

### 3. Evaluative Report of the Department

1. Name of the Department : **Centre for Stem Cell & Tissue Engineering**
2. Year of establishment : **2008**
3. Is the Department part of a School/Faculty of the university?  
**Centre for Stem Cell & Tissue Engineering and Excellence in Biomedical Sciences**
4. Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.)  
**PG, Ph.D.**
5. Interdisciplinary programmes and departments involved
6. Courses in collaboration with other universities, industries, foreign institutions, etc.  
**Nil**
7. Details of programmes discontinued, if any, with reasons :**Nil**
8. Examination System: Annual/Semester/Trimester/Choice Based Credit System  
**Semester**
9. Participation of the department in the courses offered by other departments  
**(1) Teaching B.E. Biotechnology in U.I.E.T.**  
**(2) Teaching Stem Cell Biology in Centre for Human Genomics**
10. Number of teaching posts sanctioned, filled and actual (Professors/Associate Professors/Asst. Professors/others)

Position	Sanctioned	Filled	Actual (Including CAS/MPS)
Professor	01	Nil	
Associate Professors	02	Nil	
Assistant Professor	03	One	

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. Of Ph.D. Student guided

Prof. Sanjeev Puri	Ph.D.	Professor	Cell & Mol Biology of Polycystic Kidney Disease and renal Tissue regeneration	~19 years	04
Dr. Seemha Rai	Ph.D.	Assist Professor	Cancer Stem Cell	9 years	01 (ONGOING)

12. List of senior Visiting Fellows, adjunct faculty, emeritus professors
1. **Prof. Vivekanand Jha (PGIMER)**
  2. **Prof Neelam Marwaha (PGIMER)**
  3. **Prof Shamsher Singh Kanwar (HP University Shimla)**
  4. **Prof S. K. Sharma (Statistic Deptat. P.U., Chandigarh)**
  5. **Prof V.L Sharma (Zoology Dept. P.U., Chandigarh)**
  6. **Dr. Abha Seth (Dental College P.U., Chandigarh)**
  7. **Dr Lolitika Manal (IISER, Mohali)**
  8. **Dr.Sudip Mandal (IISER, Mohali)**
  9. **Dr. Anuj Gupta, (Panjab University)**
  10. **Dr. Nidhi Mahajan (Panjab University)**
  11. **Dr. Neha Singh (Panjab University)**
  12. **Dr .Nidhi Anil (PGIMER, Chandigahr)**
13. Percentage of classes taken by temporary faculty – programme wise information
- |                            |     |
|----------------------------|-----|
| M.Sc. 1 <sup>st</sup> year | 40% |
| M.Sc. 2 <sup>nd</sup> year | 20% |
14. Programme-wise Student Teacher Ratio- **15:1**
15. Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual : **Number of Administrative Staff sanctioned : 02**  
**Filled : 01**  
**Actual : 02 ( one part time )**
16. Research thrust areas as recognized by major funding agencies : **DBT/UGC**
17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise. :**DBT funding BT/PR9150/BRB/10/545/07Regulatory cross talk between Hepatocyte Nuclear Factor-1 family of Transcription Factors and polycystic kidney disease-1 (PKD-1) gene: Understanding Autosomal Dominant Polycystic Kidney Disease. BT/PR/15334/Med.12.505/2011 February 29<sup>th</sup> 2012.**
18. Inter-institutional collaborative projects and associated grants received
- a) National collaboration
  - b) International collaboration

**Two National Grants In collaboration with Department of Nephrology**

## PGIMER, Chandigarh

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received : **DBT total ~54 lakhs**
20. Research facility / centre with
  - state recognition
  - $\sqrt$ national recognition ---**Yes, National recognition**
  - international recognition
21. Special research laboratories sponsored by / created by industry or corporate bodies : ---NA----
22. Publications:

### Dr Seemha Rai

- *Bharadwaj Seemha, Rathore Shailendra and Ghosh Prahalad C.* 2006. Enhancement of the cytotoxicity of liposomal ricin by the carboxylic ionophore monensin and the lysosomotropic amine NH<sub>4</sub>Cl in Chinese Hamster Ovary Cells. *Int. J. Toxl.* 25: 1-11. **Impact Factor:**1.346 **Ranking:**69/85 in Toxicology | 187/261 in Pharmacology & Pharmacy. Citation Index via Scopus:5, ISSN/ISBN No.: 1091-5818.
- *Bhatti Jasvinder S, Bhatti Gurjit K, Joshi Amit, Rai Seemha, Mastana Sarabjit S, Ralhan Sarju K, Bansal Devi D, Tewari Rupinder.* 2007. Identification of the risk factors for the high prevalence of type 2 diabetes and its complications in a Punjabi population: North Indian Diabetes Study: A case- control study. *Int. J. Diabetes in Developing Countries.* 27(4): 108-115. Citation index: 8, ISSN/ISBN No.: 0973-3930

