DNA Labs

A Centre for Applied Sciences (DLCAS), Dehradun, Uttarakhand

NABL Accredited | ICMR Approved | ISO Certified

Training Programs in:

(A) Biotechnology, Cell and Molecular, Biology, Virology & Recombinant DNA Technology

(B) Clinical and Applied Microbiology, Immunology & Serology

(C) Pathology , Clinical Biochemistry and Endocrinology

(D) Applied Zoology, Botany Plant Tissue Culture (PTC) and Plant Biotechnology

A HUB FOR SCIENTIFIC SKILLS LEARNING

An Organization with well Equipped Laboratories for;

BIOMEDICAL,
LIFE SCIENCES
and
APPLIED SCIENCES
STUDENTS
and
ASPIRANTS

Research Projects/ Dissertation / Summer & Winter Training Program / Thesis work and Short Term Training Programs

Brief Profile of the Organization:

LABORATORY-1


LABORATORY-2

CRIS - Centre for Research and Innovative Studies.

DNA Labs–A Centre for Applied Sciences (DLCAS), Dehradun, Uttarakhand is an ISO Certified 9001:2015 Organization, NABL Accredited and ICMR Approved and is working in the field of Diagnostics, Science Education, Research and societal upliftment of the community. We have two laboratories well equipped with Real Time PCR (Qiagen Real Time PCR thermal cycler), Non Cooling Centrifuge, Bio RAD PCR Machine, UV Transilluminator, Agarose Gel Electrophoretic unit, Cell Counter, Biochemistry Analyzer, ELISA Reader, Mini Centrifuge, Healthrow Scientific Vortex, Bacteriological Incubator, Laminar Airflow, Heating Dry Bath, Bio Safety Cabinet-II, Microscope, Autoclave, High speed Cooling Centrifuge, Hot Plate, Electrolyte Analyzer, Haemometer-20 Chest Freezer, Shaking Incubator, Microbiology Colony Counter, Magnetic Nucleic Acid Extractor-70 deep freezer, including all the necessary pre-amplification and post-amplification accessories and novel instruments. Technologies like Real Time PCR thermal cycler is being employed for the qualitative detection of clinically relevant infectious agents like Hepatitis B Virus, Hepatitis C virus, HIV, Chlamydia trachomatis, Neisseria gonorrhea, Cytomegalovirus (CMV). Same can also be used for quantification of sexually transmitted infectious agents, allelic discrimination, and SNP (Single nucleotide polymorphisms) detection. The laboratory is with more than 80 collection centre from where samples use to come and is conducting many research projects, significantly benefiting clinicians and patients.


ELISA : Play with Ag & Ab

ATCGCTATACTATACGGCCATATATTTACTTTACCTATCGGCT

ATACDNA TACGCTACGGCCATATATTTACTCATATATTCTTA

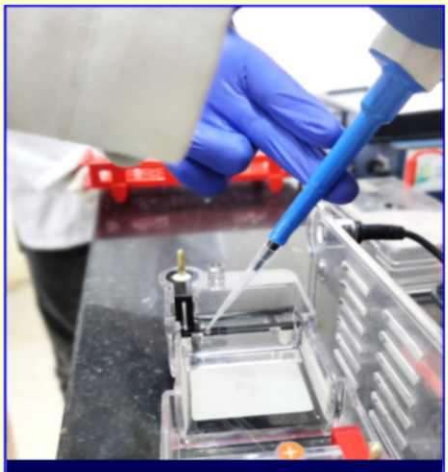
TACTACGCLABS TACGGCTATATCTATACGGCCATATATTTA

CTTTACCTATCGTA CENTRE FOR APPLIED SCIENCES CT

ATCGCTATACTATACGGCCATATATTTACTTTACCTATCGGCT

DNA is just a combination of A, T, C, G
The beauty of life is how you put
small things in a great way.


