

## Department of Biotechnology

### Proforma for submission of progress reports for evaluation to Star status by colleges supported under Star College Scheme

1. Name of the College : **Institute of Home Economics, University of Delhi**
2. Name of Coordinator, Designation, Address, Phone nos.

**Dr. Sunita Aggarwal**  
**Associate Professor,**  
**Department of Microbiology, Institute of Home Economics, DU**  
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3. Assessment duration : **01/07/2017 to 30/06/2020**                      Duration in years : **3 year**

4. Details of Departments Supported:

S. No	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc) offered	Regular Faculty members		Adhoc/Guest
			Total =19		Total=28
			With Ph.D.	Without Ph.D.	
1	Biochemistry	B.Sc. (Hons) Biochemistry	01	-	06 (Ad-hoc)
2	Food and Nutrition & Food Technology	B.Sc. (Hons) Home Science B.Sc. (Pass) Home Science B.Sc. (Hons) Food Technology M.Sc. Food and Nutrition PG Diploma in Dietetics and Public Health Nutrition (PG DDPHN)	04	03	08 (Ad-hoc) 04 (Guest)
3	Fabric and Apparel Science	B.Sc. (Hons) Home Science B.Sc. (Pass) Home Science M.Sc. Fabric and Apparel Science	05	01	04 (Ad-hoc) 02 (guest)
4	Microbiology	B.Sc. (Hons) Microbiology	03	02	3 (Ad-hoc) 1 (Guest)

5. Number & Date of Advisory committee meeting: Yet to be conducted
6. Qualitative improvements due to DBT support. Please highlight 5 salient points (within 500 words).

The support from DBT under '**Star College Scheme**' led to significant qualitative improvement in terms of:

- **Development of outlook for scientific research and Data analytics**

The hands-on-training and availability of instruments and chemicals owing to star college helped the undergraduate students in undertaking a number of minor research projects. In all 45 minor projects were undertaken involving step by step learning approaches like literature survey, developing research methodology and resolving the functional issues while carrying out the experiments. The presentation of the project work at different forums did provide a sense of achievement to the students that also led to research publications by faculty and the students.

The projects undertaken by the students provided them an opportunity for data analytics using statistical tools. The interpolation and extrapolation was carried out on large samples collected as part of the research work enabling the students to deal with large database for more meaningful results

- **Experimental based approach for understanding the theoretical framework**

Prior to the DBT support, certain segments of the curricula were not supplemented with the hands on practical sessions. 103 new experiments were carried out in addition to the existing practicals in the curricula.

- **Student centric approach in laboratory experiments**

Students were motivated to do the practicals appropriately from reagent training and engaged regularly in troubleshooting while standardizing these modern techniques and methods. Such modern approaches allowed students to think objectively and build hypotheses that could culminate in novel projects. Skills development such as interactive communication, teamwork among the students was also observed.

- **Drill down approach for scientific learning**

There has been a substantial rise in our students' involvement in conferences, academic activities, and numerous contests. More than 100 conferences/seminars/workshops / trainings and alumni interactions were organised by various departments where students could imbibe a deep sense of learning from eminent academicians/scientists/ research scholars besides hands on drill down approach for undertaking the research projects. Students did experience a sense of accomplishment as they earn the prize and award during competitions. In all, students received more than five prizes in poster competitions hosted by different colleges or institutions.

- **Community outreach**

The community outreach did encourage dissemination of knowledge through videos on social media. Making of the fabric Masks for Covid times was a hugely successful

community outreach project that started in April 2020. Various styles and fabrics were used and students were taught neem extraction, as well as Curcumin based finish was applied. Among other activities were Nutritional assessment and counselling activities for nearly 300 elderly persons, youth, students, and representatives of media, legal services authority, international and national civil society organizations by our undergraduate students specializing in Food and Nutrition and also invitations to the school students to visit the college microbiology and biochemistry labs for first hand lab experience.

