

# AIMST E-BULLETIN

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Volume II, Issue I

April, 2016

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## Editorial Desk

I present another moral which really impressed me. In this era, we have compromised a lot of moral values for personal accomplishments. The heart-touching moral from **Allegrei A. Fernando**, ignited my thoughts to ponder the direction the present generation is heading towards. I share the following, as narrated by the author:



A doctor entered the hospital in hurry after being called in for an emergency surgery. He answered the call ASAP and went directly to the operation theater. He found the boy's father pacing in the hall waiting for the doctor's arrival. On seeing him, the dad yelled: *"Why did you take all this time to come? Don't you know that my son's life is in danger? Don't you have any sense of responsibility?"*

The doctor smiled and said: *"I am sorry, I wasn't in the hospital and I came as fast as I could after receiving the call... .. and now, I wish you'd calm down so that I can do my work."*

*"Calm down?! What if your son was in this room right now, would you calm down? If your own son dies now, what will you do??"* said the father angrily.

The doctor smiled again and replied: *"I will say what Job said in the Holy Book"*

*"From dust we came & to dust we return, blessed be the name of God. Doctors cannot prolong lives. Go and intercede for your son, we will do our best by God's grace."*

*"Giving advice when we're not concerned is so easy"* murmured the father.

The surgery took some few hours after which the doctor came out happy, *"Thank goodness!, your son is saved!"*, and without waiting for the father's reply he carried on his way running. *"If you have any questions, ask the nurse!!"*

*"Why is he so arrogant? He couldn't wait some minutes so that I ask about my son's state"* commented the father when seeing the nurse minutes after the doctor left.

The nurse answered, tears coming down her face: *"His son died yesterday in a road accident, he was at the burial ground when we called him for your son's surgery. And now, that he saved your son's life, he left running to finish his son's burial."*

*"Never judge anyone..... because you never know how their life is and what they're going through."*

Just be honest all the time, be honest to all of them and more importantly, be honest to yourself. If you feel bad about thinking, 'you're getting fooled all the time'. Show them your real feelings of what you think, the concept of being true. Sometimes, learn how to control your temper. It will lessen the probability to make the situation worse. *'Less talk, Less Mistakes'*.

*Limitations?* We're after all humans, but please don't attempt to break the law.

**Source:** Quora, Allegrei A. Fernando

**Mr. Abdul Nazer Ali, Editor-in-Chief, AIMST E-Bulletin.**

**DO WHAT  
IS RIGHT,  
NOT WHAT  
IS EASY**



## Journey of Faculty of Applied Sciences at AIMST University

The Faculty of Applied Sciences (FAS) was established in 2002 in the interim campus of the AIMST University (AIMST). Under FAS, the Department of Biotechnology (DBT) and Department of Material Science were established by Professor Helen Nair, the then Dean of FAS. In 2004, IPS approved the application of AIMST to start its MSc Biotechnology (by research) as the first postgraduate degree programme.

Currently, FAS under its DBT offers three-year degree programme, BSc (Hons) in Biotechnology, Master of Science (MSc) and Doctor of Philosophy (PhD) in Biotechnology (In research). FAS is one of the most vibrant faculties in AIMST. Undoubtedly, FAS is the most successful faculty in attracting extramural research funding from various government and non-government funding agencies.

As of October 2015, about 600 biotechnologists has been produced by FAS. It is obvious that FAS has made tremendous progress in a short time and do have several successful stories to tell. However, only some selected facts, achievements and/or developments are narrated in the chronological order:

- 2006 - The 1<sup>st</sup> batch of students from 'BSc Biotechnology' programme successfully completed their degree programme.
- 2007 - FAS was shifted from interim campus to the new, ultra-modern green campus in Semeling.
- 2008 - Prof. Dr. M. Ravichandran was appointed as Dean, FAS.
- 2011 - FAS was the first to receive a total of RM 139,000.00 from the Ministry of Agriculture and Agro based industry (MOA), Malaysia.
- 2011 - FAS was the first faculty among private universities in Malaysia to adapt and adopt the Biotechnology Entrepreneurship Special Training (BeST) for its 'BSc (Hons) programme, under the purview of the Malaysian Biotechnology Corporation (BiotechCorp), the highest Biotechnology body in Malaysia.
- 2012 - FAS was granted RM 103,000.00 from MOHE and RM 265,000.00 from MOSTI.
- 2012 - FAS became the recipient of thirteen grants from the Ministry of Agriculture, MoHE, MOSTI and UBS Optimus Foundation with a total grant of RM 1, 514,859.00.
- 2013 - FAS received six FRGS research grants amounting RM 783,775.00
- 2014 - FAS received full accreditation for its PhD in Biotechnology programme and conferred first two PhD in Biotechnology at the seventh convocation ceremony of AIMST University.
- 2014 - Prof. Dr. M. Ravichandran, Dean for FAS was handpicked and appointed as the Acting Chief Executive and Vice-Chancellor to lead the AIMST University.
- 2014 - Dr. S. Kathiresan from FAS was chosen and appointed as the acting Registrar of the AIMST University.
- 2014 - Professor Dr. M. Ravichandran was promoted as Senior Professor and took over full responsibility as Chief Executive and Vice-Chancellor of the AIMST University.
- 2015 - FAS initiated collaboration with Technical University of Denmark (DTU).
- 2015 - Dr. Lee Su Yin was appointed as Deputy Dean, FAS.
- 2016 - FAS is organizing the '3<sup>rd</sup> Regional Conference on Biosensors, Biodiagnostics, Biochips and Biotechnology 2016'.