Accuracy matters


Post Amplification Techniques

PCR : An Amplification Tool


Amplify Skills


Blood : Learn to Investigate

Biotechnology, Cell and Molecular Biology Virology and Recombinant DNA Technology

Module (A)

{Duration : 15 Days}

1- Biosafety in Biomedical and Molecular Laboratories; Basic first GLPs (Good Laboratory Practices); Guidelines, regulations and Implementations.
2- Basics of Calculations; Buffers, Agarose, dNTPs, Primers reconstitutions and preparations.
3- Practical hands on and demonstrations of Molecular and Biotechnology instruments.
4- Nucleic Acid Isolation (DNA/RNA) demonstrations by Manual methods, spin column based and fully automations Systems.
5- DNA Isolation from whole Blood serum or any body fluids; Practical demonstrations and its Applications.
6- RNA Isolation by spin column methods and its Qualifications and Qualitative estimations.
7- Post Amplification Technologies; AGE (Agarose Gel Electrophoresis), Gel Documentation System.

{Duration : 01 Month}

All the 15 Days components and the followings;

8- Basics and applied Aspects of specimen collections in Clinical and Diagnostics Molecular and Virology.
9- Practical hands-on Training Program on End point PCR;
   - ❖ Selection of Molecular marker (gene)
   - ❖ Primer selection, designing and its Reconstitutions.
   - ❖ Preparations and study of various ingredients of PCR (Pre mix preparations)
   - ❖ PCR set up, Amplifications and Detection of Amplicons.
10- PCR/Multiplex PCR for the Amplification and Detection of β-Actin genes in Human Saliva. PCR and its Applications for the Characterization of Human Growth Hormone (HGH) from whole Blood. PCR trouble shootings and optimization and Standardization of annealing temperature (Ta)

{Duration : 45 Days}

All the Components of 01 Month and the following:

1- Hope and Scope of Cellular and molecular Diagnostics in the preview of infections, noninfectious and Cancer Biology.
2- Hands on Training program on Molecular Mycobacteriology, Rheumatology and Clinical and Diagnostics Virology
3- Extraction of Nucleic Acid (RNA/DNA) from serum for the Qualitative and Quantification of Clinically important viruses and bacteria (Mycobacterium tuberculosis, Hepatitis C Virus (HCV), Hepatitis B Virus (HBV) etc.
4- Real Time PCR, (qPCR): Basics and Applied Aspects. 5 plex Real Time PCR (Qiagen), HRMA demonstrations and its Applications.

{Duration : 02 Months}

All the Components of 45 days and the following:

1- Real Time PCR programming, Software and Hardware handlings.
2- Cellular, Molecular and its applications for the Characterization of Influenza Viruses (Swine flu H1N1), by rRT-PCR.
3- Contribution of Viruses in Cancer Therapy and molecular Biology
4- Bacterial Plasmids Molecular Studies;

A. Culturing of bacteria for the characterization of Plasmids

B. Isolation, purification of plasmid DNA

C. Qualitative and Quantification of plasmid DNA

{Duration : 03 Months}

All the Components of above 02 months and the following:

1- SDS PAGE
2- Blotting Techniques:
   a. Southern Blotting
   b. Northern Blotting
   c. Western Blotting
3- Forensic Biology:

A. Basics and Applied aspects of DNA profiling or DNA Fingerprinting
B. DNA Fingerprinting by RFLP and RAPD methods by PCR
C. Results Interpretations for DNA profiling.

Note: All the works related to projects, training programs will be on non-infectious materials.

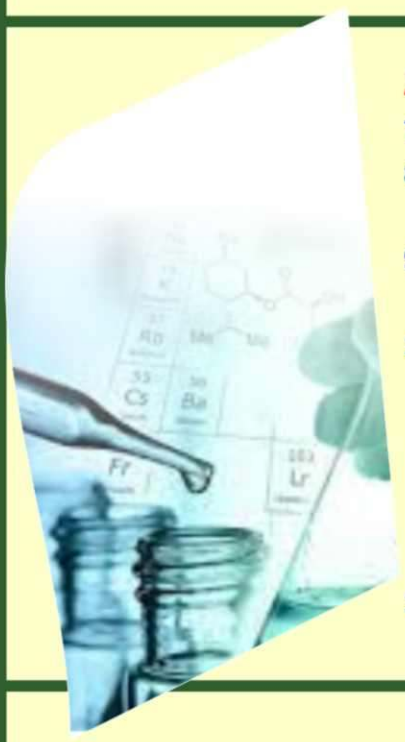
Clinical And Applied Microbiology, Serology and Immunology

Module (B)

Note: Module B will be customized as per Trainees interest.