The DBT support not only led to realistic and life long learner training but did drive us to give back to the community by regularly engaging our faculty and students in different programs for the benefit of one and all.

7. Any Novel aspect introduced or planning to introduce during the Scheme duration.

**Two novel aspect were introduced during the scheme duration**

- **Learning by doing**

Following the concept of ‘Learning by doing’ students got an opportunity to follow an application based approach that did supplement the classroom learning. The students did work with Natural dyes and mordants which are the need of the hour as both the synthetic dye manufacturing as well as their application are not favourable for the environment load. This was linked to their employment opportunities at the cottage industry level as natural dye intermediaries and auxiliaries are largely used there. Business models of the cottage industry sector are being recognised more sustainable worldwide. The conventional practicals were made interesting by introducing new variant materials, alternative protocols, and altered experimental conditions along with the classic samples so that students were excited about the results received and could assess and conceptually conclude the results. The students did learn the impact of microbes in day to day life by carrying out microbial and biochemical analysis of samples drawn from food, air, water etc. It was a big surprise for the students to know how invisible organisms are an integral part of their life when they could see microbes on their ever shining palm, air they breath and food products they eat.

- **Leveraged information technology for virtual learning, a paradigm shift from classroom learning**

The unprecedented covid 19 made us leverage IT for the online teaching learning process. The faculty and students could learn working with new platforms Zoom,

Google classroom, Google meet, that did lead to seminars turning into webinars and classroom teaching to virtual learning.

As a sequel thereto, a number of webinars and webinar lecture series and online workshops were organised wherein research scholars/ academicians/scientists were invited from different institutions across the country and globe which otherwise would not have been possible but for a huge cost in terms of travelling and logistics.

**Going forward, it shall be our endeavor to explore the use of artificial intelligence (AI) as part of new research projects with DBT support**

8. Lessons learnt/difficulties faced/suggestions if any, in implementation of the programme and utilization of DBT grant. (Max 3 points within 300 words).

● **Improvement at the planning level for better execution of the activities planned as part of the star college scheme**

We believe that the year long work plan that is prepared for undertaking various activities during the year as part of Star College Scheme needs to align to the execution level. This would not only help in optimum utilization of DBT grant but would also help in inviting the best resource persons/experts on the chosen subject. Planning would be subject to periodical review and modification in sync with the changing situation. This would also help in fair assessment of the objectives achieved as part of Star College Scheme.

● **Overlapping of the star college activities with the academic schedule for each semester due to time constraints**

Since the academic schedule of the College/University is pre-decided that leaves very little scope for last minute adjustments, the Star College activity at time overlaps with the academic schedule. This adversely impacts the desired outcome from the given activity. In our pursuit to carry out maximum number of events/activities as part of the Star College Scheme, sometimes students do find it difficult to balance out such activities with academic curriculum.

● **Additional funds to strengthen the information technology framework including facilities for audio/video recording, security system etc.**

We believe a lot can still be done to achieve the objective of Star College Scheme by strengthening the information technology framework with additional grant from DBT Scheme. Initiative would include a forum for online virtual discussion among faculty/students and the domain experts with improved security systems. Efforts

would also be made to use IT tools to make the learning more innovative and interesting while remaining aligned with the ongoing research in the respective domain.

