srijan

An E-Magazine from THSTI

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From the Editor

Lest you haven't been able to keep track, this is the very delayed second edition of Srijan, THSTI's e-magazine. But what made me not delete that folder of articles sent for publishing and not dropping the idea are those few people who kept asking about the second edition even after two years! Oh, yes, it has been two years since we did this 😊

But, better late than never. So, Srijan is back.

Putting together this issue was traveling back in time and looking for emails sent in 2018, of course. But I read through Dr. Renu Swaroop's address she delivered in 2018 and decided to retain it. Why? It has messages to keep us focussed. Jyoti and I spoke with Dr. Ramamurthy for the Srijan interview. A little sad that he left THSTI to head back to Kolkata earlier this year. But his interview had simple messages that will stay with us for a lifetime. This issue also includes a rather fun piece from Suchitra, something all single people living in the city, like me, totally relate. Also, ardent gym-goers. Two short poems from Piyali and Amit (who is a poet in the guise of a scientist). Lots of love for all the people who sent photographs. Few of them are included in the issue and all of them to THSTI's vast repository of photos.

I welcome my new team members for Srijan - Ankita Rathore and Yashika Kapoor.

With this issue, I also say a good-bye to Hina, who was on our Editorial team and has joined India Alliance to pursue her love, science communication. To the rest of my squad Jyoti, Rajdeep, Soheb, and Pawan – Thanks a tonne for making Srijan possible. I wish you all the best.

This issue also promises to save you the COVID-19 news fatigue; this is the only time I will be mentioning the C-word.

To all of you – Keep writing. Keep painting. Keep clicking pictures.

Lots of love.

Siuli

Here's to the road we have all taken together

Photograph credits: Saurabh Chugh

DBT Secretary's vision of what THSTI should be – Key takeaways from her Presidential address of 2018

Dr. Renu Swaroop, in her first Presidential address to THSTI as Secretary, DBT began by reminiscing, "*It seems like it was only yesterday that we were talking about the importance of having a translational health science institute in India. It's been nine years since we have had this vibrant institute. The mandate with which THSTI was set up, eloquently brought about by the ED, and the vision with which we must move forward by bringing about cultural changes in addition to the science and technology that we keep talking about has been brought out very clearly by Prof. Gupta*". The very beginning of her address speaks of her long association with THSTI. The fact that her first address to THSTI as the Secretary is doubly significant cannot be emphasized more. Here are some excerpts from the Presidential address delivered on July 14th 2018, a day before the 9th Foundation Day of THSTI and significant as it was a year before the young institute completes a decade. Why am I sharing this with you two years later? To remind you of her vision.

1. On the strategic partnership within the NCR Biotech Science Cluster (hereby, NCR BSC)

The accomplishment of THSTI's mandate of taking new knowledge through the translational phase to meet the needs of the society in terms of affordable product development by integrating the fields of medicine, clinical science, chemical science would not be possible if the institute were working in silo. Dr. Swaroop elaborated, "*In the verticals that the ED projected, you had the health science component, the translational component, and you had the research resource component projected. I think this whole structure being connected with the Bio-cluster is what takes it to the next step of what we are all talking about. In this whole Bio-cluster of NCR, that this translational institute is a key component of, we have Regional Centre for Biotechnology, which brings in the hardcore education linked with research along with the bio incubator and technology platform center. This will actually give the picture of how you should move from basic to translational research*." Calling the institute's vision 'unique,' she stated that this provides a distinct advantage over the other institutes set up by DBT in the past years. She went on to congratulate everyone on the achievements over the last nine years.

2. On strategic partnerships beyond NCR BSC

The institute has its strengths in infectious diseases and maternal and child health research, and the challenges in these fields have been met through various centers of vaccine research, drug discovery research, Biodesign programs. She used the very well-established biorepository as an example to explore the scope of collaborating for knowledge transfer and skill transfer. This would be to ensure that the enormous data collected is analyzed by expert programmers and used for artificial intelligence aided predictive modeling to supplement the biomarker related findings.

3. On the young institute's achievements

"*You are not only doing well in the basic research for knowledge generation through publications, but you have also moved through the initial phase of collaborations, by taking the basic research, connecting it with clinical research and moving towards the product development*," observed the DBT Secy. She mentioned that patents being taken forward is an indication of high-quality research output. She lauded the emphasis laid on high-quality student output and attracting the best of researchers and faculty. She noted that international partnerships have been necessary for a young institute to assess how it is moving forward.

