

**REPORT OF THE EXPERT COMMITTEE  
REVIEW OF NATIONAL BRAIN RESEARCH CENTRE,  
MANESAR, HARYANA.**

**INTRODUCTION:**

The Government of India/Ministry of Human Resource Development vide notification number F.9-52/2001-U.3 dated 20<sup>th</sup> May, 2002 declared National Brain Research Centre, Manesar, Haryana as a deemed to be University under De-Novo category under section 3 of the UGC Act subject to review after 5 years. The Chairman, UGC constituted an Expert Committee consisting of the following to visit and review the performance of National Brain Research Centre, Manesar, Haryana :

1. Dr. P.K. Banerjee  
Professor of Surgery  
Director of PG Studies  
Sri Aurbindo Institute of Medical Sciences  
Indore ... Chairman
2. Dr. V. Sankar  
Department of Anatomy  
University of Madras, Chennai. ... Member
3. Dr. S.N. Mathur  
Prof. & Head  
Department of Surgery  
Dr. S.N. Medical College,  
Jodhpur – 305 033.  
Rajasthan ... Member
4. Prof. J.V. Prabhakar Rao  
Professor of Management Studies &  
Principal, University College of Arts & commerce  
Andhra University  
Waltair (AP). ... Member
5. Dr. D.K. Sharma, Chairman  
Registration & Equivalence Committee, MCI  
Principal, Muzaffar Nagar Medical College,  
Muzaffar Nagar,  
Uttar Pradesh. M.C.I.- Member
6. Mr. S. C. Chadha  
Deputy Secretary, UGC ... UGC Coordinator

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## **Background of the Institution**

The Department of Biotechnology, Government of India decided to establish a National Brain Research Centre to provide the state of arts facilities for a coordinated multi-disciplinary team of scientists to work in the frontier areas of Neuro Sciences. Before becoming the deemed university in 2002 the NBRC was registered as an autonomous society with a national charter in June, 1999 under Societies Registration Act, New Delhi.

The NBRC functioned in project mode from 1999 up to March 2000 and its interim office was set up at ICGEB, Gurgaon. In May 2001, it moved to a rented building in Gurgaon and set up interim laboratories and recruited research fellows and PDFs. It mainly aims at :

- Basic research to understand brain function in health & disease.
- Generating trained human resource with the capability to carry out inter-disciplinary research in neuroscience (Deemed Univ. status accorded in May 2002).
- Understanding the biological basis of information processing and regulation at the molecular, cellular, network and systems levels across the life span.
- Promoting neuroscience in India through networking.

At present NBRC has taken land measuring of 38.78 acres at Manesar, Haryana on lease for 33 years from Indian Vaccines Corporation Ltd., New Delhi (An a public sector undertaking under DBT)

## **Mission and Vision of the Deemed University.**

The mandate of National Brain Research Centre (NBRC) is to be a Centre of Excellence in Brain Research with state-of-the-art facilities, to evolve the centre through a networking approach and generate highly trained human resource. NBRC functions as a comprehensive brain research institute, which has been envisaged as a novel institute of its kind in having both intramural and extramural responsibilities. A unique role for NBRC is that it will act as a node with linkages to other centres carrying out neuroscience

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research in the country, acting in effect as the "hub of the wheel" rather than the wheel itself.

Research at NBRC is carried out by bringing together scientists working in different disciplines into the mainstream of neuroscience. A unified, highly integrated multidisciplinary team of scientists from varying backgrounds works to pursue the objectives and address highly complex problems in neuroscience that are beyond the capacities of individual investigators.

The vision for NBRC is that it would not only grow into a world-class institute for **Brain Research and Training** but also help to create a vibrant, active neuroscience community by catalysing the overall growth of this discipline in the country and develop unique human resources.

The above Expert Committee visited the Institute On 19<sup>th</sup> – 20<sup>th</sup> December, 2008. Shri S.C. Chadha, Deputy Secretary, UGC, who coordinated the visit and brief the member about the purpose of the visit.

Director, Registrar and other Faculty Members of the National Brain Research Centre gave a warm welcome to the Member of the Expert Committee. Director, NBRC and all the faculty members made power point presentation about the infrastrure and activities of the Deemed University. Then the Committee Members visited the Departments and inspected the infrastructural and academic facilities, labs etc.

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Based on the visit and inspection made by the Expert Committee and the information / documents given by the Deemed University, the Inspection is given below:

### Inspection Report

**1. Name and address of the Deemed University**

National Brain Research Centre,  
Near Nainwal Mode, NH-8,  
Manesar-122050, Dist-Gurgaon, Haryana

**2. Headquarters of the Deemed University  
(With full address, Phone Nos, e-mail etc.)**

National Brain Research Centre,  
Near Nainwal Mode, NH-8,  
Manesar-122050, Dist-Gurgaon, Haryana

Phone Nos – 0124 – 2338922 – 26

E-mail : [info@nbrc.ac.in](mailto:info@nbrc.ac.in)  
[academics@nbrc.ac.in](mailto:academics@nbrc.ac.in)

**3. Name of the Society/Trust promoting the Deemed University**

National Brain Research Centre  
An Autonomous Body of the Department of Biotechnology  
Ministry of Science & Technology, New Delhi.

- Whether Deemed University itself is registered as a Society/Trust : YES

- Whether MOA/Rules approved and as per UGC norms:

YES, with some modifications being government sponsored institution as submitted at the time of consideration of Deemed to be university status (copy enclosed as ANNEXURE – 1)

- Whether Corpus fund maintained as per UGC norms:

NOT APPLICABLE, SPONSERED & FUNDED BY Department of Biotechnologies, Minstry of Science & Technology, GOI

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V. Santhosh

#### 4. No. and date of Notification as Deemed to be University

No.F.9-52/2001-U.3 dated 20<sup>th</sup> May, 2002 issued by  
Ministry of Human Resource Development, Government of India.

#### 5. Objectives of the Deemed University as laid down in MOA.

The major objectives of NBRC are:

- To undertake, aid, promote, develop, guide and coordinate research of high rganiz in basic and clinical neurosciences related to diseases and disorders of the nervous system.
- To develop the Centre as the national apex centre for neurosciences research and promote neuroscience research at different centres in the country and to provide consulting services to other institutions, agencies and industries.
- To promote, encourage and augment effective linkages, alliances and affiliations between the Centre and national and international scientific and research institutions, bodies, agencies / laboratories and other organizations working in the field of brain and neurosciences research;
- To establish one or more satellite centres to serve different regions of the country for efficient achievement of the objectives of the Centre;
- To collect, assimilate, publish and disseminate data and information on aspects relevant to neuroscience to the scientific community;
- To establish, operate and maintain state-of-the-art facilities and database for carrying research and development activities and make such facilities and database available to scientists and researchers from all over the country and abroad;
- To provide for instructions and training in such other branches of learning as the Centre may deem fit;
- To provide facilities for advanced research and development for advancement of learning and for dissemination of knowledge;
- To undertake extramural studies, extension programmes and field outreach activities to contribute to the development of society;
- To promote, develop, collaborate or otherwise assist in providing services of research, training, consulting or guidance related to neurosciences activities comprising biological, psychological, sociological and clinical aspects; and

To do all such other acts and things as may be necessary or desirable to further the objectives of the Centre.

