

**Dr. B. C. Roy College of Pharmacy & AHS**  
**Durgapur, West Bengal (India)**  
(NBA Accredited)\*

2020 TOP 100

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Pharmacy Educational Institutions in India

**Webinar Series**  
**International**  
**Episode # 1**

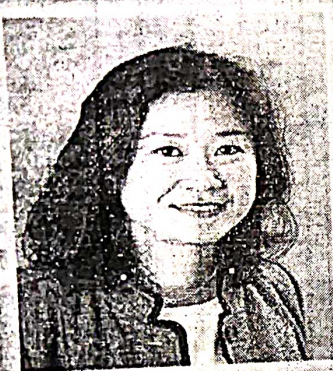
Cordially invite you to join a

**Webinar**  
**On**

**Applications of Protein Nanocages Post Covid-19**

**On 6<sup>th</sup> July 2020**

**Time: 5:00 P.M IST**



**Speaker**  
**Sie In Lim**  
**Associate Professor**  
**Nanyang Technological University**  
**Singapore**

**Chairman**  
**Prof. (Dr.) Subrata Chakraborty**

**Convener**  
**Prof. (Dr.) Subhabrata Ray**

**Coordinator**  
**Dr. Santanu Chakraborty**  
**Mr. Sagar Sengupta**

**Register on or before 5th July 2020**

**[Click Here for Registration Link](#)**

*e-Certificates will be awarded to all participants*

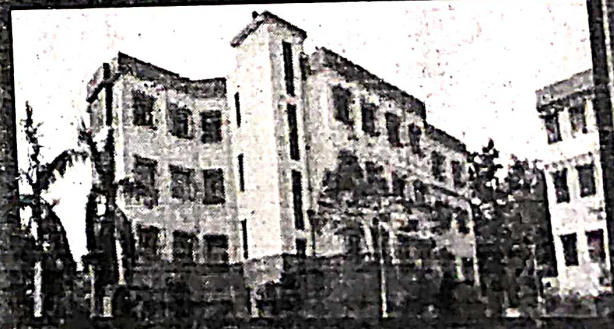
**About us**  
Dr. B. C. Roy College of Pharmacy and AHS, Durgapur is a primary provider of qualified, trained industry ready Pharmaceutical Technologists. Imparting application based pharmaceutical knowledge. BCRCP offers an open and friendly atmosphere where students learn, share and shine with expertise in pharmaceuticals to ensure a healthier tomorrow.

**Courses Offered**

**D.Pharm**

**\*B.Pharm (NBA Accredited)**

**M.Pharm (Pharmaceutics) & M.Pharm (Pharmacology)**



**[To visit us Click Here](#)**





Dr. B. C. Roy College of Pharmacy & AHS  
Durgapur, West Bengal (India)  
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10 years  
BCRCP WEBINAR SERIES - 2020-INTERNATIONAL (I)

On  
PROTEIN CAGES: OPPORTUNITIES  
AND APPLICATIONS POST COVID-19  
3 PM (IST) 06-07-2020

Speaker  
Sierin Lim, Ph.D.  
Associate Professor  
Nanyang Technological University, Singapore

Section 1 of 3

## Feedback Form

Dear Members of Pharmaceutical Fraternity,

Submit the Feedback Form within 24 hours after completion of the online session to receive your certificate.

Seminar Committee  
BCRCP

Email\*

Use email

This form is collecting emails. Change settings

PARTICIPANT ID

BCRCP/WEBINAR/2020/

Short answer text

FULL NAME OF THE PARTICIPANT (EXACTLY THIS SHALL APPEAR ON THE CERTIFICATE) \*

Short answer text

PHONE NUMBER \*

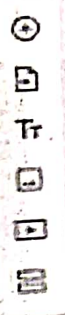
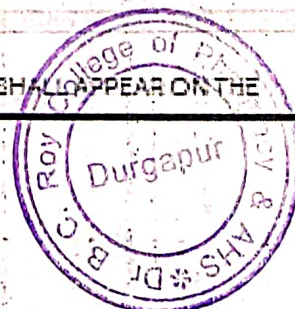
Only provide your contact no for communication and messaging

Short answer text

OCCUPATION/ POSITION/ DESIGNATION/ JOB TITLE (EXACTLY THIS SHALL APPEAR ON THE

Principal

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Bidhannagar, Durgapur-713226, Burdwan





