Post-doctoral fellowship (PDF) (Post DM/MCh) in Bioastronautics

Collaborative Programme between Human Space Flight Centre (HSFC), ISRO and Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST)

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1. Introduction

1.1. Background

Bioastronautics is the multidisciplinary study of adaptation, performance and health of humans and other living systems in the space environment, and the design of systems that enable safe and effective human presence in space. It encompasses the effects of microgravity, space radiation, isolation and confinement, altered atmospheric conditions and hostile environments on biological systems, as well as the development of countermeasures, life support systems, spacesuits, medical care capabilities and human factors engineering for spaceflight.

Considering the country's vision on the human space missions in future and with the successful progression of the Gaganyaan programme and plans for future orbital stations, lunar missions and deep space exploration, the nation is entering a decisive phase in human spaceflight. However, there exists a critical national gap in formal academic training, structured research infrastructure and translational capability in bioastronautics and space medicine. Currently, no dedicated academic programme in Space Medicine exists in Indian medical, engineering or life science institutions, despite the urgent need for indigenous expertise to design, operate and medically support human missions.

1.2. Rationale for HSFC–SCTIMST Collaboration

The Human Space Flight Centre (HSFC), established by ISRO in Bengaluru in January 2019, serves as the nodal agency for implementing India's human spaceflight programme. HSFC is responsible for end-to-end mission planning, development of crew survival systems, crew selection and training, and sustained human space mission operations. HSFC brings unparalleled expertise in aerospace engineering, mission operations, spacecraft systems, environmental control and life support systems (ECLSS), crew module design and astronaut training infrastructure.

The Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, is an Institute of National Importance under the Department of Science and Technology, Government of India. SCTIMST possesses unique strengths in

clinical medicine (particularly cardiovascular, neurological and critical care), biomedical engineering, medical device development, biomaterials research, translational research, public health and advanced clinical training. The institute's Biomedical Technology Wing has pioneered numerous medical devices and technologies successfully commercialized in India.

An MoU has been signed between SCTIMST and ISRO to establish collaborative research and training activities in space medicine. This partnership leverages HSFC's operational and mission expertise with SCTIMST's clinical, biomedical engineering and translational research capabilities to create a nationally unique centre of excellence.

1.3. Objectives of the Programme

This proposal seeks approval to establish **two Post-Doctoral Fellowship (PDF) positions in Bioastronautics** per year.

- **PDF 1 Research Position**: Based primarily at **HSFC, Bengaluru** (with rotations to SCTIMST)
- **PDF 2 Research Position**: Based primarily at **SCTIMST, Thiruvananthapuram** (with rotations to HSFC)
- **The course modules will be done together at both SCTIMST and HFSC. The place of research position shall be based on the project with rotations in both the institutes. The Projects must have PIs from both institutes.**

The specific objectives are to:

1. Train highly skilled manpower to support current and future Indian human spaceflight programmes (Gaganyaan, orbital stations, lunar and planetary missions).
2. Develop national research capabilities in human space physiology, space life support systems, biomedical engineering for space applications and space health risk assessment and mitigation.
3. Establish HSFC and SCTIMST as collaborative nodal centres for astronaut health standards, selection input, training support, in-flight medical operations planning and post-flight medical surveillance.
4. Facilitate national and international collaboration with academic, clinical, industrial and space agency partners to develop space-relevant biomedical technologies, sensors, monitoring systems, countermeasures and decision-support tools.
5. Provide comprehensive understanding of the end-to-end human space mission lifecycle – from pre-flight medical screening and training, through launch, on-orbit operations, extravehicular activity (EVA), re-entry and post-flight rehabilitation.

6. Build competence in space medical operations, including remote monitoring, telemedicine, diagnosis and management of spaceflight-related health emergencies and contingencies.

7. Enable fellows to conceptualize, design, execute and publish high-quality research in space life sciences, utilizing ground-based analogues, simulation platforms, parabolic flight opportunities and potential in-flight experiments.

8. Contribute to national policy, standards, guidelines and standard operating procedures (SOPs) related to human spaceflight medical support, crew health requirements and ethical conduct of space biomedical research.

