

SCIENCE SETU WEBINARS by NIPGR

“Exploring the Biological World at Atomic Level Detail”

Press Note

Date: 11th FEBRUARY, 2022, Friday

Resource person: Dr. Vineet Gaur, DBT-Ramalingaswami Fellow, NIPGR

The Department of Biotechnology, Government of India, had planned “Science Setu Webinar” as a virtual platform to connect the Research Institutes with postgraduate and graduate students. Under this, our college has been assigned to National Institute of Plant Genome Research (NIPGR), New Delhi. NIPGR is an autonomous institution aided by the Department of Biotechnology. Research at NIPGR focusing on functional, structural, evolutionary and applied genomics of plants, including crop plants. Through this fourth webinar program, our students and faculty members virtually gained an amazing opportunity to connect with NIPGR, New Delhi and anticipated the effects of combined stresses of environmental factors on plant life. It was a spectacular opportunity for students at undergraduate and postgraduate level of science background on exposure to plant-based research on much higher level.

The resource person, **Dr. Vineet Gaur**, DBT-Ramalingaswami Fellow, NIPGR, started his talk by explaining the plant structures related to reproduction and plant anatomy. He explained the use of different microscopy techniques including electron and light microscope for visualization of these cellular structures in detail. He also explained the use of newly introduced techniques like neutron crystallography. He further gave an overview of the impossible X-ray microscope and its functioning with respect to optical microscopy. He discusses about the DNA polymerases, their functions and crystal structures obtained with crystallography. He explained the stereo selectivity of DNA polymerases in drug designing processes. The role of endonucleases and Holliday junctions was also discussed. He concluded his talk by summarizing the seed proteins, ligand interaction and understanding human diseases through food allergies. In total 79 participants, including faculty of science and students attended this online webinar. **Dr. Pinky Agarwal**, Scientist, NIPGR attended the queries of the participants and gave vote of thanks. It was an exciting and knowledgeable session for the students as well as faculty members.

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Dr SAndeep Singh Me NB Aanchal chaudhary Amarjeet Singh

Viewing NIPGR BIC's application

Science Sets Webinars
Twenty third webinar
on 11th February, 2022, Friday
at 3:00 p.m.

"Exploring the biological world at atomic level detail"
by
Dr. Vineet Gaur
DBT-Ramanujan Award Fellow, NIPGR

Moderated by
Dr. Pinky Agarwal and Dr. Amarjeet Singh
Scientists, NIPGR

Link for the webinar:
<https://nipgr.webex.com/join?siteurl=nipgr&siteurl=11f9a218e6314b969b302308666363eb>

Participants (31)

Search

- DS Dr SAndee... Me
- NIPGR BIC Host
- AC Aanchal ch...
- AS Amarjeet Si...
- AD Aniruddho ...
- A ANJIL
- DR deepansha ...
- DA diya andotra
- JK **Jasmine Kaur:** Jasmine Kaur-2nd year Ram Lal Anand Collge (microbiology hors.)

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14:59 11-02-2022

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Dr SAndeep Singh Me melisha Aanchal chaudhary Aniruddho Das

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Dr SAndeep Singh (Me) melisha

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Reference Sets Webinar
 Tuesday 8:00 AM
 on 11th February, 2022, Friday
 at 3:00 PM
 8:00 AM

"Exploring the biological world at atomic level detail"
 by
 Dr. Vineet Gaur
 DST-Rashtriya Fellow, NIPGR

Moderated by
 Dr. Pinky Agarwal and Dr. Amarjeet Singh
 Scientists, NIPGR

Link for the webinar:
<https://niggr.webex.com/joinservice/sites/nipgr/meeting/download/119a218e6314b969b302308666363eb?siteurl=nipgr...>

Chat

from Shikha vashist to Everyone 15:01
 shikha Vashist, AP, Kanya Maha Vidyalaya
 ,,JALANDHAR

from Mohammad Anas to Everyone 15:01
 Mohammad Anas Ansari MSc botany Aligarh
 Muslim university

from sandeep kumar to Everyone 15:01
 sandeep kumar, Meerut College Meerut

from Dr. Sandeep Singh to Everyone 15:01
 Dr. Sandeep Singh, Kanya Maha Vidyalaya,
 Jalandhar

from Dr. sandeep Kaur to Everyone 15:02
 Good Afternoon Everyone... Dr. Sandeep Kaur,
 P.G. Department of Botany, Kanya Maha Vidyalaya,
 Jalandhar

Send to: Everyone

Type your message here

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Meeting Info

Layout

Participants (69)

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DS Dr SAndee... (Me)

NR NIPGR BIC (Host)

AC Aanchal ch...