#### 6. Thrust Areas of the Deemed University

Molecular & Celluar Neuroscience,  
Systems NeuroScience,  
Cognitive NeuroScience  
Computational & Theoretical NeuroScience.

*Agree*  
*V. Santhosh*

7. **Whether accredited by NAAC/NBA, if yes, rating**

No. It is under process. A letter has been sent to NAAC vide Letter No.NBRC/Acad/UGC/2008/3433 dated 30<sup>th</sup> October, 2008 for getting the University accredited by NAAC, Bangalore (Annexure-2)

8. **Whether the Deemed University is conforming to the relevant regulations / norms of the UGC and other statutory bodies concerned, regarding minimum standard of instructions, qualification of teachers, merit based admission of student on an all India basis and the reasonable fee structure.**

YES.

9. **Whether the status of Deemed University was under de-novo category?**

YES.

10. **Fee structure**

**Fees to be paid for Int.Ph.D and Ph.D Programme :**

1.	Annual Fees (Non-refundable)	Rs. 5000/- (Payable in two instalments before 15 <sup>th</sup> July / 15 <sup>th</sup> January every year).
2.	Hostel Deposit	Rs. 4000/- (Refundable)
3.	Library Deposit	Rs. 1000/- (Refundable)

**Other Fees:**

- 1) Registration Fees of Rs.7,000/- at the time of registering for Integrated Ph.D/ Ph.D.
- 2) Thesis submission Fee of Rs.3,000/- at the time of submission of thesis for Integrated Ph.D / Ph.D.
- 3) Charges for sending the application by post / courier for Integrated Ph.D Ph.D admission - Rs.50/-.  
It can also be downloaded free of cost from NBRC website.

*V. Sankar*

*V. Sankar*

- 4) Application Fee for submitting Off-line application Int.Ph.D/ Ph.D admission - Rs.850/-
- 5) Application Fee for submitting On-line application Int.Ph.D and Ph.D Admission – Rs.750/-
- 6) Application Fee for PH / SC / ST candidates – Rs.200/- applying for offline and online

**Note: The charges for application fee for submitting off-line and online application may vary year to year.**

**11. Student enrolment since the conferment of Deemed University status (course-wise).**

S N o	Name of the course	Intake capacity	Year	No.of students actually admitted
1	M.Sc (Neuroscience)	10	2004	10
		10	2005	10
Total Students				20
2	Integrated Ph.D (Neuroscience)	10 ( Depending on Lab requirement)	2006	5
			2007	10
			2008	4
Total Students				19
3	Ph.D (Neuroscience)	10 – 15 (depending on Lab requirement)	2001 and 2002	5
			2003	8
			2004	6
			2005	13
			2006	15
			2007	9
			2008	6
			2008	3
Total - 65				

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**12.No. of full time faculty with qualifications since the conferment of Deemed University status – 16.**

S.No	Name of the faculty	Educational Qualifications
1	Prof. Vijayalakshmi Ravindranath	PhD from Mysore University
2	Dr. Neeraj Jain	Ph.D in Biochemistry from Indian Agricultural Research Institute, New Delhi
3	Dr. Rema Velayudhan	Ph.D in Molecular Biology from Centre for Cellular & Molecular Biology, Hyderabad
4	Dr. P.K. Roy	Ph.D, Electronics & Communication Science, Unit, Indian Statistical Institute, Kolkatta
5	Dr. Aditya Murthy	PhD in Neurobiology from University of Pittsburgh, Pittsburgh
6	Dr. Nandini C. Singh	PhD in Physics from University of Pune
7	Dr. Nihar Ranjan Jana	Ph.D. in Biochemical Endocrinology, VisvaBharati University, Santiniketan,
8	Dr. Shyamala Mani	PhD Neuroscience from Upstate Medical Centre, New York state, USA
9	Dr. Soumya Iyengar	PhD in Neurobiology from University Southern California, Los Angeles
10	Dr. Pankaj Seth	PhD in Medical Biochemistry from Shri Shahu Jimaharaj University, Kanpur
11	Dr. Anirban Basu	PhD in Cellular Immunology from Indian Institute of Chemical Biology, Kolkata
12	Dr. Narender K. Dhingra	Ph.D in Neurophysiology from NIMHANS, Bangalore
13	Dr. Shiv Kumar Sharma	Ph.D Signal transduction and Molecular Biology from JNU, New Delhi
14	Dr. Ellora Sen	Ph.D from Indian Institute of Chemical Biology, Kolkatta
15	Dr. Ranjit K. Giri	Ph.D from Indian Institute of Life Sciences, Bhubaneshwar
16	Dr. Pravat Mandal	Ph.D in spectroscopy from IIT Madras

**13. Details of the staff since the conferment of Deemed University status (course-wise) ( Faculty, Technical, Administrative etc.)**

Details are at Annexure – 3.

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**14. Details of courses run on regular basis.**

Integrated Ph.D(Neuroscience)  
 Ph.D(Neuroscience)  
 M.Sc (Neuroscience)

**15. Details of courses run under distance mode.**

Nil.

**16. Name and place of off-campus/off-shore campus/study centre, if any**

Nil.

**17. Research Projects received since the conferment of Deemed University status (year, no. of projects, amount sanctioned, amount receive, funding agency etc.)**

Details are at Annexure-4.

**18. Publications in Conferences, Journals and Books by the faculty since the conferment of Deemed University status ( year, conferences, journals, books)**

Details are Annexure - 5.

**19. Financial position of the Deemed Univ. ( income – expenditure since the conferment of Deemed University status .**

year	Income	Expenditure
2002-03	29658556	24782738
2003-04	53478503	38629380
2004-05	69401086	65363624
2005-06	81552465	67089204
2006-07	98545036	118736509
2007-08	124388094	115170954

Details are at Annexure – 6.

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**20. Placement details of the students since the conferment of Deemed University status.**

Most of the students after completion after their M.Sc. are doing Ph.d. in NBRC and in some foreign universities. Students after completing Ph.d got Post-doctoral fellowships in some Foreign Universities.

Details enclosed as ANNEXURE – 7.

