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Report on the "Two-Day National Workshop -cum- Hands on Training on Genomics, Proteomics, and Bioinformatics Tools and Technologies: Applications from Institute to Industry
Organized by : The Department of Zoology, Jamshedpur Co-operative College
In Collaboration with: DNA Labs CRIS, Dehradun
Sponsored by: The Department of Higher and Technical Education, Government of Jharkhand
Of Dates: 9th and 10th May 2025

Submitted by:
Dr. Swati Soren
Convenor/ Organizing Secretary
Assistant Professor
Department of Zoology

The Department of Zoology, Jamshedpur Co-operative College successfully conducted a two-day National Workshop cum Hands-on Training on "**Genomics, Proteomics and Bioinformatics Tools and Technologies: Applications from Institute to Industry**," held on **9th and 10th May 2025**. This academic initiative was sponsored by the **Department of Higher and Technical Education, Government of Jharkhand**, in collaboration with **DNA Labs CRIS, Dehradun**, a leading research and diagnostics institute in molecular biology. The two-day national workshop witnessed an overwhelming response with a total of **122 registered participants**, reflecting the growing interest in interdisciplinary applications of genomics, proteomics, and bioinformatics. Notably, the participation extended beyond the boundaries of Jharkhand, attracting attendees from **Bihar, West Bengal, Uttar Pradesh, and Uttarakhand**, thereby affirming the event's stature as a **truly national academic gathering**. This diverse representation brought together students, research scholars, and faculty from various institutions across the country, fostering a dynamic platform for academic exchange and collaborative learning.

Day 1: 9th May 2025: The program commenced promptly at **7:00 a.m.** with **desk registration** at **Jamshedpur Co-operative College**. Our dedicated student volunteers coordinated the welcoming and registration process, ensuring smooth onboarding of all participants. Simultaneously, **breakfast** was served from **7:30 a.m. to 8:45 a.m.** The college campus served as the central venue for all catering, registration, and practical sessions.

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By **8:45 a.m.**, all registered participants proceeded to **XLRI LH-33 Hall**, where the **inaugural and felicitation ceremony** took place.

Inaugural Session

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The program commenced with the **traditional lamp lighting ceremony**, symbolizing the enlightenment of knowledge and the beginning of academic pursuit. The **inaugural session was gracefully hosted by Dr. Antara Kumari, Dr. Ruchika Tiwary, Sri K.Eswar Rao**, whose eloquence and coordination added significantly to the decorum and smooth flow of the proceedings. The **Chief guest** of the session was **Professor Dr. Shivanand Singh**, Hon'ble Vice-Chancellor, **Srinath University, Adityapur**, accompanied by **Dr. Amar Singh**, Principal of Jamshedpur Co-operative College. The lamp lighting was performed by all esteemed dignitaries, including the invited scientists from DNA Labs CRIS, Dehradun: **Dr. Narotam Sharma Managing Director , Scientist & Head DNA Labs at CRIS- Centre for Research and Innovative Studies in Dehradun , Dr. Ankita Singh Assistant Professor at UIT , Uttarakhand University , Dehradun and Junior Scientist & Quality Control Manager at DNA Labs.** , and along with resource persons we had **Dr. Ramesh Kumar Singh Scientist, Samvet Bharat and Research Assistant Mr. Jagjeet Singh from DNA Labs.**

The ceremony began with the rendition of the **Kul Geet of Kolhan University**, melodiously presented by students of Jamshedpur Co-operative College.

Welcome Address

Following this, a **welcome address** was delivered by **Dr. Amar Singh, Principal**, wherein he highlighted the college's growing interest in bridging the academic gap between biology with industrial research. He emphasized that this workshop would enable students and educators alike to develop a hands-on understanding of techniques in genomics and proteomics—fields that are revolutionizing personalized medicine, diagnostics, and biotechnology.

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Felicitation

Professor Dr. Shivanand Singh, Hon'ble Vice-Chancellor, **Srinath University, Adityapur** ,in his special address, elaborated on the vital role of **bioinformatics and biostatistics** in modern biological sciences. He highlighted how the integration of data science with genomics helps in disease prediction, drug development, and evolutionary biology, while also encouraging young scholars to embrace interdisciplinary approaches in scientific research.

About the workshop & Introduction of Resource Persons

I, as **Dr. Swati Soren, Convenor -cum- Organizing Secretary** had the privilege to welcome all to this Scientific workshop dedicated to the dynamic fields of Genomics, Proteomics & Bioinformatics-disciplines that were transforming our understanding of biological systems at an unprecedented scale. As research advances, the integration of these fields continues to drive innovative in molecular biology, personalized medicines, and computational biology.