OCCUPATION/ POSITION/ DESIGNATION/ JOB TITLE (EXACTLY THIS SHALL APPEAR ON THE CERTIFICATE) \*

Short answer text

COMPANY/ INSTITUTION/ ORGANISATION (EXACTLY THIS SHALL APPEAR ON THE CERTIFICATE) \*

Short answer text

After section 1 Continue to next section

Section 2 of 3

## Feedback Section

Give your feedback in the following scale of 5:  
5 - Outstanding, 4 - Excellent, 3 - Good, 2 - Fair, 1 - Poor

1. Relevance to various Pharmacy academic curriculum? \*

	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Outstanding

2. Was the webinar relevant to current social scenario? \*

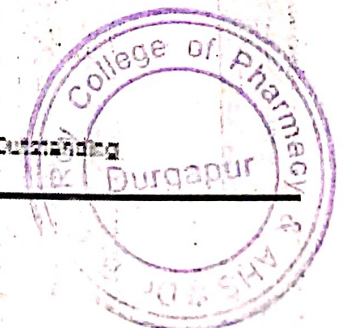
	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Outstanding

3. Was the webinar interactive to the participant? \*

	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Outstanding

*Principals*  
19/11/20

Principal





4. Impact on environment and sustainability \*

	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Outstanding

5. Applicability to enhance ethical principles in professional and social context \*

	1	2	3	4	5	
Poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Outstanding

After section 2 Continue to next section

Section 3 of 3

## Assessment Section

Based on your understanding of today's episode, kindly answer the following

Which of the following is a natural protein nanocage? \*

- Viruses
- Ferritin
- E2 protein
- All of these

The cage structure of the protein nanocages are formed by \*

- genetic engineering
- chemical engineering
- self-assembly
- All of these



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The cage structure of the protein nanocages are formed by \*

- genetic engineering
- chemical engineering
- self-assembly
- All of these

The target surface of the protein nanocages for chemical/ genetic engineering may be \*

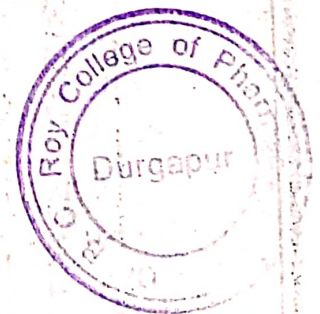
- exterior surface
- interior surface
- intersubunit
- all of these

Protein nanocages have potential application in \*

- immunity bolstering
- acute therapeutics
- diagnostics
- all of these

Nature-derived nanocarriers are potential alternatives to synthetic ones because of \*

- better biocompatibility
- lesser cellular uptake resulting minimal toxicity
- better active targeting
- both lesser cellular uptake resulting minimal toxicity and better active targeting