1. Good Laboratory Practices (GLPs) and Biosafety precautions and guidelines
   - ❖ Safety Guidelines
   - ❖ Good Microbiological Laboratory Practice (GMPL)
   - ❖ Levels of Containment and its significance
   - ❖ Risk assessment
   - ❖ Spillage management & Aerosol
2. Historical perceptive of microbiology and its recent advancements.
3. Basics and Applied Instrumentations in Clinical and Applied Microbiology. Demonstrations of various instrumentations in Microbiology.
4. Sterilization and Disinfection
   - ❖ Media Sterilization and its preparation
   - ❖ Pouring, streaking and culturing of microbes
5. Staining Techniques
6. Specimen Collection, storage and transportation for microbiological Evaluation

{Duration : 15 Days}



{Duration : 01 Month}

All the Contents of 15 Days and the Followings;

7. Identification of bacteria of medical importance
8. Study of Drug resistance pattern,
   - ❖ Sensitivity ❖ Susceptibility ❖ Multiple drug resistance
9. Biochemical characterization and its study about the different enzymes produced by microbes.
10. Identification of bacteria of Clinical importance by various biochemical test (IMVic tests)
    - ❖ Indole
    - ❖ Methyl Red
    - ❖ Voges proskauer
    - ❖ Citrate Utilization
11. Catalase and Oxidize Activity tests.

{Duration : 02 Months}

02 Months Training Program

All the Contents of 01 Month and the Followings;

1. Enumeration and identification of pathogenic and non-pathogenicE.Coli from different specimens.
2. Identification and Screening of Salmonella, Shigella, Vibrio from different specimens.
3. Assessments and evolution of;
   - ❖ Coli form
   - ❖ Fecal coli forms from water and food samples
4. Quality Control and Quality Assurance in clinical microbiology and pharmaceutical industries.
5. Food Microbiology, its scope applications and implementations.

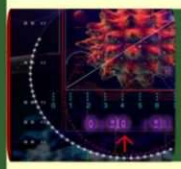
Basics and Applied aspects of Immunology and Serology

1. Introduction to Immune System
2. Serum; Separation, Study of various components, Antigen and Antibody detection and characterization by various tools.
3. Study of various immunological disorders by various tools and techniques.
4. VDRL
5. WIDAL

{Duration : 15 Days}

6. Ouchterlony double immunodiffusion (ODD)
7. ELISA (Enzyme Linked Immunosorbent Assay)
   - A. Direct ELISA
   - B. Indirect ELISA
   - C. Sandwich ELISA
   - D. DIVA
8. Study of Rheumatoid factors (RAF), C-Reactive proteins and Immunoglobulins (RIA)
9. Radio Immuno Assay (R/A)
10. Double Immuno diffusion (DIF)
11. Rocket Immuno electrophoresis (RIE)

{Duration : 01 Month}



Pathology, Clinical Biochemistry and Endocrinology

Module (C)

{Duration : 15 Days}

1. Good Laboratory Practices in Pathology laboratories
2. Instrumentations in Diagnostics Labs; Practical demonstrations of tools and techniques, SOPs
3. Basics of sample Collection / Phlebotomy;
   - A. Order of draw
   - B. Storage
   - C. Transportation
   - D. Rejection criterion
4. Hematology
   - A. CBC
   - B. ESR
   - C. Blood Groping
   - D. Determination of Bleeding and Clotting time
5. Hematological Disorders and its Characterization

All the above Components of 15 days and the following:

{Duration : 01 Month}

6. Clinical Biochemistry:

Liver Function Parameters	Kidney Functions parameters	Cardiac Profiling
a. SGOT b. SGPT c. Alkaline Phosphates Test d. Total Protein i. Albumin ii. Globulin e. Total Bilirubin A. Direct Bilirubin B. Indirect Bilirubin f. ENZYMES a. Determination of various clinically important enzymes	a. Urea I. Blood Urea Nitrogen (BUN) b. Uric Acid c. Creatinine d. Electrolytes I. Na+ ii. K+ iii. Ca+ ions	a. Triglycerides b. Cholesterol i. Low density lipoprotein (LDL) ii. High density ii poprotein (HDL) iii. Very low-density lipoprotein (VLDL)

7. Biochemistry of carbohydrates:
   - A. Serum glucose determination
   - B. Fasting blood sugar
   - C. Postprandial blood sugar
   - D. Random Blood Sugar
   - E. HbA1c (Glycated hemoglobin)

All the above components of 01 Months and the following:

{Duration : 02 Months}

8. Serology and its applications in Diagnostics
   - A. WIDAL Test
   - B. VDRL Test
   - C. HIV Card Test
   - D. HCV Card Test
   - E. HbsAg Card Test
   - F. Rheumatoid Arthritis Test
   - G. C-Reactive Protein (CRP) Test
   - H. Determination of TgG, IgM
9. Routine Examination of Body Fluids:
   - A. Routine Urine Examination
   - B. Semen Examination
10. Endocrinology
    - A. Thyroid Disorders
    - B. Determination of Thyroid (stimulating Hormone (TSH)
    - C. Determination of T3
    - D. Determination of T4
    - E. ACTH
    - F. Angiotensin II
    - G. Progesterone
    - H. Testosterone
    - I. Prolactin
    - J. Growth hormone
11. Polystic Ovary Syndrome
    - A. LH
    - B. FSH

Placement Cell of the organization develop trainees to get jobs/ & customizes their career

Projects on Molecular Characterization of Neuropathogenic Viruses & Bacteria:

- Molecular Characterization of clinically relevant etiological agents for encephalitis in Northern regions of India.

- Bacterial Meningitis and the prevalence of *Mycobacterium* Tuberculosis, Neisseriameningitides, Haemophilus influenza & Streptococcus pneumonia in Cerebrospinal Fluid(CSF) specimen.

Biology: Applied Zoology and Botany

- Southern hybridization, Northern hybridization, Polymerase chain reaction (PCR)Prenatal Diagnosis, Applications of restriction fragment length polymorphism (RFLP) inforensic Laboratories and disease prognosis.
- DNA Isolation from Tissue, Whole Blood etc. Isolation of plasmid and chromosomalDNA from bacteria culture.
- Demonstration of transformation and selection of recombinant clones. Demonstration of inducible enzyme β-galactosidase in E. coli. Software Demonstration for Phylogenetic analysis.
- Assessment of genetic diversity of high altitude medicinal plants.
- Screening of antioxidant profiling and antimicrobial activity of medicinal plants.
- Insilico analysis of genomic DNA of medicinal plants
- Clustering and sequence alignment of DNA by using bioinformatics tools.

Pathology, Clinical Biochemistry, Medical Lab Technology and Laboratory Medicine

Endocrinology

- Polymorphism of the Follicle Stimulated Hormone receptors and its clinical Importance.
- Emotional aspects of infertility: way to ways.
- Infertility, medical advice and treatment with fertility hormones and/or in vitrofertilization: a population perspective.
- Comparison of the Levels of LH and FSH, TSH, Prolactin, Progesterone and Estradiol Hormones in Infertile Women.
- Thyroid function in male infertility and its impact on outcomes of fertilization in females.

  Female Reproductive Hormones and Biomarkers of Oxidative Stress in Genital Infection in Infertility.