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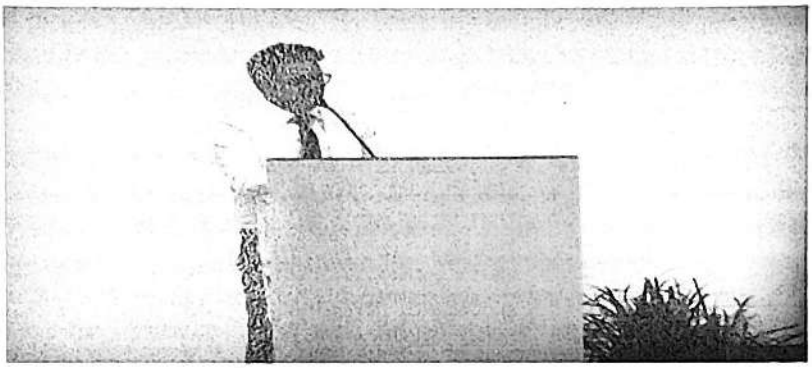
Special Address by Dr. Narotam Sharma



Dr. Narotam Sharma delivered an enlightening address where he emphasized the transformative role of **Genomics and Proteomics** in today's research landscape. He spoke about the integration of next-generation sequencing, molecular diagnostics, and high-throughput proteomics in understanding complex diseases. He also highlighted the relevance of hands-on learning and real-time lab exposure.

During the session, the team from DNA Labs **officially launched their flagship initiative – the "T3 Program" (Teaching, Training & Tourism)**. Designed especially for students from remote and underrepresented areas like Himachal Pradesh, T3 aims to immerse learners in advanced molecular biology techniques. The inauguration of the program was dedicated **"to all the mothers,"** acknowledging the nurturing roots of all scientific inquiry and personal growth.

High Tea and Technical Sessions: A brief **refreshment break (high tea)** was held from **10:30 a.m. to 10:50 a.m.** at **Abraham Hall** for participants and at **XLRI** for faculty and guests.

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This workshop served as a platform for scientists, researchers, and professionals to change insight, it was also discussed ground breaking methodologies, & explored the latest technological advancements through experts' presentations, discussions, and hands-on- training sessions, we also aimed to deepen our understanding of genomic sequencing and proteomic profiling, & the computational power of bioinformatics. By fostering collaboration and interdisciplinary dialogue, we strived to bridge the gap between experimental and computational sciences, paving the way for new discoveries and applications in healthcare, biotechnology, and environmental sciences.

It was my esteemed pleasure & honor in introducing Our resource person **Dr. Narotam Sharma Managing Director, Scientist & Head DNA Labs at CRIS- Centre for Research and Innovative Studies of Dehradun, Uttarakhand.** He had made significant contributions to the field of biology and is an expertise in molecular biology and genetic engineering . As Scientist at Sri Guru Ram Rai University he played a key role as inharge of Swine Flu H1N1 Lab and also had a priviledge to introduce Dr. Ankita Singh **Assistant Professor at UIT , Uttarakhand University , Dehradun and Junior Scientist & Quality Control Manager at DNA Labs.** She has been actively involved in various Government projects as Co-principal investigator including the development of diagnostic algorithms for cervical anomalies and cancers. Again I had a privilege to introduce resource persons who came across Uttarakhand with our Delegstes - **Dr. Ramesh Kumar Singh Scientist, Samvet Bharat,** Presently he is the founder member and working as a Country co-ordinator in Samvet Bharat (Under the aegis of Samvetan Society for Social & Scientific Research) **and Research Assistant Mr. Jagjeet Singh from DNA Labs** who is our Alumni as well.

While introducing I had the privilege to extend my deepest gratitude to **the Jharkhand Council for Science & Technology & innovation, Department of Higher and Technical Edducation, Government of Jharkhand for sponsoring us .**

Our distinguished guests from **DNA Labs CRIS, Dehradun** included:

- **Dr. Narotam Sharma** – Senior Scientist and Head, DNA Labs CRIS; chief coordinator of the workshop.
- **Dr. Ankita Singh** – Junior Scientist and Quality Manager.
- **Dr. Ramesh Kumar Singh** – Scientist, specializing in proteomics.
- **Mr. Jagjeet Singh** – Research Assistant, expert in ELISA and cancer biomarker studies.

