

VIVUS

Vol. 5 Issue 3

**SUSTAINABILITY AND MENTAL
HEALTH**

**“When ice caps melt, mental health will
too...”**

SUSTAINABLE FASHION

THE HIGH PRICE OF 'AFFORDABLE' CLOTHING



**MANIPAL SCHOOL OF LIFE SCIENCES
MANIPAL**

(A constituent unit of MSSL, Manipal)

Dear Readers,

Earth Day, is celebrated every year on April 22 to raise awareness on preserving our natural world. We always hear about sustainability in the context of “taking shorter showers” or “turning off the lights before leaving the room”. But, there are lots of other day-to-day things that require the “wash of sustainability”. How much thought do we give our wardrobes filled and stuffed with clothes we don’t use or to the amount of polyester that wardrobe contains? Did you think it wasn’t such a big deal? Find out exactly why it is a huge issue in the article titled “**The high price of 'affordable' clothing**”. There is no doubt that climate change and **mental health** are major issues for us to tackle. But they might even go hand in hand. Find out why in the “Get Scientificed” section. While we constantly threaten our Earth and all that lives on it including our own survival, why not go ahead to read on about the wondrous possibilities that **placental stem cells** hold for revival of systems.

Don’t forget to revisit all the things that MSLS has been up to in the last few months in our section called “What’s up MSLS?” And also to follow our writer “through the *gullies*” of Delhi.

We thank our Director, **Dr. K. Satyamoorthy** for his support. We are also thankful to our faculty advisors **Dr. T.G. Vasudevan, Dr. Vidhu Sankar Babu** and **Dr. Saadi Abdul Vahab** for their advice and review. We would also like to acknowledge all the support from the Student Council 2018-'19 and the various committees. But the biggest thank you is for all of you who wrote for us and to all of you who take the time out to read it and let us know you like it, a huge shoutout!

Proudly presenting Vivus 5.3,
Mayukha Bathini, Swetha Stanley and Nicole Mary Swer
Editorial Board 2018-'19
Manipal School of Life Sciences
MAHE, Manipal

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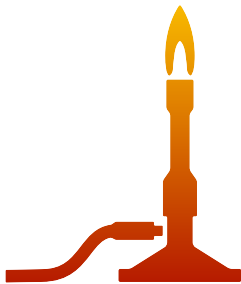


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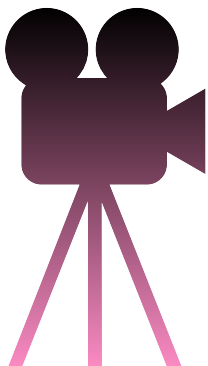
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What's up
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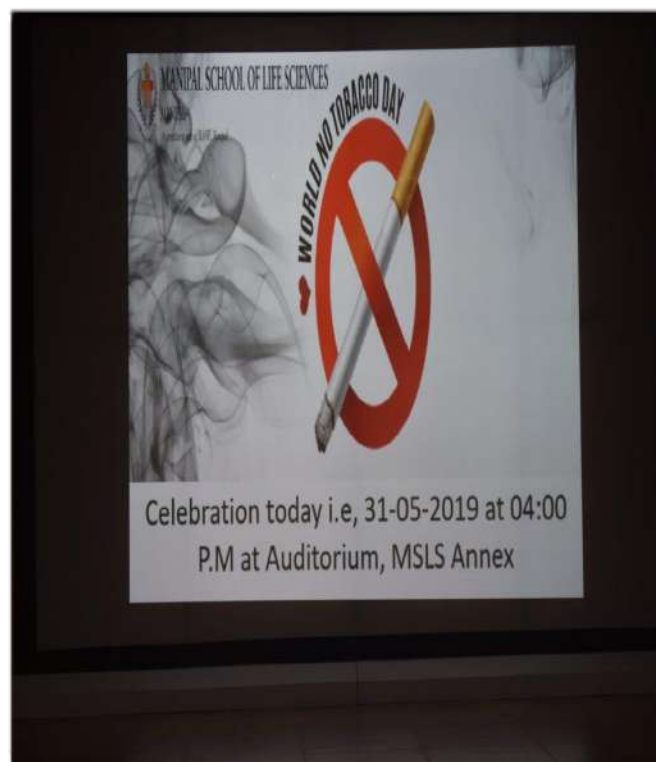
ANTI-TOBACCO DAY

World No Tobacco day was observed at MSLS on May 31, 2019. The event was inaugurated by Mr. Vishnu Karthik, President, Student Council, MSLS. He stressed on how India is the second largest tobacco consumer in the world and how one person dies every six seconds, due to tobacco consumption related problems. Representing the faculty members, Mr. Sandeep Mallya gave some insight into how tobacco chewing was introduced as a method to get rid of stress, later becoming an addiction and the harmful effects of cigarette smoking, which includes a 2% increased chance of getting Tuberculosis. He wished for the society to be rid of the evils of tobacco. Dr. T.G. Vasudevan spoke about how tobacco was introduced into the society and strongly urged the community to stay away from tobacco. Ms. Shannen Fortes, Vice President, Student Council, MSLS, led the pledge which was taken by the entire student body along with faculty members and staff to motivate the community to stay away from tobacco.

"India is the second largest tobacco consumer in the world and one person dies every six seconds, due to tobacco consumption."



The pledge to stay away from tobacco



- Sonam Mehak (II M.Sc. MBHG)

SPORTS DAY

The annual sports day of Manipal School of Life Sciences for the recent academic year was held on 15 March, 2019 at the MIT athletic field. The event comprised of multiple sports activities including but not limited to sprinting, javelin throw, discus throw, shot put, etc. Participants included students from all classes as well as research scholars, teachers, technical and non-technical staff.

