



3.2 Innovation Ecosystem

3.2.1 Central Instrumentation Facility

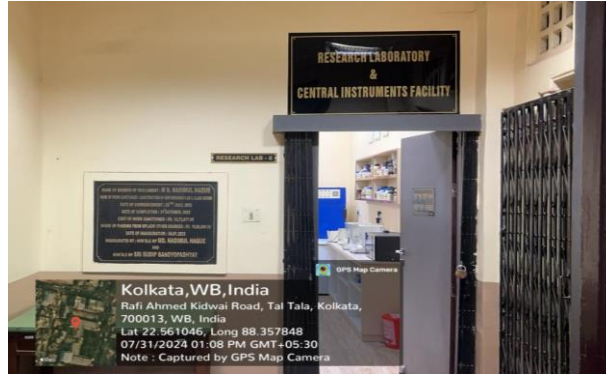
The Central Instrumentation Facility is a state-of-the art laboratory facility which provides researchers (both students and faculty members) access to the major instrumental needs under one roof as shared resources which reduce the cost and enhance productivity. The Central Instrumentation facility of Maulana Azad College is located on the first-floor main building adjacent to the Post Graduate Department of Zoology. The facility was in place under the Department of Zoology for a long time, however it got a facelifting with a generous funding from the State Government as well as through procurement of key instruments from Central Government projects such as DST-FIST and DBT-STAR College scheme and got revamped to a full-fledged Central Instrumentation Facility in January, 2023. The facility houses key instruments for biological research including UV-Vis spectrophotometer, Gel documentation Unit, Thermal Cycler, Carbon dioxide incubator, Laminar flow hood, Binocular microscope, Protein and DNA electrophoresis apparatus, centrifuge, pH meter and many other instruments of daily need. The instruments are regularly used by the students and research scholars from the Departments of Zoology, Botany and Chemistry. They are also used from time to time by research scholar and faculty members of other institutes. The instruments present cater for diverse research needs such as experiments in molecular biology, cell biology and protein purification.

In addition to the Central Instrument facility, the individual science departments also have their own laboratories. A fluorescence microscope installed at the Department of zoology caters for the need of faculty members of all disciplines of the institute. There is a sophisticated instrumentation facility at the Department of Chemistry including FT-IR with ATR facility for analysis of liquid samples along with hydraulic press for preparation of pellets, Peltier controlled UV-Vis spectrophotometer, low temperature bath, rotary evaporator with lyophilize, analytical balance (4 decimal places), digital melting temperature analysis bath etc. The department of physics has both basic and high-end instruments such as the cathode ray oscilloscope, digital storage oscilloscope, OP-AMP set up, polarimeter etc. A part of the facility under the Department of Botany functions doubly as the innovation and incubation hub of the college. The Department has a high-end fluorescence microscope, a stereo zoom microscope, a cold centrifuge amongst many others. The Department of Microbiology houses a lyophilizer, a thermal cycler, a table top cold centrifuge, a fraction collector with peristaltic pump and a phase contrast microscope.

The instruments at these facilities are integral to the execution of student research both under CBCS and CCF curriculum of the University of Calcutta at the various science departments. They are also frequently employed by the faculty members of both Maulana Azad College and other Institutions for their own research activities. Following is the list of key instruments along with their pictures installed at the Central Instrumentation Facility and the other science departments.



The Central instrumentation Facility at Maulana Azad College



Key instruments installed at the Central Instrument Facility and the Department of Zoology