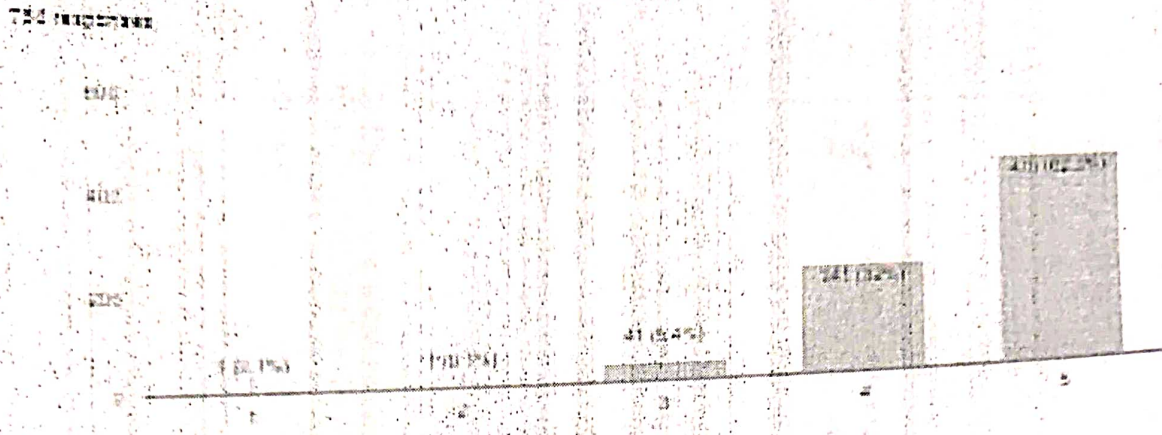


*[Handwritten Signature]*  
Principal

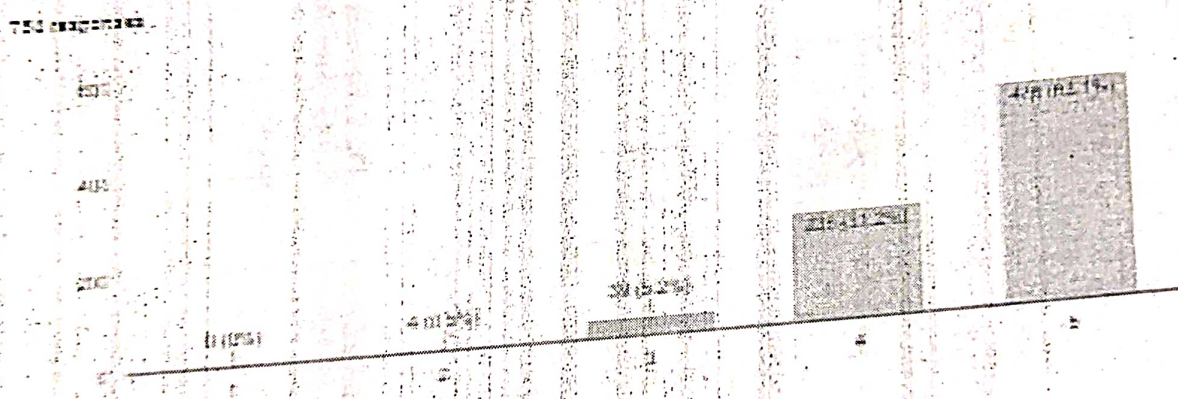


Feedback Section

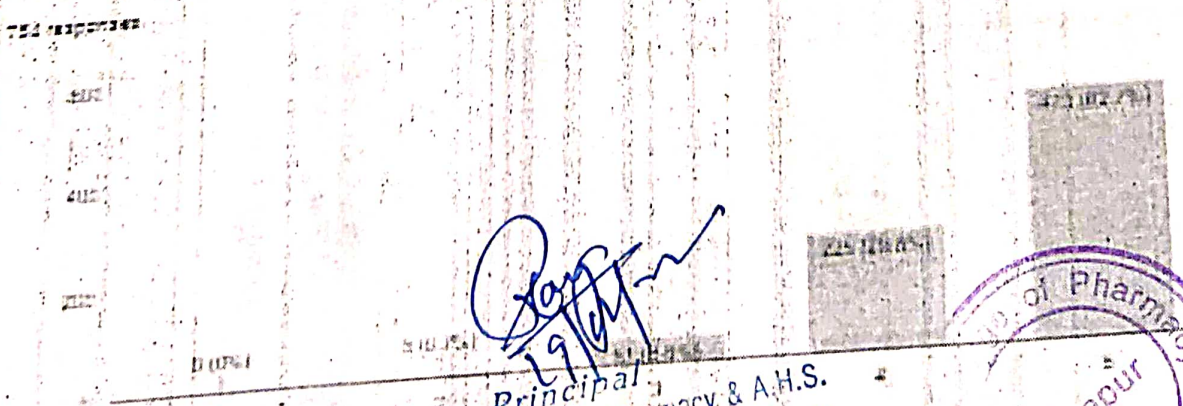
1. Relevance to various Pharmacy academic curriculum?



