



GURU NANAK COLLEGE (AUTONOMOUS)

Affiliated to University of Madras and Re-Accredited at "A" Grade by NAAC
Guru Nanak Salai, Velachery, Chennai – 600042.

Guru Nanak Centre for Research

Event Title	National Webinar on “Molecular mechanisms and methods available in nCOVID 19 detection - an update”	
Category	UG/PG Students, School Students, Faculty (Teaching and Non-Teaching), Researchers, Industry Persons.	
Date	From : 12.08.2020	To : 12.08.2020
No. of Resource Person	1	
No. of Participants	204	

(2) Report Description:

The objective of this webinar is:

As the epidemic of COVID-19 is spreading all over the globe rapidly, a timely initiative to conduct a one day National Webinar on ‘MOLECULAR MECHANISMS AND METHODS AVAILABLE IN nCOVID 19 DETECTION - AN UPDATE’ by Guru Nanak Centre for Research (GNCR) was proposed and executed by Dr. J.Jayanthi, Dean Research.

Dean Mam gave holistic bird’s eye view of the COVID pandemic situation and also highlighted that this topic is a need of an hour.

The objective was to provide a comprehensive and up-to-date assessment of the COVID-19 epidemic molecular analysis

(3) Report:

Guru Nanak Centre for Research (GNCR) of Guru Nanak College, (Autonomous), Velachery, Chennai organized National Webinar on “Molecular mechanisms and methods available in nCOVID 19 detection - an update "on 12/08/2020 between 12.00 pm. to 01.20 pm, through Google Meet Platform, where around 204 participants from various Colleges, Universities, Research Institutes and Industries actively participated in the National Webinar

The webinar theme was designed to stimulate Life science professionals to enhance their research and their career in understanding the molecular diagnosis of COVID-19. This will make the researcher for their better preparedness in further research on any viral infectious diseases.

The Dr. Kumaraguru, Dean IT, welcomed the Speaker, dignitaries of the College Management, Faculty members and the participants from all over the States. Dr. Satheesh Kumar Sabapathy, Research Scientist, Multi-Disciplinary Centre for Biomedical Research, Arupadi Veedu Medical College and Hospital Vinayaka Mission's Research Foundation (Deemed to be University) Puducherry, was the resource person who delivered the presentation about Virology of SARS-CoV-2 and the molecular analysis of nCOVID-19. He gave a brief note on coronaviruses types and briefed the difference between less pathogenic variety include HCov-229E and HCoV-HKU1 and the highly pathogenic group consists of SARS-CoV, SARS-CoV-2 and MERS-CoV. He explained the viral stability in aerosols (for 3 hrs, 4hrs, 24 hrs, 48hrs), Copper, cardboard, steel and plastic respectively

According to his opinion PCR tests are used to directly detect the presence of an antigen, rather than the presence of the body's immune response, or antibodies. He explained through video that how COVID-19 RT-PCR test is a qualitative detecting nucleic acid from SARS-CoV-2 in upper and lower respiratory specimens (such as nasopharyngeal or oropharyngeal swabs, sputum, lower respiratory tract aspirates, bronchoalveolar lavage, and nasopharyngeal wash/aspirate) collected from individuals suspected of COVID 19 patients. This video further explained how samples are collected from any individual, including from individuals without symptoms or other reasons to suspect COVID-19 infection, the amplification process, the probe anneals to a specific target sequence located between the forward and reverse primers, the extension phase of the PCR cycle and the confirmation analysis

Finally he concluded that, there is a need of scaling up PCR testing to screen vast swathes of nasopharyngeal swab samples from within a population, public health officials that can get a clearer picture of the spread of a disease like Covid-19 within a population. He also answered to all the queries of the participants

Research Dean Dr. J. Jayanthi gave the concluding remarks and proposed the vote of grateful thanks to all those who had helped to make the webinar a success.

Finally she concluded with very simple message –

Prevention is better than cure. Practice hand washing, cough etiquette. Social distancing, avoid travel and report if any symptoms arise. Follow Government advice only. Together we fight and we win.