At **11:00 a.m.**, participants were divided into **four groups** and proceeded to the **workstation laboratories** located within Jamshedpur Co-operative College for hands-on technical sessions. The rotations ensured each participant experienced every module.

Lab Sessions Overview:

- **Lab A** – Led by **Dr. Narotam Sharma**
  Topics covered: End-point PCR, reagent preparation, principles of nucleic acid chemistry, and its role in molecular diagnostics.
- **Lab B** – Led by **Dr. Ankita Singh**
  Topics covered: Nucleic acid extraction using silica column and magnetic bead-based isolation methods.
- **Lab C** – Led by **Dr. Ramesh Kumar Singh**
  Topics covered: SDS-PAGE, protein gel electrophoresis, various blotting techniques, and their relevance in proteomics.
- **Lab D** – Led by **Mr. Jagjeet Singh**
  Topics covered: ELISA, hormonal testing, and cancer biomarker diagnostics.

Each lab session lasted approximately **1.5 hours**, followed by **rotational switching of groups** to ensure comprehensive exposure to all methodologies.

The first day of the workshop was an enriching blend of academic insights and practical learning. The participants exhibited enthusiasm and curiosity, engaging actively with the resource persons and gaining substantial hands-on experience with cutting-edge tools in life sciences.

Following the high tea break, the participants resumed the first round of their respective laboratory sessions from **11:00 a.m. to 2:00 p.m.** These sessions, which were held across four separate laboratories under the guidance of our distinguished scientists from **DNA Labs, CRIS, Dehradun**, offered hands-on training in diverse areas of molecular biology and bioinformatics. The focus of each lab remained on practical exposure and real-world applications in the industry.

In **Lab A, Dr. Narotam Sharma, Scientist & Head of DNA Labs**, demonstrated the intricacies of end-point PCR on the Bio-Rad T100™ Thermal Cycler. Beginning with master-mix preparation under an RNase/DNase-free hood, students pipetted 12.5 µL of 2× Taq Master Mix (containing 0.2 mM each dNTP, 1.5 mM $MgCl_2$, and recombinant Taq polymerase), 1 µL each of 10 µM forward/reverse primers (designed to amplify a 500 bp region of the 16S rRNA gene), and 1 µL of template DNA (25 ng/µL), topped up with nuclease-free water to 25 µL. Dr. Sharma walked the group through programming the cycler: a 95 °C hold for 3 min, 35 cycles of 95 °C for 30 s, 58 °C for 30 s, 72 °C for 45 s, and a final 5 min extension at 72 °C. Live amplification plots and melt-curve analyses appeared on the connected laptop running Bio-Rad's CFX Manager software, where he pointed out how aberrant shoulder peaks signal primer–dimer formation or nonspecific products and how to adjust primer concentrations or annealing temperatures accordingly.

Halfway down the corridor in **Lab B, Dr. Ramesh Singh** of SAMVET BHARAT associated with DNA Labs guided students seamlessly between agarose gel electrophoresis and SDS-PAGE protein separation. Under his supervision, each participant prepared a 1.2 percent agarose gel by dissolving 1.2 g agarose in 100 mL 1× TAE buffer (40 mM Tris, 20 mM acetic acid, 1 mM EDTA) on a heating tray, then cast the gel with a 10-well comb in a Bio-Rad Sub-Cell® GT Unit. PCR products were mixed with 6× loading dye (0.25% bromophenol blue, 0.25% xylene cyanol, 30% glycerol) and run at 100 V for 45 min. Visualization under a UVP GelDoc-It™ Imaging System, using 0.5 µg/mL ethidium bromide staining, revealed crisp bands against a 1 kb DNA ladder. Switching gears, Dr. Singh demonstrated SDS-PAGE by preparing a 4 percent stacking/12 percent resolving gel in a Bio-Rad Mini-PROTEAN Tetra Cell. Samples were denatured in Laemmli buffer (2% SDS, 10% glycerol, 5% β-mercaptoethanol, 0.002% bromophenol blue) at 95 °C for 5 min, loaded alongside a Precision Plus Protein™ Dual Color Standard, and run at 25 mA per gel until the dye front reached the bottom. After staining in Coomassie Brilliant Blue R-250 (0.1% w/v in 50% methanol/10% acetic acid) for 30 min and destaining overnight, students measured band intensities and estimated molecular weights using the imaging software's gel-analysis module.