Contributed by: *Dr. Subhash J Bhore , AIMST University, Malaysia.*

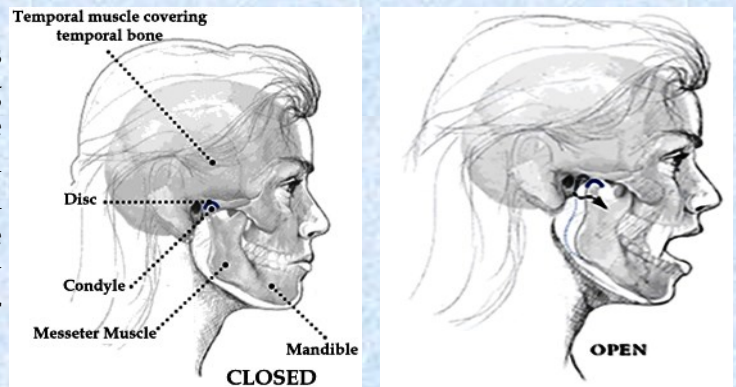
(Note: Journey of another School / Faculty in next issue)

## 'Physiotherapist as a partner in the management of Temporomandibular Joint Disorder'

### Temporomandibular Joint (TMJ):

The TMJ connects the lower jaw (called the mandible), to the bone at the side of the head, the temporal bone. If our fingers are placed in front of the ears and when the mouth is opened, the joints can be felt. These joints are flexible and the jaw can smoothly move up and down and side to side, enabling us to talk, chew and yawn. Muscles attached to and surrounding the joint (jaw) controls its position and movements.

When we open our mouth, the rounded ends of the lower jaw, called condyles, glide along the joint socket of the temporal bone. The condyles slide back to their original position when we close our mouth. To keep this motion smooth, a soft disc lies between the condyle and the temporal bone which absorbs any shock imparted from chewing and other movements.



### Temporomandibular disorder (TMD):

TMD is a problem affecting the 'chewing' muscles and the joints between the lower jaw and the base of the skull. TMD is also called as 'myofascial pain disorder'. Usually people between 20-40 years of age are affected by TMD and it is more common in males than females.<sup>1</sup>



### Symptoms of TMD:

- Clicking, popping or grating noises when we masticate (chew)
- Muscle pain around the jaw
- Pain in front of the ear that may spread to the cheek and ear
- Difficulty opening the mouth - the jaw may feel tight as if stuck, making eating difficult
- Headache or migraine
- Earache or a "buzzing" or blocked sensation in the ear

These symptoms can significantly lower quality of life and disturb sleep.

### Recent Trends:

In the last decade, dramatic advance have been made in understanding the causes of facial pain related to TMD's. Technical breakthroughs in MRI, arthroscopy, arthrography and X-ray have enhanced the clinician's ability to diagnose and distinct intracapsular temporomandibular joint (TMJ) changes associated with facial pain and jaw dysfunction. Many well designed studies have been performed and have increased our knowledge of the pathogenesis and treatment of TMJ disorder and the muscles of mastication.

Treatment of facial pain is complicated due to the inter-relationship of TMD. Although some patients may experience discomfort solely due to myofascial pain or intracapsular disorder, others may be suffering from combination of problems. For example, a patient with anterior displacement of TMJ disc that does not reduce on opening mouth and/or other has secondary myofascial pain because of the interference to condylar movements.<sup>2</sup>

## Health Issues

Success in diagnosing and treating TMD depends on the clinician's ability to interpret and assimilate data derived from an in-depth history, comprehensive examination and appropriate diagnostic test. Listening to patient's history of the problem often will be the most significant aspect of the entire work-up by helping differentiate meaningful findings from those that are incidental.<sup>3</sup>

### Treatment:

TMD is one of the challenging disorders to treat. Physiotherapy and lifestyles changes can help cure TMD.

### Lifestyle changes (self-help measures):

- Resting the joint by eating soft food and avoiding chewing gums
- Holding a warm or cold flannel to the jaw for 10-20 minutes, several times a day
- Doing a few gentle jaw-stretching exercises
- Avoiding opening the joint too wide until the pain settles
- Avoiding clenching the teeth for long periods of time
- Massaging the muscles around the joint
- Relaxation techniques to relieve stress
- Avoiding resting of chin on the hand

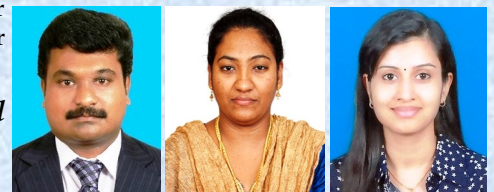
### Physiotherapy Treatment:

Modalities such as Transcutaneous Electrical Nerve Stimulator (TENS), Ultrasound therapy, moist heat and cryo therapy along with stretching and strengthening exercises can reduce relieve pain and improve range of motion. Though various treatment are available for the management of TMD, recent research suggest that Low level Laser therapy (LLLT) irradiation is an effective modality in the treatment of TMD due to myogenic and arthrogenic origin. Since LLLT is a relatively safe procedure, there is no tissue destruction or other hazards.<sup>4</sup>

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2. Hakguder A, Britane M, et al. Efficacy of low level laser therapy in myofascial pain syndrome: An algometric and thermographic evaluation. Lasers Surg Med. 2003;33:339-343.
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4. Conti PC. Low level laser therapy in the treatment of temporomandibular disorders (TMD): a double-blind pilot study. Cranio: The journal of craniomandibular practice. 1997;15:144-149.

**Contributed by:** Mr. A. N. Sundaresan, Ms. D. Jency Sudha & Ms. Elil Suthamathi, AIMST University, Malaysia.



## A Homage Message

Dear all,

With deep sadness, we would like to inform you the sad demise of Dr. Hishamudin Rahmat (50), who served in Faculty of Applied Science, AIMST University at various levels as an excellent academician passed away this February, 2016. Please pray for the departed soul and for the bereaved family members to have strength to bear the big loss.



With sincere prayers,  
Faculty of Applied Science,  
AIMST University, Malaysia.