**21. Seminars/Workshops/Conferences/Training programmes conducted since the conferment of Deemed University status**

Sl. No	Name	Period
1	Cognitive Neuroscience workshop(to be conducted)	January, 5 – 16 , 2009
2	NBNI-2008 at Cochin University of Science and Technology, Cochin	December 9 to 10, 2008
3	Computational Neuroscience Workshop at University of Delhi	December 24 to 31, 2007
4	Indo-U.S Workshop on Developmental Neuroscience and Imaging	February 19 – 21, 2007
5	Third NBRC International Conference	December 13-15, 2006
6	Workshop on Computational Neuroscience conducted at IIT Madras by NBRC	December 4 – 12, 2006
7	Brainstorm meeting at Mussorie	May 20 – 23, 2006
8	Workshop on Computational Neuroscience at IIT Bombay	October 8 – 16, 2005
9	Indo-French Workshop on Neuroscience at NBRC, Manesar	February 14-15, 2005
10	NBNI-04	November 18-20, 2004
11	Joint Workshop on Neurobiology and Neuroinformatics organized at NBRC, India	November 19-20, 2004
12	Computational Neuroscience Workshop-2004 at University of Hyderabad	October 11 - 21, 2004
13	International Symposium: Building the Brain	December 15 – 17, 2003
14	Joint Workshop on Neurobiology and Neuroinformatics organized at Dajeon, Korea	November 21-22, 2003
15	International Conference on Theoretical Neurobiology	February 24-26, 2003
16	Workshop on Computational Neuroscience at IIT Delhi	May 14 - 24, 2002
17	Indo-US Symposium on Brain Research	January 10 - 12, 2002

**22. Guest lectures conducted since the conferment of Deemed University status .**

Details are at ANNEXURE – 8.

**23. Conferences attended by the faculty since the conferment of Deemed University status .**

Details are at ANNEXURE – 9.

**24. Student faculty ratio since the conferment of Deemed University status**

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**25. Industry/Institution interface (out reach, outreach to other Institutions).**

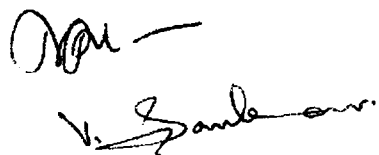
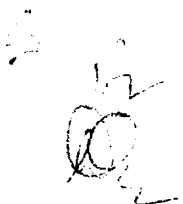
NBRC is having network centres throughout India and International Collaborations and was facilitating the outreach to other Institutions through networking and international Collaborations.

The List of 48 networking centres of NBRC are as under

1. All India Institute of Medical Sciences (AIIMS), New Delhi.
2. Banaras Hindu University (BHU), Varanasi.
3. Bangur Institute of Neurology, Kolkata.
4. Centre for Behavioural and Cognitive Sciences (CBCS), University of Allahabad, Allahabad.
5. Centre for Cellular & Molecular Biology (CCMB), Hyderabad.
6. Central Drug Research Institute (CDRI), Lucknow.
7. Centre for DNA Fingerprinting and Diagnostic, Hyderabad.
8. Central Food and Technological Research Institute (CFTRI), Mysore.
9. Cochin University of Science and Technology, Cochin.
10. Department of Biotechnology. New Delhi.

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11. Delhi University, South Campus, Delhi.
12. Dr. A. L. Neurosurgical Centre, Chennai.
13. Indo American Hospital Brain and Spine Center, Kerala.
14. Institute of Cybernetics, Systems and Information Technology, Kolkata.
15. International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi.
16. Institute of Genomics and Integrative Biology (IGIB), Delhi.
17. Institute of Human Behaviour & Allied Sciences (IHBAS), Delhi.
18. Indian Institute of Information Technology (IIIT), Allahabad.
19. Indian Institute of Technology (IIT), Mumbai.
20. Indian Institute of Technology (IIT), Delhi.
21. Indian Institute of Technology (IIT), Kanpur.
22. Indian Institute of Science (IIS), Bangalore.
23. Indian Institute of Chemical Biology (IICB), Kolkata.
24. Institute of Nuclear Medicine and Allied Sciences (INMAS), New Delhi.
25. Industrial Toxicology Research Centre (ITRC), Lucknow.
26. Indian Statistical Institute, Kolkata.
27. International School of Photomics, Cochin.
28. Jagadguru Sri Shivarathreeshwara Medical College, Mysore
29. Jawaharlal Nehru University (JNU), New Delhi.
30. Jawaharlal Nehru Centre for Advance Scientific Research (JNCASR), Bangalore.
31. Jiwaji University, Gwalior.
32. M.S. University of Baroda (Dept. of Microbiology and Biotechnology Centre), Baroda.
33. National Centre for Biological Sciences (NCBS), Bangalore.
34. National Informatics Centre (Medical Informatics and Telemedicine Division), (NIC) New Delhi.
35. National Institute of Mental Health & Neuroscience (NIMHANS), Bangalore.



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36. Nizam's Institute for Medical Sciences (NIMS), Hyderabad.
37. Rajiv Gandhi Centre for Biotechnology, Trivandrum.
38. National Neuroscience Centre (NNC), Kolkata.
39. Sanjay Gandhi Post-Graduate Institute of Medical Sciences (SGPGIMS), Lucknow.
40. School of Information Technology, West Bengal University.
41. Shree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvanthapuram.
42. Sri Venkateswara Institute of Medical Sciences, Tirupati.
43. Tata Institute of Fundamental Research (TIFR), Mumbai.
44. University College of Medical Sciences (UCMS), Delhi.
45. University of Hyderabad, Hyderabad.
46. University of Calcutta, Kolkata.
47. Vidyasagar Institute of Mental Health and Neuroscience (VIMHANS), New Delhi.
48. Vision Research Foundation, Chennai

### INTERNATIONAL COLLABORATIONS

International collaborations aimed at promoting neuroscience enabling the Centre to evolve cross border relationship for Indian Neuroscientists with the international neuroscience community through such exchange programs. Towards this endeavour of excellence in a very short span of time, NBRC has made great strides in establishing such collaborations with various prestigious neuroscience institutions in different countries around the world. Following are a few notable collaborative arrangements:

1. United States

NBRC signed an MOU with the National Institute of Mental Health (NIMH), USA. Significant progress has been made since then and there is communication channel open between scientists from the two countries for exchanging ideas and expertise. An NIH-RO1 grant has also been awarded to Dr. Ravindranath.

2. Russia

Dr Neeraj Jain and other NBRC scientists have a collaborative research project entitled "Spinal cord plasticity and rehabilitation after spinal cord injuries" with Dr Yuri Gerasimenko. Dr Valerie Avelev and other scientists at Pavlov

Institute, Russia to develop technology to improve recoveries from spinal cord injuries.