9. **Key performance indicators :**

S.No	Indicator	Pre-support (2014-2017)						During /After Support (2017-20)						Remarks
		Year	Total	SC	ST	OBC	Gen	Year	Total	SC	ST	OBC	Gen	
1	No. of students admitted (Females only)													
	Microbiology	2014-15	35	5	0	9	17	2017-18	42	7	2	13	15	
		2015-16	39	10	0	7	22	2018-19	33	4	0	11	14	
		2016-17	40	3	1	10	24	2019-20	32	5	0	6	14	
	Biochemistry	2014-15	30	6	0	9	15	2017-18	34	5	2	8	19	
		2015-16	34	4	0	7	23	2018-19	31	6	1	9	15	
		2016-17	35	5	0	10	20	2019-20	25	6	0	7	12	
	B. Sc. (Hons) Food Technology	2014-15	Course started in 2017	-	-	-	-	2017-18	42	0	0	11	30	
		2015-16		-	-	-	-	2018-19	74	13	0	16	41	
		2016-17		-	-	-	-	2019-20	35	11	0	5	13	
	PG DDPHN	2014-15	21	-	-	-	21	2017-18	24	0	0	7	17	
		2015-16	25	0	0	2	23	2018-19	25	2	0	3	19	
		2016-17	26	2	0	5	19	2019-20	20	0	1	4	15	
	M.Sc. Food and Nutrition	2014-15	19	2	1	5	11	2017-18	18	2	1	5	10	
		2015-16	15	0	0	3	12	2018-19	15	1	1	3	10	
		2016-17	18	3	1	3	11	2019-20	20	4	1	5	10	
	MSc FAS	2014-15	15	2	1	4	8	2017-18	15	2	1	4	8	
		2015-16	15	2	1	4	8	2018-19	15	2	1	4	8	
		2016-17	14	2	1	3	8	2019-20	9	2	0	2	5	

		Pre-support (2014-2017)			During /After Support (2017-20)			
2	No. of students passing out (%)	Department	Year	No.	Year	No.	.	
		Microbiology	2014-15	94 %	2017-18	100%		
2015- 16	97%		2018-19	100%				
2016-17	100%		2019-20	Result awaited				
Biochemistry	2014-15	100%	2017-18	100%				
	2015-16	100%	2018-19	100%				
	2016-17	100%	2019-20	Result awaited				
B.Sc. Food Technology	2014-15	Course started in 2017	2017-18	-				
	2015-16		2018-19	-				
	2016-17		2019-20	Result awaited				
PG DDPHN	2014-15	-	2017-18	83.3%				
	2015-16	100%	2018-19	80.0%				
	2016-17	76.92%	2019-20	Result awaited				
M.Sc. Food and Nutrition	2014-15	100%	2017-18	100%				
	2015-16	100%	2018-19	100%				
	2016-17	92.85%	2019-20	Result awaited				
M.Sc. FAS	2014-15	100%	2017-18	100%				
	2015-16	87.8%	2018-19	93%				
		<b>Pre-support (2014-2017)</b>			<b>During /After Support (2017-20)</b>			
		Microbiology	2014-15	40 %	2017-18	2.6%		

3	Drop-out rates (%)		2015-16	12%	2018-19	2.5 %		
			2016-17	23%	2019-20	9.5 %		
		Biochemistry	2014-15	15.7%	2017-18	NIL		
			2015-16	2.04%	2018-19	14.2%		
			2016-17	13.3%	2019-20	14.7%		
		M.Sc. FAS	2014-15	NIL	2018-19	NIL		
			2015-16	NIL	2019-20	13%		
		4	Number of students opting for M. Sc.	<b>Department</b>	<b>Year</b>	<b>No.</b>	<b>Year</b>	<b>No.</b>
Microbiology	2015-16			20/28	2017-18	18/29		
	2016-17			20/25	2018-19	25/30		
Biochemistry	2014			10/24	2017	13/26		
	2015			17/34	2018	23/28		
	2016			30/48	2019	17/30		
Food Nutrition & Food Technology					2018	25		
					2019	25		
<b>Pre-support (2014-2017)</b>					<b>During /After Support (2017-20)</b>			
5	Average marks	<b>Department</b>	<b>Year</b>	<b>No.</b>	<b>Year</b>	<b>No.</b>		
		Microbiology	2015-16	73%	2017-18	74.1%		
			2016-17	71%	2018-19	75.5%		
		Biochemistry	2014	68%	2017	73.8%		
			2015	74.4%	2018	73.9%		
			2016	73.4%	2019	69.6%		