In **Lab C, Junior Scientist Dr. Ankita Singh** showcased two complementary DNA-extraction methods—silica-column and magnetic-bead protocols—providing both low- and high-throughput workflows. Beginning with 100 mg of plant leaf tissue ground in liquid nitrogen, she added 400 µL CTAB lysis buffer (2% CTAB, 100 mM Tris-HCl pH 8, 20 mM EDTA, 1.4 M NaCl) and 20 µL Proteinase K (20 mg/mL), incubating at 56 °C for 30 min. After chloroform-isoamyl alcohol extraction and centrifugation at 12,000 × g, the aqueous phase was mixed with an equal volume of binding buffer (6 M guanidine thiocyanate) and loaded onto a Qiagen DNeasy® silica column; subsequent 70% ethanol washes removed proteins and polysaccharides before elution in 50 µL TE buffer. For the magnetic-bead method, 200 µL lysate was combined with 20 µL Thermo Fisher Dynabeads® MyOne™ Silane beads and 200 µL binding buffer. The bead–DNA complexes were captured on a 96-well magnetic rack, washed twice with 80% ethanol, air-dried briefly, and eluted in 50 µL buffer. Dr. Singh highlighted that bead-based protocols reduce centrifugation steps, enabling processing of up to 96 samples in parallel and minimizing plastic consumables, while NanoDrop™ 2000 spectrophotometer readings confirmed A_{260}/A_{280} ratios of 1.8–2.0, indicative of high purity.

Finally, in **Lab D, Research Assistant Mr. Jagjeet Singh** led an intensive session on sandwich ELISA using a BioTek Synergy™ HT microplate reader. He coated Costar® 96-well plates overnight at 4 °C with 100 µL/well of mouse anti-human cytokine capture antibody (2 µg/mL in carbonate–bicarbonate buffer, pH 9.6). Following three washes with PBS-Tween 20 (0.05%), plates were blocked with 200 µL 5% BSA in PBS for 1 h. Serial dilutions of recombinant cytokine standards (ranging 0–1,000 pg/mL) and unknown samples were added in duplicate, incubated for 2 h at room temperature, then washed before adding 100 µL HRP-conjugated detection antibody (1:5,000 dilution). After a 1 h incubation and final wash, 100 µL TMB substrate was introduced; the enzymatic reaction developed for 15 min before being stopped with 50 µL 1 M H_2SO_4. Absorbance at 450 nm was recorded, and using Gen5 software, students generated a four-parameter logistic (4PL) standard curve. Mr. Singh emphasized how coefficient of variation

400 µL 100% ethanol before passing through the silica membrane at 8,000 × g. After two washes with AW1 and AW2 buffers to remove polysaccharides and proteins, DNA was eluted in 50 µL AE buffer, yielding A_{260}/A_{280} ratios of ~1.85 on a NanoDrop™ 2000c. She then demonstrated the Thermo Fisher Dynabeads® MyOne™ Carboxylic Acid bead workflow: lysate binding in the presence of 1:1 PEG/NaCl solution, three washes in 80% ethanol, and gentle elution in TE buffer—emphasizing that magnetic racks enable 96-well high-throughput extraction for large-scale genotyping.

Lab D's session with Mr. Jagjeet Singh focused on sandwich ELISA for quantifying cancer biomarkers—specifically CA-125 and PSA antigens—using a BioTek Synergy™ H1 plate reader. He showed how to coat Costar® flat-bottom 96-well plates overnight at 4 °C with 100 µL/well of mouse anti-human CA-125 capture antibody (5 µg/mL in bicarbonate buffer), block with 200 µL 3% skim milk in PBS-Tween 20 for 1 hour, and apply serial dilutions of recombinant antigens alongside patient plasma samples diluted 1:10 in assay buffer. After two hours of incubation and triple washes with PBS-Tween, participants added 100 µL HRP-conjugated detection antibodies (1:2,000) for another hour, followed by development with 100 µL TMB substrate for precisely 10 minutes and quenching with 50 µL 2 M H_2SO_4. Absorbance at 450 nm was recorded, and Mr. Singh taught the creation of a five-parameter logistic (5PL) standard curve in Gen5 software, discussing how to maintain intra- and inter-assay CVs below 8% and troubleshoot high backgrounds by adjusting blocking conditions.