### Dr Prof Sanjeev Puri (2011 onwards)

#### **Book chapters:**

- Veena Puri, Sanjeev Puri and R.C. Sobti (2013) Symbiosis of Stem cell Biology and Nanotechnology In: Emerging Paradigms in Nanotechnology. Eds. Ranbir Chander Sobti, Anupama Kaushik, Bhupinder Singh and Surya Kant Tripathi, Dorling Kindersley (India ) Pvt. **Pearson Publishers.** ISBN: 978-81-317-8991-9.
- R. C. Sobti and Sanjeev Puri (2011) Biotechnology in Economic Development of India. In; Understanding North-West Indian Economy. Eds. H.S. Shergill, Sucha Singh gill and Gurmail Singh. Serial Publications, New Delhi. ISBN 978-188387-453-3.
- S. S. Kanwar, M . L. Verma, Sanjeev Puri, Hydrogels.

#### **Peer reviewed articles**

- Gandhi M, Aggarwal M, Puri S. & Singla Sk (2013) Prophylactic effect of coconut water (*Cocos nucifera* L.) on ethylene glycol induced nephrocalcinosis in male wistar rat. **International Braz J Urol., 39 (1): 108-117**
- Parnell SC, Puri S., Wallace DP, Calvet JP (2012) Protein Phosphatase-1 $\alpha$  Interacts with and Dephosphorylates Polycystin-1. **PLoS ONE 7(6): e36798.** doi:10.1371/journal.pone.0036798
- Shashank Gandhi, Veena Puri and Sanjeev Puri (2012) Gankyrin: A potential target for drug therapy against hepatocellular carcinoma, **J. Biomedical Science and Engineering**, 2012, 5, 469-475

- Mahajan N., Kaur T., Puri V., Singla SK., Jha V., and Puri S. (2012) Evaluation of Dysmorphogenesis in Embryonic Kidney Induced by Calcium Channel Blockers. **Am J. Biomed Sci.** 4(2), 132-142.
- Mahajan N., Kaur T., Puri V., Singla SK., Jha V., and Puri S. (2012) Calcium Ameliorates renal cysts growth in metanephric organ culture: a Morphological Study. **J. Environ. Path Oncl & Toxicol.** 31 (3), 285-293. DOI: 10.1615/J
- Gupta A., Puri V., Sharma R., and Puri S. (2012) Folic acid induces acute renal failure (ARF) by enhancing renal prooxidant state. **Expt.Toxicol. Path.**, 64 (3), 225-232.
- Kanwar SS. and Puri S. (2012). Stem cells and their potential in regenerative medicine. **Int. J. Inst. Pharma & Life Sci.**, 2(2), 37-58.
- Chhabra S., Ranjan M., Bhandari R., Kaur T., Aggarwal M., Mahajan N., Puri V., Kaur IP., Puri S. and Sobti RC. (2011) Solid Lipid Nanoparticles Regulate Functional Assortment of Mouse Mesenchymal Stem Cells. **J. Stem Cell & Regen. Med.** 7 (2), 75-79.
- Kamboj P., Aggarwal M., Puri S., Singla SK. (2011) Effect of aqueous extract of *Tribulus terrestris* on oxalate-induced oxidative stress in rats. **Ind. J Nephrol.** 21 (3), 152-159.