		B.Sc. Food Technology		Course started in 2017	2018	9.4 (CGPA)			
		PG DDPHN	2017	73%	2018	75.6%			
		M.Sc. Food & Nutrition	2017	81%	2018	83.85%			
		M.Sc. FAS	2016	79%	2019	74.3%			
		<b>Pre-support (2014-2017)</b>			<b>During /After Support (2017-20)</b>				
<b>6</b>	<b>No. of hands-on experiments being conducted</b>	Microbiology		<b>124</b>	Microbiology	<b>132</b>	Annexure I		
		Biochemistry		<b>115</b>	Biochemistry	<b>135</b>			
		B.Sc. (Hons) Food Technology		<b>275</b>	B.Sc. (Hons) Food Technology	<b>275</b>			
		PG DDPHN		<b>50</b>	PG DDPHN	<b>50</b>			
		M.Sc. Food and Nutrition		<b>150</b>	M.Sc. Food and Nutrition	<b>150</b>			
		M.Sc. FAS		<b>57</b>	M.Sc. FAS	<b>61</b>			
		<b>Total No of hand-on expt introduced</b>		<b>NIL</b>	<b>Total No of hand-on expt introduced</b>	<b>32</b>			
<b>7</b>	<b>No. of new experiments introduced</b>	<b>Total = 0</b>			<b>Total= 103</b>			Annexure II	
		Microbiology:	Nil		Microbiology:	37			
		Biochemistry:	Nil		Biochemistry:	34			
		FNFT -	Nil		FNFT -	5			
		FAS-	Nil		FAS -	27			
<b>8</b>	<b>Publications (scopus)</b>	<b>Total=Publications : 44</b>			<b>Total= Publications : 43</b>				
		<b>Chapters : 2</b>			<b>Chapters : 6</b>				

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	<b>indexed) /patents, if any.</b>	Microbiology: Publications: 2 Biochemistry: Publications: 14 Chapters: 2 FNFT : 20 FAS : 8	Microbiology: Publications: 2 Chapters: 1 Biochemistry: Publications: 14 Chapters: 5 FNFT : 23 FAS : 4	Annexure III
<b>9</b>	<b>Training received by faculty</b>	<b>Total=19</b>	<b>Total =54</b>	Annexure IV
		Microbiology: 5 Biochemistry: 3 FNFT : 9 FAS: 2	Microbiology: 17 Biochemistry: 19 FNFT : 15 FAS: 3	
<b>10</b>	<b>Exhibitions/seminars/training courses conducted</b>	<b>Total= 18</b>	<b>Total= 42</b>	Annexure V
		Microbiology: 5 Biochemistry: 6 FNFT : 1 FAS: 6 Internships organized for (UG & PG students) ~ <b>85</b>	Microbiology: 15 Biochemistry: 10 FNFT : 8 FAS: 9 Internships organized (UG & PG students) ~ <b>130</b>	
11	<b>Book/journals subscribed from grants</b>	NIL	NIL	
12	<b>Outreach activities (Popular lectures)</b>	<b>Total= 5</b>	<b>Total= 23</b>	Annexure VI
		Microbiology: Nil Biochemistry- Nil FNFT 5 FAS Nil	Microbiology: 2 Biochemistry- 2 FNFT - 13 FAS- 6	

13	<b>Colleges mentored to apply for DBT Star College grants</b>	NIL	NIL	
14	<b>Invited lectures</b>	<b>Total = 15</b>		Annexure VII
		Microbiology: 3 Biochemistry- 3 FNFT - 7 FAS- 2	<b>Total = 54</b>	