After a catered buffet lunch highlighting Uttarakhand specialties, all hands reconvened in the bioinformatics suite for a marathon session led **by Dr. Ramesh Kumar Singh**. He began with sequence retrieval from NCBI's GenBank using Entrez Direct (EDirect) command-line tools, then demonstrated pairwise alignment via EMBOSS needle and local BLAST+ (blastn and blastp) with parameter tweaks—such as E-value thresholds of 1e-5 and word sizes of 11—to detect homologs of drug-resistance genes. Participants learned to parse multi-FASTA files using BioPython scripts, feed them into Clustal Omega for multiple sequence alignment, and view consensus motifs in Jalview. For phylogenetic analysis, Dr. Singh exported aligned sequences to MEGA X, instructed on selecting the Tamura–Nei substitution model, bootstrapping 1,000 replicates, and constructing maximum-likelihood trees. The primer-design segment featured Primer3Plus's web interface: students input target regions, adjusted product size (100–300 bp), and optimized T_m to 58–62 °C with salt corrections. Finally, he introduced AutoDock Vina for in silico docking—prepping receptor PDBs in AutoDockTools, defining grid boxes around active sites, and interpreting binding affinities—culminating in a panoramic view of how genomics, proteomics, and bioinformatics coalesce to propel modern molecular research.

At **2:00 p.m.,** all participants, resource persons, and faculty proceeded for lunch, which was arranged at **Mrs. A. Abraham Hall** within the premises of **Jamshedpur Cooperative College**. The lunch break provided a much-needed interlude and an opportunity for informal interaction among participants and experts.

(CV) between replicates should stay below 10% and discussed troubleshooting tips for high background, such as optimizing wash stringency or antibody dilutions. Throughout the day, participants left with not only procedural fluency but also a nuanced understanding of how reagent chemistry, instrument settings, and data analysis intertwine to produce reliable molecular data.

GLIMSE OF DAY 1- WORSTATION -ALL LABS A,B.C D

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Gala Event
Organized on 9th May, 2025 at 6: 30 pm in Swami Vivekanand Conference Hall

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To balance the intensity of the academic proceedings and to foster a spirit of camaraderie and cultural appreciation, a **Gala Evening** was organized on the evening of **9th May 2025** at **6:30 p.m.** This special segment was graced by the esteemed presence of our **Chief Guest, Hon'ble Shri Ananya Mittal, IAS, Deputy Commissioner of East Singhbhum, Jamshedpur**. Also in attendance were **Dr. Amar Singh, Principal, Jamshedpur Co-operative College**, principals and faculty members & students from various institutions across Jamshedpur and neighboring districts, our invited scientists, students, and alumni of the Department of Zoology.

The event commenced with a **ribbon-cutting ceremony** to formally inaugurate the evening's proceedings, followed by a **lamp-lighting ceremony**, upholding the tradition of invoking light and knowledge. The Chief Guest was felicitated by **Principal Dr. Amar Singh**, expressing gratitude for his gracious presence and continued encouragement to academic endeavors.

In his keynote address, **Shri Ananya Mittal, IAS**, delivered an inspiring speech that resonated deeply with the youth and academic community. He appreciated the initiative taken by the Department of Zoology and expressed his admiration for the enthusiasm and discipline exhibited by the students. He remarked that the energy and vibrancy of the event rekindled his own college memories, and he commended the efforts of all organizers, especially the seamless integration of academic seriousness with creative expression.

I as **Dr. Swati Soren, Convenor /Organizing Secretary** welcomed our Chief guest and all the dignitaries, faculties and students across Nation.

The evening was adorned with a range of **cultural performances** including traditional **folk dances, classical music, instrumental pieces, and vocal performances** by both students and faculty members. Of special mention was the introduction of **Payatkar painting**, one of Jharkhand's oldest tribal art forms, showcased by renowned tribal artist **Shri Vijay Chitrakar**. He not only demonstrated the method and philosophy behind his art but also set up a **pop-up exhibition** featuring painted artifacts including earrings, bookmarks, and decorative art, made using natural dyes and organic techniques. This fusion of art, biology, and culture significantly enriched the thematic essence of the event.

The gala concluded with a **lavish dinner** hosted at **Mrs. A. Abraham Hall**, bringing together all participants, resource persons, organizing committee members, faculty, and dignitaries. The evening was a celebration of science, culture, and community, leaving everyone with cherished memories and a renewed zeal for the sessions scheduled on the following day

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Day 2– 10th May 2025

The second day of the two-day national workshop commenced with a networking breakfast session held from 7:30 a.m. to 9:30 a.m. at Abraham Hall, Jamshedpur Co-operative College.