### 'Tooth Ache - Some Common Home Remedies'

Tooth ache is one of the worst pains encountered by human beings. Tooth pain occurs due to infection of the innermost part of the tooth called pulp, which contains the nerve supply to the tooth. In this article I would like to share some of the common home remedies for toothache.

#### Toothache Self-Home Remedies<sup>1</sup>

Trying home remedies for tooth pain can give some relief too in times of emergency or when a dentist appointment is not immediately possible. Some handy tips are listed below:

1. **Avoidance** - Do not chew on the pain side. Do not eat or drink anything very cold or hot. Ice chewing needs to be strictly avoided. While you brush your teeth, make sure to be very gentle and not to increase the pain.
2. **Saltwater gargle** - The use of salt for health care purposes has a long history, dating back to some of the oldest medical scripts in existence, according to the Science Tribune.<sup>2</sup> Ancient Egyptian papyruses from 1600 B.C. provide recipes for a range of medicinal treatments using salt, particularly as anti-infective. The ancient Greeks used it for similar purposes for more than 2,000 years for its anti-inflammatory effects. You can mix one teaspoon of salt in a glass of normal or lukewarm water and gargle to provide temporary pain relief.
3. **Clove Oil** - An essential oil from the clove plant has both analgesic and antibacterial properties, which can be particularly handy in case of a toothache instigated by bacteria. Soak a cotton pellet in clove oil, place it on the affected tooth and gently bite it. There is a temporary relief of pain experienced.

**Caution:** Usage of clove oil for long time might cause burning sensation of the gums.

4. **Flossing** - This is done using a dental floss available at any supermarket nearby. This will remove any food particles that are stuck/present between the teeth.

#### Use these tips to floss correctly:<sup>3</sup>

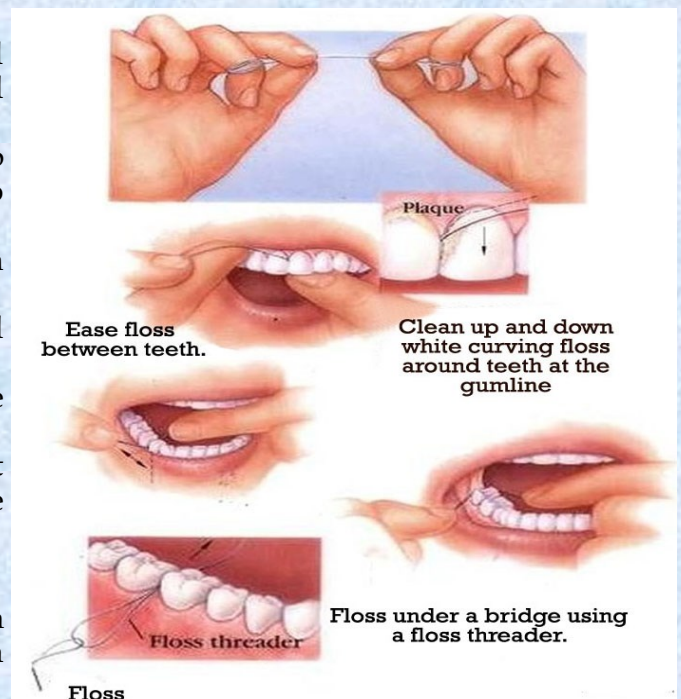
- Use 18 inches of floss. Wrap most of it around the middle finger of one hand, the rest around your other middle finger.
- Grasp the string tightly between your thumb and forefinger, and use a rubbing motion to guide it between the teeth.
- When the floss reaches the gum line, form a 'C' to follow the shape of the tooth.
- Hold the strand firmly against the tooth, and move it gently up and down.
- Repeat with the other tooth, and then repeat the entire process with the rest of your teeth.
- Use fresh sections of floss as you go. Don't forget the back of your last molars. Most gum disease and decay occurs in back teeth.

#### Food-Based Home Remedies for Toothaches<sup>1</sup>

Certain vegetables/fruits that we regularly use in our day to day life can help us in relieving tooth pain. Some of them are as follows:

**Garlic** - Has been used for medicinal purposes by the ancient Chinese dating back to 2000 B.C. and by the ancient Egyptians, the Romans and the Greeks. Garlic has proven itself for its extremely effective antiseptic, strong antiviral, antifungal and antibacterial properties. Garlic also acts like an antibiotic, and with repeated application of raw cut garlic to the infected area, it can cure an abscessed tooth.

By all means use the garlic remedy below to bring quick relief to severe toothache resulting from an abscess infection, but always consult your dentist.



## Health Tips

An abscess left untreated or not properly treated can lead to complications. Be aware that use of raw garlic can cause mild to moderate burning stinging sensation.<sup>4</sup> Garlic is a wonderful natural antibiotic and is extremely effective as a broad spectrum antibiotic. Unlike any pharmaceutical antibiotics, bacteria does not (or cannot) build up a resistance to garlic no matter how often you use it.

**Directions:** 3 to 4 cloves of raw garlic crushed or very finely chopped and mixed with a serving of plain yoghurt.

**Onions (all types)** – Place a piece of raw onion on the affected tooth. This may provide a temporary/permanent relief because onion also has antimicrobial properties.

**Lime/Lemon Juice** – Lemon has anti-inflammatory properties and relieves pain. Apply freshly squeezed lemon juice to the painful tooth with a cotton ball.

### Medicines that can relieve pain:

NonSteroidal Anti-Inflammatory Drugs (NSAIDs) such as aspirin, ibuprofen, diclofenac sodium, acetaminophen (Paracetamol) can be used for temporary relief. Bonjela or Oral Aid Mouth Ulcer Gel contains a topical pain reliever.