Clinical Biochemistry

- Vitamin D: An Examination of Physician and Patient Management of Health and Uncertainty.
- Vitamin D Deficiency: A Global Concern.
- Study of Vitamin D levels as a Profile Marker for Cardiovascular Diseases in different populations.
- Clinical Biochemistry and Amplification technologies in the current era of diagnosis of various diseases and disorders.

- Hematological, Serological, Biochemical and Molecular profiling of Blood: Applications to reveal the hidden danger.

Pharmaceuticals and Food Technology

- Detection of various probiotics agents in different sources and enumeration of its efficacies.
- Physical, Chemical and Microbiological identification of food adulterants.
- Microbial limit test (MLT), water analysis for various Pharmaceutical Products and raw materials.
- Isolation and bio chemical Identification of phytochemicals from medicinal plants and study of antibacterial, antimicrobial and anti fungal activities.
- Food and water for life; need to revised the methodologies.
- Study of drug resistance and susceptibility for various etiological agents.

Do your Research Works at

DNA Labs - A Centre for Applied SCIENCES, Dehradun

Ph.D. Programs

Disciplines::

• Biotechnology • Microbiology • Medical Microbiology • Pharmaceuticals Sciences (All Disciplines) •Biochemistry• Medical Biochemistry •Medical Physiology • Medical Biotechnology • Molecular Biology • Zoology • Botany • Medical Lab Technology, •Chemistry • Environment Sciences

PhD : Research Scholar can choose the topics and projects as laboratory will provides lab facilities, instrumentations and technical and Sciecntific support to the candidates.

Student registered with the University can come for the lab works

• Ph.D. Topic Selection – Monitoring to identify right topic based on the Gap from industry, Your experience and supervisor thoughts. Works as per guidelines and mentorship of the registered Universities.

ASSISTANCE :

- **Problem Identification**
- **Research Proposal Preparation**
- **Pilot Study**
- **Synopsis Preparation**
- **Preparation of Power Point Presentation**
- **Manuscript Writing**
- **Manuscript Copyediting,**
- **Manuscript Peer Reviewing**
- **Ph.D Manuscript Formatting**
- **Manuscript Plagiarism Correction**
- **Conference & Seminar Papers**

Note: For more details call or whattsapp to : 9557650069

Trainees Rotations on Different Platforms during Project / Dissertation / Training Work

PHASE 1 (01-02 WEEKS)

Registration of the Trainee Learn Basics First

Introductory Lecture : Good Laboratory Practices and Biosafety Guidelines to all the Trainees

Laboratory Culture : How to do the work?

Basic Handling of the Instruments / Equipments and Pipetting

PHASE 2 (02 WEEKS)

Project Topic Allotment to the Trainees.

General discussion on the topics by Scientist / Faculties & Lab Technicians

How to compile thesis work

Scientific Publication discussion to related allotted project

PHASE 3 (08 WEEKS)

Experiment Designing, Setup and Laboratory Practical.

Exposure in Biotools and techniques, Cellular and Molecular Biology,

Microbiology, Serology and Immunology

Pathology, Learning new tools and techniques.

PHASE 4 (01 WEEKS)

Thesis compilation and Report checking

Research Publications / Case Reports, Short Communication,

Review Articles Publication, Resume drafting and Personality development classes etc.

Certificate distribution to the trainee.

Note:

1) **Duration of all the phases entirely depends on the duration of the training programs registered by the trainees.**
2) **Guest Lectures/Scientific Lectures/Placement assistance classes will be organized in between the training programs/sessions.**

ELIGIBILITY CRITERIA:

UG/ PG/ PhD Scholar/ Faculties from Biotechnology, Microbiology, Biochemistry, Zoology, Botany, Medical Lab Technology, Pharmaceutical Sciences, Horticulture Agriculture, Food Technology & Genetic breeding etc. can apply

Duration and Fee Structure for Training Program (Rs.) Please tick and circle :-

Registration Fee : Rs. 1000 (includes training manual & book, Id card)

15 Days	01 Month	45 Days	02 Months	03 Months	04 Months	05 Months	06 Months
3,000/-	6,000/-	7,500/-	9,500/-	15,000/-	18,000/-	22,000/-	24,000/-

Fee can be paid in cash or can submit online: Account Name: -

DNA Labs- A Centre for Applied Sciences,

State Bank of India- A/C No. 38078066142, IFSE code: SBIN0021477, Dehradun, Uttarakhand, for google pay, Phone pay, Paytm: 9027312357

03, 04, 05 and 06 months trainees can submit the fee in installments.