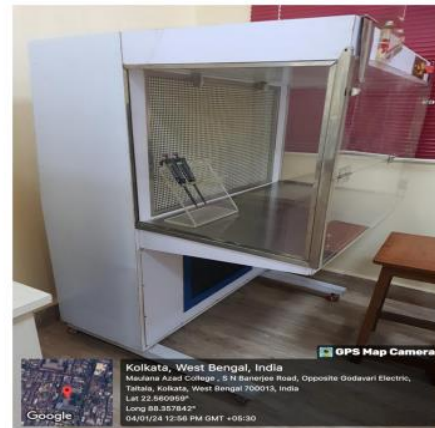
SDS PAGE Apparatus



Weighing machines



Colorimeter



Biosafety cabinet



UV-Vis Spectrophotometers



Cold centrifuge and GEL DOC



Dancing shaker and ELISA PLATE Reader



Incubator



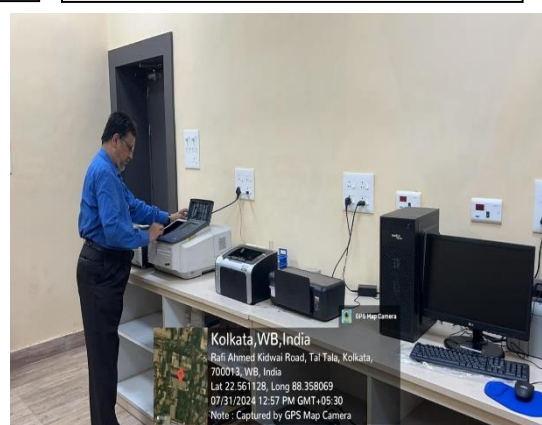
Fluorescence microscope with attached image acquisition software



Phase contrast microscope with attached image acquisition software



Cell and tissue culture facility with carbon di oxide incubator and laminar flow hood



The UV-Vis spectrophotometer at the Central Instrumentation Facility



Key instruments installed at the Department of Chemistry



A faculty member of the Department of Chemistry giving a demonstration of pellet making for FTIR analysis to the students and working in the spectrofluorimeter