(4) INVITATION



The poster features a blue and white background with a network diagram of nodes and lines. At the top center is the logo of Guru Nanak College (Autonomous), Chennai. Below it, the text reads: "GURU NANAK COLLEGE (AUTONOMOUS)", "RE-ACCREDITED AT 'A' GRADE BY NAAC, AFFILIATED TO UNIVERSITY OF MADRAS", "GURU NANAK SALAI, VELACHERY, CHENNAI - 600 042". The main title is "GURU NANAK CENTRE FOR RESEARCH ORGANIZES A NATIONAL WEBINAR ON 'MOLECULAR MECHANISMS AND METHODS AVAILABLE IN nCOVID 19 DETECTION - AN UPDATE'". The resource person is "Dr. SATHEESH KUMAR SABAPATHY", a Research Scientist at the Multi-Disciplinary Centre for Biomedical Research, Aarupadi Veedu Medical College and Hospital, Vinayaka Mission's Research Foundation, Puducherry. The event is scheduled for August 12, 2020, at 12:00 Noon. A "CLICK HERE" button with a registration link is provided. The poster is signed by Dr. M. G. Ragunathan, Principal, and Sardar Manjit Singh Nayar, General Secretary & Correspondent.

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GURU NANAK SALAI, VELACHERY, CHENNAI - 600 042

GURU NANAK CENTRE FOR RESEARCH
ORGANIZES A NATIONAL WEBINAR ON
*"MOLECULAR MECHANISMS AND METHODS AVAILABLE
IN nCOVID 19 DETECTION - AN UPDATE"*

RESOURCE PERSON

Dr. SATHEESH KUMAR SABAPATHY
RESEARCH SCIENTIST
MULTI- DISCIPLINARY CENTRE FOR BIOMEDICAL RESEARCH
AARUPADI VEEDU MEDICAL COLLEGE AND HOSPITAL
VINAYAKA MISSION'S RESEARCH FOUNDATION
(DEEMED TO BE UNIVERSITY) PUDUCHERRY, 607 403

12
AUGUST, 2020
at 12:00 Noon

CLICK HERE
<https://forms.gle/VkKZNhT5kx9fnhYk7>

GOOGLE MEET TO REGISTER

Dr. M. G. RAGUNATHAN
PRINCIPAL

SARDAR MANJIT SINGH NAYAR
GENERAL SECRETARY
& CORRESPONDENT

(5)PHOTOS

REC Prithivi Raj is presenting

159 76 12:10

MODES OF DISEASE TRANSMISSION

1. DIRECT CONTACT WITH INFECTED PERSON

2. INFECTED DROPLETS

3. INFECTED DROPLETS GET ON YOUR HAND

4. WHEN TOUCHING ANY SURFACE OR OBJECT

5. VIRUS TRANSFERRED

6. SNEEZE / COUGH BY INFECTED PERSON

7. INFECTED DROPLETS

8. INFECTED DROPLETS GET ON YOUR HAND

9. VIRUS TRANSFERRED

Prithivi Raj

BT MURALI has left the meeting

REC Prithivi Raj is presenting

kanakraj max and 154 more 159 56 12:13

Coronavirus virion

4860 P. Akash has left the meeting

Prithivi Raj

4785_AZBT_RI... 4759_AZBT_S... Dev

Kulkarni Prachi DR. JAYANTHI J Dr.D.Anand Des... Gur

Modhu Madhav... BT Ripna Chak... Saravanan Dha... 584

REC Prithivi Raj is presenting 5828 SNEHA.P A... and 158 more 173 92 12:15

Replication mechanism of SARS-CoV-2 strain

The diagram illustrates the replication cycle of SARS-CoV-2. It starts with the virus attaching to a host cell and injecting its RNA. The RNA then undergoes replication and transcription within the cytoplasm, involving the synthesis of viral proteins and the production of new viral genomes. A list of inhibitors is provided on the right side of the diagram.