The valedictory function was graced by the presence of Dr. Arun Maiya, Dean, School of Allied Health Sciences (SOAHS) – as chief guest. His speech was followed by a fun tug-of-war game where all students contested against all the research scholars and staff. The day ended with the prize distribution ceremony.



cricket

- Sports Committee 2018-'19, MSLS, MAHE

Primer 2019



the group dance event

PRIMER is the leap taken by MSLS, towards UTSAV, MAHE's biggest cultural fest. But Primer is mostly about celebrating the talent and enthusiasm of the entire college, and spending a few fun evenings together. Primer 2019 was held from March 6 to 9, 2019. It mainly consisted of various music and dance events in addition to literary events and art segments like rangoli and collage.

Enthusiastic participants and their supportive friends turned up every evening for the competitions making them a success.

The prizes were distributed by Dr. Vidhu Sankar Babu to the winners during the concluding event held on March 9, 2019.

- Swetha Stanley, (II M.Sc. MBT)

ANTI-TERRORISM DAY

"Promoting unity, peace and harmony across the nation and the world has been the major motive for the observance of this event."

May 21, 2019, in accordance with the UGC guidelines, was observed as Anti-Terrorism Day at MSLS. The day is observed in remembrance of and to honour our late former Prime Minister, Shri Rajiv Gandhi, who was assassinated on this day. Promoting unity, peace and harmony across the nation and the world has been the major motive for the observance of this event and we at Manipal School of Life Sciences did exactly that.

Held in the Auditorium at MSLS Annex with over 100 students and faculty present, the event started with a brief introduction about the day, followed by the screening of a video clip with more information about the state of affairs of countries, including our own, regarding terror attacks.

We also heard one of our very own faculty, Dr. Angela Brand, speaking about her experience with a terror attack. She recollected and shared with us the incidents and scenes she observed and survived during the Brussels Terror Attack of 2016. Her story reminded us how terror attacks can happen anywhere, anytime and to anyone of us.

In remembrance of all the victims who have fallen, all the families broken and all the lives lost due to terrorist activities, we then observed a two-minute silence to pray for them and show our respect as a community.

An informative video, by the army was played to educate us as common citizens and people on



Everyone taking a pledge after the program to be vigilant



the proceedings and ways to do our part and help fight terrorism threats. A pledge then followed which stated that we as citizens of India will do our best to oppose all forms of terrorism and violence and that we will uphold all counts of peace and unity in our country. The event concluded with everyone in the gathering leaving with a strong urge to be aware of their surroundings.

- Sonam Mehak, (II M.Sc. MBH)

Annual Day

Annual Day is celebrated by MSLS every year as an event to bring the MSLS family together, for one vibrant evening. It is an event to celebrate, to look back on the past year and look forward to a new one.

This year, the Annual Day was held for the first time in the Auditorium, MSLS Annex on April 27. Dr. Subhash Chandra Lakhota, Distinguished Professor, Department of Zoology, Banaras Hindu University graced the event as the Chief Guest. He addressed an enthusiastic gathering and talked about his academic journey. The Guest of Honour was Dr. Jagadish Mittur, LEAD, KBITS, Department of IT&BT and Government of Karnataka. Dr. Jagadish delivered a talk titled: "Marriages and the Drama of Genetics in Human Welfare", focused on the changes in society with the advent of genetic testing.

The Annual Day is also a time to appreciate the achievements of the student body and faculty of MSLS. The various activities, competitions and conferences that MSLS has been a part of or has hosted were described by our Director, Dr. K. Satyamoorthy. He also talked about the successes of the faculty and students in research. Mr. Vishnu Karthik, President, Student Council highlighted the various activities of the Student Council and the committees for the year 2018-'19. Awards for outgoing students, best athletes, best faculty and best supporting staff were given out with much applause.

The cultural programme began soon after with the all the batches of students, supporting staff and even

the faculty members putting up entertaining performances. A dinner under the stars concluded the event and was an apt closure to the academic year.



Supporting staff showed off their runway talents!

"An apt closure to the academic year."



Students performing a skit on the struggles of a college student

- Mayukha Bathini, (III B.Sc.)

MENTAL HEALTH AWARENESS WEEK

"You don't have to be positive all the time. It's perfectly okay to feel sad, angry, annoyed, frustrated, scared or anxious"

The Social Committee of Manipal School of Life Sciences organised the Mental Health Awareness week from March 25-28. During these four days, small events and get-togethers were set-up in the evenings, to just simply de-stress or talk about anything that might have been bothering someone.

The sessions were held with a hope to create some awareness about mental illness, and tackle the stigma associated with them.

Some people are silent sufferers, others are open about their mental health issues but many are unable to cope. While many go through counselling and therapy in order to improve their well-being and may also be on medication for the same, so many do not even realise they are mentally unwell. The week was meant to be for everyone to get out there, interact and be self-aware.

The sessions had the following activities:

Day 1: Blind-folded rants

Students came together, and could literally rant about anything under the sun - anything that's been causing them stress or anything they have always wanted to speak about. Sharing truly makes one feel better

Day 2: A talk

Ms. Debasmita Phukan, therapist at the Student Support Centre gave a talk which was truly appreciated for the professional advice on dealing with mental health issues - for oneself and for a loved one who needs the help.



Blind-folded conversations

"It's okay to not be okay"

Day 3: Karaoke and 'Follow the Leader'

What better than some soulful music and a power packed dancing session to relax!

Day 4: Games and more!