3. France

Dr. Pierre Gressens and Dr. Shyamala Mani have been awarded an INSERM-ICMR collaborative grant to study the effect of maternal malnutrition on the developing brain of the fetus and also plan to use stem cells for neonatal neuroprotection. In addition, Dr. Hicks and Dr. Prabodha Swain have written a grant proposal for funding under Indo-French programs to facilitate their research collaborations.

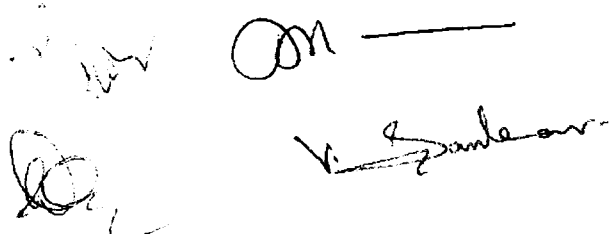
4. Italy

An Indo-Italian agreement on neuroinformatics has been signed under the auspices of which research will be initiated in memory and language impairments in the early stages of Alzheimer's Disease using multimodal imaging techniques (PET, SPET; MRI) and the development of grid computing networks in research areas of common interest. Furthermore, the Italian Ministry of Education and Research has approved for funding a collaborative proposal between Dr Prasun Roy, NBRC, and Dr Patrizia Baraldi, University of Modena and Reggio Emilia, on tensor imaging and brain connectivity.

5. Canada

A Memorandum of Understanding was signed by National Brain Research Centre, Manesar, and Montreal Neurological Institute, McGill University, Canada during November 2006, to express their commitment to cooperate and to develop programmes which will foster the advancement of Neuroscience at both the Institutes.

The cooperation will be carried through the activities that include (i) pursuit of collaborative scientific projects (ii) exchange of scientific personnel (iii) procurement of funds through joint effort for use in collaborative projects and exchanges (iv) a visit to the National Brain Research Centre by a delegation from the Montreal Neurological Institute. The terms of cooperation would be further defined by Director NBRC and Director, MNI. By this MOU the MNI and NBRC have been declared as Sister Institutes.

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**26. Recent achievements.**

NBRC was awarded Deemed University status in 2002 by M/HRD and is the first Institute of the Department of Biotechnology to achieve this status. NBRC conducts both Ph.D. and M.Sc. programmes in neuroscience. The goal is to train Ph.D. students with an understanding of different aspects of neuroscience integrating information across traditional boundaries. The M.Sc. and Ph.D. programmes at NBRC have two components – course work (including lab rotations), and research work. Courses are taught by NBRC faculty members as well as external faculty members from industry and institutes with expertise in specific areas to cover the major disciplines of neuroscience, such as neuroanatomy, neurophysiology, neurochemistry, molecular neuro-biology, development and regeneration, neurogenetics, systems neuroscience, cognitive neuroscience, systems and clinical neuroscience, and computational neuroscience.

NBRC has a summer training programme for students of other academic institutions for project work as part of their post-graduate training. The institute jointly holds workshops on Computational Neuroscience at various Institutions to make students with technical backgrounds aware of the current state of knowledge and outstanding problems in Neuroscience. NBRC also has programme to train post-doctoral fellows at various other neuroscience centres.

Since its establishment in the year 2000, NBRC has achieved outstanding progress on all fronts namely, research, networking and human resource development. It has initiated research in frontier areas ranging from molecular, cellular, systems and theoretical neuroscience including neural stem cells and neuro-informatics. NBRC produces unique manpower resource and has developed into a role model for integrative biological research. It has networked 48 centres across the country and has initiated several multi-institutional, inter-disciplinary projects to further our understanding of human brain. NBRC has created a digital library, which is made available to the scientists all over the country through

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electronic networks. This is the first such effort in the country. NBRC has received tremendous international attention and established close collaboration with several institutions abroad, which is shared with the scientists at its networked centers for grant from National and International agencies and the original scientific publications are now appearing in premier journals.

NBRC has created a new paradigm in one of the emerging fields of neurobiology by creating a smooth interaction between theoretical methods of computational scientists and experimental biologists.

NBRC has received international acclaim and has been awarded research grants from international agencies such as The Wellcome Trust, UK, National Institutes of Health (NIH) and the Third World Academy of Science.

Trained manpower development in the field of neurosciences is fulfilled through initiation of M.Sc. programme in neurosciences from August, 2004. A PhD programme is already in force. NBRC has been one of the first institutes in the country to develop an integrated multi-disciplinary teaching programme in life sciences.

NBRC, through its networking with 48 institutions has helped to promote neuroscience in the country and established multi-institutional collaborative projects with other institutions in the country such as, IISc., IIT Kanpur/ Mumbai, NIMHANS and AIIMS, thus, establishing a new trend of multi-institutional multi-disciplinary research. NBRC initiated a unique mechanism of sharing on-line journals, through e-resources. This facility is being offered to over 50 centres in the country and has been hailed as the first such effort of sharing information. NBRC has also created National facilities such as DNA microarray and DNA sequencing facilities, which are open to researchers in the country.

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**27. Growth in infrastructural facilities since the conferment of Deemed University status .**

**1) Computational Facility -**

In 2002, NBRC had 2 servers and approximately 30 computers. In order to meet the growing computational needs of the Institute, this has grown enormously. NBRC now houses 12 high performance servers, approximately 40 thin clients and 120 desktops. In addition, dedicated storage servers to the tune of 10 TB with regular tape backup have been provided to faculty and students to enable storage of scientific/research data in a secure environment. NBRC is an e-campus with Local Area Network distributed across all the buildings using fiber optic backbone. Secure campus wide Wi-Fi connectivity is also available for personal laptops. NBRC Network has also been secured with firewalls from external intrusions. Email services and Website of the institute has developed in-house. Internet connectivity has been upgraded to 4 Mbps for aiding faculty and students in their research work. In additional 1 Mbps RF backup facility for internet services has also been installed. Multi-user software licenses for advanced scientific softwares like Matlab, Eprime, BrainVoyager, Sigmaplot, Sigmastat, Prism, Neurolicida Microsoft office and various DTP applications have also been procured. NBRC also has state-of-art Video Conferencing facility for exchanging academic/ research discussions with national and international researchers

**2) DNA Micro-Array Facility**

The core DNA microarray facility established at National Brain Research Centre has a broad goal of catering the need of high throughput genetic tools required for answering neuroscience related questions posed by the scientist working in the field. The facility provides all basic platforms to execute a microarray experiment using prearrayed microarray slides. The facility is available to all scientists across the country inclined to work on neuroscience related fields.