Inhibitors
1. Chloroquine
2. Hydroxychloroquine
3. Remdesivir
4. Favipiravir
5. Nitazoxanide
6. Acyclovir
7. Sofosbuvir
8. Cyclosporin A
9. Cyclosporin B
10. Cyclosporin H
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199. Cyclosporin C
200. Cyclosporin A

antibodies.com

5846_AZBT_SNEHALATHA.S has left the meeting

REC Prithivi Raj is presenting Sadhna Kaushik and 151 more 166 80 12:10

Prevention: self practice in community

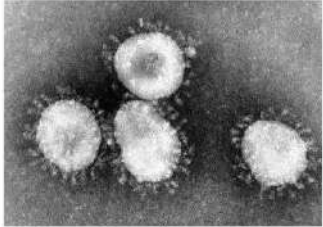
The infographic lists four essential self-practice measures for community prevention:

- HAND HYGIENE**: Represented by an icon of hands being washed with soap and water.
- RESPIRATORY HYGIENE**: Represented by an icon of a person wearing a face mask.
- SOCIAL DISTANCING**: Represented by an icon of two people standing apart.
- HIGH RISK GROUP**: Represented by an icon of a person in a green protective suit.

REC Prithivi Raj is presenting

171 senthil vairavan and 156 more 12:14

Electron Micrograph



Diameter- 80 to 125nm
Genome - 27 to 32 kb
+ve single stranded RNA

Corona viruses are a group of viruses that have a halo, or crown-like (corona) appearance when viewed under an electron microscope

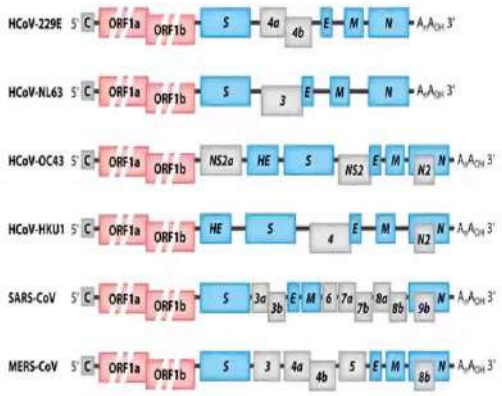
Prithivi Raj

PUJA GHOSH has left the meeting

REC Prithivi Raj is presenting

4789 AZBT_E.SUREN... and 159 more 12:14

Genome structure of human coronaviruses (HCoVs)



HCoV-229E 5' C- ORF1a ORF1b S 4a 4b E M N A_nA_{3'}

HCoV-NL63 5' C- ORF1a ORF1b S 3 E M N A_nA_{3'}

HCoV-OC43 5' C- ORF1a ORF1b NS2a HE S NS2 E M N2 N A_nA_{3'}

HCoV-HKU1 5' C- ORF1a ORF1b HE S 4 E M N2 N A_nA_{3'}

SARS-CoV 5' C- ORF1a ORF1b S 3a 3b E M 6 7a 7b 8a 8b 9b N A_nA_{3'}

MERS-CoV 5' C- ORF1a ORF1b S 3 4a 4b 5 E M 8b N A_nA_{3'}

Prithivi Raj

5804 Karthic G 4759_AZBT_S... Dev

Kulkarni Prachi DR. JAYANTHI J 4785_AZBT_RI... Gu

Madhu Madhav... Svarupa Bama Saravanan Dha... 580

REC Prithivi Raj is presenting Hary Msp and 154 more 169 99+ 12:19

Concentration of virus from water by TFF

The diagram illustrates the TFF process for virus concentration. It starts with 'WATER' entering a reservoir with a '50µm Filter'. A 'Peristaltic pump' circulates the water through a '0.2µm TFF Cartridge'. The 'Filtrate' from this stage goes to a '100KDa TFF Cartridge', which produces 'Virus concentrate' and 'Discard Filtrate'. A 'Peristaltic pump' also circulates the water through the 100KDa cartridge. A flowchart on the right shows 'water' going through 'Pretreatment (5µm)' and 'Microfiltration (0.2µm)' to produce 'Virus concentrate'.

