongly and elute last.

iv. affinity chromatography:

separation based on specific biological interaction; eg enzyme – substrate recognition; elute with substrate

v. immunoaffinity chromatography:

separation based on specificity of antibody recognition of peptide sequence; elute by lowering pH to 2-3 to disrupt antibody – peptide interaction. Neutralize quickly to avoid loss of activity.

Assessment of purity

- SDS polyacrylamide gel electrophoresis
- enrichment
- N-group analysis

Synopsis: Microarray Technology

Introduction:

Microarray technology is a powerful method for analysing gene expression and DNA sequences. It is widely used in cancer research, predictive genomics, and drug development.

Principle:

Microarrays work based on hybridization, where complementary DNA or RNA sequences bind to each other, allowing comparative analysis.

Key Contributors:

- **Patrick O. Brown** - Developed the first microarray in the late 1980s at Stanford University.
- **Ronald Davis** - Collaborated in advancing the technology with a robotic spotting system.

Types of Microarrays:

- **DNA Microarrays** - Measure gene expression or repression (e.g., cDNA arrays).
- **Protein Microarrays** - Analyse protein interactions (e.g., antibody profiling).
- **Phenotype Microarrays** - Used in drug development and toxicology (e.g., antibiotic resistance profiling).

Working Mechanism:

1. **DNA Chips** - Microarrays contain DNA spots on a glass slide.
2. **Sample Preparation** - Extract RNA/DNA from tissues.
3. **Hybridization** - Target genes bind to known probes.
4. **Detection & Analysis** - Fluorescence techniques detect expression levels.

Applications:

- **Gene Expression Analysis** - Used in projects like the Human Genome Project and single-cell RNA sequencing.
- **Cancer Research** - Helps classify cancer subtypes and identify biomarkers.
- **Genetic Disease Diagnosis** - Detects genetic variations (e.g., Williams's syndrome).
- **Personalized Medicine** - Tailors drug treatments based on genetics.
- **Pathogen Detection** - Identifies viruses like influenza.
- **Toxicity Testing** - Assesses environmental pollutant effects.
- **DNA Profiling** - Used in forensic science and paternity testing.

Advantages:

- High-throughput and fast data generation.
- Miniaturization allows automated processing.
- Cost-effective and highly sensitive.

Limitations:

SEMINAR SYNOPSIS

Extremophiles : adaptation and application

Submitted by : Ankita Ashok Khot.

Msc 2 roll no. 1055.

Latin origin- "Extremus" means 'Being on the Outside' PLUS "Philos" means 'Love'.
Extremophile- An organism with the ability to thrive in extreme environments. The term coined by Bob MacElroy. The extreme environmental conditions include temperature, pH, salinity, low nutrition concentration, water availability, pressure and ionizing radiations etc. On the basis of these conditions there are several types of extremophiles such as

A) thermophile – Organisms that can thrive in a wide range of temperature. Types of thermophile on the basis of optimum temperature are mesophile, thermophile and hyperthermophiles. The location where thermophiles are present is hot spring, hydrothermal vents etc. They have special enzymes which help them to survive in those extremely hot conditions. B) Psychrophiles – Capable of survival, growth or reproduction at temperatures of -15°C or lower for extended periods. Location is glaciers, deep oceans. C) Halophiles – Organisms that can survive in extremely salty environments. According to the optimal salt concentration for growth – a. Extreme halophile-Grows in an environment with 3.4-5.1 M NaCl b. Moderate halophile-Grows in an environment with 0.85-3.4 M NaCl c. Slightly halophile-Grows in an environment with 0.2-0.85 M NaCl. D) Acidophiles – An organism with optimal growth at pH levels of 3 or below. Highly acidic environments can result naturally from geochemical activities (such as the production of sulfur gases in hydrothermal vents and some hot springs) and from the metabolic activities of certain Acidophiles themselves. Acidophiles are also found in the debris left over from coal mining. E) Alkaliphiles – An organism with optimal growth at pH levels of 9 or above. Examples of alkaline ecosystem are Lonar crater soda lake, Maharashtra, India, Big Soda Lake, US, Soap Lake, Central Washington. F) Radioresistors – Organisms resistant to high levels of ionizing radiation, most commonly UV radiation. Some capable of resisting nuclear radiation.

The interesting example of extremophiles is **Tardigrade**. It is a microscopic animal with body size varies from 0.05 to 1.2 mm. Caterpillar like creature with eight legs and it has claws which look like bear claws. Therefore it is commonly known as Water Bear. It can survive all extreme environments like 120 to 150°C high temperature 200 to 300° below 0°C , 1000 atm high pressure, X-rays, UV rays. In the active stage-not tougher than any other animal- But when conditions worsen- dry or freeze called cryptobiosis look like they are dead – they don't eat, don't move, and don't breathe- "dead but still alive"- water is replaced with trehalose in order to prevent cellular destruction due to water freezing in their cells. Applications of Extremophiles is mainly in producing enzymes and other like in PCR, biofuels, biomining, food industry and oil recovery etc.