## 10. Self evaluation

Department	*Objective (as stated in proposal)	% achieved	Reasons for underachievement / If achieved, state in quantitative metrics
Microbiology	<ul style="list-style-type: none"> <li>● To augment the Curriculum with add on practical sessions in the respective areas to abreast the students with latest procedures and techniques.</li> <li>● To create an interface between academics, research institutes and industries for one to one interaction among the experts, faculty and the students.</li> <li>● To augment/enhance knowledge of faculty and lab staff through training programmes</li> <li>● To inculcate scientific temperament and research culture for holistic development of the students.</li> <li>● To have better infrastructure and lab facilities with latest equipments for effective practical demonstrations, teaching- learning process &amp; research.</li> </ul>	90%	<ul style="list-style-type: none"> <li>● Time constraint</li> <li>● Delay in procurement of material</li> <li>● Lock down</li> <li>● Strike by non teaching staff</li> </ul>
Biochemistry	<ul style="list-style-type: none"> <li>● To augment the Curriculum with add on practical sessions in the respective areas to abreast the students with latest procedures and techniques.</li> <li>● To have better infrastructure and lab facilities with latest equipments for effective practical demonstrations,</li> </ul>	90%	<ul style="list-style-type: none"> <li>● Delay in procurement of materials</li> <li>● Strike by non-teaching and adhoc staff</li> <li>● Lockdown</li> <li>● Time constraint</li> </ul>

	<p>teaching- learning process &amp; research</p> <ul style="list-style-type: none"> <li>● To create an interface between academics, research institutes and industries for one to one interaction among the experts, faculty and the students.</li> <li>● To inculcate scientific temperament and research culture for holistic development of the students</li> <li>● To augment/enhance knowledge of faculty and lab staff through training programs.</li> </ul>		
FAS	<ul style="list-style-type: none"> <li>● To expose students to enhanced textile testing , dyeing -printing and finishing methods</li> <li>● To integrate science and technology with craft and design</li> <li>● To build an interface between classroom knowledge and industry by way of field visits, summer internships and outreach projects</li> </ul>	70-80%	<ul style="list-style-type: none"> <li>● Delay in procurement of materials, shorter academic sessions, strikes by non teaching staff .In totality in the period of 2017-20 there have been more number of beneficiaries than those stated in the proposal</li> </ul>
FNFT	<ul style="list-style-type: none"> <li>● To have better infrastructure and lab facilities with latest equipment for effective practical demonstrations, teaching- learning process &amp; research.</li> <li>● To create an interface between academics, research institutes and industries for one to one interaction among the experts, faculty and the students.</li> <li>● To inculcate scientific temperament and research culture for holistic development of the students.</li> </ul>	70 - 80%	<ul style="list-style-type: none"> <li>● Strikes by non-teaching staff and lockdown</li> </ul>

**11. 2 new dimensions that shall be added if accorded Star status (within 200 words).**

● **Digital learning**

In view of the changing dimension of teaching pedagogy because of online teaching and learning, it shall be our endeavor to create the digital teaching aids as part of digital learning. These aids would be used as tools for knowledge Resource Management whereby the knowledge would be shared not only at the classroom or national level but also at the international level with renowned experts and our illustrious alumni.

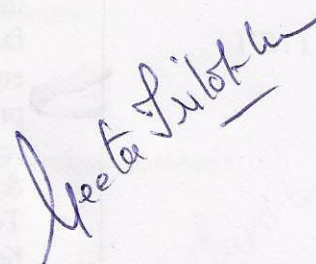
● **To work for 'Atmnirbhar Bharat'**

Responding to the call of 'Atmnirbhar Bharat', it shall be our endeavor to establish a state of the art central lab facility. The facility would be accessible to the PG and research scholars and would also provide the exposure to UG students to high end equipments and their use under the able guidance of the faculty. This would also help in carrying out interdisciplinary research in collaboration with other institutions and industry thus providing an opportunity to our research scholars for application based research as a part of self-reliance India and also to showcase their work at national/international forums.