Type here to search ENG 12:19 8/12

REC Prithivi Raj is presenting 5853_THARIKA... and 172 more 187 99+ 12:29

Interpretation - some confusing aspects

- D 0 - D5 - A symptomatic phase
- D 0 - D7 - window period (only PCR +ve)
- D 7 - IgM - +ve (7-21 Days)
- D 14 - IgG - +ve
- D 1 - D 28 - RNA/Ag +ve (>28 Disappear)

REC Prithivi Raj is presenting Hary Msp and 154 more 169 99+ 12:19

Concentration of virus from water by TFF

The diagram illustrates the TFF process for virus concentration. It starts with a reservoir of water containing a 5µm filter. The water then passes through a 500L TFF cartridge. A peristaltic pump circulates the water through the system. The retentate is collected as a virus concentrate, while the filtrate is discarded. The process involves prefiltration (5µm) and microfiltration (0.2µm). The retentate is collected as a virus concentrate, while the filtrate is discarded.

water

Prefiltration (5µm)

Microfiltration (0.2µm)

Water

5µm filter

Discard Retentate

500L TFF cartridge

Filtrate

Retentate

1000 kgds TFF cartridge

Discard Filtrate

Peristaltic pump

Virus concentrate

Peristaltic pump

Prithivi Raj

REC Prithivi Raj is presenting D.E.Nirman Kan... and 154 more 169 99+ 12:18

VIRAL DIAGNOSTIC METHODS

- Histopathology method
- Molecular methods:
 - Dot blot (Lightner, 1996),
 - In situ* DNA hybridization (Lightner, 1996),
 - Polymerase chain reaction (PCR) (Nunan and Lightner, 1997)
 - Real-time PCR (Hruchi et al., 2001 & Durand et al., 2003).
- Antibody based diagnostic methods:
 - Indirect Immunofluorescence (Ecobedo Bonilla et al., 2005)
 - Enzyme Linked Immunosorbent Assay
 - Dot blotting, Western blotting
 - Immuno histochemistry (Chavisuthangkura et al., 2014)

Prithivi Raj

REC Prithivi Raj is presenting karthika thanigai and 176 more 191 12:41

nCOVID-19 -PCR master mix preparation

Master/Mix:	25µl single rxn, µl	Cycler:
H ₂ O (RNase free)	2.6	55°C 10'
2x Reaction mix*	12.5	
MgSO ₄ (50mM)	0.4	94°C 3'
BSA (1 mg/ml)**	1	94°C 15"
Fwd primer (10 µM)	1	58°C 30"
Rev primer (10 µM)	1	45x
Probe (10 µM)	0.5	
SSIII/Taq EnzymeMix*	1	
Template RNA	5	' = minutes; " = seconds

REC Prithivi Raj is presenting Maria Infanshia and 153 more 168 12:21

Factors Affecting Virus Persistence in the Environment?

Factor	Effect
Physical	
Heat	Inactivation is directly proportional to temperature
Light	UV component is germicidal
Desiccation/Drying	Increased inactivation at lower relative humidity
Aggregation/Adsorption	Protection from inactivation
Pressure	High pressure induces inactivation
Chemical	
pH, salinity and Ammonia	Worst stability at extreme pH, increased salt concentrations are virucidal
Inorganic ions and Organic matters	Virucidal, dissolved colloidal and solid organic matter protect from inactivation
Enzymes	Protease and nucleases contribute inactivation
Biological	
Microbial activity, proteosomal proteolysis and biofilms	Contribution to inactivation/removal/death and adsorption to biofilms protect from inactivation
Type of virus	Stability varies according to the strains and type of virus

REC Prithivi Raj is presenting BT Ripna Chakma and 181 more 196 99+ 12:31

nCOVID-19 panel

RT-PCR	IgM	IgG	Interpretation
-ve	-ve	-ve	-ve, not immunized, patient at risk
+ve	-ve	-ve	Pre clinical phase & < 7 days
+ve	+ve	-ve	Acute phase of infection & 7-10 days
-ve	+ve	-ve	Active phase, 7-10 days, low RNA & Repeat PCR
-ve	+ve	+ve	Active phase of > 14 dys, low viral load & good prognosis
+ve	+ve	+ve	Active phase of infection, good prognosis for IgG & viral load decreasing
-ve	-ve	+ve	Patient recovered

REC Prithivi Raj is presenting Krishna Kishore and 151 more 166 99+ 12:20

VIRUSES IN THE ENVIRONMENT

VIRAL OCCLUSION BODIES AND DNA IN SOIL

4796_AZBT_Vijitha has left the meeting

REC Prithivi Raj is presenting

Vinuja S Viswambh... and 165 more 12:25

Best method-?