4. On doing our bit for societal impact

Taking a leaf from Prof. Anil Gupta's address, she said that enhanced user engagement would help redefine our priorities. She noted that the approach is being pursued by the Biodesign and social innovation programs and proclaimed that more of it should happen. The completion of a decade should culminate into the recognition of products and technologies generated through start-up industrial collaboration that would have an impact on the society alongside indicators of new knowledge generation vis-à-vis publications and patents. Her opinion can be summarized here: "*We need very well-structured translational platforms to see to it that you provide the researchers here an efficient system in which the research moves out of the laboratories to a larger ecosystem of reaching the users.*" She lauded the efforts of CDSA who is playing a pivotal role in formulating policies with DBT, ICMR, and CDSCO among other organizations to facilitate the transition for higher societal impact.

5. On academia-industry collaborations

"*This is an important institute of the cluster. By putting in place proper governance mechanisms, it will be important to collocate the cluster with industries. We have had consultations for putting in place policy and governance where that can happen and which is the missing link currently. The missing link is how to connect academia with the industry. Collaborations are existing with the academia and industry (BIBCOL, BIRAC partnerships mentioned). What we need to do is solidify that collaboration and find out how it can be taken forward."*

The Secy told the audience that a section opines that the academia and industry are poles apart; the academia generates knowledge by pursuing curiosity-driven science while the industry focuses on using existing knowledge and explore its potential for commercialization. The idea of academia-industry collaboration is rejected, calling them immiscible like oil and water. She encourages the audience to create new chemistry and make THSTI the 'go-to place' for every industry and researcher to see how they translate their research to move forward.'

6. On the way forward

"*Being a scientist myself, I know there are no quick solutions in science, but we have expectations when we find the potential to deliver. The next step is to challenge yourself and see how to meet these expectations.*"

The Secy proposed that the NCR BSC should aim at elevating itself into becoming a world-class biomedical cluster and setting an example for others to follow. She suggested pursuing well-defined product development and identification of collaborations that would guide the delivery of those products to follow already existing research priorities. She advised the adoption of a corporate culture that would ensure we have well-defined timelines, strategically driven investment, and accountability.

While the discourse on the significance of translational research has been around for some time, it is now time to transform the new knowledge into usable products and prove to the world that publicly funded institutes are capable of accomplishing this feat.

"… we have to let the world know that both the oil and water can mix. It is a new chemistry that we have to create; it is a new chemical equation that we have to write. It's the same H and the O. It's only the C that is different. We have to see how we can get the C for the academia and industry to work together. Unless we do that, it will be impossible for us to achieve the vision with which this institute was set up, this wonderful vision that each one of you is contributing to. Together, you can write this chemical equation, and I am hoping as you enter your tenth year, THSTI, which is already very well known, will be an integral part of this cluster and see to it that we take research to translation to impact. Once again, congratulations and good luck for all your future endeavors."

And to everything beautiful in store for us

Photograph credits: Sucheta De

Third Edition of THSTI's course on Cellular and Molecular Immunology

Ankita Rathore

"DCs lurking everywhere,

They'll get your antigen don't spare.

From CCL 21 to CCL 7,

Come DC baby make this lymphocyte heaven.

Fret that peptide into tap,

Everybody does the lymphocyte rap!

Collectins, complements, macrophages,

That's what you get on early stages.

Antibodies, cytokines, CTLs too,

Hey pathogen! That's the end of you.

Fret that peptide into tap,

Everybody does the lymphocyte rap!"

These are the few lines from '*The Lymphocyte Rap*' Dr. Shiv Pillai, Professor of Medicine and HST, Harvard Medical School, Ragon Institute of MGH, Harvard and MIT, performed at the end of one of the lectures which made audience applaud with joy. The third edition of '**Overview of Cellular and Molecular Immunology,**' a basic immunology course, was held at DBT-Translational Health Science and Technology Institute (THSTI), Faridabad, from March 16th to 18th, 2020. This three-day lecture series is one of its kind where every year, eminent scientists are invited for guest lectures in THSTI, Faridabad, to teach the basics of immunology. This course aims at strengthening the fundamental knowledge of research scholars and students in cellular and molecular immunology. It was organized by Dr. Amit Awasthi and Dr. Deepak Kumar Rathore from THSTI, who believe, "This is an amazing platform to encourage young minds to discuss the questions in the field of immunology and network with guest lecturers."

