TEACHER'S ACTIVITY REPORT 2017 - 2018

FACULTY: Science

DEPARTMENT/ COMMITTEE: Biochemistry

IQAC ACTIVITY No: SVC/2017-18/BIOCHEM/VM/1

NAME OF THE ACTIVITY: Student - Faculty Article			
DATE	**FACULTY**	**DEPARTMENT/ COMMITTEE**	**COORDINATOR NAME**
January 2018	Science	Biochemistry	Dr. Vandana Malhotra
TIME	**VENUE**	**NUMBER OF PARTICIPANTS**	**NATURE: Outdoor/Indoor**
Open ended	College hours	1 student and 1 faculty	Indoor
SUPPORT/ASSISTANCE:	No Funding (Independent)		

BRIEF INFORMATION ABOUT THE ACTIVITY (CRITERION NO. I, II, III, VII):

TOPIC/SUBJECT OF THE ACTIVITY	**(Student-Faculty Article)** **Title:** Translational Research – Perspective and Approach
OBJECTIVES	The objective was to teach skills pertaining to review of literature, data interpretation and scientific writing in the form of an article.
METHODOLOGY	The topic of the article was chosen in line with the theme of the Expressions 2018 magazine issue – Translational Science. A dialogue comparing the basic versus translational science approaches was initiated and student was urged to explore the literature, interpret it, formulate conclusions and write an article on the topic of Translational Research.
OUTCOMES	The student learning outcomes from such an exercise were multifaceted. Not only did the student learn how to do review of literature but also learnt the process of data interpretation and lastly, the skill of scientific writing. The article was published in the Departmental annual magazine Expressions 2018 themed Translational Science as a student-faculty article.

PROOFS & DOCUMENTS ATTACHED (Tick mark the proofs attached):

Notice & Letters	Student list of participation	**Activity report √ (published article)**	Photos	Feedback form
Feedback analysis	News clip with details	Certificate	Any other	

IQAC Document No:	Criterion No:	Metric No:
Departmental file no	IQAC file No;	

NAME OF TEACHER & SIGNATURE	NAME OF HEAD/ COMMITTEE INCHARGE & SIGNATURE	IQAC COORDINATOR (SEAL & SIGNATURE)
Dr. Vandana Malhotra	Dr. Shalini Sen (Teacher-in-Charge) Department of Biochemistry	Dr. N.Latha IQAC Coordinator Sri Venkateswara College

For Reference

Criterion I	Curricular Aspects (planning & Implementation)		Criterion V	Student Support & Progression
Criterion II	Teaching Learning & Evaluation		Criterion VI	Governance
Criterion III	Research, Innovations & Extension		Criterion VII	Institutional Values & Best Practices
Criterion IV	Learning Resources and Infrastructure			

Proofs:

- **Annual Departmental Magazine 2018**

  https://drive.google.com/file/d/1ED_EyBNcdI5zIFi2rc-bIK1ZSvWoWjVx/view?usp=sharing

- **Published Article (Expressions 2018 : pages 9-11)**

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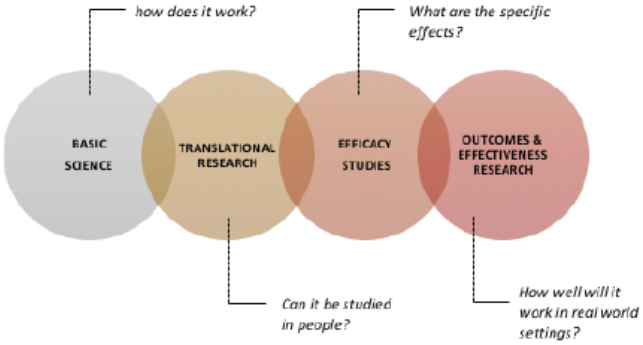
Translational Research-Perspective and Approach

Vaishali Goyal, B.Sc (H) Biochemistry II yr and Dr. Vandana Malhotra

"Translational Research" or "Translational Science" is the latest buzzword in the world of science. The meteoric rise in the popularity of translational science started in 1980s when universities were first allowed to patent discoveries made with government funded projects and suddenly, applied research had become the 'in thing to do' in academia. Today, in pace with the worldwide R&D growth, the Department of Biotechnology, a central funding agency in India has made translational research a priority forming translational research centers at its institutes. At the forefront is the recently established Translational Health Science Technology Institute whose mandate is to create an environment that fosters innovation and drives translation of research into clinical settings and development of commercially viable products or services for benefit of public health in India.

But what exactly is Translational Science? For many the term refers to the "Lab to Life" enterprise of harnessing knowledge generated through basic scientific enquiry to produce new drugs, devices and treatment options for the public. Translational research aims to support early stage investigation and the challenges involved in organizing clinical trials, both of which contribute to the factors that pose a problem in application of research done in basic science to clinical medicine beneficial to the people. The adjacent figure depicts the flowchart of directional efforts and pertinent questions asked at each step to reach the end-point wherein a product or service can be used clinically or commercially, in other words "brought to the market".