**Course Coordinator**  
**(With Seal)**

Programme Coordinator  
DBT, Star College Scheme  
Institute of Home Economics  
(University of Delhi)  
F-4, Hauz Khas Enclave  
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**Head of the Institution**  
**(With Seal)**

Dr. Geeta Trilok-Kumar  
Director  
Institute of Home Economics  
(University of Delhi)  
F-4, Hauz Khas Enclave  
New Delhi-110016

**Proofs (For pts 6-14 from 2017-20)**

**Point 6 : Experiments mentioned in curriculum and converted from demo to hands on**

**Total No. 32 (Some are enlisted below):**

*(Details of all the experiments are given in Annexure I)*

1. Separation of albumin/globulin from serum using anion-exchange chromatography.
2. Continuous assay of lactate dehydrogenase.
3. SDS-PAGE analysis of proteins.
4. Isolation of lecithin, identification by TLC, and its estimation.
5. Serum/ urine MMA estimation.
6. Estimation of Size of DNA

**Point 7: New experiments introduced**

*(Details of all the experiments performed are given in Annexure II)*

**Total No. of new experiments introduced - 103 (Some are enlisted below):**

1. Plotting fungal growth curve using Radial growth curve method for *Aspergillus* and *Penicillium*.
2. Diauxic growth curve of bacteria (*E.coli*) using different carbon sources
3. Isolation of microflora from the fermented milk
4. Isolation of VAM fungi spores from soil samples
5. Growth of blue green algae, VAM inoculants & *Azolla* biofertilizer in lab
6. Grey Scale rating for colour fastness using Colour Matching cabinet
7. Assessment of geometric and physical properties of new generation fabrics like casein , soybean etc
8. Analysing microscopic structures of textile fibres using microscope with a camera
9. Study of new and used tea leaves as a dye, stain and a mordant
10. Analysis of absorption spectra of Tea
11. Application of Harad ( Terminalia Chebula) on cotton and silk by different mordanting methods
12. Estimation of para anisidine value
13. Estimation of total phenolic content.
14. Estimation of protein content by Folin's method.
15. Case studies on Food service establishment.
16. Estimation of serum electrolytes using chemical method.
17. Extraction of m-RNA and Reverse transcriptase PCR.
18. Complementation of  $\beta$ -galactosidase for Blue and White selection.
19. RFLP in Genetics.
20. Solvent perturbations for protein structure.
21. Effect of hydrogen peroxide and UV light on lymphocytes (PBMCs).

22. Progress curve of an enzyme (acid phosphatase).
23. Antioxidative enzymes activity in Neem and Papaya:
24. SDS page to separate human RBC membrane proteins.
25. Estimation of serum TSH levels using ELISA.

**Point 8 : Publications**

*(Details of all the publications are given in Annexure III)*

**Total - 43 (Some are enlisted below):**

1. Sudha, Gupta, C., Aggarwal, S. (2017) 'Optimization and extraction of extra and intracellular color from *Penicillium minioluteum* for application on protein fibers', *Fibres and Polymers*, Vol.18, No.4, 741-748 Impact factor: 0.531, ISSN No. ISSN 1229-9197 (print version) 1875-0052 (electronic version)
2. Seema Puri. Addressing Critical Failures in Infant and Young Child Feeding in India. *Annals Nutr Met.* 2019; 75:8-9. ISSN 0250-6807. Impact factor 2.85.
3. Urvashi Mehlawat, Tejmeet Kaur Rekhi, Seema Puri, Status of Breastfeeding at Birth and at 6 Months Amongst Mothers Residing in Urban Delhi-NCR. *Annals Nutr Met.* 2019;75:368-369.ISSN 0250-6807. Impact factor 2.85
4. Dangi, P., Chaudhary, N. & Khatkar, B. S. (2019). Rheological and microstructural characteristics of low molecular weight glutenin subunits of commercial wheats. *Food Chemistry*, <https://doi.org/10.1016/j.foodchem.2019.124989> (Impact factor - 5.3).
5. Dangi, P., & Khatkar, B. S. (2019). Extraction and purification of low molecular weight glutenin subunits using size exclusion chromatography. *Journal of Food Science and Technology*, 56(2), 951-956 (Impact Factor - 1.8)
6. Sablania, V.,& Bosco, S. J. D. (2018). Optimization of spray drying parameters for *Murraya koenigii* (Linn) leaves extract using response surface methodology. *Powder Technology*, 335, 35-41. (Impact factor: 3.849)
7. Sablania, V.,Bosco, S. J. D., Rohilla, S., & Shah, M. A. (2018). Microencapsulation of *Murraya koenigii* L. leaf extract using spray drying. *Journal of Food Measurement and Characterization*, 12(2), 892-901. (Impact factor: 1.649)
8. Vachher Meenakshi, Arora Kriti, Burman Archana, Kumar Bhupender. NAMPT, GRN, and SERPINE1 signature as predictor of disease progression and survival in gliomas. *J Cell Biochem.* 2020 Apr; 121(4):3010-3023. doi: 10.1002/jcb.29560. Epub 2019 Nov 11. PubMed PMID: 31710121. ISSN 1097-4644 Online IF-3.44.
9. Zafar Iqbal Bhat\*, Bupender Kumar\*, Savita Bansal, Afreen Naseem, Raj Ranjan Tiwari, G.D Sharma and M. Moshahid Alam Rizvi. Association of PARK2 promoter polymorphisms and methylation with colorectal cancer in North Indian population. (Volume 682, January, 2019, Pages 25–32, GENE) ISSN 0378-8981 IF 2.6