2. Was the webinar relevant to current social scenario?

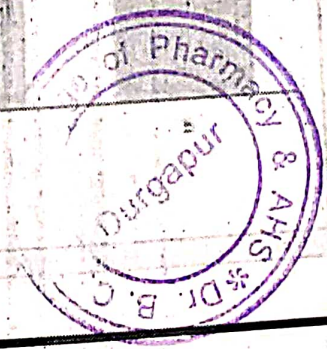


3. Was the webinar interactive to the participant?



*Signature*  
19/11/21

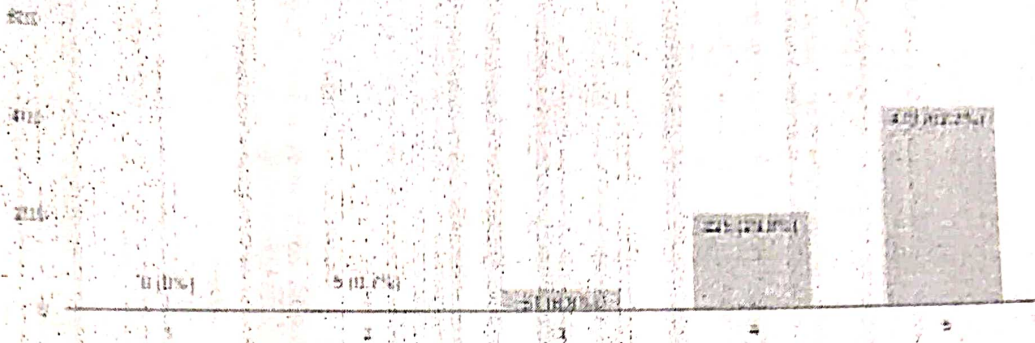
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3. Was the webinar interactive to the participant?

753 responses



4. Impact on environment and sustainability

753 responses



5. Applicability to enhance ethical principles in professional and social context

753 responses



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19/11/2021

Dr. B. C. Roy, M.S.,  
Bidhanagar, Durgam (2021)





# Protein cages: applications and opportunities post COVID-19

Sierin Lim

School of Chemical and Biomedical Engineering

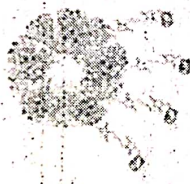
Webinar by Dr. B.C. Roy College of Pharmacy & Allied Health Sciences, Durgapur, India

6 July 2020



# External Modifications: Display

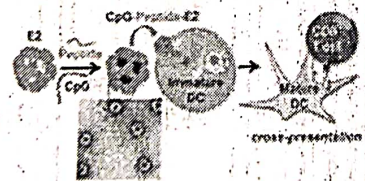
## Precise spatial control for multiple ligand display



### Targeting

- Antibody
- Antibody fragment
- Peptides

• SPACE: Skin Penetrating and Cell Entering  
 •  $\alpha$ -MSH: melanocyte stimulating hormone



### Immunomodulation

- Epitopes: malaria
- Peptides: CpG (in), gp100 (out)

Domingo GJ, et al. (2001) *JMB* 305 259-267  
 Molino LM, Wang SW, et al. (2013) *ACS Nano* 7 (11) 9743-9752  
 Duecheler JW, Um S\*, et al. (2015) *J Chem Technol Biotechnol* 20(7): 1230-1236



  
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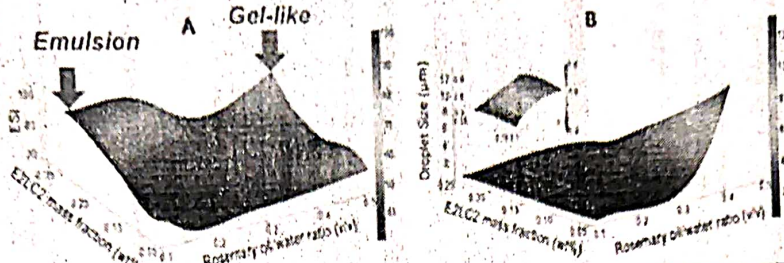




# Emulsion Stability Index at Different Compositions



Emulsion Stability Index (ESI) Droplet Size Profiling (DSP)



Colloidal system	Oil/water ratio (OWR) (v/v)	Protein mass fraction (PMF) (wt %)	Droplet size
Emulsion	1:9	0.35%	~300 nm
Gel-like	4:6		~3-4 $\mu\text{m}$

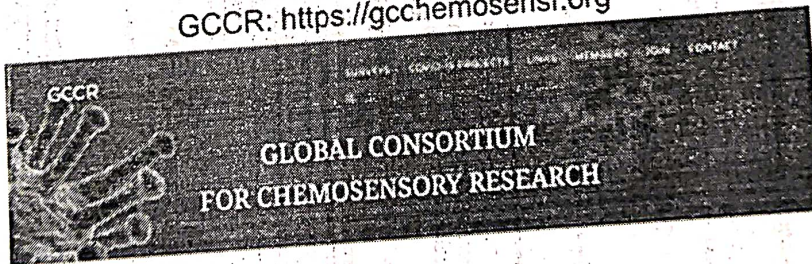
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# CoViD-19 and Molecular Senses



Some CoViD patients are suffering from the loss of sense of smell (anosmia) and taste (ageusia)  
 Studies in Iran, Italy, and USA

GCCR: <https://gcchemosensr.org>



Yan, C.H., et al., International Forum of Allergy and Rhinology, 2020.  
 Bagheri, S.H.R., et al., medrxiv, 2020.  
 Giacomelli, A., et al., Clinical Infectious Diseases 2020: p. ciaa330.