The microarray facility was commissioned in September 2002 at the NBRC interim facility at Gurgaon. Different instruments that form the part of current set-up includes a versatile scanner (Typhoon 9210), both for fluorescence and phosphorescence scanning applications; an automated hybridisation station; robotic liquid handling system and Real-Time PCR. The research areas that have been using such microarray experimentation in NBRC includes monitoring changes in the neurodegenerative diseases, changes in nutritional deficient mice brain

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and understanding role of different signaling molecules in the functioning of retinal photoreceptors. NBRC has also provided hands on training to students and faculty from other institutes.

### 3) DNA Sequencing Facility

NBRC uses the MegaBase TM 1000 DNA Analysis system to perform DNA sequencing. Raw data generated by this system is processed using a sequence analyser to determine the order of base pairs in DNA samples. Base calling algorithms are used to analyse the raw data. The accuracy and length of the sequence generated depends on quality of the DNA prepared. Once the analysed sequence is obtained, the sequence is subjected to a BLAST search to verify the cloned gene.

### 4) National Neuroimaging Facility

The National Neuroimaging Facility has been set up at NBRC to map the human brain activity in both high temporal and spatial resolutions simultaneously with a vision to be an apex center of Neuroscience in the country. For this wide gamut of goals, the facility has capability for performing structural and functional MRI, MR spectroscopic imaging, diffusion tensor tractography, arterial spin labeling and multinuclear chemical shift imaging. There is also a high-resolution 64-channel EEG system that can be used to monitor electrical activity in the brain while the subject is being scanned for MRI and is performing demanding cognitive tasks therein. This enables simultaneous measurements of recording brain reactivity, such as evoked potentials and contingent variation. The facility was dedicated to the nation by Dr.M.K.Bhan, Secretary, department of Biotechnology, Govt. of India on 29<sup>th</sup> September, 2006. This MRI/fMRI facility, the first of its kind in India, and one of the few in the world, housed in a new building on the NBRC campus and consists of a 3 Telsa Philips whole body MRI system capable of obtaining very high resolution images of the brain while subjects perform cognitively demanding tasks. In addition to understanding brain function, the corner also is closely interacting closely with researchers worldwide to develop new and better methods to image brain function.

In addition to the basic machine deemed university have also procured state-of-art software and hardware for the delivery of auditory and visual stimulation, (NEUROSCAN, 'Eloquence' and E-prime systems) to programme proper sophisticated sequencing and timing of such cognitive tasks. It is anticipated that such a non-invasive approach utilizing human subjects will provide deep insights into how the brain areas interact to

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enable complex functions such as decision-making, objects perception and language and thought.

In the field of functional imaging, research is being pursued in neural control of action using eye movements, language acquisition during child development, Semantic-syntactic response in linguistic processing, and somatosensory processing and objects recognition. Another active area of research is neuroimaging of central executive function of working memory in normal and schizophrenics, especially with respect to information manipulation and processing.

5. Confocal microscope

The Confocal Laser Scanning Microscope has been used as a central facility for all scientists at NBRC from 2004 onwards. The system comprises a completely motorized high end inverted fluorescence microscope (Axioplan 2 Imaging Zeiss, Germany) which is fully integrated into confocal system software, also from the same company. The system is fitted with three lasers [Argon (458, 477, 488 and 514nm) and two HeNe lasers (with laser lines 543 and 643nm). A high end cooled monochrome integrating digital camera (Axiocam HRC) is attached to the microscope for capturing high resolution images. The system has been recently upgraded for spectral imaging applications of multiple overlapping fluorophores (LSM 510 Meta Zeiss, Germany) and is capable of FRET (Fluorescence Resonance Energy Transfer), calcium imaging, FLIM (Fluorescence Lifetime Imaging Microscopy), and FCS (Fluorescence Correlation Spectroscopy). Hands-on training workshops were initially conducted by Zeiss personnel so that scientists, post-docs and students at NBRC could use the confocal system for their specific requirements. A number of NBRC personnel are now fully qualified to use the confocal system and to train new users.

28. Library ( details of Books, Journals and Magazines since the conferment of Deemed University status )

NBRC has a state of the art Digital Library. The library subscribes to a large number of on-line journals, many of which are accessible from the first volume. There is an extensive collection of Books which can be issued to the students. The library also provides Reference Service/Assistance, Inter-library Loan, access to on-line Databases, Online Public Access Catalogue (OPAC), CD-ROMs, and Multimedia resources.

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Year	Books	Journals Institutional Including online	Magazines Institutional
2002	471	110	5
2003	629	110	6
2004	929	122+(106 Back Vol. e-Pkg)	10
2005	1077	125	11
2006	1456	171	15
2007	1456	176+(14 Back Vol. e-Pkg)	15
2008	1600	201	16

## 29. Facilities for faculty and staff.

1. Transportation Facility for pickup and drop has been provided for faculty and staff members who are coming from Gurgaon to the office Institute situated at Manesar which is 25 kms from Gurgaon.
2. Canteen facility has been provided for the benefit of the faculty and staff
3. One of the Senior faculty member who has a Medical degree has been identified and authorised to examine patients and prescribe medicines for our serve faculties , staff, students and others who work our Campus. Medicines are being replenished from time to time as and when required to meet any Medical requirement.
4. Transport facility will be provided in case of any Medical exigencies to go to city hospitals.
5. Inhouse accommodation will be provided temporarily to any of the faculties who like to stay in the campus for a short time for conducting any Experiments and also for staff in case of any exingencies
6. Round the clock Internet facility has been provided to all Laboratories
7. A Travel support of Rs.2,00,000 for every 3 years is provided from the Institute for each of the faculty members to meet the expenditure for the travel abroad for attending Seminars / Conferences/ Workshops.
8. Medical Insurance floater upto Rs.3,00,000 per annum for Hospitalisation and OPD facilities are provided to faculty and staff of NBRC.

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V. Sankar.

**30. Facilities for students.**

1. Hostel – Two Hostels at NBRC accommodating about 170 students.
2. The Hostels have a subsidized mess facility on monthly fixed charge basis for the benefit of students. The students play an active role in running of the mess.
3. There is Guest house facility for the parents of the students who visit this Institute as well for visiting scientists and others.
4. Round the clock transport facility has been provided for the benefit of students to utilize the same during Medical Exigencies.
5. Medical Facilities – Medical care available in campus for exigencies and minor ailments. Emergency care provided at NSG. Medical expenses reimbursed.
6. Monthly fellowship is being paid as per the norms of the Institute and for the students sponsored by CSIR / UGC / DBT as per the guidelines of respective departments qualified agencies.
7. Sports Facilities: Gym, Table Tennis, Volley Ball; Foot Ball, Basket Ball Court, Badminton.
8. A banking service has been provided in the NBRC premises to facilitate the students.
9. Students have 24 hour access to internet, including wireless access through out the NBRC building for research and access to information.
10. A Separate wing called DIC facilitates students digital need and takes care of administration and maintenance of Internet access, Local Area Network (LAN). Central facility, Internet, printing facility including colour and large-format printing, scanning, troubleshooting for software and hardware.
11. NBRC has multimedia enabled seminar and conference rooms for teaching and training sessions, seminars, tutorials and lectures by national and international guest faculty.
12. Competitive Travel award for students to attend and present their work at Conferences/Workshops.

