Course Leadership

Chief Patron

Dr. N.H. Mohan
Director, ICAR-National Bureau of Animal Genetic Resources, Karnal, Haryana

Patrons

Dr. S.P. Dixit
Head, Animal Genetics Division

Dr. A.K. Mishra
Head, Animal Genetics Resources Division

Dr Monika Sodhi
Head, Animal Biotechnology Division

Course Director

Dr. Raja K. N.
Principal Scientist, ICAR-NBAGR, Karnal

Course Coordinators

Dr. Sonika Ahlawat
Senior Scientist, ICAR-NBAGR, Karnal

Dr. Vishakha Uttam
Scientist, ICAR-NBAGR, Karnal

Important dates

Last date of application: 20 January 2027
Notification of selection: 25 January 2027

Bank account details

Beneficiary Name: I.C.A.R. Unit NBAGR, Karnal
Bank Name: State Bank of India (SBI)
Account Number: 10093065125
IFSC Code: SBIN0001761
Branch: Model Town, Karnal

APPLICATION FORM
ICAR Sponsored Winter School
on
Advancements in Management and Sustainable Utilization of Indigenous Animal Genetic Resources of India for Viksit Bharat 2047

1. Full name: _____
2. Designation: _____
3. Discipline: _____
4. Present employer and address: _____
5. Address for correspondence: (along with mobile/telephone no. and email): _____
6. Date of birth: _____ Sex (Male/Female): _____
7. Teaching/Research/Professional experience _____
8. Marital status (Married/Unmarried): _____
9. Online payment transaction ID and date: _____
10. Number of courses attended in the last five years: _____
11. Academic Record

Degree	Discipline	Year	University
Graduation			
Masters			
PhD			
Any other			

Date:
Place:

Signature of the applicant

Date:
Signature of forwarding authority with Seal

Address for Correspondence
Course Director
Dr. Raja K. N., Principal Scientist
ICAR–National Bureau of Animal Genetic Resources, Karnal
Email: drrajakn@gmail.com; kn.raja-icar@nic.in
Phone: +91-9729070777

भाकृअनुप
ICAR

ICAR Sponsored Winter School
on
Advancements in Management and Sustainable Utilization of Indigenous Animal Genetic Resources of India for Viksit Bharat 2047

02–22 February 2027 | 21 Days

Course Director
Dr. Raja K. N.
Principal Scientist, ICAR-NBAGR, Karnal

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Organized by
ICAR- National Bureau of Animal Genetic Resources
Karnal-132001 (Haryana) INDIA

Institute at a Glance

ICAR-NBAGR, Karnal

ICAR-NBAGR functions as the nodal agency in India for the characterization, documentation, and conservation of indigenous Animal Genetic Resources (AnGR). The institute leads national initiatives for systematically characterizing the genetic diversity of livestock and poultry, supports *in-situ* conservation, and undertakes molecular characterization and population diversity studies using genome-wide molecular markers. The institute also focuses on functional genes and biomolecules linked to economically important traits including milk, meat and fibre production, climatic adaptability and disease resistance, with the overarching goal of promoting sustainable utilization of Animal Genetic Resources in India.

About Karnal

Karnal, historically associated with **Karna of the Mahabharata**, is a vibrant city in Haryana known for its greenery and rich cultural heritage. Located along the historic Grand Trunk Road (NH-44), it lies approximately equidistant from New Delhi and Chandigarh, making it a convenient base for exploring the region. The city and its surroundings offer a blend of historical, cultural, and religious attractions.

Places of Interest to Visit

- Karnal: Karan Lake
- Kurukshetra: Brahma Sarovar, Sannihit Sarovar, Jyotisar, Kurukshetra Panorama and Science Centre, Dharohar Museum, Sthaneshwar Mahadev Temple

About the Winter School

The Winter School is designed to strengthen scientific capacity in the characterization, conservation, management and sustainable utilization of India's indigenous Animal Genetic Resources (AnGR). The programme integrates conventional approaches with genomics, next-generation sequencing, bioinformatics, reproductive biotechnology, quantitative genetics, precision livestock farming, artificial intelligence and data-driven breeding strategies.