1.4. Programme Highlights

- **Training Modules:**

- **At HSFC (ISRO):**

  - Mission operations, flight rules, real-time decision support
  - Crew systems, human factors, cockpit/vehicle ergonomics
  - Astronaut selection medical standards
  - Survival training exposure, high-G centrifuge, parabolic flight
  - EVA contingency planning and medical kit design

- **At SCTIMST:**

  - Rotations through ICUs and other labs of hospital (neuro, cardiac, surgical)
  - Neurophysiology, cardiology, basic sciences, (including SANS-related imaging)
  - Biomedical device engineering and prototyping
  - Signal processing, computational modelling, digital twins
  - Rehabilitation, exercise physiology, and clinical assessment

- **Collaborative research project:** Leverage ground analogs, simulation platforms, and emerging flight experiment opportunities, biomedical engineering platforms and payloads aligned with Gaganyaan/BAS mission needs.

- **Personalized Training Plan:**

  Each fellow tailors a detailed rotation and research schedule for approval by mentors and committee from both the institutes

2. Goals and Competencies

2.1. Programme Goals

The training programme aims to:

a) Train highly skilled professionals to support India's human spaceflight programmes in the field of space medicine (Gaganyaan, future orbital and deep space missions).
b) Develop national research capabilities in human space physiology, bioastronautics and space biomedical engineering.
c) Establish HSFC and SCTIMST as centres of excellence for astronaut health, crew training medical support and post-flight medical follow-up.
d) Foster collaboration with national and international space agencies, academic institutions and industry for biomedical technology and countermeasure development.
e) Provide comprehensive training across the human spaceflight mission lifecycle – from crew selection, pre-flight preparation, in-flight operations, EVA support, to post-flight rehabilitation.
f) Build competence in space medical operations including remote diagnosis, telemedicine, medical decision-making under operational constraints and emergency management.
g) Enable fellows to conduct and publish high-quality research in space life sciences, utilizing ground analogues, simulation platforms and future spaceflight opportunities.
h) Contribute to national space health policy, medical standards, SOPs and ethical frameworks for human spaceflight research.

2.2. Competencies to be Achieved

Upon completion of the fellowship, trainees will have achieved competencies in the following domains:

2.2.1. Human Spaceflight Fundamentals

- Understand human mission architectures for LEO, lunar, Mars and deep space exploration, including mission phases, timelines and biomedical constraints.
- Comprehend principles of microgravity, partial gravity, space radiation environment, spacecraft atmospheres and their physiological impacts.
- Understand mission planning, risk assessment and systems integration from a biomedical perspective.

2.2.2. Human Space Physiology and Pathophysiology

- Describe acute and chronic adaptations of major organ systems to spaceflight:
  - **Cardiovascular**: orthostatic intolerance, cardiac atrophy, fluid shifts, altered autonomic regulation
  - **Musculoskeletal**: muscle atrophy, bone demineralization, connective tissue changes
  - **Neurovestibular**: space motion sickness, sensorimotor adaptation, spatial orientation challenges

- **Visual**: Spaceflight Associated Neuro-ocular Syndrome (SANS), optic disc edema, etc.
- **Respiratory**: altered ventilation-perfusion, exercise capacity,
- **Endocrine and metabolic**: altered circadian rhythms, hormonal changes, nutritional challenges
- **Immune system**: immune dysregulation, reactivation of latent viruses
- **Gastrointestinal**: altered motility, microbiome changes
- **Renal and fluid-electrolyte**: renal physiology and alterations in kidney function, etc.
- **Skin and wound healing**: delayed healing, radiation effects

- Understand cellular, molecular and genetic responses to spaceflight stressors: oxidative stress, DNA damage, epigenetic modifications, altered gene expression, microbiome alterations.
- Recognize clinical features, differential diagnosis and management principles of spaceflight-associated medical conditions including acute illnesses, injuries, psychological crises and chronic diseases.

2.2.3. Space Radiation Biology and Protection

- Understand sources and characteristics of space radiation: galactic cosmic rays (GCR), solar particle events (SPE), trapped radiation belts.
- Comprehend biological effects: deterministic effects (acute radiation syndrome) and stochastic effects (cancer risk, cataract, CNS effects).
- Understand radiation dosimetry, risk models and lifetime exposure limits.
- Learn radiation shielding strategies, mission planning, ALARA principles and pharmacological countermeasures.