The students of NBRC are encouraged to actively participate in extra-curricular and co-curricular activities. Keeping in mind the essential need of holistic development of students NBRC has developed programs and infrastructure for sports and cultural activities. Any initiative by students in these directions is actively encouraged, supported and nurtured.

1. NBRC conducts Summer Training Programme for the students of other institutes. Our senior students form an integral part of that summer training program by

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helping the summer training get exposure to modern neuroscience research environment.

2. NBRC students actively participate in organizing science awareness camp for various schools which is held at NBRC in December every year.
3. NBRC students are the main participants of the National Science Day Celebrations which is conducted every year at a local school.
4. Students run wall magazine in the hostel.
5. Students run a film club with support from NBRC which regularly screen films, of diverse cultural backgrounds.
6. In the course the scientific meetings the students are encouraged show case their talents to the national and international audience on the cultural and entertainment evening.

### 31. Administration and governance

#### General & Academic Administration

The General Administration of the Institute consists of the following major wings:

1. General Administration, headed by the Chief Administrative Officer, is responsible for Establishment, Personnel & Administration Wing, Stores & Purchase Wing, Import & Project Cell, Finance & Accounts Wing, Estate Management & Engineering Maintenance Wing – Civil, Electrical & Mechanical.
2. Academic Administration is headed by the Registrar, responsible for the students administration, project co-ordination, Entrance test administration, course co-ordination etc. Also a students grievances committee has been formed to look after any grievances of the students.
3. Implementation of Official Language

NBRC though a scientific research organization is making effort the usage of Hindi in all the administrative jobs such as internal official meetings, questioning in the interviews, debate and essay competition, general applications etc. The welcome board shows a Hindi moral line everyday. The official language

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committee with worthy members is actively looking into the use of Hindi and is being reviewed every quarter. Thus, the organization has manifold use of Hindi by way of nameplates, letterheads, and visiting cards, Boards etc. A proposal for creation of posts for Hindi Officer/Assistant and other positions has already been sent to the Department of Biotechnology for further consideration. The Brochure of International Brain Research Organization has been translated in Hindi for wide circulation among the Scientific Community in India.

#### 4. Women Empowerment

NBRC has a distinct feature of giving equal opportunity to women by words and deed. The committees, constituted to do various work of Administration, Academics and Scientific activities, have women members which ensure fair participation and protection of women. There is a complaints committee for redressal of grievances, if any, from aggrieved girl students/women employees of NBRC, who are subjected to sexual harassment, can approach the Registrar, the Person-in-charge for redressal of the grievance and the Person-in-charge along with the Director would initiative action with help of the Complaints Committee constituted for this purpose.

#### 32. Whether approval of Statutory bodies obtained for starting new courses / increased intake.

Yes,

#### 33. Result during the last three years

Result of the course work(I Year) of M.Sc, Integrated Ph.D and Ph.D in the last 3 years.

S.No	Name of the course	2005-06		2006-07		2007-08	
		No. of students joined	No of students passed the course work	No. of students joined	No of students passed the course work	No. of students joined	No of students passed the course work
1	M.Sc. (Neuroscience)	10	10*	-	-	-	-
2	Integrated Ph.D			5	5		

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 [Signature] [Signature] [Signature]  
 V. Sankar.

3	Integrated Ph.D					10	8#
4	Ph.D	15	15\$				
5	Ph.D			6	4^		
6	Ph.D					5	4@

\* 2 M.Sc students of the year 2005 passed in supplementary exam in the course work for one subject

# 2 Integrated Ph.D -2007 students were not allowed to sit for the final exam for 2 subjects due to shortage of attendance and passed in supplementary

\$ One Ph.D student passed in supplementary exam in the year 2005 for one subject

^ 2 Ph.D students of 2006 were not allowed to sit for the final exam for 1 and 2 subjects respectively due to shortage of attendance and they passed

in supplementary exam, also 2 Ph.D students had not completed the course work exams

3 Ph.D students of the year 2006 have been waived off the course work as they did their M.Sc in NBRC

@ One Ph.D-2007 student passed in supplementary exam for one subject, also was not allowed to sit for the final exam for 2 subjects due to shortage of attendance.

Ph.D Degree Awarded by NBRC :

1. 9 Ph.D Degrees have been awarded by NBRC as on date
2. Out of these, 6 Ph.D students had been given the degree in the last 3 years
3. 4 Ph.D students have submitted their thesis and are awaiting reports and completion of their viva-voce examination.

M.Sc Degree Awarded by NBRC :

1. 20 M.Sc students have been awarded M.Sc degrees in the last 3 years.

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**34. Conditions in the notification, if any and compliance by the Deemed University.**

Nil.

**35. Future Growth Plan of the Deemed University.**

The field of neuroscience is rapidly progressing in the world. In India the Neuroscience is increasingly being recognized as an important area of Biology and Medicine. Hence there is an urgent need to build the capacity for training and research in the field

of Neurosciences in the country. After obtaining the deemed University Status, NBRC has already initiated pioneering programs in manpower development in the field of Neurosciences. There are ongoing training programs at the Master's and doctoral levels. At present NBRC is running two year M.Sc. course in Neurosciences, which has been converted this year to an integrated 5 year M.Sc. - Ph.D. program in Neurosciences. Candidates who have completed the bachelor's level of training in medicine, engineering, physical/biological sciences are eligible to apply. A Ph.D. programme is underway, which is open to candidates who have completed the Master's level in sciences, and Bachelor's level in engineering and medicine. In keeping with the national priority for increasing human resource in the field of science and technology it is proposed to increase the capacity for training scientific manpower in the field of Neurosciences. Hence NBRC proposes to increase the seats in the M.Sc. and Ph.D. programmes by 50% in the 11<sup>th</sup> plan.

Training manpower in Neurosciences is long and arduous process. Brain drain takes away a large percentage of the personnel thus trained. In order to retain the highly talented doctoral degree holders in our country and to promote young talent in the field of neurosciences, it is proposed to set up Post Doctoral Fellowships of Rs. 25,000/- per month together with a

research grant for the exceptionally talented. Adequate screening and selection procedure would be set up to ensure that high quality post-doctoral scientists are recruited into this programme.