People gathered to play some fun games, talk and just engage - carroms, dumb charades, Jenga and many more!

The week ended as a big success, evident in the fact that conversation surrounding mental health was being a little more heard.

- The Social Committee 2018-'19, MSLS

Get
Scientific!

The high price of 'affordable' clothing

Turning off the taps and taking shorter showers does save water. But did you know, it takes 2,000 gallons of water to produce enough cotton for one pair of regular jeans? Or that the 2700 litres of water to produce enough cotton for one shirt is enough water for a person to drink in two and a half years?

An accurate representation of fast fashion



Once upon a time, “fashion” belonged on the runway, and designs used to be presented as two collections in a year – autumn/winter and spring/summer. The scenario now, however is not the same anymore. We see racks and racks of clothing made in millions to be sold by franchises all over the world. This phenomenon has a name – fast fashion. Fast fashion is characterized by extremely short turnaround times, offshore manufacturing where labour is cheaper, low quality materials and complex supply chains with a low visibility.

Fast fashion pushes consumers into impulsive buying habits. The temptation and the prices are hard to resist. But alas, they never last long. The poor quality fabric does not hold, the clothes don't fit all that well (it's quite hard to make clothes fitting different body types when

produced in millions) and the trends become outdated all too soon.

The real price tag –

There has been an exponential increase in the consumption of textiles but also an increase in a throwaway culture - according to McKinsey and company, the average consumer bought 60% more clothing in 2014 than in 2000 but kept them for only half as long.

Synthetic fabrics that revolutionized the apparel industry like polyester, are made through energy intensive processes derived from burning fossil fuels. Even the natural fabrics like cotton require huge amounts of water and pesticides. Cotton is in fact one of the most pesticide consuming crops.

Because of the short life of fast fashion, and the rapid turnaround times, production way exceeds consumption leading to massive wastage.

Apart from the environmental damage, fast fashion has a staggering social impact - extremely low wages and abysmal working conditions for the garment factory employees.

The apparel industry is the second most water polluting industry in the world.

Sustainable and ethical fashion – What can I do?

Buy less

Buy only what you need, build a **capsule wardrobe**. Not only is it easy on the environment, it will also declutter your life. Favour quality over quantity and investment pieces.

Choose well

Make it a habit to check the labels on your clothing. Know what the fabric is and where it's made.

Fabrics

Natural fabrics are generally thought of to be more sustainable than synthetic fibres. However, cotton is one of the most water and pesticide consuming crops. Cellulose fibres like viscose rayon made from bamboo trees, responsible for the clearance of age-old rainforests, requires harmful chemicals for processing.

Linen, made from flax can be grown on land unsuitable for food crops and can be processed

Fast fashion has a staggering social impact - the workers pay the remaining cost of our *discounted clothes*, out of their wages.

without toxic chemicals. Modal (Tencel™) obtained from cellulose of softwood trees and **hemp**, made from the stem of *Cannabis sativa* are better options, especially since hemp can be grown in all soil conditions.

Synthetic fibres like polyester are not only energy intensive and non-biodegradable but also release microfibres with every wash which enter the oceans and are harmful to aquatic life. Why would you want to wear plastic?

Brands

An established, famous brand doesn't always mean their production is sustainable. Look for certifications that the brand has received. Fashion blogs, YouTubers, websites like ethicalconsumer.org, ecofashionworld.com, apps like Good On You are useful resources to know how ethical a brand is and to find **sustainable brands**.

BOHECO, No Nasties, Brown Boy, The Pot Plant, Brass Tacks and Do You Speak Green are some affordable sustainable clothing brands in India.

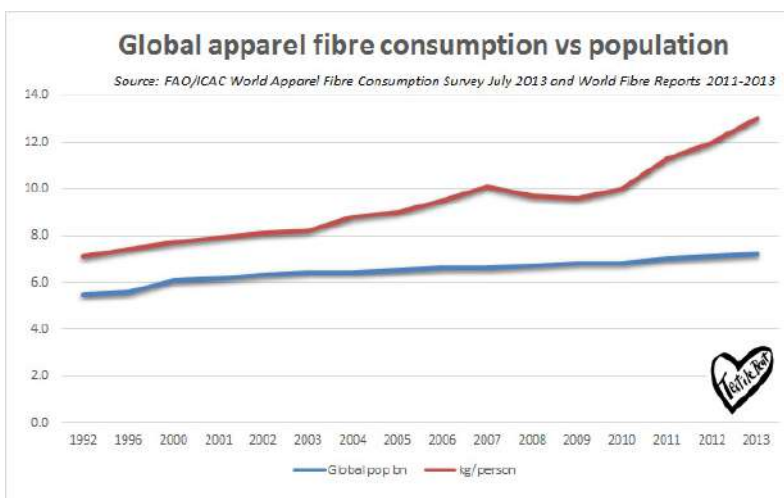
Collective effort can also help to push street fashion retailers into adopting more ethical production choices. While shopping at multinational retailers may be convenient, make it a point to support local brands and handlooms.

Make it last

The energy consumption of a clothing article does not stop at purchase. Water and energy used for laundry significantly increase the footprint of an individual. Around 75% of energy required to do laundry is used to heat the water. Washing in cold water is not only extremely more efficient but is also better for the clothes for the same reasons why line drying is better than using dryers.

Treat your clothes like you treat your friends. ***Do not rush to replace a piece of clothing for a tiny tear or a lost button!*** There are tons of videos showing you how you can fix them with a few minutes of your time. Remember the amount of pesticides it takes to produce your cotton shirts, the energy to produce the synthetic fibres for your blouses and the 10,000 litres of water it takes to produce cotton for your one pair of jeans before you throw them away for something new.