10. Bhupender Kumar\*, Zafar Iqbal Bhat\*, Savita Bansal, Sunil Saini, Afreen Naseem, Khushnuma wahabi, Archana Burman, Geeta Trilok Kumar, Sundeep Singh Saluja and M. Moshahid Alam Rizvi. Association of mitochondrial copy number variation and T16189C polymorphism with colorectal cancer in North Indian population. (Volume: 39 issue: 11, November 2017, Tumor Biology) ISSN: 1010-4283 (Print) IF-3.65
11. Taruna Kumari, Meenakshi Vachher, Savita Bansal, Rameshwar NK Bamezai and Bhupender Kumar. Association of mitochondrial T16189C polymorphism with risk of cancer and Type 2 diabetes mellitus - A meta-analysis. (Volume 482, July 2018, Pages 136-143, Clinica Chimica Acta) ISSN 0009-8981 Print IF-2.87

**Point 9 : Trainings received by faculty**

*(Details of all the training pgms received by faculty are given in Annexure IV)*

**Total No. - 54 (Some are enlisted below):**

1. FDP cum workshop on Climate across the curriculum: Resources for Integrating Climate Topics in Discipline- Specific Teaching 13-14th October, 2018 by □Sri Venkateswara College, DU
2. National Workshop on “Recombinant Proteins: Expression, Purification & Characterization” on 2<sup>nd</sup> July to 16<sup>th</sup> July 2019 by CIIDRET, South Campus, University of Delhi
3. Workshop on ‘Food and Environment’ organized by Centre for Disease Control and Harvard T.H. Chan School of Public Health at Public Health Foundation of India in September 2018
4. Science Communication Workshop organized by Indian National Science Academy and DBT Wellcome Trust India Alliance in September 2018
5. Workshop on ‘Capacity Building in Survey Research Methodology for Researchers and Faculty’ organized by ICMR-NIMS in October 2018
6. Workshop on ‘Metabolomics in Food and Nutrition Science Research: From Concepts to Application’ organized by Central University of Haryana, Mahendragarh in February 2019
7. Faculty Development Programme on ‘Paradigm Shift in Higher Education’ organized by IQAC, Lakshmbai College, University of Delhi/ Delhi on 16th - 21st April 2019
8. Workshop on ‘Research Methodology & Research Publication’ organized by NIFTEM, Sonapat, Haryana on 5th - 9th June 2019
9. MHRD-sponsored Online Faculty Development Programme on Advanced Concepts for Developing MOOCS organized by Teaching Learning Centre (TLC), Ramanujan College under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNTT) on 2nd - 17th July 2020
10. Online FDP on “Online Teaching-Learning Practices: Challenges & Solutions” from July 7- July 13, 2020. (Sponsored by DBT Star College Scheme Ministry of Science and