Most of the lectures in this three-day course were taught by Dr. Shiv Pillai, who is known to be an acclaimed world leader in the study of fundamental B-cell immunology. Did you know he coined the term '*surrogate light chains'* for proteins that he identified (with David Baltimore) as a part of a novel receptor, now known as the pre-B receptor, that drives B-cell development? Dr. Pillai weaves magic with his words as he discusses the fundamentals of immunology. On being asked about what intrigues him most about immunology, he says, "There is no field of modern biology that is more intimately connected to the disease, the underlying basis of disease in almost every case is because of imbalance in the immune system. I find it interesting from this perspective." Recalling the contributions of Peter Brian Medawar, who is known as the father of transplantation, he elaborated on the T cell-mediated immunity, an overview of Th subsets and therapeutic targeting of Th subset cytokines. Furthermore, he talked about CD8 + T cells and NK cells, immune effector functions, and disease, modern approaches to investigate the immune system in human's condition - metabolic changes and epigenetic alterations in the following lectures.

Dr. Amit Awasthi talking about Helper T cell subsets in health and disease.

The second day of this course was the highlight as Dr. Dipankar Nandi, who is a distinguished scientist from Dept. of Biochemistry, Indian Institute of Science, Bengaluru, joined for a guest lecture on T cell Co-stimulation and checkpoint Inhibitors.

Following this, Dr. Amit Awasthi, Associate Professor, THSTI, who was also the core member of the organizing team of this event, took a lecture discussing the Helper T cell subsets in health and disease.

Another eminent immunologist, Dr. Vijay K. Kuchroo, Professor of Neurology at Harvard Medical School, Senior Scientist at Brigham and Women's Hospital, and Co-Director of the Centre for Infection and Immunity, at the Brigham Research Institutes, Boston, was invited for a guest lecture at the last day of this course. He is first to describe the TIM family of genes and identifies Tim-3 as an inhibitory receptor expressed on T cells, which is now being explored for its role cancer immunotherapy. Even through lecture over skype, he kept the audience hooked as he talked about CNS autoimmunity, tissue injury, genetic factors of autoimmunity, and interaction of nervous system and immune system to regulate tissue inflammation.

The lecture series was not only informative for the audience but entertaining as well. Sadrak Ohsu, an integrated Ph.D. student from Regional Centre for Biotechnology, Faridabad, says, "The lectures were very informative, and I learned a lot. I wish I attended these lectures before my exams as they helped me clear my basic concepts. The most interesting thing is that it makes immunology so much fun."

Another Ph.D. student from THSTI in the audience said she found Dr. Shiv Pillai's lectures most intriguing and especially the way he never lost the attention of his audience with his style of teaching immunology through stories and poems.

To conclude, Dr. Pillai motivated the young audience by narrating the story of Icarus and Daedalus. He urged the students to find what they love to do and leave a mark in this world of endless possibilities. To end the three-day lecture series, the audience responded by applauding when he quoted Oscar Wilde, "***Never regret thy fall, O Icarus of the fearless flight. For the greatest tragedy of them all, Is never to feel the burning light***."

Dr. Ramamurthy on when he almost joined the coveted Civil Services, students' internet addiction and more

Interview by: Jyoti Verma

***Srijan's* schedule lists questions, the responses to which are solely subject to the interviewee's experiences as a member of the Indian scientific community. The questions have been framed considering that doctoral students are going to constitute a substantial chunk of *Srijan's* readers.**

Jyoti:

Thank you, Sir, for finding time to speak to us and answer the *Srijan* questions. So, in your opinion, what sets apart Indian scientists from the rest of the world; could you shed light on at least one good and one inferior quality?

Dr. Ramamurthy:

We are currently experiencing very rapid developments in science and from multiple sectors, be it agriculture, health, or others, and this should be attributed to the skillful expertise we have. Of course, scientists will have funding agencies to thank. And skills, of course. Many scientists went abroad, and they are coming back and are doing a fantastic job. These are all the plus points.

Still, we lack dynamism in creativity, especially in the health sector, because we have enormous problems in the health sector. Especially in infectious diseases and also the aging problem - the life span has increased in more Indians, but the quality of life is lost. So, this sector must receive much focus. Also, infant mortality has come down a lot, but we still have to do a lot of research. These are the potential areas to work on to strengthen. I won't say it's a minus point, but these are areas on which we still need to work.

Jyoti:

One overrated & one underrated quality to which a scientist's success is usually ascribed?

Dr. Ramamurthy:

Overrated: Nowadays, whenever scientists publish, we tend to find out the impact factor first. Every paper comes out of sheer hard work that scientists put in. The papers ought to be measured for their scientific merit and not because somebody formulated the high impact factor. Even journals like the American Society of Microbiology have done away

with the impact factor. The findings should be translational and should also have their impact in due course of time. Not today or tomorrow but in the long run.