2.2.4. Space Medicine and Clinical Operations

- Apply principles of aerospace and space medicine to crew selection standards, medical evaluation, fitness determination and waiver processes.
- Understand medical certification requirements for astronauts and payload specialists.
- Design and evaluate medical kits, pharmaceuticals and medical devices suitable for spaceflight (mass, volume, shelf life, usability in microgravity).
- Develop skills in telemedicine, remote diagnosis, teleconsultation and tele-ICU concepts for space applications.
- Understand in-flight medical contingency protocols, emergency procedures, crew medical officer training and medical decision-making under resource constraints.

- Interpret advanced diagnostic modalities relevant to space: point-of-care ultrasound (POCUS), ECG telemetry, continuous physiological monitoring, remote imaging interpretation.

2.2.5. Environmental Control and Life Support Systems (ECLSS)

- Understand principles of ECLSS: atmosphere control and supply, oxygen generation, CO_2 removal, trace contaminant control, temperature and humidity control, water recovery and management, waste management, fire detection and suppression.
- Comprehend biomedical interfaces of ECLSS: acceptable environmental ranges for human health, monitoring of environmental quality, health risks from ECLSS failures.
- Understand integration of ECLSS with spacesuit systems, airlocks and habitats.

2.2.6. Spacesuits and Extravehicular Activity (EVA)

- Understand spacesuit architecture: pressure garment, portable life support system (PLSS), thermal control, communication systems.
- Comprehend physiological challenges of EVA: pre-breathe protocols, decompression sickness risk, metabolic demands, thermal stress, ergonomics and human factors.
- Learn EVA operations, training, procedures and medical monitoring.

2.2.7. Countermeasures and Rehabilitation

- Understand exercise countermeasure systems and protocols: resistive exercise devices, treadmills, cycle ergometers, exercise prescription for microgravity and partial gravity.
- Learn pharmacological countermeasures: bone loss medications, cardiovascular medications, sleep aids, anti-nausea agents.
- Understand nutritional countermeasures: caloric requirements, macronutrient and micronutrient needs, vitamin D, sodium regulation.
- Learn sensorimotor and neurovestibular training, visual-motor adaptation protocols.
- Understand behavioral health countermeasures: sleep hygiene, circadian lighting, psychological support, team dynamics training, stress management.
- Plan post-flight medical surveillance, reconditioning programmes and long-term health follow-up for returning astronauts.

2.2.8. Psychological Health and Human Factors

- Understand psychological challenges of spaceflight: isolation, confinement, monotony, workload, team dynamics, cultural differences, communication delays (deep space).
- Learn psychological selection, monitoring and support strategies.

- Comprehend crew resource management, team performance, leadership and conflict resolution in space crews.
- Understand human factors, habitability and ergonomics in spacecraft design, workstations, controls, displays and interfaces.

2.2.9. Space Biomedical Engineering and Technology Development

- Design and prototype biomedical sensors, monitoring devices and diagnostic tools suitable for spaceflight (miniaturized, low-power, robust, autonomous, easy to use in microgravity).
- Understand hardware qualification requirements for space environments (vibration, radiation, thermal cycling, EMI/EMC, outgassing).
- Apply artificial intelligence, machine learning and decision-support algorithms to physiological monitoring, predictive analytics and medical decision support.
- Learn systems engineering approaches to integrate medical requirements into mission design.

2.2.10. Research Methods in Space Life Sciences

- Formulate research questions and hypotheses with clear relevance to human spaceflight health, performance or risk mitigation.
- Design and conduct experiments using appropriate ground-based analogues:
  - Bed rest / head-down tilt (cardiovascular and musculoskeletal deconditioning)
  - Dry immersion (rapid fluid shifts, sensorimotor changes)
  - Isolation and confinement chambers (psychological, circadian, team dynamics)
  - Hypoxia and hypobaric chambers (high-altitude/EVA analogue)
  - Parabolic flight (brief microgravity)
  - Centrifuge and high-G environments (launch/re-entry stress)
  - In vitro and in silico models (cellular responses, computational physiology)
- Apply rigorous study design: controlled trials, blinding, randomization, sample size calculation, statistical power.
- Master data management, statistical analysis and reproducible research practices.
- Write and publish at least one peer-reviewed research manuscript and present at one national/international conference during fellowship.
- Understand regulatory and ethical requirements: institutional review boards (IRB), informed consent, astronaut privacy and data confidentiality, dual-use research considerations.