Hydraulic Press facility for making the pellets



A faculty member explaining acquisition of spectrum in FTIR to students



Key instruments installed at the Department of Physics



Polarimeter



Digital storage oscilloscope



Cathode Ray Oscilloscope



Planck's Constant Apparatus



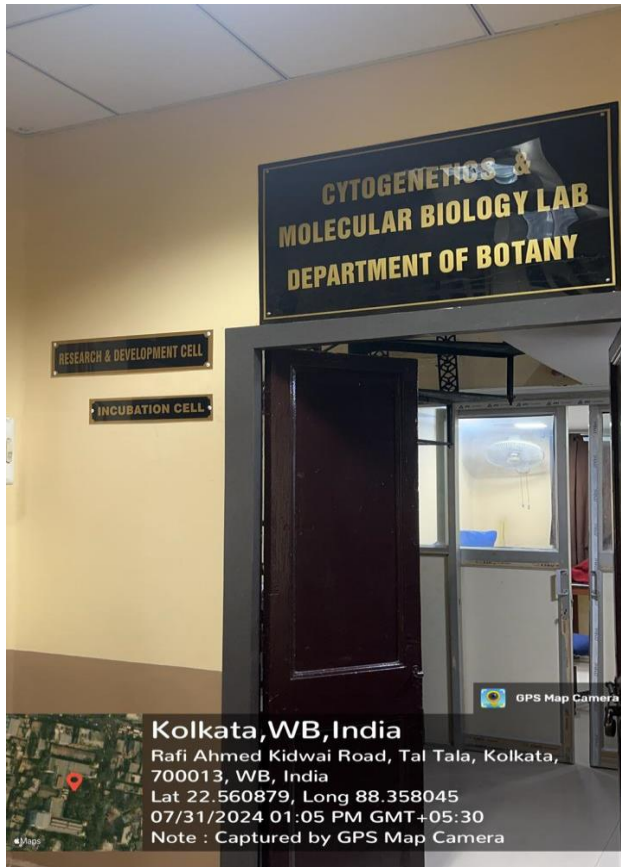
OP-AMP Set up



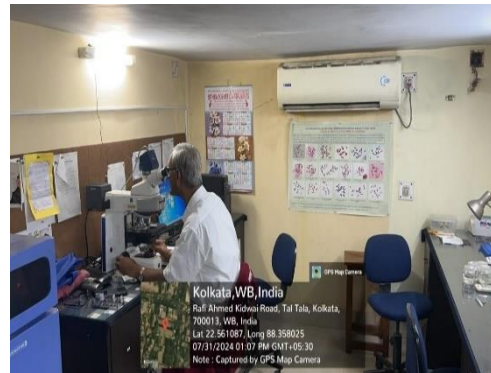
Gouy's balance Set up



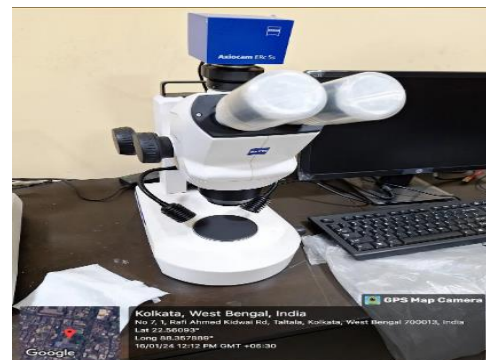
Key instruments installed at the Department of Botany



A wing of the Department of Botany has been converted to Incubation Cell



A Faculty member working on Chromosomal analysis using fluorescence microscope



Microscope with photographic attachment



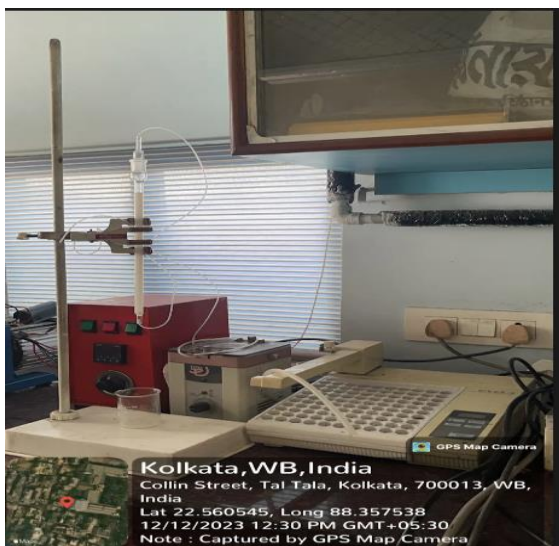
Stereo zoom microscope



UV-Vis spectrophotometer



Key instruments installed at the Department of Microbiology



Students engaged in loading a protein in the Sephacryl S200 gel filtration column fitted to a fraction collector and driven by a peristaltic pump



Thermal Cycler apparatus



Biorad powerpack for protein gel electrophoresis



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Website: <https://maulanaazadcollegekolkata.ac.in>



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560679, Long 88.357568
12/11/2023 01:31 PM GMT+05:30
Note : Captured by GPS Map Camera

Autoclave



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560610, Long 88.357599
12/11/2023 01:31 PM GMT+05:30
Note : Captured by GPS Map Camera

Biosafety Cabinet



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560473, Long 88.357621
12/11/2023 12:47 PM GMT+05:30
Note : Captured by GPS Map Camera

Hermle Cold centrifuge



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560505, Long 88.357524
12/11/2023 12:43 PM GMT+05:30
Note : Captured by GPS Map Camera

Zeiss phase contrast microscope



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560736, Long 88.357589
12/11/2023 01:33 PM GMT+05:30
Note : Captured by GPS Map Camera

pH and conductivity meter



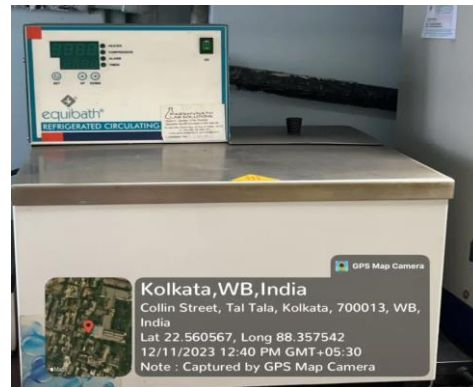
Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560559, Long 88.357570
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Note : Captured by GPS Map Camera

UV-Visible spectrophotometer



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560534, Long 88.357545
12/11/2023 12:39 PM GMT+05:30
Note : Captured by GPS Map Camera

Lyophilizer/free dryer instrument



Kolkata, WB, India
Collin Street, Tal Tala, Kolkata, 700013, WB, India
Lat 22.560567, Long 88.357542
12/11/2023 12:40 PM GMT+05:30
Note : Captured by GPS Map Camera

Refrigerated circulating water bath



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Representative pages of log book entry at Central Instrumentation Facility