Underrated quality: Because of sheer compulsion, especially in the colleges and the universities, each Professor or each scientist has to publish. This is usually the mandate of an institute. Because of the compulsion, poor quality work is often published. Creativity takes a back seat and is, and I think, quite underrated. This is what I feel. Each scientist has his stimulating factors. That should be enriched by providing each of them with an environment suitable for them to be creative. Not function out of compulsion.

Jyoti:

Was there ever a point in your life when you felt like leaving science? If yes, what made you stay back?

Dr. Ramamurthy:

Leaving science? Yes. When I was young like you, I had the option of becoming an IAS officer. I passed the preliminary exam and then the final exam. I went without my Professor's permission, and the news eventually leaked out. "You want to go for administration, or you want to do Science," he asked. So, I asked, " If you were in my position, what would you have done?". He said, "I would prefer science." And I said, "Fine, then I will follow you." So, I am a scientist. But after that, no regrets. I never changed my track.

Jyoti: Who was your Professor?

Dr. Ramamurthy: He was a Professor in the genetics of soft-shelled animals - Molecology.

Jyoti: What kept you going?

If you are into research on infectious diseases, you are coming across a lot of patients, and you are asked to attend outbreak investigations which is a very challenging field of science, I feel. Every patient has a problem unique to him. The infectious disease also varies from species to species and within species. This kept me going. Every time I kept encountering a new experience and I published my findings in more than 250 papers. If you see those publications, you will see the importance of different pathogens at different times, and some are new, especially OL39. It's the first time we discovered it in India and Bangladesh. In a scientific career, there will be boredom if you keep doing a monotonous job. But if you look carefully at what the results are, then it will be fascinating.

Jyoti:

Any book that you have read, and think is a must read for people in science and why is it so?

Dr. Ramamurthy:

I won't say one book. They have to read many books. [laughter].

The Selfish Gene by Richard Dawkins. It's very old…may be published in 1970s. But I will ask students to read [something] that has fascinated me. It's a monograph called 'Coelacanths' by Prof L. B. Smith. He discovered an extinct species called *Latimeria*. This fish links four-legged animals in the land and the fishes. So, at that time it was thought to have become extinct 60 million years back but he could see a live form of fish. Imagine how he felt! He cried as he held the specimen. The sheer joy of discovery is unimaginable. It's called fossil. He never kept his name after the discovery, but after the museum curator called Mary or Marius Latimer, who found it and brought it to him. The story does not stop there. Recent publications reported the molecular aspects. Then, these specimens were discovered on the East Coast of Africa and also in Indonesia. And it's called a living fossil. Most scientists working with molecular tools on the genome of those species now say its not a living fossil. Living fossil should be a specimen…it should not have any relatives. And the next definition is the phenotype should not be changed for millions of years. These are the two critical points that should be met by a living fossil. In the molecular epidemiology era, the whole genome sequencing found that Latimeria had relatives. It has its evolutionary trend, and it has changed during evolution on many occasions. If Smith were alive, he would be crying again [laughs].

Change is a characteristic of science as we know it. In the last two or three decades, science has changed during the molecular era. Molecular tools will be handy in identifying several diseases. If a person is predisposed to any disease, even when he is healthy, we can say, "Arey bhai in due course of time you may be having this disease."

Jyoti:

Do you have any advice for our student readers on qualities they should cultivate, so that their work is rewarding as individuals and as a part of the world of science?

Dr. Ramamurthy:

I have many.

1. Working in the lab and then focusing only on one particular field is not enough. Their focus should not be just on their work. They must read a lot about work being done by their peers on other aspects. This will be nurturing.
2. Students should read a lot. Just benchwork won't help in the long run.
3. There are so many distractions available now. Tools like social media are very helpful but one should train themselves to correctly tap these to their benefit.
4. Also, they should not worry too much about the future. Nature will take its own course, and you will get your answers in due course of time. When your work is recognized, you will be appreciated. If you are doing good, the good will come back to you.