AG Abhilash Je...

AK abhilasha k...

AP Aditi Panwar

AT Akanksha T...

WhatsApp

Msc Botany Sem II
 +91 60060 22050: Photo

Pinky Agarwal

Dr SAndeep Singh (Me)

Vineet Gaur

ENG IN 24:42 11-02-2022

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Dr. Sandeep Singh Me Aanchal chaudhary Abhilash Jeas George abhilasha kumari Layout

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Exploring the biological world at atomic level detail

Science Setu Webinar Series 2021-22

Dr. Vineet Gaur
Ramalingaswami Fellow (DBT)

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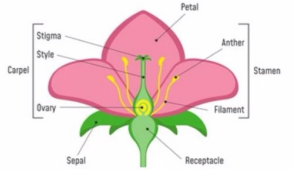

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madhuri:
Madhuri
Bhattacharya
B.Sc.(H)
Microbiology
Ram Lal
Anand
College 2nd
year

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- AK abhilasha kumari
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Speaking: Pinky Agarwal

Layout

Dr. Sandeep Singh Me	Vansh Goyal	Amarjeet Singh	Pinky Agarwal	
Aanchal chaudhary	Abhilash Jeas George	abilasha kumari	Aditi Panwar	Akanksha Tyagi
anamica	anchal sharma	Aniruddho Das	Anjali Rani	ANJIL
Antu Shrivastav	Anurit kaur bbk dav college fo...	Arpan bbk dav	arya patra	AYUSHI 4538
Badar Ali	chahat 3805	Chanuka Nisalanka Wijewarda...	Deepika Vashistha	Dr Lavanya

Participants (78)

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Dr. Sandeep Singh Me Vineet Gaur Amarjeet Singh Pinky Agarwal Layout

Participants (76) Chat

Resolution (Ability to see fine details)

Electron Microscope (0.1nm) Light Microscope (100nm) Unaided eyes (100 μm)

Images from google

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Dr. Sandeep Singh Me Vineet Gaur Vansh Goyal Pinky Agarwal Amarjeet Singh Aanchal chaudhary

X-ray microscope?

enlarged image system of lenses sample light

Optical microscope

electron density = atomic positions computer amplitudes phases? crystallographers

crystal diffracted beams X-rays

"Impossible" X-ray microscope

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Dr. Sandeep Singh Vineet Gaur Vanish Goyal Pinky Agarwal Amarjeet Singh Aanchal chaudhary Layout

DNA Polymerases: Understanding function

Why DNA Polymerase:
 Family comprises of wide range of polymerases
 Single subunit Pol β to E. coli DNA PolIII (20 subunits, almost 900kDa)

Functions:
 DNA replication and DNA repair

Chemistry remains the same irrespective of size or function

Protein Sci. 2019;28:288-291

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Dr. Sandeep Singh Vineet Gaur Vanish Goyal Pinky Agarwal Amarjeet Singh Aanchal chaudhary

Crystal structure of a replicative DNA polymerase (DNA pol α)

Exonuclease domain Exonuclease active site Thumb
 N-terminal domain C-terminus
 symmetry-related DNA molecule Fingers Polymerase active site
Cell, 2001; 105, 657-667

(Holds the ss template DNA) fingers
 (Holds the primer DNA) thumb
 palm (Catalytic site)
 primer
 pyrophosphate
 Base
 glycosidic bond
 HO OH = ribose
 H = deoxyribose
 nucleoside
 nucleoside monophosphate
 nucleoside diphosphate
 nucleoside triphosphate

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