S.NO.	DATE	TIME (ENTRY)	TIME (EXIT)	DEPARTMENT	PURPOSE	NAME	SIGNATURE
1.	06.01.2020	11:45 am	3:00 pm	Zoology	Weight machine	Eetondyuti Chakraborty	E. Chakraborty
2.	02.01.2020	12:00 pm	5:30 pm		Spectrophotometer	Sudipta Banerjee	SBS
3.					Centrifuge	Taniya Mondal	Taniya Mondal
4.	02/01/2020		4:00 pm		Weight Machine	Soubhik Das	Soubhik Das
5.	07/01/2020	1 pm	2 pm		Gel ZOE	Nabavita Ghosh	Nyasha
6.	09/01/2020	12:30 pm	3:00 pm		Spectrophotometer	Poulami Dey	P. D.
7.	28/01/2020	12:45 pm	3:00 pm		Weight machine	Surovi Mondal	Surovi Mondal
8.	28/01/2020	12:45 pm	2:30 pm		Weight machine	Shreya Das	Shreya Das
9.	28/01/2020	2 pm	4 pm		Spectrophotometer	Nabavita Ghosh	Sour
10.	01/02/2020	01:00 pm	2:50 pm		Centrifuge	Pratip Mukherjee	P. M.
11.	04/02/2020	01:00 pm	2:45 pm		Centrifuge	Anulava Bera	Anulava Bera
12.	08-02-2020	01:15 pm	3:00 pm		Computer use	Santosh Dasgupta	Santosh Dasgupta
13.	18-02-2020	11 am	1 pm		ELISA Reader	Nabavita Ghosh	Nyasha
14.	16-02-2020	12:30 pm	3:15 pm		Weight machine	Subhanyu Ghosh	S. Ghosh
15.	18-02-2020	12:45 pm	3:20 pm		Computer use	Tarjita Das	T. Das
16.	18-02-2020	2:30 PM	3:30 PM		Weight machine + Spectro	Akhilak Mukherjee	A. Mukherjee
17.	24-02-2020	12:05 PM	3:10 PM	Microbiology	Fluorescence Microscope	Samanta Prasad Banik	S. Prasad Banik
18.	25-02-2020	12:10 PM	2:10 PM	Microbiology	Fluorescence Microscope	Samanta Prasad Banik	S. Prasad Banik
19.	27-02-2020	11:30 AM	3:25 PM	Microbiology		Rishi Roy	R. Roy
20.	3-03-2020	12:00	3:30 pm	Microbiology		Somnath Mondal	S. Mondal
21.	9-3-2020	11:30 AM	12:00 PM	Microbiology		Arindam Das	A. Das
22.	11-3-2020	12:00 pm	3:30 pm	Microbiology		Sourav Mondal	S. Mondal

Representative pages of log book entry of Instruments at Dept. of Chemistry

S.No.	Date	Time	Name of the person	Signature
101.	10.05.2017	4 pm - 6 pm	Ambarish Ray	A. Ray
102.	17.05.2017	3 pm - 4 pm	"	"
103.	18.05.2017	4 pm - 6 pm	"	"
104.	16.06.2017	4 pm - 5 pm	"	"
105.	23.06.2017	10 am - 12 noon	"	"
106.	04.09.2017	4 pm - 6 pm	Nabavita Ghosh	Nyasha
107.	11.09.2017	4 pm	Sanjiv Das	S. Das
108.	18.09.2017	3 pm	"	"
109.	25.09.2017	4 pm	"	"
110.	15.01.2018	3 pm	"	"
111.	02.01.2018	4:00 pm	"	"
112.	04.06.2018	4:30 pm	"	"
113.	17.06.2018	11 AM	Nabavita Ghosh	Nyasha
114.	25.06.2018			
115.	20.09.2018	3:00 pm	Dr. Prabir Kumar Das	P. K. Das
116.	20.09.2018	3:05 pm	Dr. Sanjiv Kumar	S. K.
117.	21.08.2019	3:15 pm	Dr. Akhilesh Mukherjee	A. Mukherjee
118.	05.02.2020	2:25 pm	Ahona Das	A. Das
119.	05-02-2020			
119.	19.04.2022	3:20 pm	Dr. Dipak Kumar Som	D. Som
120.	20.04.2022	2:10 pm	Nabavita Ghosh	Nyasha
121.	04.07.2023	2:15 pm	Nabavita Ghosh + 2	Nyasha
122.	10.07.2023	1:30 pm	Sudipta Chakraborty	S. Chakraborty
123.	11.07.2023	1:30 pm	Sudipta Chakraborty	S. Chakraborty
124.	07.08.2023	2:00 pm	Ronit Sarkar	R. Sarkar