Neurosciences is a rapidly advancing field. Training in the state of art techniques is required to keep pace with the ever-happening advances in neuroscience. It is proposed to initiate a special training for scientists. The areas identified include stem cell research, functional imaging etc. Such short-term training would be offered to faculty and students. There is special need for creating such training programmes in neuroscience, which is relatively a young field in general and more so in India. NBRC has initiated several pioneering research programmes for the first time in the country and is well poised to offer such training.

Clinicians who are interested in being exposed to the techniques for conducting basic research in neurosciences, would be given an orientation through two week long hands-on workshops in basic research techniques in neurosciences. This will disseminate knowledge about possibilities for conducting research in the field of neurosciences among clinicians. Further, neuroscience workshops would also be conducted at Indian Institutes of Technology and other related centres to enthuse computational scientists and engineers to undertake neuroscience-related research. As a part of this exercise, NBRC proposes to conduct International meetings periodically ensuring the participation of young students and post-doctoral fellows from around the country.

Many of the mid-level researchers at these centers would be provided an opportunity to update their research interests. It is proposed to hold Summer Schools for small groups in cooperation with other networked centres to provide updates on the latest developments in neuroscience.

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**36. Admission Procedure**

- Advertisement in major news papers across the country.
- Special provisions for reserved candidates (SC/ST/PH).
- The applications are screened and in the initial years a cut-off mark was applied and students asked to appear for 2-tier interview.
- In the last 2 years national entrance exam conducted in 4 centres in the country and then a 2-tier interview is held.

**37. Examination Pattern**

- An internal exam is conducted during each course
- One written assignment for each course.
- The semester end final exam for each course with paper set by an external examiner.
- Lab – Rotation / Practicals: Students are rotated in various labs to get an exposure to all the groups and it enables them to choose a lab and a supervisor of their choice. A viva exam is held at the end of semester.
- A comprehensive viva with an external examiner is held at the end of the 1 year.
- PhD thesis evaluation is done by 2 external examiners (international & national). An open viva is held followed by a closed viva by the Indian examiner and guide.
- Integrated PhD students will be awarded both MSc and PhD degrees at the end of the course

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**38. Design of Curriculum**

1st year is devoted to rigorous course work along with lab rotations to learn experimental techniques across the different divisions of neuroscience:

- Molecular & Cellular Neuroscience
- Systems Neuroscience
- Cognitive Neuroscience
- Computational Neuroscience

The goal is to impart the fundamentals of neuro-biology, neuroanatomy, systems, cognition & computational NS to students. In addition to formal teaching, students are taught written and oral communication skills through assignments & seminars

**Observations of the Committee**

The NBRC has state of art campus at Manesar, Haryana, having beautiful and artistic buildings, well furnished Labs, playground and sports facilities. The other infrastructure includes:

- Digital Library with 500 journals, books, On-line Databases, CD-ROM & Multimedia resources.
- State-of-art laboratories for carrying out research (molecular biology, biochemistry, electrophysiology, behaviour & computational neuroscience)
- Includes high-end facilities such as confocal microscope, DNA microarray, DNA sequencer, FACS, well maintained animal house with labs.
- 3Tesla functional MRI with EEG/ERP and transcranial magnetic stimulator.

The Committee had separate interaction sessions with Faculty, Students/Scholars and non-teaching staff. They were all happy with the existing academic and other infrastructure facilities.

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All students are getting JRF, SRF and Post – doctoral fellowships.

The Deemed University has got the required infrastructure for conducting the present programmes and also developing the infrastructure for future programmes. The management of the Deemed University is willing to support the faculty and students of research activities and is financially viable.

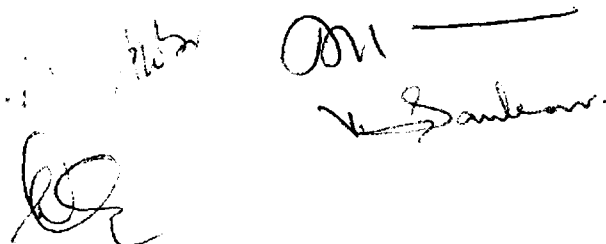
NBRC has many modern climate controlled, well equipped state-of-the-art, laboratories for training and research. The labs have 100% power backup and are equipped to carry out experiments in diverse areas of modern neuro science..

The Deemed University has made appreciable achievements in research activities after getting the status of deemed university as is witnessed from the research projects undertaken by the deemed university and facilities available. The faculty members are also motivated and dedicated to research activities.

National Brain Research Centre has to its credit 46 Research Projects including 35-92 crores funds sanctioned by the agencies like DBT, DST, Department of Information Technology, IMCR, DRDO, CSIR, NIH (USA), RIKEN (Japan), Welcome Trust (UK), TWAS, Italian Ministry for University & Research.

At present the premises has constraints of space for office work and for the book library. The open labs also need more space.

A new building complex is coming up which shall take care of this in future.



**Suggestions of the Committee**

- 1) The staff quarters for the faculty members should be provided so that they are encouraged to devote more time for future research and guide the students.
- 2) The post of Director should be redesignated as Vice-Chancellor in tune with the provision of Deemed University.
- 3) NBRC should take further steps to offer Faculty Development Programme and Refresher Course programmes for related basic sciences to make its presence widely felt and recognized.
- 4) The students intake for M.Sc. courses should be increased to a minimum of 20 students. The intake at Ph.d and Integrated Ph.d level should also be increased as per availability of future faculty & qualified guides.
- 5) A placement cell shall be created to help the students in getting good placement.
- 6) The deemed university should initiate Research funding from Non-Government organizations such as pharmaceutical Industries and International Agencies.
- 7) The hostel facilities for the students are to be further increased with single rooms and married couple accommodation. The students are satisfied with academic and hostel facilities.

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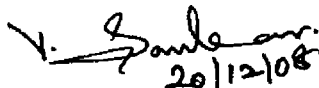
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### Recommendations of the Committee


Based on the observations the Expert Committee is of the opinion that NBRC has made tremendous and serious efforts to develop the necessary academic and physical infrastructure to meet the requirements of the Deemed University. The Deemed University being Government sponsored Institution has been able to create sufficient funds to achieve its mission and vision to become a nature of benchmark University in the area of neurosciences. Considering this as one of the multi-disciplinary innovative nature of research in emerging area i.e. neuro sciences, training of man-power in the emerging health care and education, the Committee unanimously agreed to recommend the continuation of deemed to be university status to National Brain Research Centre, Manesar, Haryana.

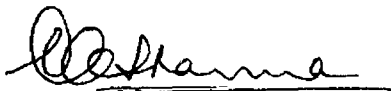
The Expert Committee unanimously agreed to recommend the continuation of Deemed to be University status to National Brain Research Centre, Manesar, Haryana.