Facilities & Learning Environment

The institute provides well-equipped laboratories with modern instruments, a well-stocked scientific library, a dedicated seminar and conference hall with audio-visual facilities, and an on-campus guest house. The available infrastructure supports both theoretical and practical components of the training programme.

Scientific Objectives of the Winter School

- Strengthen understanding of the diversity, characterization, and documentation of indigenous Animal Genetic Resources.
- Strengthen knowledge of *in-situ* and *ex-situ* conservation, cryobanking and germplasm management.
- Relate conservation and genetic improvement strategies to sustainable utilization and the Viksit Bharat 2047 vision.
- Expose participants to advanced genomic and molecular approaches for genetic resource characterization.
- Develop practical understanding of NGS, SNP genotyping, variant discovery and genomic data analysis.
- Introduce population genetics, selection signatures, GWAS, and other advanced approaches for understanding genetic diversity.
- Discuss quantitative genetics, BLUP/GBLUP, Bayesian models and genomic selection for sustainable genetic improvement.
- Explore functional genomics, transcriptomics, proteomics, metabolomics, and reproductive biotechnology.
- Introduce AI, machine learning, precision livestock farming and decision-support approaches in animal genetics.

Core Scientific Domains

The programme combines expert lectures, practical demonstrations, genomic-data analysis sessions and institutional/farm visits.

AnGR Characterization

- Breed characterization
- Registration
- National Databank
- Livestock census
- State-wise breeding policies

Conservation

- *In-situ* conservation
- *Ex-situ* conservation (Somatic cells, embryos)
- Cryobanking
- Breed societies
- Sustainable Development Goals

Advanced Omics & Biotechnology

- Transcriptomics and functional genomics
- Genetic diversity analysis
- Proteomics and metabolomics
- Multi-omics
- Genomic selection

Data-Driven Livestock Science

- AI and big data in breeding
- Machine-learning models
- Deep learning in livestock data
- Precision livestock farming
- Decision-support systems

Hands-on / Practical Exposure

- Genomic data formats and files in NGS analysis
- Variant calling using GATK: best-practices workflow
- DNA extraction and SNP array demonstration
- Chromosome preparation and karyotyping
- Genome assembly and analysis
- Fundamentals of PLINK
- DNA methylation data analysis
- Estimation of EBV using BLUP
- Estimation of GEBV using SNP-BLUP and GBLUP
- SNP data analysis and GWAS
- Weighted Gene Co-expression Network Analysis (WGCNA)
- CRISPR-Cas genome-editing tools
- Overview of genomic data analysis
- Introduction to machine-learning models

Exposure Visits

- ICAR-NDRI, Karnal — Institutional Farm Visit
- ICAR-CIRB, Hisar — Institutional Farm Visit
- Model Dairy Farm, ICAR-NDRI

Programme Snapshot

Day 1–5	AnGR foundations, characterization, breed registration, breeding policies, and breed improvement
Day 6–10	Conservation, cryobanking, genome editing, CRISPR, breed societies, and SDGs
Day 11–15	Transcriptomics, epigenomics, proteomics, WGS, exome sequencing, proteomics, and institutional visits
Day 16–20	NGS, SNPs, variant discovery, quantitative genetics, GWAS, and AI/ML
Day 21	Viksit Bharat 2047 roadmap, integrated genomic selection framework, future strategies and valedictory

Application procedure

Eligible candidates should submit their application in the prescribed format, duly recommended by the competent authority. The approved application must be emailed to drrajakn@gmail.com on or before **20 January 2027**. There is **no course fee**, but participants are required to pay a **registration fee of Rs. 50/-** online to the account **"I.C.A.R. Unit NBAGR, Karnal."** Details of the online transaction should be shared for verification. A confirmation email will be sent to all selected candidates.