2.2.11. Policy, Standards and International Collaboration

- Understand international standards and best practices in human spaceflight: NASA, ESA, Roscosmos, JAXA, CSA guidelines.
- Learn medical standards for astronaut selection, certification and operational constraints.
- Contribute to development of Indian national guidelines, SOPs, checklists and risk matrices for crewed missions.
- Understand bilateral and multilateral agreements, crew exchange programmes and collaborative research frameworks.

3. Facilities and Resources

3.1. Facilities at HSFC, Bengaluru

HSFC is the nodal centre for India's human spaceflight programme and provides access to:

- **Gaganyaan crew module simulators**: Full-scale mock-ups, virtual reality systems, crew-vehicle interfaces
- **Training infrastructure**: High-fidelity simulators for mission operations, docking, rendezvous
- **Mission control and operations centres**: Real-time monitoring, telemetry, command and control
- **Crew training facilities**: Survival training, Spacesuit development and testing, parabolic flight coordination
- **Crew medical and health monitoring infrastructure**: Pre-flight, in-flight and post-flight medical protocols and systems
- **Human factors and habitability labs**: Ergonomics, crew workstation design, interface evaluation
- **Integration with other ISRO centres and IAM:**
  - **VSSC (Thiruvananthapuram)**: Launch vehicle systems, crew safety, abort dynamics
  - **LPSC (Thiruvananthapuram):** ECLSS test beds and development facilities Atmosphere control, water recovery, thermal systems
  - **SAC (Ahmedabad)**: Space environment monitoring, radiation dosimetry, remote sensing
  - **ISTRAC (Bengaluru)**: Communication, telemetry, tracking and data relay systems
  - **Institute of Aerospace Medicine, IAF (Bengaluru)**: Aeromedical evaluation, altitude chamber, centrifuge, aviation medicine expertise

3.2. Facilities at SCTIMST, Thiruvananthapuram

SCTIMST provides world-class clinical, biomedical engineering and research infrastructure:

Hospital Wing

- **Cardiovascular and Thoracic Surgery (CVTS)**: 8 areas of operating theatres with advanced hemodynamic monitoring, interventional cardiology labs with catheterization and imaging
- **Neurosurgery and Neurology**: 5 neuro-OTs, neuro-ICU, interventional neuroradiology suite, neurophysiology lab (EEG, EMG, evoked potentials, intraoperative monitoring)
- **Critical Care Units**: Cardiac ICU, Neuro-ICU, Surgical ICU – multi-parameter monitoring, ventilators, ECMO, advanced life support
- **Anaesthesiology**: Regional anaesthesia, advanced airway management, physiological monitoring
- **NeuroOphthalmology**: Comprehensive ophthalmic evaluation and imaging
- **Radiology and Imaging**: CT, MRI, DSA, ultrasound, POCUS
- **Clinical Physiology labs**: Exercise testing, pulmonary function testing, autonomic function testing
- **Rehabilitation services**: Physical medicine, physiotherapy, exercise physiology, musculoskeletal assessment

Biomedical Technology Wing (BMT Wing)

Located at Poojappura campus, the BMT Wing is dedicated to medical device development and translational research:

- **Medical Devices Engineering Division**: Device design, CAD/CAM, rapid prototyping (3D printing), electronics and embedded systems, software development
- **Medical Instrumentation Division**: Biosignal acquisition and processing (ECG, EEG, EMG, bioimpedance), transducer and sensor development, safety testing and calibration equipment
- **Biomaterials Divisions**: Polymer processing, bioceramics, surface modification, scaffolds for tissue engineering
- **Applied Biology (Biocompatibility and Testing)**
    - Characterization: FTIR, UV-Vis, Raman, XRD, SEM, Micro-CT, thermal analysis, mechanical testing (UTM)
    - Cell culture and in-vitro testing
    - Toxicology and histopathology

- Microbiology and thrombosis testing
- Animal surgery and in-vivo studies
- Sterilization facilities (steam, ETO, gamma irradiation)

- **Central Analytical Facility**: Shared access to advanced characterization and imaging tools
- **Technology Incubation and Commercialization (TechnoPROVE)**: Scale-up, validation, regulatory support, industry partnership

Academic and Research Support

- **Library and digital resources**: Access to biomedical, engineering and space science journals and databases
- **Computational facilities**: High-performance computing, MATLAB, Python, LabVIEW, simulation software
- **Research methodology and biostatistics support**: Workshops, consultancy, data analysis services
- **Ethics committee and regulatory support**: IRB, IAEC, biosafety, clinical trial coordination