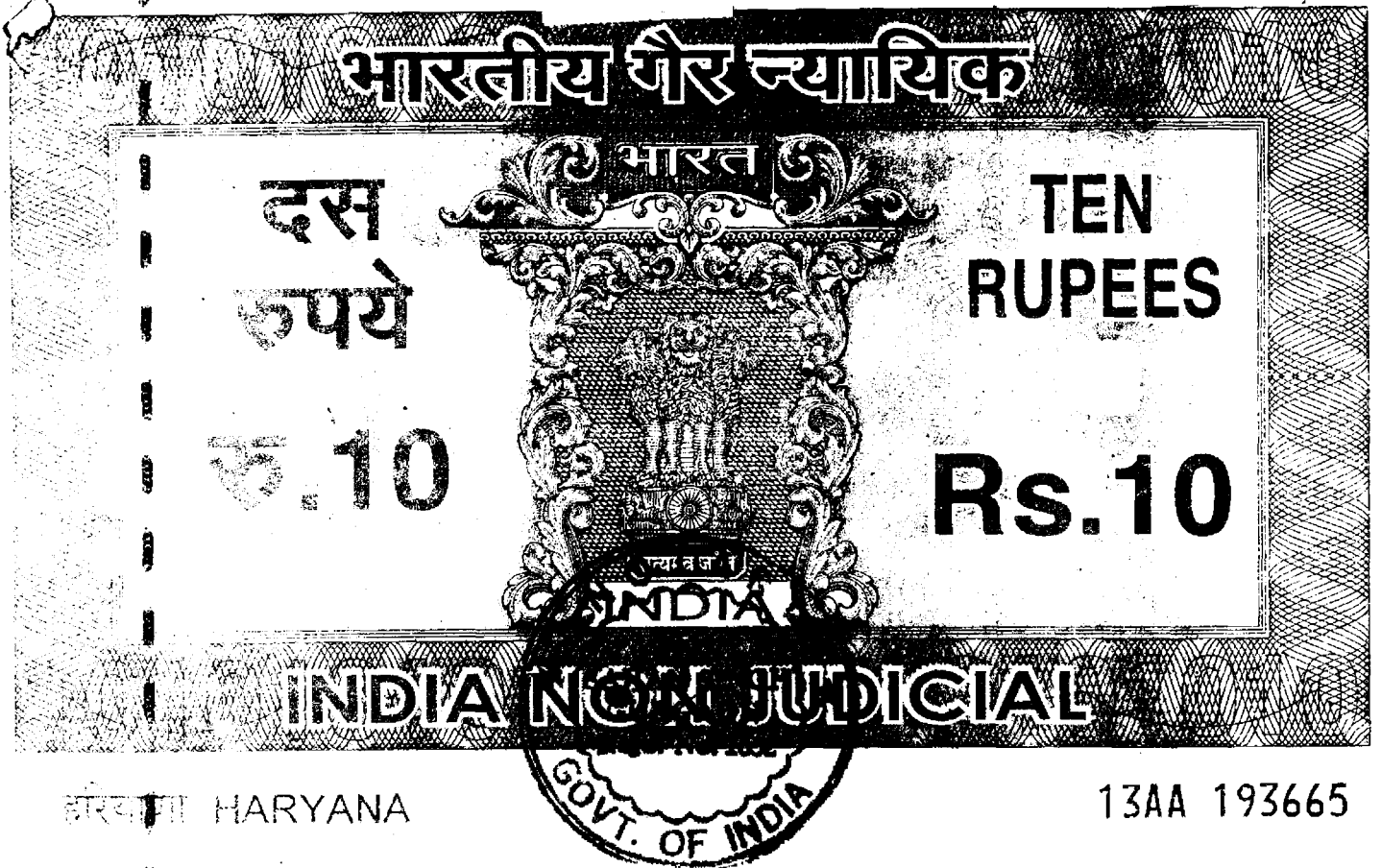
  
(Dr. P.K. Banerjee)

  
(Dr. V. Sankar) 20/12/08

  
(Dr. S.N. Mathur)

  
( Prof. J.V. Prabhakar Rao) 20/12/08

  
(Dr. D.K. Sharma)  
MCI-Nominee



NBRC hereby undertakes to give the following undertakings:

All the prescribed forms and procedures of the UGC and other relevant Statutory Councils, such as UGC and other authorities concerned, in the matter of admission of students, intake capacity of students, starting of new courses / programmes, renewal of approval to the courses, etc, will continue to be in force, and shall be adhered to by NBRC.

NBRC shall take all the required steps to get itself rated for valid accreditation by the National Assessment and Accreditation Council (NAAC) in terms of instructions issued by the UGC vide its circular No.F.6-1(7)/2006(CPP-I) dated the 12<sup>th</sup> March, 2007.

NBRC University shall not conduct any distance education programmes without prior approval of the UGC and Distance Education Council (DEC). NBRC understands that the guidelines issued by both the DEC and the UGC from time to time in the matter of imparting education through distance mode have to be complied with.

NBRC shall not start and run any study centre/off-campus centre/off-shore campus without obtaining the requisite prior approval of the UGC / Government of India, as the case may be.

Contd...

*[Signature]*

**K.V.S. KAMESWARA RAO**

Registrar

National Brain Research Centre

Govt. of India

Mainwal Road, Near NSG Campus

Haridwar-221002, Uttarakhand (India)



4. As and when necessary, the NBRC shall suitably amend and update its MoA / Rules in consultation and in concurrence with the UGC. Specific changes / amendments, if any, suggested by the deemed-to-be-University Institution in its MoA / Rules will be made with the approval of the UGC.
5. NBRC shall strictly abide by all the norms and guidelines as laid down by the UGC and other Statutory Councils from time to time, as are applicable to Institutions notified as "Deemed to be University".
6. NBRC shall follow the UGC / Govt. of India Pay Scales etc, for its teaching faculties as per instructions issued by UGC / Govt. of India from time to time.
7. The land lease which is at present for 30 years would be extended by NBRC upto 99 years before the expiry of the existing lease period.
8. NBRC shall not divert the assets of Deemed University without prior permission of the UGC and hereby authorize UGC / Govt. of India to take control of assets etc., of the Deemed University Institution concerned in the event of winding up or dissolution of the said Institution.
9. NBRC shall not award any degrees that are not specified under section 22 of the UGC Act, 1956



K.M.S. KAMTEVARA RAO  
Re. Director  
National Brain Research Centre  
Govt. of India  
Nainwal Mode, Near NSG Campus  
Manesar-122050, Haryana (India)

ATTESTED

23/12/08  
(SAJJAN SINGH)  
ADVOCATE & NOTARY  
GURGAON (HARYANA)