### Other natural home remedies include<sup>5</sup>

Hydrogen peroxide, alcohol, vanilla extract, tea tree oil, apple cider vinegar, ginger, peppermint leaves, potato, plantain, cucumber, cayenne or black pepper, baking soda, tea, guava, wheat grass juice, avocado, asafoetida, bay berry, turmeric, myrrh, acupuncture, ice pack or hot compress can come handy in situations of tooth ache.

*The above remedies are for temporary relief only; medication should be consumed only under guidance of physician. The permanent solution will be to visit your Dentist/Dental Specialist.*

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3. The Truth About Healthy Teeth: At-Home Dental Care. Available in <http://www.webmd.com/oral-health/healthy-teeth-14/flossing-excuses?page=1> [Last accessed on 13/04/2016]
4. Garlic Cures For a Severe Toothache and Abscess. Available in <http://www.umpah.com/health/toothache/ma1504-5-garlic-cures-for-severe-toothaches-and-abscess.php> [Last accessed on 13/04/2016]
5. DIY Home Remedies for Toothache. Available in <http://homeremediesforlife.com/toothache/> [Last accessed on 13/04/2016]

**Contributed by:** Dr. Jawahar Dhanavel, AIMST University, Malaysia.



## Prescriptions

### Can you read these prescriptions?

**Rx 1**  
Ira Green, RPh, at CVS Pharmacy in Washingtonville, New York, was stumped by this prescription.  
**Do you know what it says?**

**Rx 2**  
Despite her talent for reading bad handwriting, pharmacy technician Morgan Smith needed help reading this prescription that came in during her shift at Publix Pharmacy in Newberry, Florida.  
**Can you read this Rx?**



## Research Updates

### 'Robotics in Paediatric Physiotherapy – An eye opener'

The rehabilitation of paediatric patients involves unique constraints in comparison to adult rehabilitation. The utilization of robotic technology in the rehabilitation of paediatric patients provides a solution for unique challenges. A variety of solutions are being investigated that place robotics in different roles in relation to spastic patients, in paediatric cerebral palsy patients and many other paediatric conditions.

#### Brief history of Robotics:

The word 'Robot' was introduced by Karel Capek a Czech playwright. According to him, robots are 'machines which resemble people but work tirelessly and are not paid any incentives for extra work'. Till now, we have two famous robots.

- **Puma** – Programmable Universal Machine for Assembly (1978)
- **SCARA** – Selective Compliant Articulated Robot Assembly (1979)<sup>1</sup>

#### Robotic Manipulator:

A collection of links inter-connected by flexible joints. At the end of the robot there is a tool or end-effector.

#### Robotics in Paediatric Physiotherapy:

Robotics can provide treatment to paediatric patients in three domains:

1. Aiding the establishment of neuro-muscular pathways
2. Extending range of motion, and
3. Providing patient motivation<sup>2</sup>

#### Roball:

Roball was designed to develop the language, affective, motor, intellectual and social skills for children aged between 12 to 24 months.<sup>3</sup> This can be used for children with short attention span, attention deficits, autism and various physical disabilities.

#### Blocks Assembly Robot:

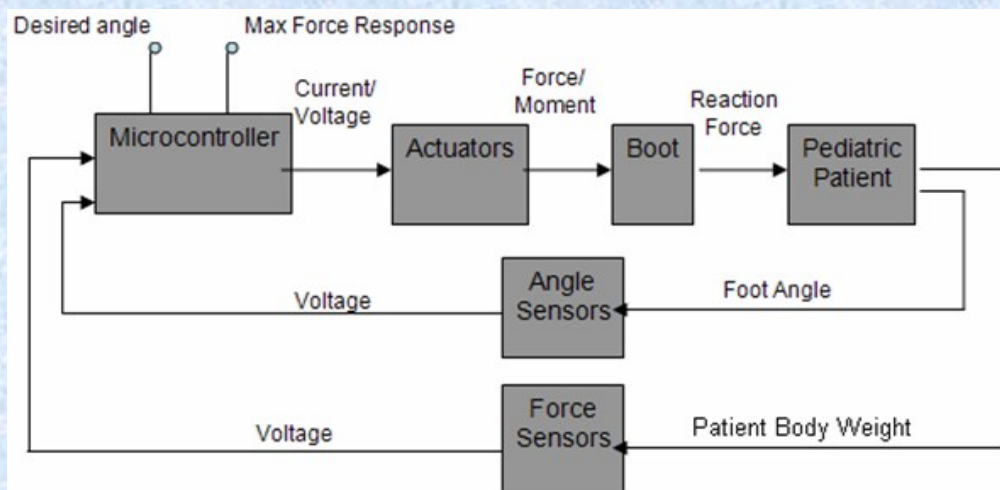
Blocks assembly is a robot that provides the ability for blocks play for children without the physical capability to manipulate blocks with their hands.<sup>3</sup>

#### Active Rehabilitative Boot:

Children with spastic diplegia often walk on their toes. The most common rehabilitative method for spastic diplegia are:

- Manual Stretching
- Ankle foot orthosis.
- Botox, paired with serial casting

The advanced method of rehabilitation is Active Rehabilitation Boot. An active rehabilitative boot is the application of a programmable platform to the stretching of the lower leg to maximize range of movement for children with spastic cerebral palsy. The programmability of a microcontroller-based device provides the boot with the flexibility to address the needs of different patients as well as different therapeutic applications.





## Research Updates

### Motivational Robots:

These robots were designed for children who suffer from cerebral palsy. Everyday activities such as walking, crawling, or stretching are a struggle for these children. To address these issues of CP patients, focus is placed on walking, stretching, and positive reinforcement for motivation. AIBO [Artificial Intelligence roBOT] robotic dog is used as a motivational robot to enhance the attention issues and improve children's motor skills and social interactions during physical therapy sessions.