Clothing may now be lighter on our individual wallets but it sure weighs heavy on our shoulders as a population.

Why sustainable fashion?

Treat your clothes the way you treat your friends - quality over quantity, and make it last!

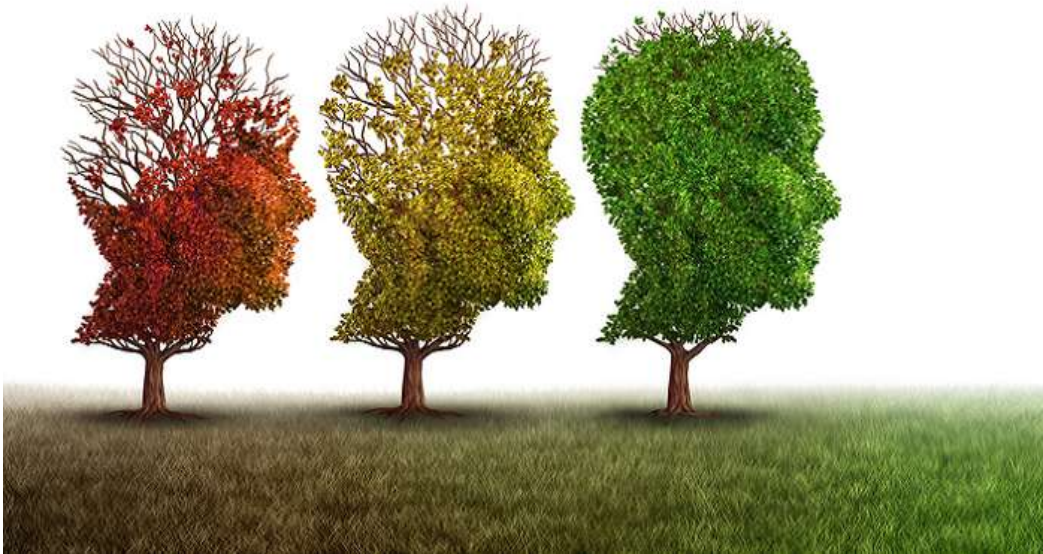
Lastly, when all else fails and it is indeed time to bid adieu to an article of clothing, attempt to find it a new home first. Try out clothes swapping within your circles or even check out platforms like the app ThisForThat. Finding someone who can use them (for example, domestic helpers) is loads better than letting them end up in a landfill. If you plan to donate them, do your research to see if the charity actually gets them to the people since a lot of donated clothes end up wasted. If the clothing is beyond usage, then consider recycling. Search for companies that take textile wastes. Even recycling is an energy intensive process, therefore, **BUY LESS, CHOOSE WELL and MAKE IT LAST.**

Know more:

- <https://curiosity.com/topics/there-are-2000-gallons-of-water-in-your-jeans-sort-of-curiosity/>
- <https://www.globalefficiencyintel.com/new-blog/2017/infographic-textile-apparel-energy-water-pollutions>
- <https://www.smithsonianmag.com/smart-news/case-washing-clothes-cold-water-180955459/>
- <https://medium.com/@ministryofhemp/how-is-hemp-fabric-made-d3b3c61d4945>
- <https://www.treehugger.com/sustainable-fashion/do-you-know-which-fabrics-are-most-sustainable.html>
- <https://www.onegreenplanet.org/environment/how-to-reduce-the-impact-of-your-clothing-on-the-planet/>
- Image sources: <https://textilebeat.com/the-numbers-on-textile-waste/>, <http://fivefigurenews.com/environment/fast-fashion/>,
- **Vegan fabrics** - <https://goodonyou.eco/here-are-the-six-most-sustainable-vegan-fabrics/>

UPHOLDING FALLACIES ON CLIMATE CHANGE WON'T HELP

The catastrophic effects of these changes is revealing itself on many levels and one cannot discount this. Behind closed doors, arguing about what scientists tell you and not what to do about what scientists tell you will be a futile exercise.



"The good thing about science is that it's true whether or not you believe in it." In the words of Neil deGrasse Tyson, fondly known as NdGT, an influential astrophysicist, scientific evidence of climate change is true and the question of belief arises when there is doubtfulness. Human beings are always out for what one can get. For the noble beings, research says don't worry about the Earth. Earth will survive this and survive it well enough to be here long after we become extinct.

Cherry picking 'that' favourable scientific paper contradicting climate change involves cultural, political, religious and economic philosophies. For any phenomenon to be non-objectionably true, it requires more than one scientific paper; it requires systematic research pointing towards the same

results. And science certainly verifies for the taxing effects of climate change whether or not one wants to believe it.

Some of the important cities in the world, were built on a coastline to accomplish better trade, transportation and connection among communities. And these cities will be the first to suffer from climate change causing rising sea levels. What is unsettling is that we do not have a system with the capacity to relocate a city to the inland to face consequences of rising water levels - not in millimeters or inches but in tens of feet. All of this is occurring at a rate faster than our ability to respond. And this is a major contributor to agony associated with climatic change. For amusement's sake, let's say we might even have a

newer version of the maps of the world owing to the eroding coastlines!

WHEN ICE CAPS MELT; MENTAL HEALTH DOES TOO

Consider the situation of a storm in Manipal as a consequence of the severely changing climatic patterns. Monsoon decides to arrive with floods and not a downpour. The effect on the mainland inhabitants, like ourselves can be anticipated albeit indirectly. However, a direct impact is probable. The impact on the headland inhabitants is however, profound as their lives are built upon the activities that involve trade. Relocation and re-establishment of their homes comes with a loss that can be and not restricted to loss of family members or next to kin, decline in physical health, hence a vulnerability to diseases. Not to forget, this is accompanied by economic and social stress. In order to regain monetary loss, they will be unable to get back to their daily lives at a normal pace anytime soon after the impact.