23. Details of patents and income generated : **Applied one/income generated Nil**
24. Areas of consultancy and income generated: **Animal Cell Culture and Stem cell income generated nil**
25. Faculty selected nationally / internationally to visit other laboratories / institutions
- industries in India and abroad : **One Faculty selected for Attending International Training work shop at Marine Biological Laboratory, Woods Hole, Massachusetts, USA**
26. Faculty serving in
- a) National committees b) International committees c) Editorial Boards d) any other (please specify)
- National Committee, Member DBT Cancer Task Force, Editorail boards of Indian JI Nephrology, PU Science Bulletein, Indian JI of Pharamcy & biological Sciences. Stem Cell Ethics committee at JP University Wagnaghat.**
27. Faculty recharging strategies (UGC, ASC, Refresher/orientation programs, workshops, training programs and similar programs).
- Yes, UGC ASC, Refresher/Orientation programs**
28. Student projects
- percentage of students who have done in-house projects including inter-departmental projects : 100%
  - percentage of students doing projects in collaboration with other universities / industry / institute ~10 %
  - /
29. Awards / recognitions received at the national and international level by

- Faculty Fellowship to attend Stem cell training at MBL Woods hole Massachusetts, USA
- Doctoral / post doctoral fellows **Four**
- Students **Two**

30. Seminars/ Conferences/Workshops organized and the source of funding (national / international) with details of outstanding participants, if any.

31. Code of ethics for research followed by the departments : Yes

32. Student profile programme-wise:

Name of the Programme(refer to question no. 4)	Applications Received	Selected		Pass percentage	
		Male	Female	Male	Female
M.Sc.	39	05	09	40%	40%
PhD.	20	01	03	40%	40%

33. Diversity of students

Name of the Programme (refer to Q. no.4)	% of students from the same university	% of students from other universities within the State	% of students From universities outside the State	% of students from other countries
M.Sc.	75%	15%	% 10	Nil
PhD.	50%	25%	25%	Nil

34. How many students have cleared Civil Services and Defence Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise. : **06 ( NET),**

35. Student progression

Student Progression	Percentage against enrolled
UG to PG	Nil
PG to M.Phil.	Nil
PG to Ph.D.	06

Ph.D. to Post-Doctoral	Nil
<input type="checkbox"/> Campus selection	04
<input type="checkbox"/> Other than campus recruitment	
Entrepreneurs	02

### 36. Diversity of staff

Percentage of faculty who are graduates	
of the same university	02 ( adhoc)
From other universities within the State	01
- from universities from other States	01 (permanent )
from universities outside the country	NIL

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period **Nil**
38. Present details of departmental infrastructural facilities with regard to
- Library: **yes**
  - Internet facilities for staff and students: **yes**
  - Total number of class rooms : **02**
  - Class rooms with ICT facility : **Two**
  - Students' laboratories : **Two**
  - Research laboratories : **Two**
39. List of doctoral, post-doctoral students and Research Associates
- from the host institution/university : **03**
  - from other institutions/universities: **03**
40. Number of post graduate students getting financial assistance from the university. : **Nil**
41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology. : **Yes,**
42. Does the department obtain feedback from
- Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback? : **Yes**
  - Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback? : **Yes**
  - Alumni and employers on the programmes offered and how does the department utilize the feedback? : **Not Yet**
43. List the distinguished alumni of the department (maximum 10)  
**Students are still pursuing their Research degree, however, some of the outstanding students from this departments are:**
- (1) Malika**
  - (2) Swati**
  - (3) Ruchika**

**(4) Sugandha Ralhan**

**(5) Baldeep**

**(6) Simonjot**

**(7) Naina Singhi**

44. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.
- 12<sup>th</sup> INDO-US workshop on Applications of flow cytometry in clinical Research and 4<sup>th</sup> Annual Meeting of The Cytometry Society of India (TCS), held at Panjab University in collaboration with PGIMER, Chandigarh from 8<sup>th</sup>-12<sup>th</sup> October, 2011.
  - International Symposium on cancer Research & Translational Initiatives cum workshop on flow cytometry, held at Panjab University, Chandigarh from 14<sup>th</sup>-16<sup>th</sup> October 2010
  - 8<sup>th</sup> Chandigarh Science Congress, ( CHASCON-2014) 25-28<sup>th</sup> February 2014
45. List the teaching methods adopted by the faculty for different programmes.:

**Tutorials and virtual class room lectures, group discussions, seminars and journal clubs**

46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?: **Through scoring in the sessional & final exam as well as based on the %age of student clearing national Tests (NET)**
47. Highlight the participation of students and faculty in extension activities.