Robotic dog has helped on the needs of Cerebral Palsy and Autism patients in the age range of 3 to 12. More specifically, the Robotic dog will be used to improve children's motor skills and social interactions during physical therapy sessions.

### Results of Research Conducted on Robotics:

#### Motivation:

Kuren, studied the effect of robotic therapy towards motivation in children and found out a marked increase in motivation after the treatment (Figure 1).<sup>4</sup>

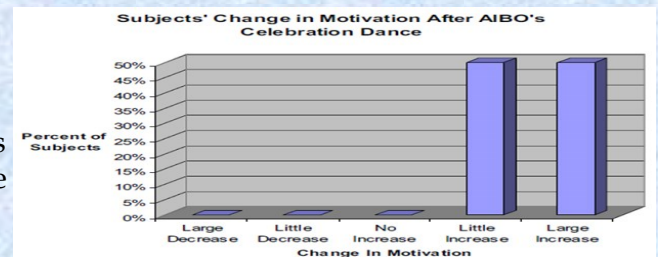


Figure –1: Robotic therapy showed improvement in motivation.

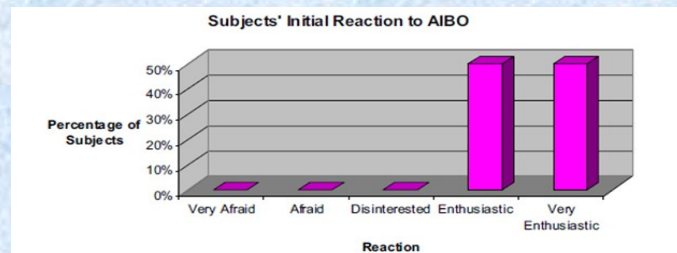


Figure –2: Initial reactions towards robotic therapy.

#### Initial reaction to Robots:

Kuren, studied the initial reactions towards robotic therapy and found that the children were very enthusiastic towards robotic therapy treatment (Figure 2).<sup>4</sup>

### Pathway Ahead:

Although robotics has been successfully applied to rehabilitation and interaction with children, these systems have not been designed to meet the specific needs of children with cerebral palsy. Therefore, different paediatric robotic therapy approaches should be investigated to take advantage of reprogrammable platforms.

### The Future???

Although most robots in use today are designed for specific tasks, the goal is to make universal robots, robots flexible enough to do just about anything a human can do. Still a robot is not a replacement for the therapeutic healing given by human hands. So, robots are not a substitute for humans, but an assistive device to help physiotherapists for making a disability - free world and to enhance movement.

### References:

1. You SH, Jang SH, Kim YH, et al. Virtual reality-induced cortical reorganization and associated locomotor recovery in chronic stroke: an experimenter-blind randomized study. *Stroke*. 2005;36:1166-1171.
2. Bailey-Van Kuren M. Robotic Solutions in Paediatric Rehabilitation. Available in <http://cdn.intechopen.com/pdfs-wm/548.pdf> [Last accessed on 11/04/2016].
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4. Selig JM. *Geometrical Methods in Robotics*. 1st ed., Springer, New York. p. 1-2.
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**Contributed by:** Albin Jerome, Rishi Kesavan, Elanchezian Chinnavan, AIMST University, Malaysia.



### Answers for Prescriptions

**R<sub>x</sub> 1:** Claritin 10 mg, #30 – take 1 tablet daily.

**R<sub>x</sub> 2:** Phenergan with codeine syrup, #240 mL, 1 tsp by mouth 3 times daily.

**Reference:** Pharmacy Times, Published Online: Thursday, February 19, 2015.



### 'Search for novel compounds as Acrolein Scavengers'

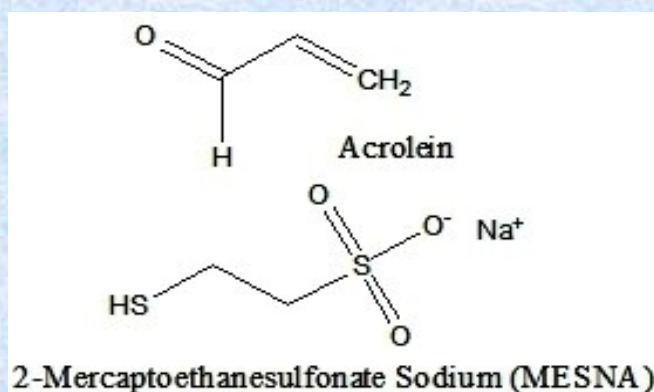
Acrolein (also known as 2-propenal) is an unsaturated aldehyde and toxic respiratory irritant present in tobacco smoke and other environmental pollutants leading to lung cancer.<sup>1</sup> Approximately 18–98µg of acrolein is exposed per cigarette smoke. It's evident from many studies that acrolein and its related aldehydes are significant contributors of fatal death among smokers.

Slash-and-burn technique is widely practiced among the farmers of South Asia to clear their land after vegetation. The smoke haze generated from such slash burning also contains traces of acrolein and triggers asthma.

Acrolein is an urotoxic secondary metabolite of the oxazaphosphorine class of anticancer drugs such as Cyclophosphamide and Ifosfamide, resulting in haemorrhagic cystitis and haematuria. Long term administration of such chemotherapeutic agents could also result in urinary bladder cancer. In addition to its urotoxic effect, it also displays the neurotoxic and nephrotoxic effect.

MESNA, chemically known as sodium salt of 2-mercaptoethane sulfonate is a synthetic sulfhydryl compound. It is used as prophylactic drug against urotoxic side effects of oxazaphosphorines.<sup>2</sup> The uroprotective effect of MESNA is due to the conjugation of its free sulfhydryl group with acrolein in the urine. Hence its use is limited only to combat urotoxic effects of acrolein and does not prevent non-urologic toxicities.