To a place that is nurturing us

Photograph credits: Greeshma Nair

Muscle Power

Dr. Suchitra Gopinath

Here's what I truly believe: A rolling stone gather's no moss, but goes places, sees a lot of people and has one hell of a good time. That would describe my alternate perspective to bearing no strong roots to any location in particular. For instance, as far early back as I can remember, I interacted with several vibrant wildlife groups based in Maharashtra and the South of India that included a motley crew of herpetologists, ornithologists, taxonomists, and botanists through my college and PhD years. In my head and in the heads of people who knew me well, it made sense, given my fundamental interests in the natural world, in science, and biology. However, under no circumstances in my life would have I predicted that there would be a time when I would interact with - (hold your breath) - Haryanvi bodybuilders. It started with my attempts to join a local gym in Faridabad, after I convinced myself that I needed to extend my research objectives of studying and increasing lean muscle mass in infants as part of the Maternal & Child Health Program at THSTI to…myself. I was first approached by the head trainer who had a speech impediment, that didn't prove to impede getting hired since he had what it took to be part of the bodybuilding franchise. Rather presumptuously, I explained I knew everything there was to know about skeletal muscles and revealed my intent to join the gym was to see if "this whole thing works." I hesitantly signed up for a 3-month membership, cautioning everybody in the reception area (a clueless receptionist obsessed with her nails and a couple of other trainers standing around motionless like expensive furniture) that if I was not satisfied, they risked lousy press. But if they succeeded, I would promote them in 2 institutes! All that bluster seemed to have some effect with the head trainer, who proceeded to chalk up a regimen. I walk into the gym, and the first thing I notice- mirrors everywhere. Almost everyone (95% of them men) conversed with others, all the while looking at themselves in the mirror. Trainers strutted around, giving instructions apparently to their own reflections. This was the ultimate vanity room. Then, I see the all-too-familiar poster of the human skeletal muscle anatomy on the walls. I look closer and say, "*Aree, yahan to TA hai hi nahi*," assuming he had no idea what I was saying. And then he responds, "*Haan pata hai*, tibialis anterior *nahi dikhaya gaya*". I must have looked a sight. My jaw dropped. Did he just say "tibialis anterior"?? I plodded on and told my upper body muscles on the side need work. He says, "Haan Lats *ke liye* exercises hai". Lats- that's bodybuilder speak for "Latissimus dorsi". But I had to have the last word. So I said, "*Yeh muscle jo hai, jisko Soleus bolte hain, woh doosre muscles se alag hai.*" His response, a prolonged *achhhaaaa*. Then followed occasional requests for advice on bodybuilding supplements. The more memorable ones are being asked if it's worth taking testosterone, stanozolol, and EPO. All of those caught me off guard, as I started to realize that all of these supplements were available over the counter. "*Are paisa de do, sab kuch milta hai*", says my trainer. Instead of going into a long lecture on anabolic steroid biochemistry and its effects on the body, I asked him, "Ben Johnson *aur* Lance Armstrong *ke saath kya hua*"? He says, "*haan pata hai, pehla mar gaya, doosre ko testicular cancer hua*". *Baaas*. I told him he had answered his own questions on the safety of those supplements. But I was the humbled one that day. I wanted to say, "*Bhai, aap humara PhD ley lo*". The consolation was I got addressed as "Doctor *saab*" by the lot in the room.

My lesson for the time being - Not to presume academic ignorance from any group and bodybuilders score heavily in the entertainment section.

Moksha: The ultimate goal

Piyali Mazumdar

To the company we will always have
Photograph credits: Tina Yadav

Sea of loneliness rioting,
For cosmic torrent decisive of demolition
Before it sweeps over the limits of heart
Let mortality be perked by death's dart.
Denizens sailing off to shores of acquaintance
Desires submerging in silt of its ambience
Like heavy being carved fire by bees
One's desirous to experience that eternal peace.
Even in the nth diary fights
None realize what's perpetually right
Those grasping truth ensure of existence
Let it protect them with its glory.
By furtive, death truly a cleaning fire
Purifying by touch, defending self-attire
And that should be freedom from cycle of karma
For ignorant world of present it's still on enigma…

To the place that we can call our own

Photograph credits: Sucheta De

Photograph credits: Saurabh Chugh

एक और चुनौती की, हम चाह में बैठे हैं

डॉ अमित कुमार यादव

स्मृति पटल पर दबे, कुछ अधूरे हैं वादे विकल,

फुर्सत के कुछ पलों की चाह में बैठे हैं।

मंज़िलों का नहीं भरोसा, यूँ ही रोज़ बदलती रहती हैं,

हम तो नयी राहों की, चाह में रहते हैं।

ख़बर नहीं कल कहाँ होंगे

क्या अपने भी कहीं निशाँ होंगे

पर एक वादा है ज़िन्दगी

चलते रहेंगे जहाँ होंगे।

आलोचकों और मित्रों का करते हैं शुक्रिया ,

एक और उड़ान की जिनसे प्रेरणा मिलती रही

यह इति नहीं है, एक नयी शुरुआत है

एक और चुनौती की, हम तो चाह में बैठे हैं।

SRIJAN'S TEAM

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We are always looking for guest writers. If you wish to be one, do join us.

Write to us if you have suggestions and of course everyone loves a good compliment 😊

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