Copy of log book for FT-IR

187.	22.11.2017	8:40 - 5:00 pm		
188.	23.11.2017	4:00 pm - 5:00 pm		
189.	25.11.2017	2:40 pm - 3 pm		
190.	05.12.2017	12:00 pm - 1:00 pm		
191.	5.12.2017	3:00 pm - 4:30 pm		
192.	6.12.2017	3:00 pm - 4:00 pm		
193.	7.12.2017	12:00 pm - 3:00 pm		
194.	7.12.2017	3:00 pm - 4:00 pm		
195.	8.12.2017	3:00 pm - 4:30 pm		
196.	8.12.2017	4:30 pm - 4:40 pm		
197.	22.12.2017	12:00 pm - 2:30 pm		
198.	3.01.2018	3:40 pm - 4:45 pm		
199.	5.01.2018	4:00 pm - 4:15 pm		
200.	8.1.2018	2:15 pm - 2:45 pm		
201.	10.1.2018	3:30 pm - 3:45 pm		
202.	16.1.2018	1:55 pm - 2:00 pm		
203.	02.02.2018	3:00 pm - 4:00 pm		
204.	08.02.2018	4:30 pm - 5:30 pm		
205.	13.02.2018	12:30 pm - 3:30 pm		
206.	21.02.2018	1:00 pm - 4:10 pm		
207.	28/02/2018	2:00 pm - 4:00 pm		
208.	01/03/2018	2:45 pm - 3:15 pm		
209.	08/03/2018	4:15 pm - 5:00 pm		
210.	14-03-2018	3 - 4:30		
211.	21/3/18	2:15 - 3:30		
212.	29/3/18	1:45 - 4:10		
213.	3/4/18	4:20 - 4:50		
214.	10-04/2018	2:50 - 3:20 PM		
215.	19.04.2018	12:40 - 2:00 PM		
216.	25.04.2018	3:40 pm - 4:15 pm		
217.	16.05.2018	4:30 pm - 5:00 pm		
218.	04/05/18	3:15 - 4:30 pm		
219.	19/05/18	11:00 - 12:15 PM		
220.	24/05/18	11:45 AM - 1:30 PM		
221.	28/07/18	12:00 - 12:10 PM		
222.	04-08-2018	12:00 - 3:05		
223.	08-08-2018	2:00 - 4:00 PM		

Copy of log book for Spectrofluorimeter



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List of significant publications (2018-23) using the in-house instruments of Central Instrumentation facility and Other Departments