Following the breakfast, the day's **academic engagements began at 9:30 a.m., with oral and poster presentations conducted simultaneously at Swami Vivekananda Hall and Gallery,** Jamshedpur Co-operative College. This segment was aimed at encouraging student researchers and young scientists to present their insights and projects in alignment with the emerging domains of genomics and proteomics.

A total of nine participants were scheduled for the oral presentation session, themed "Personalized Genomics in Modern Healthcare", but three participants presented their work. While the turnout was lower than anticipated, it is noteworthy that the topic of genomics often in stills apprehension among students due to its complex and rapidly evolving nature. However, the workshop created an encouraging and supportive environment that allowed the presenters to overcome their hesitation and engage meaningfully with the subject matter. This platform acted as an important milestone for many budding researchers, helping them gain confidence in public speaking and scientific communication.

The oral presentations were judged by Dr. Ankita Singh, Junior Scientist, DNA Labs CRIS, Dehradun, and Dr. Mridula khess, Assistant professor Botany , Gossner College. whose critical insights and thoughtful feedback greatly enriched the academic value of the session. The presentations were attended by a large gathering of student researchers, faculty members, and scholars from various institutions, reflecting a keen interest in advancing discussions in personalized medicine and genomics.

The winners of the oral presentation were:

- First Prize: Ms. Wajiha Khursheed – Jamshedpur Co-operative College
- Second Prize: Ms. Falak Nausheen – Indira Gandhi National Open University (IGNOU)

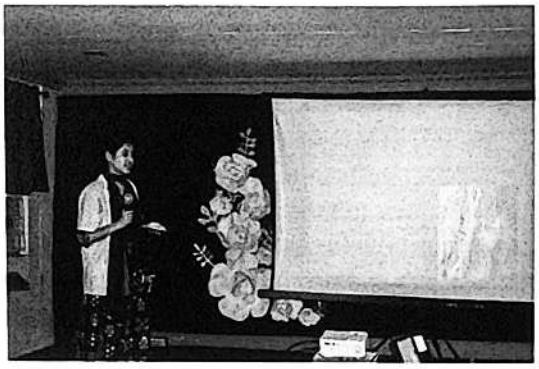
In parallel, the poster presentation session was also conducted with the theme "Proteomics in Drug Discovery and Biomarker Identification". Out of 14 registered participants, only three presented their posters. The session, however, maintained its academic integrity, offering an insightful glance at how proteomics is shaping the future of diagnostics and therapeutic development. The judges for the poster session were Mr. Jagjeet Singh, Research Assistant, DNA Labs CRIS, Dehradun, and Mr.Ganesh Baskey, Head, PG Dept. Zoology, Shyama Prasad University , who assessed the posters based on scientific relevance, presentation, and originality.

The winners of the poster presentation were:

- First Prize: Ms. Sunita Kumari Pradhan – Tata College, Chaibasa
- Second Prize: Ms. Lipinka Jamuda – Jamshedpur Co-operative College
- Third Prize: Ms. Arpana Ram – Tata College, Chaibasa, Kolhan University

The presentation segment concluded by 10:30 a.m., after which a technical rotation session was held from 10:30 a.m. to 11:30 a.m.. This session allowed participants to engage in lab sessions continued from Day 1, ensuring every attendee had full access to all practical modules of the workshop. The hands-on exposure across the various laboratories enriched the participants' understanding of real-world applications of molecular biology techniques.

ORAL & POSTER COMPETITION GLIMSE

With competitive spirits high, on the **second day the hands-on training resumed in Lab A** under the guidance of **Dr. Narotam Sharma**, who dove straight into the technicalities of programming the Bio-Rad T100™ End-Point PCR Thermal Cycler. He began by reviewing primer design strategies for drug-target genes—illustrating the choice of 20- to 24-mer oligos with 40–60% GC content for optimal binding to oncogenes like KRAS and PIK3CA—and demonstrated how to enter custom protocols via the T100's touchscreen: setting an initial denaturation at 95 °C for 3 minutes, followed by 40 cycles of 95 °C for 15 seconds, gene-specific annealing (52–62 °C) for 30 seconds, and 72 °C extension for length-dependent durations (30–60 seconds), capped by a final 5 minute elongation phase. He explained the use of hot-start Taq polymerase to reduce nonspecific amplicons, the inclusion of 0.2 µM SYBR Green I dye for melt-curve analysis, and the critical calibration of the heated lid to prevent condensation—all crucial when amplifying GC-rich targets in drug discovery pipelines.