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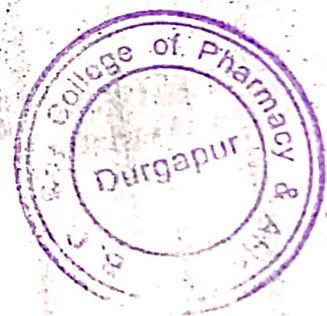
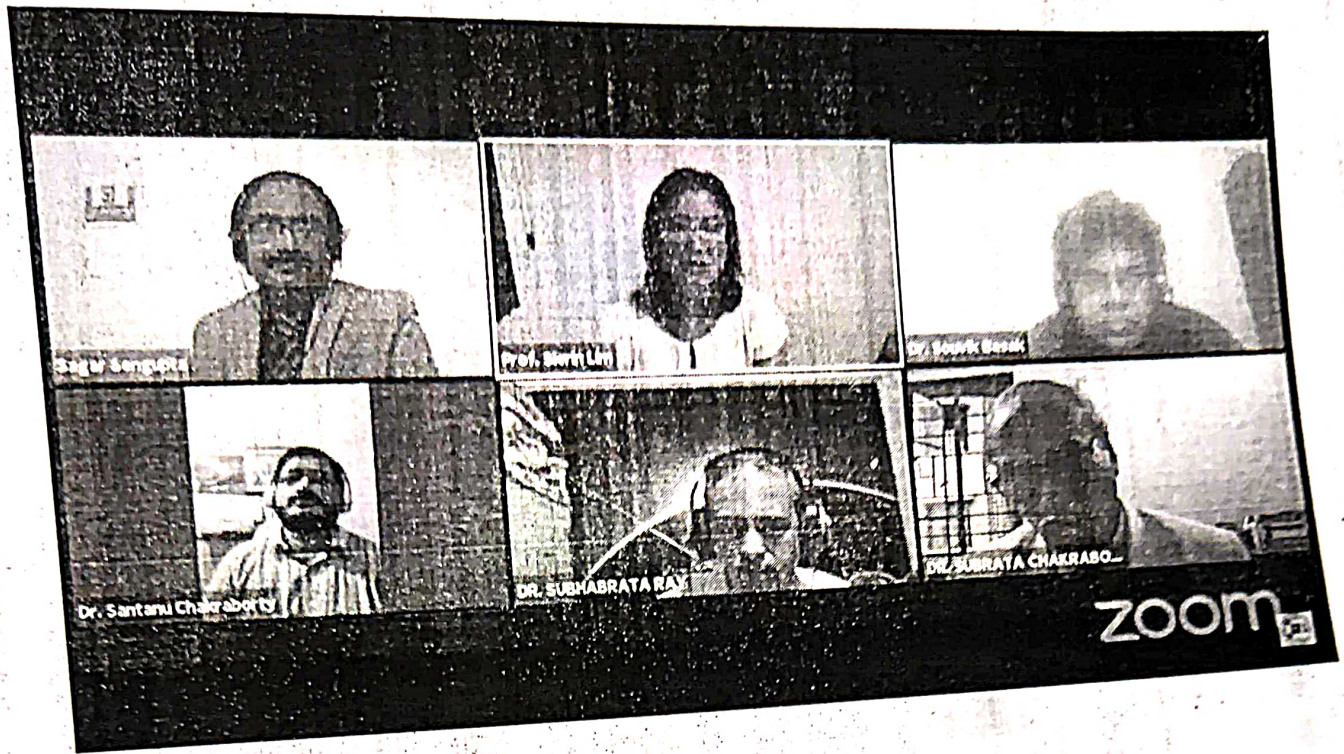
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## REPORT

1. Dr. Sierin Lim, Associate Professor, Nanyang Technological University, Singapore, discussed about Protein Cages: Opportunities and Applications post Covid 19. She shared her expertise in the field and provided insights about the future of Protein cages.
2. All faculty members of the Institute, students from Dr. B. C. Roy College of Pharmacy & AHS and students along with faculty members from other colleges also participated in the seminar. A total of 1243 participants joined the session and felt satisfied with the webinar.



Dr. Santanu Chakraborty

Seminar/ Workshop committee

(In-charge)



Dr. Sudip Kumar Mandal

Seminar/ Workshop committee

(Co-ordinator)



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