MODULE A

Biotechnology, Cell and Molecular Biology, Virology and Recombinant DNA Technology

MODULE B

Clinical And Applied Microbiology, Serology and Immunology

MODULE C

Pathology, Clinical Biochemistry and Endocrinology

MODULE D

Applied Zoology and Botany, Plant Tissue Culture, Pharmacognosy, Phytochemistry

Registration Process:

- *Fill the Registration Form either Online or Offline* (See Website : **www.dnalabscas.com**)
- **Submit Registration Fee**
- **Send all the documents with payments receipt to Email: dnalabsteachingtraining28@gmail.com or Whattsapp to 9557650069**
- **Applicant will get confirmation letter within 24 hours**

(1) The Registration fee is non-refundable and non-transferable.

(2) Customize/Special module of **15 Days, 01 Month, 45 Days** are also available to students coming in groups or as per University/Institute demand.

(3) Selection will be purely on **"First come, First Serve Basis."**

(4) **For 03, 04, 05 and 06 months:** Certificate Program in **"Quality Management System and its implementation"** and Scientific Personality Development Certificate will be provided at the end of Training of Trainee) 80% discount to the trainees.

Fee Structure is same for both the Laboratory of DNA Labs and for any of the module

About the organization-

(1) Registered under Directorate General and CMO office Dehradun
(2) NABL Accredited and ICMR Approved Laboratories for SARS COVID-19 Testings
(4) Life Time Member of Indian Immunology Society (IIS)
(5) 12+ Years of Experience
(6) Organized more than 60 (CMEs, Workshops, Conferences, Scientific meets)
(7) 120+ Associated Institutes / Universities
(8) Experience in training more than 4000 students
(9) 150+ Research Publications
(10) Member of India Association of Medical Microbiologist- Delhi Chapter.
(11) Research Projects, Programs under the flagship of UCB, USERC, IIS, UCOST

Organized

National, International Conferences, CMEs, Workshops, Seminars, Research Projects, Sensitization, Awareness and Health Camps under the Aegis of the various Govt bodies:

Uttarakhand Council for Biotechnology (UCB)

National Accreditation Board for Testing & Calibration Laboratories MC-4046

उत्तराखण्ड शासन
Uttarakhand Science Education Research Centre (USERC) Department of Information and Science and Technology

Indian Council for Medical Research (ICMR)

Uttarakhand Council for State Science and Technology (UCOST)

Indian Immunology Society (IIS)

Uttarakhand Medical Council (UMC)

भारतीय जीवाणुतत्ववेत्त संगठन
Association of Microbiologists of India
Association of Microbiologists of India

Medical Council of India (MCI)

HOSTEL/PAYING GUEST FACILITIES NEAR DNA LABS - 1

Name of the Hotel/	Contact No. Paying Guest	Distance from Laboratory-1 (approx..)	Boys/Girls	Monthly Charges
Jai Jwalapa PG	9897483587	200 meters	For Boys only	6500 with Food
Uphadhya PG	9675913999, 9897483587	500 meters	For Boys & Girls	7000 with Food Wifi, Hot/Cold Water/
STAR PG FOR GIRLS	9410316151	300 Meters	For Girls	4500-room, 3500-food
MANGLAM PG	7947431023	500 Meters	For Girls	4800 Room
SUVIDHA PG	9756395170	500 Meters	For Girls	6500 room and food
HAPPY GIRILS PG	9897164009	500 Meters	For Girls	3700, 3200, 4000 Only
				Room, Food Excluded
ROOP GIRLS PG PAYING GUEST	9411703220 8868824946	500 Meters 50 Meters	For Girls Boys & Girls	7500-room & Food Both 3500-room