Technology, GOI) organized by The Department of Mathematics and Computer Science, Sri Guru Teg Bahadur Khalsa college Sri Anandpur Sahib

11. Workshop and course at IISER TVM where instructors from EMBL taught on NGS sequencing (Oxford NANOPORE MinIon and Illumina) during 10-17th January 2020.
12. Workshop on “Bioinformatics Training Program for the College Teachers” being organized by DBT-BTISNET Bioinformatics Centre at Sri Venkateswara College on July 27-28,2017.
13. Finalization Workshop on Life-Science Resources for teachers in higher Education” organised by National Resource centre for Education, National Institute of Educational Planning and administration (NIEPA) during January 16-17, 2020.

**Point 10 : Exhibitions/seminars/training courses conducted**

*(Details of all the Exhibitions/seminars/training courses conducted are given in annexure V)*

**Total No. - 40 (Some are enlisted below):**

1. Two day conference on ‘Microbiology -Current Challenges & Future trends
2. Two day workshop on IPR: its genesis, significance and compliance.
3. Panel Discussion on “Emerging Concerns in Food and Nutrition
4. Workshop on “Role of Food in Prevention and Management of Cancer”
5. 10 day training in Bureau Veritas , an accredited textile testing lab
6. Webinar on “ Sustainability in textiles and apparel
7. Webinar on Garment laundry and finishing equipments by Ramsons
8. Workshop on “Moodle: an online learning management system”.
9. Lecture series on “Understanding lifestyle disorders: A biochemical perspective”
10. Workshop on “PCR and ELISA: Techniques in molecular Biology and Immunology”
11. Workshop on “Introduction to Clinical Biochemistry”.
12. An international symposium “Replacing Regulatory Experiments on Animals: Introduction to In Silico Models and In Vitro Test Methods” (in association with People for Ethical Treatment of Animals (PETA).

**Point 12 : Outreach activities**

*(Details of all the outreach activities conducted are given in Annexure VI)*

**Total No. - 23 (Some are enlisted below):**

1. Training to Class X Students of Govt. school on ‘Basic techniques in Microbiology
2. Students performed street play on ‘Health eating practices’ outside Hauz Khas Metro station
3. Awareness activities for college students on ‘Importance of Breastfeeding’ during World Breastfeeding Week

4. Nutritional assessment and counselling activities conducted at Intergenerational Mela organized by National Institute of Social Defence, Ministry of Social Justice & Empowerment, Govt. of India, in association with Anugraha at Shahdara Courts, Delhi
5. Application of natural black dye on khadi and handloom denim for Denim Club of India
6. Testing compatibility of CMC-TKP with fermented dye with Rudra Agrotech
7. Community outreach of making of fabric masks in different styles and fabrics
8. Community outreach activity on selection of fabrics as per season for children with Scope plus
9. A one day outreach programme was organized for school students on "Unravelling the mystery of DNA" on 19<sup>th</sup> August 2019.

**Point 14 : Invited lectures**

*(Details of all the Invited Lectures conducted are given in Annexure VII)*

**Total No. - 54 (Some are enlisted below):**

1. United nations and its microbiology agenda in global health
2. Food Safety: Global Prospect & India's Strategy
3. ICMR efforts to combat Anti -Microbial Drug Resistance
4. Solving the nutrition problem through Food Fortification
5. Edible oil blends: some insights
6. Field Innovations to Field Businesses: Ideas, Markets and Consumers
7. Personalized Nutrition: Holistic Principles and Algorithms
8. Measuring Carbon footprints in Garment Industry
9. Herbal antimicrobial finishes on textiles
10. Extraction of fibre from Bagasse
11. Emerging certifications and standards in textile wet processing industry
12. Nanobiotechnology: Drug delivery for cancer
13. Hemoglobin: Its significance
14. Prognostic and Therapeutic Relevance of Cysteine Cathepsins in Myeloid Leukemia
15. Role of MHC Complex in Biology and Medicine

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