People residing in regions vulnerable to these disasters and those who are economically disadvantaged are more likely to be affected by the flood. A study found that if you were the victim of a flood and you happen to be a socio-economically disadvantaged person, the effect on your mental health was at least twice as bad as it would have been had you not been in that situation. So, that amounts to a double jeopardy of sorts. This is applicable all around the world in different situations of different natural calamities like drought, forest fires, extreme heat, to list a few.

Extreme weather events that are more frequent and intense can trigger post-traumatic stress disorder (PTSD), depression, anxiety, survivor guilt, and suicidal ideation. This has been observed in people who were subjected to the aftermath of hurricane Katrina.

"Psychological impacts from any form of disaster precede physical injury by forty fold and since 2000 the frequency of climate change-related weather disasters has increased by 46%." says a review from the American Public Health Association.

The inattention to mental health is of concern not only in the field of mental health as mental health now shares an interface with climate change in terms of their impact.

References:

- Startalk; Joe Rogan (podcast)
- Reuters
- Berry, H. Pearl in the Oyster: Climate Change as a Mental Health Opportunity. *Australas Psychiatry*. 17(6), 453-456 (2009).
- Image source: <https://s3-eu-central-1.amazonaws.com/centaur-wp/employeebenefits/prod/content/uploads/2018/05/mental-health.png>

- Madhuri Srinivasan (II M.Sc. MBHG)

REVIVAL OF THE DEAD BY PLACENTAL STEM CELLS

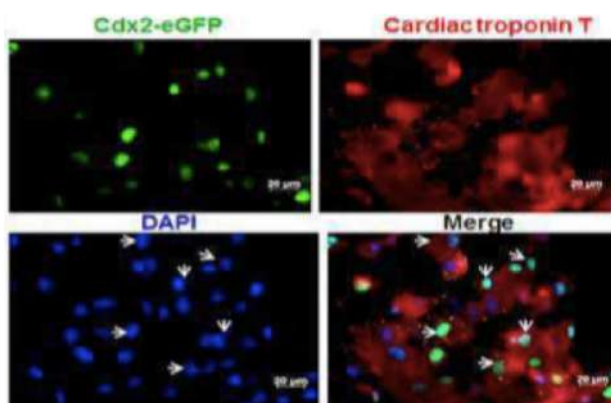
Seems far-fetched? Science says not. 31% of deaths worldwide are caused by cardiovascular disease. Placental cells might actually be able to regenerate hearts.

The topic seems a little far-fetched but scientifically, it might be possible in the years to come. Let us concentrate on a number - 17.9 million or 31% of all deaths worldwide. Does it not sound alarming? Although a lot of research worldwide concentrates mostly on cancer, there is another major disease that has caught the attention of scientists - "cardiovascular disease (CVD)" and the figure mentioned above, is the deaths caused per year by heart failure and heart attacks.

The history of studying CVD dates back to the era of Sir Leonardo Da Vinci, who studied coronary arteries. This was followed by an increased interest in the study of atherosclerosis in the 1900s. The 1956 Nobel Prize was awarded to Sir Werner Forssmann for the discovery of heart catheterization, which created an uproar in the diagnosis of CVD. Since then, there has been a massive shift in the approach to research. Regenerative medicine coming into play has

revolutionized the entire concept of tissue grafting and transplantation. Also, GWAS studies revealed over 300 mutations in genes encoding β -cardiac myosin heavy chain (MYH7) associated with the genetic aspect of the disease. We now know that it is a syndrome with collective causes, but limited cure.

As is rightly said, science is all about curiosity and imagination. It is this quest for finding answers to the unknown, that pushes hypotheses and logical reasoning further. Earlier, it was observed that mixed fetal cells could naturally migrate to an injured maternal heart, but now it has been hypothesized that there is a specific Caudal-type Homeobox - 2 domain (Cdx2) in the placenta. Cdx2 expressing cells are a novel cell type for cardiac regeneration. The placenta that is discarded as biomedical waste is essential for studying adverse fetal outcomes like cerebral palsy, fetal restriction etc. It has the master homeodomain protein Cdx2 that defines trophoblast during development and is involved in self renewal of trophoblast stem cells that have now been discovered as a novel form of cell therapy. These



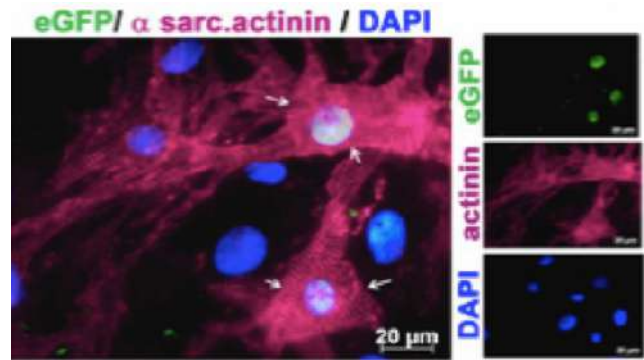
Vadakke-Madathil *et al.* (2019)

The Cdx2-eGFP cells could synthesise Troponin T very early.

cells when intravenously injected into the mouse were able to selectively and specifically home through the circulation to injured hearts and when labelled with enhanced GFP, showed clonal differentiation into beating cardiomyocytes (CMs) and vascular cells *in vitro* indicating that they are multipotent. These Cdx2 cells displayed rod shaped and striated sarcomeres similar to the endogenous myocytes. The proteomics and immune transcriptomics revealed that, similar to ESCs, they retained stemness but also had unique properties specific to Cdx2 cells such as very low expression of MHC I and MHC II associated with immune rejection making them immunologically naïve. Even after 3 months, these Cdx2-eGFP cells showed strong engraftment, proliferation, and differentiation in the infarct and periinfarct zones of the heart which highlighted their safe retention, survival, and function *in vivo* in mouse models.