The Risk and the Risk Takers

Despite significant funding in Translational Research, the number of commercially applicable products that reach the public are limited. Clearly, there is a significant risk associated with translational research. The recent bankruptcy filing by deCODE, a company with an exceptional pedigree in associating genetic variance with disease onset, highlights the commercial gambles of translational research. Investigators are under tremendous pressure from funding agencies to engage in research that is clinically relevant and to demonstrate the utility of their research findings for the public. Undoubtedly, the goal of societal benefit is every scientist's dream come true. However, there is a downside to doing translational research that is largely ignored. One sometimes wonders, what is the impact of translational research on the researcher? For example, development of a drug is an extremely long process, often taking a significant period of any research career. For investigators that engage in a pilot study, the failure of a trial is emotionally difficult, especially if any patients are harmed in the progress of the study. Also, if a pilot project turns unviable, their

entire research endeavor is considered dead and without merit. Expectedly, possibilities for future funding and publications are remote. Given our incomplete knowledge about disease mechanisms, clinical trials often fail and thus, such a judgement is rather unfortunate. Negative results of a study face resistance and delays in publishing and hence, the critical parts of a study remain unreported.

So, should researchers abandon their translational efforts and stick to the basic biology that formed the original hypothesis of their research? The development of beta-blockers for the treatment of heart failure is an inspiring example of how investigators followed the data, and were not deterred by the initial discouraging results in clinical trials. Sildenafil was approved for pulmonary arterial hypertension and erectile dysfunction, yet it initially failed in phase II hypertension and angina pectoris trials (Ghofrani et al., 2006). There is no easy solution or a secret recipe for translational scientists; however, having a clear understanding of risks and benefits, a collaborative approach and most importantly, staying involved may ease out the process.

Basic Science: Lost in Translation

"Poetry is what gets lost in translation" – Robert Frost

With a boom in translational research projects across multiple disciplines, there is an obvious hype in the scientific community. To the extent that there is growing impatience and a prejudicial attitude towards basic research. One fears that in the rush to fund translational projects, the government and funding agencies might be forgetting good old Basic Science and all that it has enabled us to accomplish. It is not surprising to note that the proportion of funding to Basic Science has decreased in the budget 2017. Dr. Krishna Ganesh, Director of IISER Pune observed that, while the IIT's have received a big boost up - "there is negligible enhancement in budget for science IISERs, IISc, Bengaluru and central universities that produce the majority of quality basic research".

"Basic research is the pacemaker of technological processes. New products and new processes do not appear full grown. They are founded on the new principles and new conceptions which in turn are painstakingly developed by research in the purest realms of science"

- Vannevar Bush
(Headed US office of scientific R&D during WW II)

People argue that basic and applied research are complementary, with basic science uncovering promising new ideas for use in applied research, and applied research raising new questions for basic scientists to answer. However, many view them as two separate entities, with basic science as the ignition and applied research as a conveyor belt that takes the research to the market on the opposite end. If your motivation to do science is to acquire knowledge for knowledge sake, it is likely to be termed Basic Science, but if the motivation to do science is to make better vaccine, efficient fuels, faster networks and agriculture etc, then its Translational Research. In other words, comparing them is like comparing two sides of the same coin.

Basic and Translational Science differ primarily in 'Integration' and 'Practicality', respectively. While the importance of Translational Research lies in the 'Practicality', Basic Science is crucial for contributing to the ever-growing tree of information and consequently has greater potential for 'Integration' as demonstrated by the serendipitous discovery of the therapeutic use of radioisotopes long after the discovery of Radium. *"When Radium was discovered no one knew that it would prove useful in hospitals. The work was of pure science and this is the proof that scientific work must not be considered from the point of view of the direct usefulness of it"- Marie Curie.* The basic research on DNA polymerase of *Thermus aquaticus* with no medical or agricultural application

at that time is of great importance in PCR now-a-days and the fact that discovery of 'Statins' was done much earlier than the breakthrough that these molecules can lower cholesterol, exemplify that research done with one particular goal in mind can lead to the loss of many unanticipated discoveries which are a result of natural curiosity in uncharted areas of basic science.

The need of the hour is to have a balanced approach and ensure that the buildup created by Translational Research does not result in disproportionate division of resources and efforts of researchers between the two branches, as prior knowledge gained by the meticulous work done for years and years in Basic Science, is the foundation of many translational successes. The onus is on the scientific community to educate politicians and the funding agencies on how science works. Unless, our mindset changes and Basic Science reemerges as a priority, every scientist will have to think about practical applications of his/her research which may in future, result in the loss of spirit and passion of research work.

References:

- Fang, F.C and A. Casadevall (2010). Infect. Immun. February 2010 78:563-566.
- Ghofrani HA, Osterloh IH, F. Grimminger (2006). Nat Rev Drug Discov. 2006 Aug; 5(8):689-702.
- https://thewire.in/105887/research-budget-biotech-iiser.
- https://www.eurekalert.org/multimedia/pub/21133.php.

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Internal Quality Assurance Cell

This is to certify that the Activity report (Teacher/Department /Society/Association) has been submitted for documentation to IQAC, Sri Venkateswara College, University of Delhi.

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