Next door in **Lab B, Dr. Ramesh Kumar Singh** led an in-depth exploration of agarose gel electrophoresis and SDS-PAGE for nucleic acid and protein analysis. He showed students how to prepare a 1 percent agarose gel in 1× TBE buffer—mixing 1 g agarose with 100 mL buffer, microwaving until clear, and casting with a 15-well comb inside a Bio-Rad Sub-Cell GT unit—before demonstrating sample loading of PCR products mixed 1:6 with 6× BlueJuice™ loading dye. Running the gel at 120 V for 35 minutes, participants visualized bands under a UVP GelDoc XR+ imager after staining with 1 µg/mL GelRed™, correlating band sizes to a 1 kb Plus DNA Ladder. Switching to proteomics, Dr. Singh prepared a 5 percent stacking and 15 percent resolving SDS-PAGE gel in a Mini-PROTEAN Tetra System, denatured cell-lysate proteins in Laemmli buffer with 5% β-mercaptoethanol at 95 °C for 7 minutes, and ran the gel at a constant 200 V until the dye front exited the gel. Coomassie Brilliant Blue R-250 staining revealed discrete protein bands, which students quantified using ImageJ's densitometry plugin to assess expression levels of drug-target enzymes.

In **Lab C, Dr. Ankita Singh** guided participants through two complementary DNA-isolation workflows—silica-column and magnetic-bead methods—highlighting how high-quality genomic DNA underpins downstream sequencing and genotyping. For the Qiagen DNeasy® protocol, she instructed students to grind 100 mg of leaf tissue in liquid nitrogen, add 400 µL AP1 lysis buffer supplemented with 4 µL RNase A (100 mg/mL), incubate at 65 °C for 10 minutes, then mix with

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Post-lunch, the second round of laboratory sessions commenced from **3:00 p.m. to 4:30 p.m,** during which all batches rotated to the remaining labs, ensuring that each participant experienced all four modules of training. The rotations were executed smoothly, maintaining punctuality and discipline. By **4:30 p.m.,** the hands-on sessions concluded for the day, marking the end of a highly productive and intellectually enriching experience.

Glimse of DAY 2- WORSTATION -ALL LABS A, B.C D






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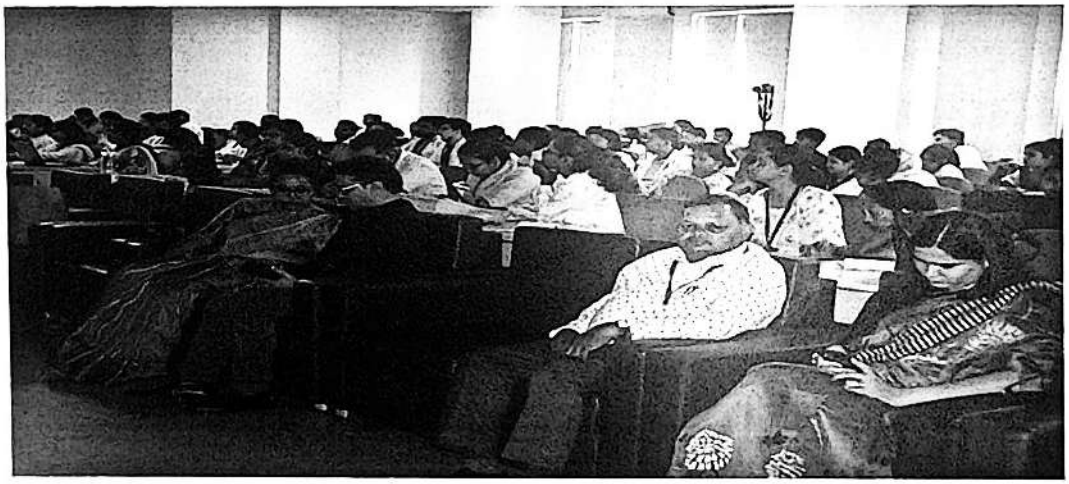
Valedictory Session and Concluding Ceremony

The final session of the workshop began promptly at **12:00 p.m.** at **XLRI LH33 Hall**, where participants and guests reassembled for a much-awaited **technical session on bioinformatics**. The session commenced with a formal introduction of the guest speaker, **Dr. Ramesh Kumar Singh**, a distinguished scientist with **Samvet Bharat**, by **Dr. Sangeeta Kumari**, Assistant Professor, Department of Zoology, Jamshedpur Co-operative College.