Presentation Topic : Biofortification : Enhancing Nutritional Quality

Biofortification is an innovative approach to improve the nutritional quality of staple crops, enhancing the health and well-being of millions of people worldwide. This sustainable and cost-effective strategy involves breeding crops to be richer in essential micronutrients, vitamins, and minerals.

The Problem : Micronutrient Deficiencies

Micronutrient deficiencies particularly in iron, zinc, vitamins and minerals affects over 2 billion people globally, causing stunted growth, weakened immune systems, and impaired cognitive development. These deficiencies are often referred to as "hidden hunger" because they can occur even when people have access to sufficient calories.

The Solution: Biofortification

Biofortification addresses micronutrient deficiencies by increasing the nutritional content of staple crops, such as maize, wheat, rice and sweet potatoes. This approach has several advantages:

1. **Sustainability:** Biofortification is a long-term solution, as the enhanced nutritional content is built into the crop itself.
2. **Cost-effectiveness:** Biofortification eliminates the need for costly supplements or fortified foods.
3. **Scalability:** Biofortified crops can be grown and consumed by millions of people, making it a scalable solution.
4. **Targeted impact:** Biofortification can be tailored to address specific micronutrient deficiencies in different regions and population.

Disadvantages:

1. **Initial Investment:** Developing biofortified crops requires significant investment in research, breeding and testing.
2. **Time Consuming Process:** Biofortification is a time consuming process that requires multiple generations of crop breeding.
3. **Limited Crop Selection:** Biofortification is limited to specific crops that can be genetically modified or bred to accumulate micronutrients.
4. **Intellectual Property Issues:** Biofortified crops may be subject to intellectual property rights, potentially limiting access to these crops for small scale farmers or developing countries.

Examples of Biofortified Crops:

1. **Golden Rice:** Enriched with beta-carotene, a precursor to vitamin A, to combat vitamin A deficiency.
2. **Iron-rich pear millet:** Developed to address iron deficiency in India and Africa.
3. **Zinc-rich wheat:** Biofortified to improve zinc intake in Pakistan and other countries.

Conclusion:

Biofortification offers a powerful tool to enhance the nutritional quality of staple crops, improving the health and well-being of millions of people worldwide. By breeding crops to be richer in essential micronutrients, we can create a more sustainable and equitable food system, reducing the burden of micronutrient deficiencies and promoting a healthier future for all.



Seminar Synopsis

Student Name :- **SURAJ SANTOSH KADAM**

Class : - Msc I Biotechnology.

Presentation topic: - **Hypersensitivity Reactions and its types.**

Introduction

- ▶ Disease caused due to uncontrolled immune response.
- ▶ It is uncontrolled immune response.
- ▶ Hypersensitivity is an exaggerated or inappropriate immune response to a harmless antigen, resulting in tissue damage and disease.

Types

There are four main types of hypersensitivity reactions, classified based on the immune mechanisms involved and the timing of the response.

Type I: Immediate Hypersensitivity

- ❖ **Definition:** IgE-mediated hypersensitivity reaction that occurs within minutes of exposure to the antigen.
- ❖ **Examples:** Allergic rhinitis, asthma, anaphylaxis, food allergies.
- ❖ **Mechanisms:** IgE antibodies bind to mast cells, triggering the release of histamine and other mediators.

Type II: Antibody-Dependent Hypersensitivity

- ❖ **Definition:** Hypersensitivity reaction mediated by IgG or IgM antibodies that recognize and bind to antigens on cell surfaces or in tissues.
- ❖ **Examples:** Hemolytic disease of the newborn, Goodpasture's syndrome, autoimmune hemolytic anemia.
- ❖ **Mechanisms:** Antibodies bind to antigens, activating complement and triggering cell destruction.

Type III: Immune Complex-Mediated Hypersensitivity

- ❖ **Definition:** Hypersensitivity reaction caused by the deposition of immune complexes (antibody-antigen complexes) in tissues.
- ❖ **Examples:** Systemic lupus erythematosus, serum sickness, rheumatoid arthritis.
- ❖ **Mechanisms:** Immune complexes activate complement, triggering inflammation and tissue damage.

Type IV: Delayed Hypersensitivity

- ❖ **Definition:** T-cell mediated hypersensitivity reaction that occurs 24-72 hours after exposure to the antigen.
- ❖ **Examples:** Contact dermatitis, tuberculosis, leprosy.
- ❖ **Mechanisms:** T-cells recognize and respond to antigens, triggering the release of cytokines and chemokines that recruit immune cells to the site.



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