**Student participation**

- Under the new initiative of Panjab University, students of stem cell and tissue engineering organized 'Stem Cell Awareness Day' on 23<sup>rd</sup> September, 2009 and this is now a regular activity and held each year. This is an initiative of California Institute of Regenerative Medicine (CIRM) due to which this day is being celebrated throughout world. The students of M.Sc. Stem Cell and Tissue Engineering, Panjab University took initiative to spread awareness of stem cell biology and cord blood banking. Under this programme various competitions like poster making, collage making and student-student interaction on stem cell therapy and cord blood banking took place at student centre, Panjab University.
- The Organizers, Students of stem cell and tissue engineering opened up the chapter of "Student Society for Stem Cell Research at Panjab University called "SSSCR-PU" with Panjab University being the 1<sup>st</sup> Indian University to have the chapter of this society.
- Two student researchers from the department namely Hemant Verma and Geetika Mehta were honoured by the Council of Scientific and Industrial Research (CSIR) for their contribution to the Central government's Open Source Drug Discovery (OSDD) initiative, a path-breaking project to comprehensively map the genome of mycobacterium tuberculosis (Mtb). Panjab University students was among the 114 'best annotators' honoured by the CSIR. Through their contribution the CSIR released results of the 'Connect 2 Decode' (C2D) project, aimed at re-annotating the biological and genetic information of Mtb.

**Faculty Participation**  
**Extension lectures ( 2012 onwards)**

- Popular Lecture on “ Stem Cells what do we need to know” organized by organized by **Society for Promotion of Science & Technology in India (SPSTI)** in Botany department auditorium on 19<sup>th</sup> April 2014
  - **Key note Address** at IEEE student chapter at Golden Jubilee hall, Panjab University, Chandigarh on 2<sup>nd</sup> October 2013 Title “ Research, need of the hour” by IEEE.
  - **One** Invited Lecture orientation course (Panjab University , Chandigarh ) 14<sup>th</sup> September 2013
  - Two Invited Lecture orientation course (GNDU), 27<sup>th</sup> August 2013
  - Two Invited Lecture, Refresher course in Science (GNDU)
  - **Key note Address**, Entitled “Stem Cell A Multifaceted structure : Where are we heading?” during a conference organized by **Association of Biology Teacher, India**, held at DAV college, Sector-10, Chandigarh on 12<sup>th</sup> May 2013.
  - **DBT sponsored workshop on hands on “Molecular and Cytogenetic techniques”** at GMCH-32, Chandigarh. “Stem cell biology”. From 3<sup>rd</sup> to 15<sup>th</sup> December; 2012. Title of Talk Stem Cell Biology””
  - **National Seminar on Cosmetology, Health and Disease**, Department of cosmetology, Dev Smaj College Ferozepur, 14-16 Novemeber 2012.
48. Give details of “beyond syllabus scholarly activities” of the department.: **Competitions on Stem Cell Day, Stem cell awareness programme, Ethics awareness programmes, Students presentations, quiz etc.**
49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details. : **UGC**
50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied. : **This is the first ever 2 yrs degree course on stem Cell & Tissue Engineering which is providing training and research in the field of stem cell. Students are imparted training on different aspects of the stem cell biology together with research projects in the field. The Centre has provided sufficiently trained workforce in the form of postgraduates to work in the academia and industry. Currently six students are pursuing Ph.D in the departments while 15 others are pursuing their higher degrees in different reputed National institutes like NCCS Pune, PGIMER, IMTECH, Serum institute etc. While ~7 in industry, Panacea, Quantum world, Cell care etc. Five students have gone abroad for higher studies. So the centre has contributed sufficiently in such a short duration ever since the first batch of students passed out in 2010.**
51. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.
- 1) Strengths
    - **Providing stem cell teaching and training to the students**
    - **Providing trained workforce for the academia and industry**



- **Research initiatives in the cutting edge of stem cell and tissue engineering**
  - **Collaborative research on stem cell**
  - **Outreach activity by organizing focussed training in the field of stem cell**
- 2) Weakness
- **Faculty crunch**
  - **Trained technical support**
  - **Additional Dedicated laboratories**
- 3) Opportunities
- **For cutting edge training in the field of stem cells**
  - **Multidisciplinary collaboration**
  - **Industry innovation and interaction**
  - **Renal tissue engineering**
  - **Inter and intra institutional collaborations**
- 4) Challenges
- **National /Internationally acclaimed centre**
  - **Industry involvements for focussed projects**
  - **National /international collaborations**
52. Future plans of the department.: **In future we intend to develop this facility as a national/international facility for developing the novel stem cell lines from different organisms including human beings along with developing bio-scaffolds for tissue regeneration. We hope to see that this centre also cater to the industry demand for setting up *in vitro* testing facility employing stem cells. We also plan to develop this centre as a technology spinoff centre.**