Several thiol-containing compounds such as N-acetylcysteine, glutathione, dimethyl sulphoxide have been preclinically tested for their uroprotective effects but still MESNA is clinically used because of its effectiveness and lack of systemic toxicity.<sup>3</sup> Carbonyl scavengers such as hydralazine and pyridoxamine have also been reported to partially attenuate acrolein toxicity.<sup>4</sup>



Modern scientific approaches such as *in silico* methods could be adopted in identifying aldehyde sequestering agents or MESNA like compounds using bioinformatics tools. The medicinal chemists play a vital role in synthesizing the rationally designed compounds at the lab bench and test their safety and efficacy in collaboration with scientists of life sciences leading to discovery of safer antidotes for acrolein toxicity.

The formulation scientists could aim to produce chewable tablets containing acrolein scavengers, since the formulation need not require water for administration and could be taken by people at any time and in any place. Such formulations could also be beneficial to protect people (e.g. fire fighters, armed forces, road traffic controllers, etc.) from acrolein related health hazards.

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Contributed by: **Dr. Sridevi Chigurupati**, AIMST University, Malaysia.



## Letters to Editor

### 'Self-Care Instructions - As part of initial therapy for Temporomandibular Disorders (TMD)'

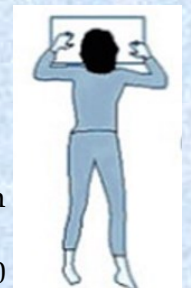
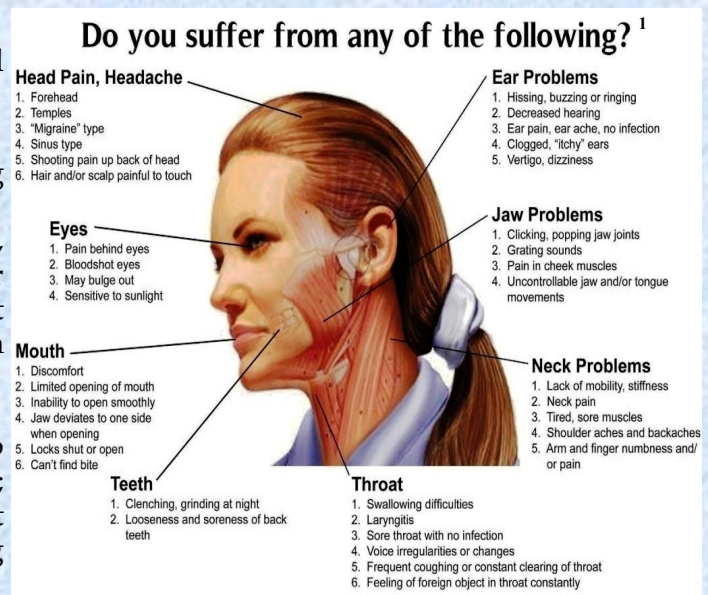
TMD is not just one disorder but a broad range of conditions, often painful, that affect the jaw system. The jaw system is composed of the two TM joints, the muscles that control jaw movements and the teeth. The discomfort from TMD may come from any one or all of these components.<sup>2</sup> It is evident that the occurrence of TMD appear in about 60–70% of the general population and only about one in four people with signs are actually aware of or report any symptoms.<sup>3</sup> When TMD is acute, immediate therapy directed to an obvious etiology is normally sufficient to reduce and/or eliminate symptoms. However when symptoms are prolonged, management becomes far more difficult. Chronic TMD is often not resolved by simple dental procedures. This is likely due to the presence of psycho-social factors that may be associated with characteristic changes in brain controlled physiology.<sup>2</sup>

The following self care instructions are considered to be part of general TMD therapy.

1. Beware the patterns of jaw use.
  - Avoid tooth contact except during chewing and swallowing
  - Check for tooth clenching while driving, studying, working in computer, reading or engaging in athletic activities, when at work or in social situations and when experiencing overwork, fatigue or stress.

**Remedy:** Position jaw to avoid tooth contact.

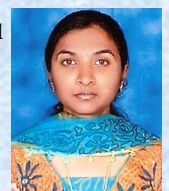
- Place the tip of the tongue behind the top teeth and keep the teeth slightly apart; maintain this position when the jaw is not being used for functions such as speaking and chewing.
2. Modify your diet.
    - Choose soft food and foods that can be chewed without pain, cut food into smaller pieces and avoid foods that require wide opening of mouth or foods that are sticky, chewy and that require excessive mouth movements. Do not chew gum.
  3. Do not open wide or move the jaw around excessively to assess pain or motion.
    - Avoid habitual maneuvering the jaw into positions to assess its comfort or range.
  4. Avoid habitually clicking the jaw if click is present.
  5. Avoid certain postures.
    - Do not lean on or cup the chin when performing desk work or at dining
    - Do not sleep on the stomach or in postures that place stress on the jaw
  6. Avoid elective dental treatment while symptoms of pain and limited opening are present.
  7. During yawning, support the jaw providing mild pressure underneath the chin with the thumb and index finger or with the back of the hand.
  8. Apply moist compresses to the sides of the face and to the temple areas for 10 to 20 min twice daily.<sup>4,5</sup>



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## 'Duchenne Muscular Dystrophy (DMD): A Monogenic Disorder'

Duchenne Muscular Dystrophy (DMD) is a rare X-linked recessive disorder.<sup>1</sup> It is a progressive neuromuscular disease which is also the most common form of muscular dystrophy.<sup>1</sup> DMD claims an incidence rate of 200 per million births.<sup>1</sup> It typically affects males; however, due to skewed X-inactivation or other X-chromosome abnormalities, it also affects females.<sup>2</sup> DMD patients show clumsiness and difficulty in walking by the age of 4-5 years where Pseudohypertrophy (false enlargement) of calf muscle is commonly observed.<sup>3</sup> Patients become wheelchair-bound and dependent, by teen-age. The mean age at death is found to be ~19 years due to fatal complications including cardiomyopathy and respiratory failure.<sup>3</sup> Despite its earliest description reported in 1880 as monogenic disorder, it still remains as incurable disease.<sup>3</sup>