Dr. Ramesh Kumar Singh, delivered a highly informative **online session** on the **applications of biological databases** in modern bioinformatics. He elaborated on the significance and functional use of various global repositories such as **NCBI, FASTA, EMBL, FASTQ**, and **GeneBank**. He also clarified the conceptual distinction between **wet labs** and **dry labs**, emphasizing how modern scientists can integrate bioinformatics tools and genomic data to enhance the accuracy and efficiency of biological research. The session was **interactive and hands-on**, with all participants

having brought their **personal laptops** to follow the tools in real-time. This not only enriched the learning experience but also bridged the gap between theoretical knowledge and its practical implementation.

The bioinformatics session concluded at **2:00 p.m.**, after which a **lunch break** was organized at **Abraham Hall**, offering participants a final opportunity to network and informally discuss the day's insights.

Valedictory and Felicitation Ceremony

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The **Valedictory Session** commenced at **3:00 p.m.** back at **XLRI LH33 Hall**. The event was anchored once again by **Dr. Antara Kumari, Dr. Ruchika Tiwary, Sri K.Eswar Rao**, whose poised and graceful conduct added a warm closing note to the event. The ceremony began with a **lamp-lighting ritual**, led by our **Chief Guest, Professor Dr. Firoz Ahmed**, former Vice-Chancellor, Nilamber-Pitamber University, Medininagar. His gracious presence and enlightening words set a dignified tone for the concluding session. Another esteemed guest present was **Professor Dr. S.S. Razi**, former Vice-Chancellor,Arka Jain University, who shared profound insights into the **applications of genomics and proteomics in real-world healthcare and research scenarios.**

Following this, our **Principal, Dr. Amar Singh**, felicitated the Chief Guest and all visiting scientists with words of heartfelt appreciation. His address was deeply enriching and appreciated by both students and faculty members.

A **comprehensive report presentation** of the entire two-day event was delivered by me, **Dr. Swati Soren**, expressing sincere gratitude to **the Jharkhand Council For Science And Technology and Innovation ,Department of Higher and Technical Education, Government of Jharkhand** for sponsoring this initiative. Special acknowledgment was also extended to **DNA Labs, CRIS**, for their technical collaboration and active involvement. Emphasis was given to how this workshop has sparked new curiosity and confidence in students regarding high-end topics like genomics, proteomics, and bioinformatics.

As part of the feedback session, **two participants** shared their experiences:

- **Ms. Iram**, faculty member from **Netaji Subhas University**, and
- **Mr. Abhiral**, a postgraduate student from **Kolhan University, PG Department, Chaibasa**.

They both conveyed their heartfelt appreciation for the event, expressing how it broadened their understanding and opened doors to further research and academic pursuits. Their testimonials added immense value, affirming the workshop's success in igniting scientific curiosity.

Jamshedpur Co-operative College
(A Constituent Unit of Kolhan University, Chaibasa, Jharkhand)
Accredited Grade 'B' by NAAC
ISO 21001:2018, ISO 50001:2018, ISO 140001:2015 Certified By IMAB

Certificate Distribution and Closing Ceremony

The **certificate distribution ceremony** followed, wherein **all participants, oral and poster presentation winners**, received their certificates. The moment was commemorated with **group photographs** taken for official documentation and media coverage.

The two-day workshop concluded formally at **4:00 p.m.** with the **National Anthem**, echoing a sense of unity and academic pride among all attendees.

In conclusion, this workshop stood not merely as an academic event but as a platform for **interdisciplinary learning, collaboration, and scientific enthusiasm**. The resounding success of this program would not have been possible without the unwavering support of the **Jharkhand Government**, particularly the **Jharkhand Council for Science and Technology and Innovation, Department of Higher and Technical Education, Government of Jharkhand Department of Higher and Technical Education**. Their trust in our institution has enabled us to host such a

meaningful national-level training and knowledge-sharing event. Conducting workshops has indeed had numerous benefits for both students and faculties, and for all the academicians.

We remain deeply **grateful to all the scientists, judges, speakers, collaborators, and participants** for their time, expertise, and enthusiasm. The feedback and appreciation received motivate us to organize many more such enriching programs in the future. We really acknowledge all the efforts made by Advisory Committee, organizing committee , managing committee members and dedicated volunteers .

THANK YOU

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CONVENOR / ORGANIZING SECRETARY
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