HOSTEL/PAYING GUEST FACILITIES NEAR DNA LABS - 2

Name of the Hotel/	Contact No. Paying Guest	Distance from Laboratory-1 (approx..)	Boys/Girls	Monthly Charges
Jagar Singh PG Laxmipur	6398317742 8171287547	200 Meters	For Boys/Girls	3000 (without food), 60 Per time food
Maa Anpurna Food and Tiffin Services	9675385822	200 Meters		Food Menu and Rates as per students choice
Sohan Sharma PG	9149221903	01 Km	Boys/Girls	One, Two Room Set
Chamoli Niwas	6377385799	50 meters	For Boys/Girls	7500/-
Shivalik Boys Hostel Suddhowala Chowk, Dehradun	9971615478	2.5 Km	Only for Boys	6500 with food 3000 without food
Mannat Girls PG Suddhowala Chowk, Dehradun	9756600202	4 Km	Only for Girls	7000 with food
Green Home Boys Hostel Suddhowala Chowk, Dehradun	9837372857	6.5 Km	Only for Boys	7000 (with food) Wi-Fi and Laundry
Balaji Hostel Jhajra, Premnagar	9012514505 9027812301	2 Km	Boys/Girls	15,000 with food per two student Wi-Fi and Laundry
Bhawna Girls Hostel Suddhowala, Dehradun	8171755240 9997170440	4.5 Km	Only for Girls	7000 (with food) Wi-Fi and Laundry
Bhawna Boys/Girls Hostel Nanda Ki Chowki	8171755240	4.5 Km	Boys/Girls	6000 (with food) Wi-Fi and Laundry

Note: Students/Research Scholars can directly contact the mentioned PGs/Hostels. Above staying arrangements are close to DNA Labs-A Center for Applied Sciences, Dehradun-Uttarakhand. It will be the responsibility of the trainee to choose the PG/Hostel Facility.

- Transportation facilities, pick and drop from Balaji dham, Suddhowla and Premnagar to and from DNA Labs- 2 will be provided to the trainees (on mutual consent basis).
- Scientific tours during Training Programms to FRI, Regional Sciences Centres, Vigyan Dham, Science Galleries will be arranged.

Student Welfare Committee (SWC):