4. Eligibility and Selection

4.1. Minimum Qualifications

Applicants must possess **one** of the following qualifications:

- **Medical Stream (MD/MS/DM/MCH)**

Required: Shall possess MBBS with postgraduate medical degree in an NMC-recognized (MD/MS/DNB/DM/MCH) in approved specialties (Anaesthesiology, Internal Medicine, General Surgery, Cardiology, CVTS, Neurology, Neurosurgery, Orthopaedics, Rehabilitation, Pulmonary/Emergency/Critical Care Medicine, Radiology, Ophthalmology, Community/Public Health, Aerospace/Aviation/Sports Medicine, Physiology).

- **Biomedical/Engineering/Life Sciences Track (PhD)**

Required: PhD in Biotechnology, Physiology, Neuroscience, Biophysics, Biochemistry, Microbiology, Molecular Biology, Space Science/Astrophysics (biology focus), Exercise Physiology, Biomedical with First-class M.Sc / M.Tech/ ME (or equivalent) in any of the above subjects

4.2. Desirable Skills & Experience

- Advanced research experience: PhD degree, lead-authored publications, conference presentations, patents, awards.
- **Proficiency in:**
  - Programming and data analysis (MATLAB, Python, R, LabVIEW), signal processing, machine learning, simulations (Simscape, COMSOL, ANSYS), High Throughput Sequencing (NGS) data analysis.
  - Device/technology development, prototyping, hardware systems, embedded design, medical device testing, regulatory documentation,
  - Hands-on experience with molecular biology, microbiology, animal handling experiments.
- Prior exposure to aerospace/aviation/high-altitude/extreme environment medicine, human and animal performance, or related research
- Demonstrated interest in human spaceflight, space life sciences, or extreme environment adaptation via coursework, projects, workshops, internships, certifications
- Interdisciplinary collaboration experience (clinical-engineering, academic-industry, national-international teams)
- Excellent written/oral communication and scientific presentation skills

- **Key Selection Criteria:**

Proven research, technical, and communication skills; demonstrated interest in space medicine, bioastronautics, or human performance; multidisciplinary collaboration experience.

- **Age Limits:**
  - Medical postgraduates: up to 40 years
  - PhD holders: up to 35 years

*(**Age relaxations:** Up to **5 years** for SC/ST candidates, ex-servicemen and serving defense personnel, as per Government of India rules.)*

- **Application and Selection**
  - Documents Required:

- Application form
- CV (max. 4 pages)
- Degree certificates and proof of age
- Statement of Purpose (SoP; 1000–1500 words): *Motivation and interest in bioastronautics and human spaceflight; Relevant background, skills and experience; Proposed broad research area or question (1–2 sentences); Career goals and how this fellowship aligns with them.*
- Two Letters of Recommendation: ***Two*** *letters from academic or professional referees (at least one from supervisor/mentor of postgraduate/doctoral work or current employer).*
- List and PDFs of top publications
- Proof of age, caste certificate (if applicable), photo

- **Selection Process:**
- *Stage 1:* Shortlisting by academic merit, research, SoP, recommendations, alignment with programme goals
- *Stage 2:* Interview and presentation on past work and proposed research interests

5. Fellowship Terms and Conditions

5.1. Fellowship Details

- **No. of Positions:** 2 annually (one at each host institute)
- The proposal of placement shall be considered as follow; however, as per the project allotted, the placement can be decided by the Guide. The candidates shall be attending labs, departments in both places in both years related to the course, and research guides who will be from both the institutes.

Position	Primary Location	Rotation Site
PostDoc-1: HSFC-based research	HSFC, Bengaluru	SCTIMST, Trivandrum
PostDoc-2: SCTIMST-based research	SCTIMST, Trivandrum	HSFC, Bengaluru

- **Duration:** 2-year course with time divided equally between ISRO centres and SCTIMST

- **Stipend: Rs** 80,900 pm and with applicable HRA, DA, and TA as per institute rules for PDF.
- **Benefits:** Accommodation (Guest house/Hostel/HRA), research support, conference travel, insurance, full lab/journal access. (as applicable)

5.2. Application Timeline

- Advertisement release: March/August
- Application deadline: [Date; 4–6 weeks after release]
- Shortlist: [Date; 2–3 weeks after deadline]
- Interviews: [Date; 2–4 weeks after shortlist]
- Final selection: [Date; within 1 week of interviews]
- Joining: [Date; 2–4 weeks after selection] 1st July or 1st January of academic year

5.3. Leave and Working Hours

- **Leave entitlement**: As per SCTIMST norms
- **Working hours**: Full-time commitment (As per SCTIMST/ISRO norms) including rotations, research and on-call duties as assigned.
- **Attendance and conduct**: Fellows are expected to maintain professional conduct, punctuality, academic integrity and adherence to institute and ISRO policies.