The genetic analysis of DMD patients revealed that mutations in translational reading frame of DMD gene (dystrophin) transcript, result into dystrophin protein deficiency or unstable dystrophin protein which leads to the development of DMD.<sup>2,4</sup> On the contrary, functional or quantitative dystrophin abnormalities may lead to Becker Muscular Dystrophy (BMD).<sup>2,4</sup>

### Dystrophin Gene:

The Xp21 locus bound Dystrophin gene is the largest human gene which comprises >2.5 million base pairs of genomic sequence.<sup>5</sup> It occupies ~0.1% of total human genome and ~1.5% of entire X-chromosome.<sup>5</sup> It was the first gene isolated by positional cloning and is considered as the most complex genetic locus.<sup>6</sup> It possesses total 79 exons which altogether express a messenger RNA (mRNA) of 14 kilobases to yield a cytoskeletal protein, dystrophin, of 427 kDa.<sup>2</sup> The 79<sup>th</sup> exon is considered as the longest exon of DMD gene which comprises 2.7 kilobases and contains full 3' UTR (untranslated region).<sup>6</sup> Interestingly, DMD gene also comprises numerous large introns across its full length which are claimed to be one of the major causes of high mutation rate leading to develop two well known mutation hot spots (intron 7 and 44) of the gene.<sup>6</sup>

Though duplication, translocation and point mutations have been observed; the intragenic deletions are the most commonly reported mutations (65%) in case of dystrophin gene.<sup>4,5</sup>

### Dystrophin Protein:

The rod shaped dystrophin protein comprises four domains.<sup>4</sup> The amino terminal binds with F-actin whereas central coiled-coil rod contains 24 spectrin-like repeats and 4 hinge regions.<sup>4</sup> The cysteine rich domain binds to the  $\beta$ -dystroglycan ( $\beta$ DG) and C-terminal binds to syntrophin and dystrobrevin.<sup>4</sup>

Dystrophin forms a complex (dystrophin-glycoprotein) with integral membrane proteins (sarcoglycan, dystroglycan, syntrophin and dystrobrevin) and plays a vital role as a bridge between basal lamina and inner cytoskeleton of muscle fiber.<sup>4</sup> The principle chore of the complex is to stabilize sarcolemma and protect muscle fibre from long term contraction-induced damages.<sup>4</sup>

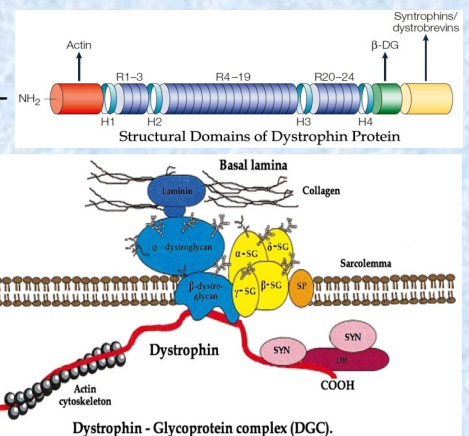
The loss of dystrophin leads to muscle fibre damage and membrane leakage which eventually progress to muscle fibre degeneration. The progressive muscle weakness forces DMD patient to be wheelchair-dependent by the age of 12 and often between the ages of 15-25, patient may die due to cardio-respiratory failure.<sup>3,4</sup>

Even after ~135 years of identifying the basis of DMD, it still remains a challenge for healthcare team. Currently, DMD may be diagnosed by serum Creatine Kinase (CK), electromyography (EMG), western blot analysis, immune-fluorescence studies, multiplex Polymerase Chain Reaction (PCR) assays and southern blot analysis using cDNA (complementary DNA) probes.<sup>3,6</sup> However, limitations of the medical science to provide only symptomatic treatment to DMD patients, necessitate a cure which is yet to be discovered.

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## Letters to Editor

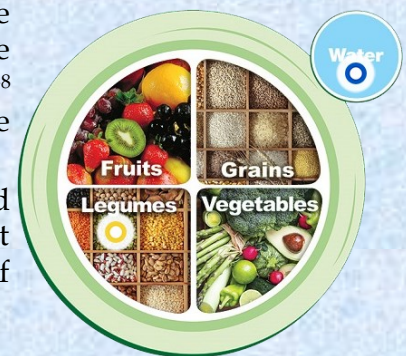
**‘Reversing Type 2 Diabetes: A Nutritional Approach’**

Suffering from diabetes is not new to mankind. Type 2 diabetes is one of the obesity-related illnesses and is on the rise.<sup>1</sup> According to the International Diabetes Federation, western pacific, there were 3.3 million cases of diabetes in Malaysia in 2015.<sup>2</sup> It is likely that if this trend continues, 1 in every 5 Malaysian adult above the age of 30 would be diabetic.<sup>3</sup>

There have been many approaches and treatments available for normalizing blood sugar, fixing insulin resistance, stopping neuropathy pain, preventing blindness, amputations and other diabetes problems but none of them could give a sustainable treatment without side effects. In the recent past significant development have taken place in the treatment modality of type 2 diabetes. Food and nutrition is seldom taught in medical school as a separate course. Despite that, finally medical professionals are now starting to recommend diet and exercise for the prevention and reversal of type 2 diabetes. Type 2 diabetes is a completely reversible condition. Now the researches have proven that diabetic’s medicines can be taken off completely in some cases and can be reduced within 3 weeks of scientific diet plan. Few notable programs are given by Dr. Neal Barnard’s program for reversing diabetes. Dr. Neal Barnard is one of America’s leading advocates for health, nutrition and higher standards in research.<sup>4</sup> Type 2 diabetes recovery program by Dr. Cousens with unique method of spiritual juice fast, 4-day zero point intensive to undo patterns, addictions, and emotional blocks and conscious eating also as another choice of reversing diabetes. However both the reversal programs are on approach of food and nutrition.<sup>5</sup>