The expression of β -parvin (affixin), an adaptor protein that is important for actin dynamics is also reported to exhibit cardioprotective effects when bound to STAT3 in isolated Cdx2-eGFP cells. Additionally, proteins like sorcin, involved in calcium handling and in rhythmic contractility were uniquely identified in the Cdx2-eGFP cell population and also the proteome study of Cdx2-eGFP cells showed exertion of a conducive and synergistic effect on regeneration and functional recovery in a post-MI setting. Earlier studies on mesenchymal stem cells and iPSCs showed failure in formation of CMs and lack of functional coupling after transplantation due to immune rejection and moreover they had risk of arrhythmias and teratoma formation.

Dr.A.P.J Abdul Kalam once said, **"We need to dream before our dreams come true"**.



Vadakke-Madathil *et al.* (2019)

This depicts an eGFP-derived cardiomyocyte expressing sarcomeric actinin. Morphology, rod-shape, was similar to feeder myocytes.

Maybe one day this novel discovery would pave the way for allogenic stem cell therapy for cardiac disease and regenerate heart tissues after an attack. Science has always been beyond our imagination so as the youth of today we should never stop imagining and striving towards a better future so that maybe we could make CVD a disease of the past. Because, ***"imagination is more important than knowledge."*** - Albert Einstein

If the topic seems exciting to you, then do check out the paper related to this published in PNAS.

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- Vadakke-Madathil, S. et al. Multipotent fetal-derived Cdx2 cells from placenta regenerate the heart. Proc. Natl. Acad. Sci. 116, 11786 LP – 11795 (2019).
- https://www.who.int/cardiovascular_diseases/en/

- Pallavi Kundu (II M.Sc. MBT)

*Words
of Wisdom*

Could you please tell us a little about yourself?

I'm from Indian Institute of Science, Department of Biochemistry. I joined the department in 1989 as an Assistant Professor and am currently a Professor. Actually, I'm going to retire next year in July 2020. I have an honorary professorship for five years from then. I would like to teach biochemistry after I retire, and the idea is to go around from place to place, to conduct two month courses in biochemistry.

My research has not been "high flying", but we have done some good work in biochemistry, using microbes and microbial systems.

What got you interested at first in biochemistry and microbiology?

It started in school. I liked chemistry very much and then when I got into college, I had a very good teacher, and that's the thing about subjects, it also depends upon how good the teacher is. I had good teachers throughout my school and college time and that is one of the major reasons I got into biochemistry. It's in the last recent years that I've studied biochemistry with microbial systems and have now got more interested in the biology of the microbes like *Helicobacter*. The biology of all of these pathogenic organisms is very fascinating to me.

What would you say is the scope for microbiology in India?

We are in a very important era right now, especially with things like antibiotic resistance and how researchers are searching for a way to counter it. A combination of

biochemistry and microbiology is a deadly combination. There are also research development centers and big multi-nationals that are always looking for biochemists and microbiologists or people who know both of them, so there is scope. Hospitals, for example, have so many cases of infectious diseases here and microbiology deals with that area. And therefore, places like Manipal which have both medical laboratories and conduct translational research are good places to work at.

How do you think microbiology in India will advance in the future?

A lot more work is going on now. More facilities are coming up but you know, nothing compared to what the western countries are doing. But I think these subjects are becoming more popular. It can become much better. But there are a number of Institutes that are very dedicated to this field. But there is still a lot more to be done. Our population is

Dr. D N Rao

Dr. DN Rao is presently, a Professor and Head in the Department of Biochemistry, AIIMS, the elected president of Indian Immunology Society and is also the chairman of the Intramural Research project of AIIMS.

Dr. D.N. Rao is currently involved in teaching Biochemistry and Immunology to various professional courses. His research interest includes Biochemistry and Immunology of infectious diseases.

large and issues rise up but I still think that there is lot of scope for this field in India to advance.

What would you like to recommend to young aspiring students who are interested in this field but are unsure of it?

I think that this century is going to be the century for life sciences. Everything related to humans is becoming more relevant and important. We have so many plant, animal diseases to study, especially in India with such a large population. I urge the students to take more interest in this. I believe that it is better for students to have a better knowledge of subjects like biology, chemistry and physics and then they can then go onto specialize in their interested subject in their Masters' and Ph.D. programs.

Based on your talk, by studying *H. pylori*, how do you attempt to apply it in different fields?

Nowadays, everyone is trying to study the millions of bacteria that are present. Studying one type of bacteria is nice but that doesn't give the whole picture. So, this is just an attempt to mimic the *in vivo* conditions and more. Studying interactions between several bacteria is already going on in many labs but studying one bacterium can be done more easily and you also get a lot of information. If there is a pyloric infection, you can get a biopsy of the stomach, or for example in China, what many clinics do is that they ask the patient to take a urea test, checking for ammonia and a very strong presence of ammonia indicates strong presence of pylori. And all these came from research. Both basic and



Dr. D.N. Rao delivering his oration lecture

applied research is important and one should not condemn one or the other.

In your talk you mentioned about collaborating with different scientists from different fields. Could you stress on that a little bit more?