(1) Mr. Divya Prakash Pandey- 90273 12357 (2) Mr. Vipin Nautiyal - 87553 27278

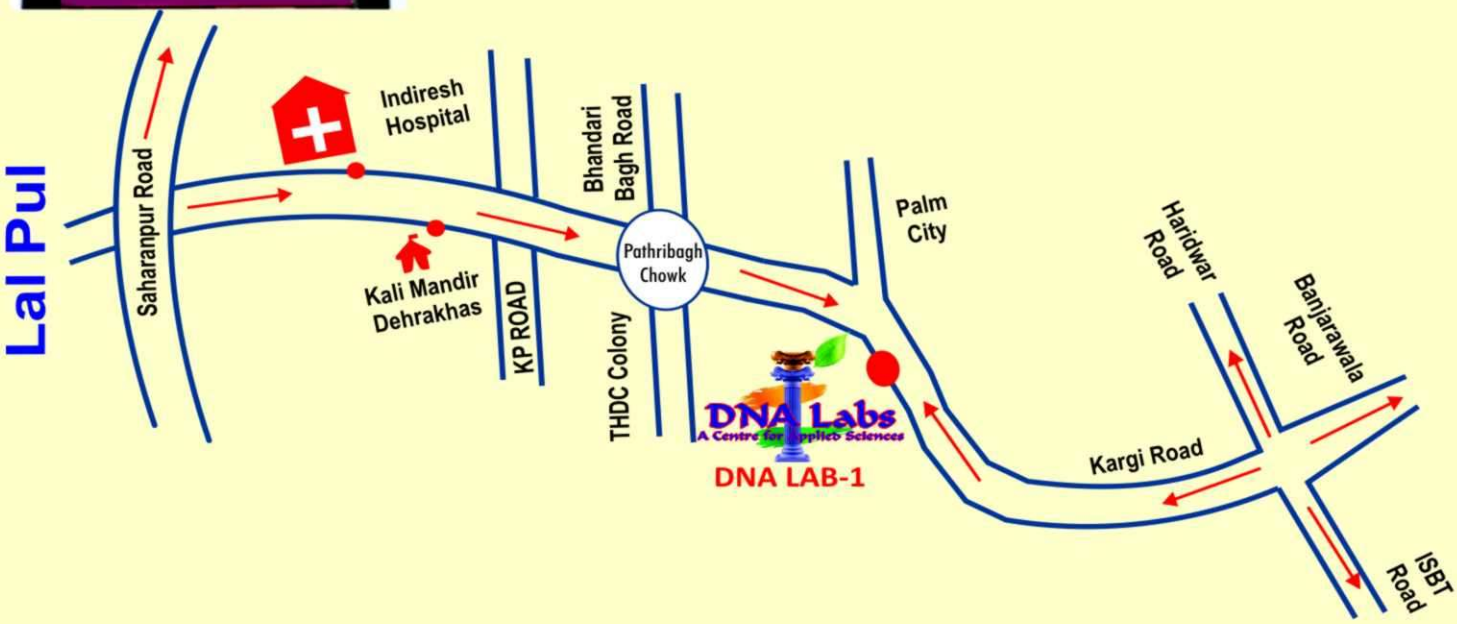
(3) Mr. Dharmender Prakash Veer - 96751 60000

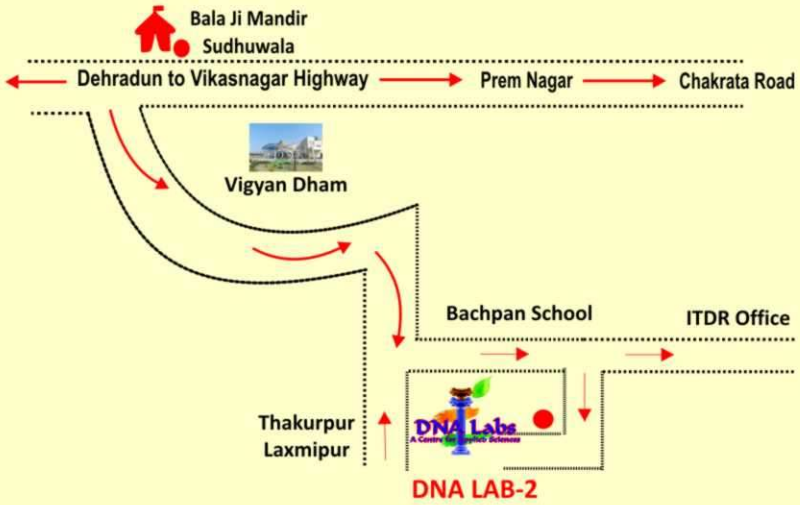
Any issues related to Hostel/PG/Rooms, Foodings, Travel and Transportation.

LABORATORY 01

Distance from Lab 1: (in Km)

ISBT	:	3 Km
Railway Station	:	2 Km
Airport	:	20 Km
Labs 2	:	10 Km





Distance from Lab 2 : (in Km)

ISBT	:	13 Km
Railway Station	:	10 Km
Airport	:	35 Km
Labs 1	:	10 Km

Workshops

Excellence for Trainees

Research Publications

Why To Choose

DNA LABS

A CENTRE FOR APPLIED SCIENCES

PubMed

PLOS ONE
A peer-reviewed, open access journal

Career Guidance & Placement Cell

Guest Lectures

Customize your future in the

VALLEY OF NATURE

Nearby Places to Visit

9557650069, 9027312357

www.dnalabscas.com dnalabscas@gmail.com

Batches (Every Month)

Morning Batch 9.00 am to 1.00 pm | *Evening Batch* 2.00 pm to 5.00 pm