Details of the publications	JCI Impact Factor during the year of publication	Name of the faculty member and student involved	In-house instrument used	Department where the instrument is installed
Trehalose mediated stabilisation of cellobiase aggregates from the filamentous fungus <i>Penicillium chrysogenum</i> Journal name- International Journal of Biological macromolecules (2019) https://doi.org/10.1016/j.ijbiomac.2019.01.062	5.162 (2019)	Samudra Prosad Banik, Avishek Ghosh	Column chromatography apparatus and fraction collector, Protein gel Electrophoresis apparatus, Cold Centrifuge	Microbiology
			Fluorescence spectrophotometer	Chemistry
Ribosylation induced structural changes in Bovine Serum Albumin: understanding high dietary sugar induced protein aggregation and amyloid formation Journal Name- Heliyon (2020) https://doi.org/10.1016/j.heliyon.2020.e05053	3.4 (2020)	Samudra Prosad Banik, Avishek Ghosh	Column chromatography apparatus and fraction collector, Protein gel Electrophoresis apparatus, Cold Centrifuge	Microbiology
			Fluorescence spectrophotometer	Chemistry
Glutathione-selective “off-on” fluorescence response by a probe-displaced modified ligand for its detection in biological domains Journal Name- New Journal of Chemistry (2019) https://doi.org/10.1039/C8NJ05784B	2.7	Sanju Das	FT-IR	Chemistry
Highly sensitive colorimetric and fluorescent pH sensor of physiological interest (2023) Journal Name - Materials Today: Proceedings	Cite score 4.9 (2023)	Sanju Das	FT-IR	Chemistry
A facile potassium 18-crown ether catalysed synthesis of 2,6-dicyanoaniline and 3-amino-9,10-dihydrophenanthrene -2,4 dicarbonitrile and their in vitro intercalation study on calf thymus DNA Journal name- Synthetic communications (2021) https://doi.org/10.1080/00397911.2021.1980807	1.8	Arijit Kundu	Fluorescence spectrophotometer and UV-Vis spectrophotometer	Chemistry
TNFR2 mediated TNF- α signaling and NF- κ B activation in hippocampus of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine treated mice. Journal name- Neuroscience Research DOI: 10.1016/j.neures.2018.02.007	2.4	Nabanita Ghosh	Fluorescence microscope and Gel-Documentation Unit	Zoology
Study of Microglial and Astroglial Alterations Induced by Acute 1-Methyl- 4-Phenyl- 1,2,3,6-Tetrahydropyridine Treatment in Mouse Brain. Journal name- Proceedings of Zoological Society doi.org/10.1007/s12595-019-00296-4		Nabanita Ghosh	Gel documentation unit and fluorescence microscope	Zoology
Anti- fibrotic effect of black tea (Camellia sinensis) extract in experimental pulmonary fibrosis. Journal name- Tissue and Cell (2019) https://doi.org/10.1016/j.tice.2018.11.006	1.837	Subir C. Dasgupta	Fluorescence microscope, Phase Contrast Microscope, Carbon di-oxide incubator	Zoology
Interrelation between Surface Wax Alkanes from Red Kidney Bean (<i>Phaseolus vulgaris</i> L.) Seeds and Adzuki Bean Weevil [<i>Callosobruchus chinensis</i> (F.)] (Coleoptera:		Abhishek Mukherjee	FT-IR	Chemistry



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Bruchidae) Journal Name: Legume Research - An International Journal (2021) https://arccjournals.com/journal/legume-research-an-international-journal/LR-4420				
Karyotype Analysis from Aerial Roots of <i>Piper nigrum</i> Based on Giemsa and Fluorochrome Banding Journal Name- Cytologia (2019) https://doi.org/10.1508/cytologia.84.3.13	1.027	Timir Baran Jha	Fluorescence Microscope	Botany
Evaluation of karyotype diversity in Indian traditional aromatic rice cultivars through EMA-based non-fluorescent Giemsa and fluorescent DAPI staining Journal name – Genetic Resources and crop evolution (2023) https://doi.org/10.1007/s10722-023-01696-4	1.6	Timir Baran Jha	Fluorescence Microscope	Botany
Critical Review on Karyotype diversity in Lentil based on Classical and Molecular Cytogenetics Journal name- Molecular Biology Reports (2022) https://doi.org/10.1007/s11033-022-07441-x	2.316	Timir Baran Jha	Fluorescence Microscope	Botany
Karyotype diversity in Cultivated and Wild Indian Rice through EMA based Chromosome analysis Journal name: Journal of Genetics (2021) https://pubmed.ncbi.nlm.nih.gov/34787116/	1.3	Timir Baran Jha	Fluorescence Microscope	Botany
Analysis of CMA-DAPI bands and preparation of fluorescent karyotypes in thirty Indian cultivars of <i>Lens culinaris</i> Journal name- Caryologia (2021) https://doi.org/10.36253/caryologia-919	0.690	Timir Baran Jha	Fluorescence Microscope	Botany
Evaluation of morphological traits, fluorescent banding and rDNA ITS sequences in cultivated and wild Indian Lentil Journal name - Genetic Resources and Crop Evolution (2021) https://doi.org/10.1007/s10722-021-01234-0	1.6	Timir Baran Jha	Fluorescence Microscope	Botany