5.4. Intellectual Property

- **Ownership**: Intellectual property (IP) arising from research during the fellowship will be governed by the MoU between SCTIMST and ISRO, and applicable institutional IP policies.
- **Inventions, patents, publications**: Fellows may be listed as co-inventors/co-authors. Prior approval from mentors and institutions required before submission for publication or patent filing.
- **Confidentiality**: Fellows must sign non-disclosure agreements (NDAs) for access to sensitive mission data, proprietary technologies or unpublished research.

5.5. Performance Evaluation

- **Mid-term evaluation** (at 6 months): Review of progress by mentors and advisory committee. Feedback and course corrections if needed.
- **Final evaluation** (at 12 months): Assessment based on:
    - Completion of training modules and rotations
    - Research progress: data collection, analysis, manuscript submission
    - Publications and presentations

- Overall performance, professionalism and contribution

- **Extension decision** (if applicable): Based on mid-term and final evaluations, availability of funds and research project requirements.

5.6. Termination

The fellowship may be terminated:

- By the fellow: With one month's notice in writing, stating reasons.
- By the institutes: For unsatisfactory performance, violation of conduct rules, prolonged absence, breach of confidentiality or other disciplinary reasons, with due process.

5.7 **Course Coordinators**

A) SCTIMST

Program In-charges:

Dr S. Manikandan, Sr. Professor In Anaesthesiology ,

Dr Anilkumar P.R., Scientist 'G, Division of Tissue Culture

B) Human Space Flight Centre

Program In-charges:

Dr Dinesh K Singh, Chairmain of HSFC

Dr Sunil, HSFC

6. OUTCOMES AND IMPACT

6.1. Expected Outcomes for Fellows

Upon successful completion of the fellowship, fellows will:

- Be competent to contribute to human spaceflight medical operations, crew training, mission planning and post-flight support.
- Possess interdisciplinary expertise spanning clinical medicine, biomedical engineering, aerospace physiology and human factors.
- Have published research in peer-reviewed journals and presented at national and international forums.
- Be positioned for career advancement in space agencies (ISRO, international agencies), academia (teaching and research in aerospace medicine, biomedical

engineering), industry (space biotech, medical device companies) or healthcare (aerospace medicine, critical care, rehabilitation).

- Serve as ambassadors and mentors for future trainees in bioastronautics and space medicine.
- The course does not authorize managing various clinical conditions in case of non-medical professionals after completion of the course as clinical management are governed by applicable rules of the country.

6.2. Expected Outcomes for Institutions

- **HSFC**: Build in-house biomedical expertise to support Gaganyaan and future human missions; establish medical operations protocols, SOPs and training modules; foster research culture and international collaborations.
- **SCTIMST**: Establish leadership in space medicine and biomedical engineering for space applications in India; create niche research capabilities; attract funding and collaborative projects; expand academic offerings (future Master's or PhD programmes in bioastronautics).
- The postdoctoral fellowship program will be for two years with the time equally divided between the two centres. Two PDFs will be selected for the course per year. For the initial two years, SCTIMST will bear the cost of salary for the PDF students.

AC recommended the proposal for the approval of FC and GB

B7. The Bio Medical Research Eligibility Test (DHR-BRET) To Determine the Eligibility of Indian nationals for the award of Junior Research Fellowship (JRF)

The Department of Health Research–Biomedical Research Education and Training (DHR–BRET) Program is a flagship national initiative of the Government of India aimed at strengthening biomedical and health research capacity through structured doctoral training. The DHR–BRET Program is designed to support high-quality PhD research in priority areas of health, medicine, and allied biomedical sciences by providing competitive fellowships, a standardized national-level selection process, and rigorous academic oversight, thereby creating a skilled pool of researchers capable of addressing national and global health challenges. Under this program, eligible candidates with postgraduate qualifications in medicine, dentistry, nursing, pharmacy, public health, biotechnology, life sciences, or other