Test	Merit	Demerit
RT-PCR	Sensitive - 100% Specificity - 100%	Expensive
Antigen detection	High specificity Cost effective	Low sensitivity
Antibodies detection (IgG & IgM)	Cost effective Mass examination	Not for early diagnosis- used for sero surveillance

- RT-PCR - Reference technique
- Ab detection - Epidemiology survey

Both are powerful

Pinki Basak has left the meeting

REC Prithivi Raj is presenting

Rabeeha Moham... and 174 more 12:37

nCOVID-19- Screening Process

1 a swab is taken from the nose or the back of the throat and sent to a laboratory

2 RNA of SARS-CoV-19 is purified and converted into DNA

3 the PCR duplicates the virus DNA, the dyes bind to the copied virus DNA

Problems

COVID-19 can move from the upper airways to the lung, samples come from nose or throat => limits amount of pathogen

pathogen does not last many hours => time to get sample to lab is critical

contamination or degradation can cause issues

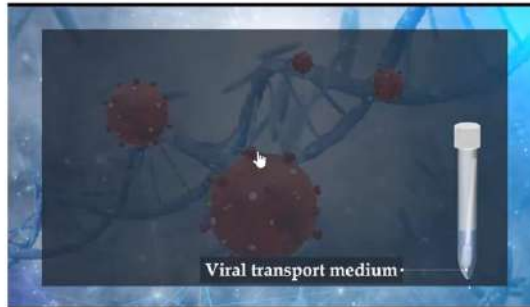
copied with high demand => enough chemicals, personnel, time

REC

5852_AZBT Agal... and 187 more

190

12:44



Presentation (Prithivi Raj)

BT Ripna Chakma
Perfect presentation sir

Rima Nandy
Amazing presentations

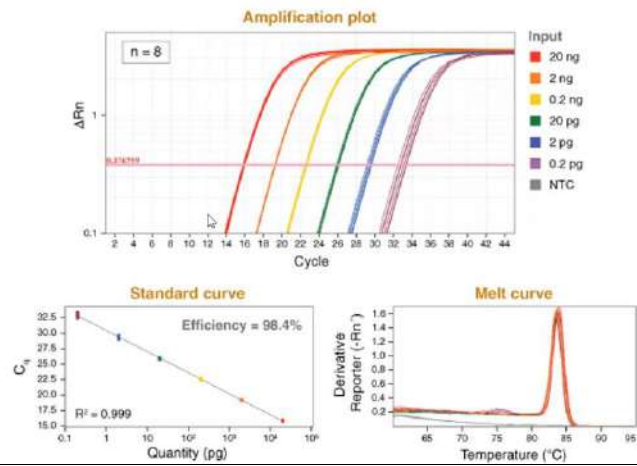
REC

Dr Raj Pratim Sa... and 196 more

199

12:47

Results Interpretation



Presentation (Prithivi Raj)

(7) CERTIFICATE COPY



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GURU NANAK CENTRE FOR RESEARCH

CERTIFICATE OF PARTICIPATION

This is to certify that

<<FULL NAME>>

has participated in the NATIONAL WEBINAR on
"MOLECULAR MECHANISMS AND METHODS AVAILABLE IN
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organized by the GURU NANAK CENTRE FOR RESEARCH
(GNCR), GURU NANAK COLLEGE (AUTONOMOUS),
Guru Nanak Salai, Velachery, Chennai - 600 042.

Dr. J. JAYANTHI
DEAN RESEARCH &
CONVENER

Dr. M. G. RAGUNATHAN
PRINCIPAL

Mr. MANJIT SINGH NAYAR
GENERAL SECRETARY &
CORRESPONDENT