Nowadays, if you want to do some nice work and you want a product, for example, something coming out, or even want to publish a nice paper, most journals want a complete picture and this will involve a lot of things.

How do you think ethical issues have affected the advancement of science?

I don't think its hindered. There's just a check, because you do any kind of experiments using humans, with mice and



Dr. D.N. Rao was awarded the Prof. J. V. Bhat Memorial Oration and he delivered the oration on this occasion.

some kinds of animals, people are able to do it. But with humans it is a question of what is ethical, for example, you have somebody inserting genes which favor one kind of trade and therefore, that is a concern. But now, gene therapy in terminally ill patients are being conducted which is good.

Would you like to offer any advice to students that are planning to take up a similar type of work like yours?

You have to be interested in the subject. That's the first most important step. If you have no clue what the subject is about and you're just taking it then that's the wrong way. To do any subject relating to science you have to be interested in it. You can be interested in other subjects also. For example, I was interested in history and geography but I never thought I would take them up as my main subject, I was fascinated by science and that's why I took science. You should also be very good at writing as now I see that most of the students are very poor in writing and they should take up extra courses in English and writing skills because you have to sell your science and if you cant speak or write about it then science is gone. But there are agencies that help you write such papers since we are all learning.

Every year, Manipal School of Life Sciences organises an oration to honour Late Prof. J.V. Bhat (a renowned microbiologist who served KMC, Manipal upto 1980) on his birthday, March 3. An eminent scientist of repute in the field of microbiology and life sciences is awarded the endowment and invited to deliver an oration. This year, Prof. D.N. Rao received the endowment.

- Nicole Mary Swer and Dharti V. K. (II B.Sc.)

WANDERLUST

Through the Gullies

*The magical subway where gravity
was lost*

The concept of early mornings seems to be a little lost once you are in the hot burning summers of Delhi. The sun floats on the horizon for a while and the next thing you know it's a helium balloon left free into the sky. Well, I think that's one thing about Delhi, it hits you right at the start, and takes you down by the end of the day. I could say that Delhi was my cycling trail, the place where I was riding free for the first time without boundaries except for morals, of course (disastrous if those leave us).

So my daily travel (if one may allow me put it in such words) would begin at around 3 in the afternoon with a little walk from my abode to the closest metro station. And trust me if you keep your eyes open while you are walking on the streets you are bound to feel like a bee in a swarm. Delhi is like a place where you could find jhota buggy and a black BMW parked right next to each other. It's a land that has something for everyone and in this walk to the metro station, would lie a subway which was magical in its own ways. Not only did it have weird graffiti on the wall, but it was also a sort of a rectangle where the sense of gravity was lost, meaning you could imagine yourself in any plane and it would fit in okay.

The first place I decided to drop in, is one I love and cherish very deeply. You may call it love at first sight. It was the National Gallery of Modern Art. The museum is almost like a deep plunge back in time where it chronologically retells the story of how Indian art took its form. It begins the story from British India where artists like Tilly Kettle and Thomas Daniel who were realists, (they in form denoted what appeared to eye) were a rather great influence on Indian artists like Raja Ravi Verma himself. A shift came in when Rabindranath Tagore, a member of the Bengal School of Art, moved paintings away from realist portraits of the maharajas

and landscapes to folklore and cultural representations. This was an important aspect in the history of Indian art. The museum has the paintings of some of the most

appreciated painters such as MF Hussain, whose Mother Teresa series spoke out to me. I would say it's a must visit, giving loads of time and patience. I realised later that the gallery was situated in a region that had all the government buildings - The Lodhi Road, a place of grand importance and known as the Lutyens' Delhi for it was Sir Edward Lutyens who designed the architecture of the buildings there. The area is now celebrated as the governance hub of India. Since this region hosts various embassies and cultural centres, it has come to now play the role of an important hub for international cultural exchanges.

One of my favourite places here is the Alliance de Francais and the Habitat Centre with ongoing free movie screenings, cultural programs and an amazing cafeteria where I couldn't help but find myself sitting in front of French motion pictures. If I may say so, life appeared to be too short within just a 14 mile radius. It felt like I was just jumping to far off places in these walls that Lutyens metaphysically built.

There was another thing I came to realise while I was in Delhi. A lot of times it's not about our likes and dislikes but rather about acceptance because with a sense of acceptance comes a sense of understanding and with understanding comes appreciation. And I believe food is one of those aspects where trying and accepting goes a great deal. So yes being a metropolitan city Delhi has almost anything you may want to eat. And few places I loved visiting were the "ALL AMERICAN

DINER” at the Habitat centre with the whole 90’s pop feel to it. And don’t miss out on the milkshakes there!

Now I must come an important chapter in my life which is composed by three elements : A really awesome bookstore (in South Extension, Delhi, must visit), the Japanese Cultural Centre and the Tea House. Now since I recall the exact day this happened from my arrival in Delhi. I am gonna jump straight to that.

DAY 42 It was about on Day 42 after my arrival in Delhi that I discovered this bookstore in a basement called the Midland Bookstore (I am lowkey advertising for them) and fished out a book called “Lost Japan” by Alex Kerr. The book was majorly about Japanese culture and it drew parallels with how one sees Japan today.

DAY 49 It was on Day 49 I found my steps pacing to the Japanese Cultural Centre. This place will never fail to surprise you. With a thousand mangas and books on samurais you are bound to start living here. Of course, you wouldn't want to miss the brilliant movies they screen here and on other days book discussions on Murakami or Kazuo Ishiguru. In the attempt to discover more about the different cultures of the world, I found this place called the Mandi House. Now, Mandi House is the hub for theatres in Delhi. You could just drop down here on any one fine evening and you are bound to find shows running. In some of the best theatres like the Kamani auditorium and the Indian Kala Manch I came to discover Bunraku (Japanese Puppetry) and Kabuki (a Japanese dance-drama). Never before had I felt so close to discovering something that lay thousands of miles away. Those were the national treasures of Japan performing right in front of me and it was one of

those few times where I was in tears for how beautiful the world could be.

Day 62 I found myself carried back to the Midland Bookstore where I ended up buying a book on TEA. Of course I could never attend the authentic tea ceremonies that were held with so much grandeur but I was much taken by the tea itself. Try out some *matcha* and *sencha*, all sold at the fancy stores in Delhi. Especially at one of the world’s five most expensive markets ‘THE KHAN MARKET’. Well I am not really kidding. It’s a place full of awesome bistros, restaurants and grocery stores selling imported stuff. I loved this market for a little tea place called ‘Dilmah’. It’s a company based in Sri Lanka that went on much further to even experiment with tea. They made infusion, cold brew *sencha* (an overnight brew in ice) and served tea in champagne glasses. Even if you are not so much a tea lover this place has something for everyone. There is much going on with how Delhi turns out to be a flow of international cultures but beside this 14 mile radius, your nose goes on high alert as the air is filled with the smell of oil in a kadai, the roadside *chola baturas* and the famous *parathas* of ‘Chandni Chowk’. So there I was, one fine day amidst that some sort of weird organised mess. I recall this day as one where I had one of the most important realisations. While I tried clicking a few portraits, I realised how almost everyone was proud of something and some of those could be as simple as a mustache.

It was here that a few kids helped me get to the Jama Masjid after they grew interested by my clicking pictures of them. They were a reminder of my childhood, of how I grew up in congested streets full of traffic and an uncanny smell.



When we finally reached the Jama Masjid, I went in to the altar to find two men bend down in prayer. Even in the scorching heat and a busy day both of them seemed engrossed in prayer. I stole a photograph there which I believe holds the power of religion and belief. And finally it being a thursday I ended my evening at the Hazrat Nizamuddin Dargah where the evening Qawwali filled the air while the rock pigeons hovered over the evening sky as the day came to a close.

And as we traced our way parallel to the Red Fort which sat magnificently in the backdrop through small alleys with stores selling almost anything and everything, it was here that I saw a gramophone store for the first time and was fascinated by them.

- Yash Goel (III B.Sc.)



creativity
beyond this
page!

Snapshots...



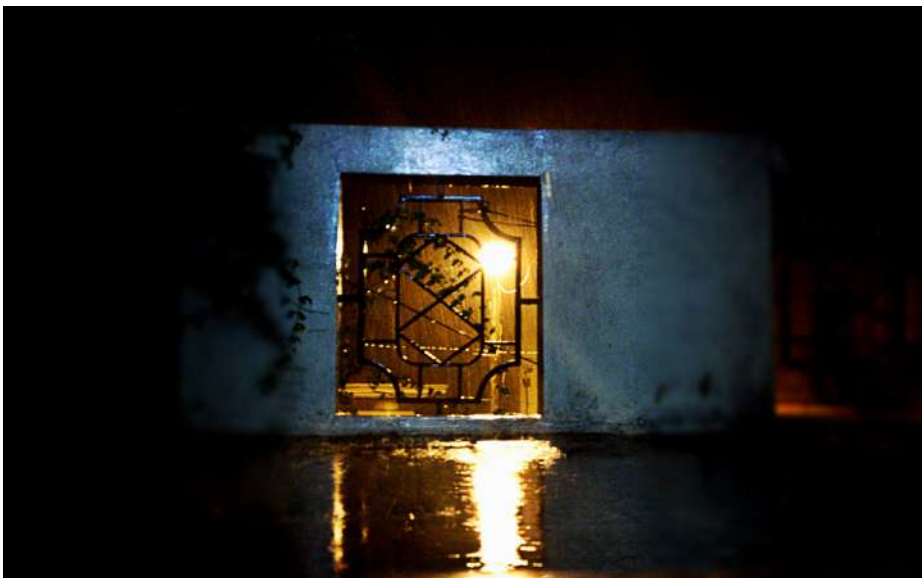
"THERE IS NO TIME TO BE BORED
IN A WORLD AS BEAUTIFUL AS
THIS"

- Shiksha Saraogi (III B.Sc.)



"Blooming flowers."

- Sazida Dudekela (II B.Sc.)



"The light finds
its path in the
eerie darkness
and solitude."

- Swetha Stanley
(II M.Sc. MBT)

A Requiem

-Russell Lorenzo Castelino (Alumnus)

Floating on the wind
Old, brittle I sometimes feel the life I left behind
The years spent hooked to that thing
Let it give me life
Let it become what I existed for
Everything I had I poured into it
Every drop of my sustenance
the monkey on my back
Needing the juice and all that came with it
The incessant goodness that was so much part and parcel of my life
On it ,I was a better me
More verdant, More likable
A metaphor for everlasting happiness
But as the days went by I got less and less
I felt my self fade and didn't know why
I begged for more
Told them I'd work twice as hard
But they said "supply's short,gotta cut you loose."
And so more of me disappeared
My veins clogging,filling with dirt
My body old and wrinkled
And So I chose
For once in my life
To be the master of my own life
I Broke away
And for a second I'd lost everything
But then I began to float
The wind my only companion
I realised I don't quite need the juice
And I finally knew what It was to be free

“You're the creator of your own future. Get to writing.”

— Ashley Brooke Robbins

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