This approach of treatment is based on removing the causes of disease like fat interfering with hormones, acidic and inflamed body system and lack of micronutrients. Fat inside muscle cells causes insulin resistance and leptin resistance. To reverse the disease, these resistance should be recovered by proper diet and exercise because there is no effective drug that can correct leptin signalling and insulin resistance. It also helps in normalizing weight and blood pressure.<sup>6</sup> In reversal program strategy based on plant based wholesome diet, one need to increase greens, legumes, beans, vegetables (low GI), fruits (low GI) and grains (low GI). Nutrient dense green smoothie can be power packed chlorophyll option to detoxify and recover the insulin and leptin resistance. Juice fasting is used to cleanse, detox and regenerate. Pesticide levels are higher in animal products compared to plants products. Foods that should be avoided to reverse diabetes are refined sugar, grains, especially gluten containing grains like wheat, conventional cow’s milk, A1 casein produced by conventional cows will harm the body and trigger an immune response similar to gluten and cow milk contains IGF (Insulin like growth factor), hormones, pesticides, pus, antibiotics, urea, etc.<sup>7-8</sup> Exercise is an absolutely essential factor to control the diabetes. It is one of the most successful ways to lower insulin and leptin resistance.

**The Sustainable Power Plate:** Vegetables, fruits, whole grains, and legumes based diet is a scientifically proven approach to help prevent and manage obesity, type 2 diabetes, heart disease, and certain forms of cancer.

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**Contributed by: Dr. Mukesh S. Sikarwar, AIMST University, Malaysia.**



### 'An outline of new drugs approved by the U.S. FDA'

The U.S. Food and Drug Administration (FDA) on January 28, 2016 approved elbasvir and grazoprevir combination (Zepatier) with or without ribavirin to treat adult patients with chronic hepatitis C virus (HCV), genotypes 1 and 4 infections.<sup>1</sup> Zepatier is a fixed-dose combination of two direct-acting antiviral agents such as elbasvir, an NS5A inhibitor, and grazoprevir, an NS3/4A protease inhibitor.<sup>2</sup> HCV disease causes inflammation of the liver, resulting in diminished liver function or liver failure. Of note, most HCV infected patients have no symptoms until an apparent liver damage occurs.<sup>1</sup> Genotype 1 is accountable for 70-80% of HCV infections in the US. Alternatively, genotype 4 is infrequent in the US and Canada; but it is the most dominant strain of HCV in Central sub-Saharan Africa, North Africa as well as Middle East.<sup>2</sup> The most common adverse effects of Zepatier without ribavirin are fatigue, headache and nausea. On the other hand, the most common adverse effects of Zepatier with ribavirin are anaemia and headache.<sup>1</sup>

The U.S. FDA on February 18, 2016 approved brivaracetam (Briviact) as an add-on treatment to other medications for the treatment of partial onset seizures in epileptic patients, 16 years of age and older.<sup>3</sup> Brivaracetam is a high affinity synaptic vesicle protein 2A (SV2A) ligand with around 20-fold higher affinity for SV2A protein as compared to levetiracetam.<sup>4</sup> In clinical trials, brivaracetam, taken along with other medications, was shown to be effective in reducing the frequency of seizures.<sup>3</sup> The adverse effects observed in clinical trials included drowsiness, dizziness, fatigue, nausea and vomiting.<sup>3</sup>

The U.S. FDA on March 18, 2016 approved obiltoxaximab (Anthem) injection to treat inhalational anthrax in combination with appropriate antibacterial drugs.<sup>5</sup> In addition, obiltoxaximab has been approved to prevent inhalational anthrax when alternative therapies are not existing or not suitable.<sup>5</sup> It is a monoclonal antibody which neutralizes toxins produced by B. anthracis.<sup>5</sup> Its safety was evaluated in 320 healthy human volunteers where the most frequently reported adverse effects have been headache, itching/pruritus, upper respiratory tract infections, cough, nasal congestion, hives, swelling and pain at the infusion site among others.<sup>5</sup>

The U.S. FDA on March 23, 2016 approved reslizumab (Cinqair) for the purpose of using with other asthma medicines for the maintenance treatment of severe asthma in patients aged 18 years and above.<sup>6</sup> Of note, reslizumab has been approved for asthmatic patients of having a history of severe asthma attacks in spite of receiving current asthma medications.<sup>6</sup> Blood eosinophils are the type of white blood cells that contribute to the development of asthma. Reslizumab, a humanized interleukin-5 antagonist monoclonal antibody, reduces severe asthma attacks through reduction in the levels of blood eosinophils.<sup>6</sup> Reslizumab could cause some serious adverse effects including allergic/hypersensitivity reactions, which could be life-threatening while the most common adverse effects noted in clinical trials include anaphylaxis, cancer and muscle pain.<sup>6</sup>

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Contributed by: *Dr. Pitchai Balakumar, AIMST University, Malaysia.*



## University Events

AIMST Faculty Members along with the Marketing Team were involved in the Facon EduFair @ KLCC, Kuala Lumpur on 12<sup>th</sup> and 13<sup>th</sup> March, 2016.



## Faculty Events

### Educational Tour to VADS Data Center in Penang

Total of six students from the Programme, Management Information System (MIS) of FBM and the lecturer, Ms. Kalaiselva went for an educational tour to the VADS Data Center in Penang.

VADS Berhad (VADS) is one of Malaysia's leading Managed ICT Service providers. The data center is serving more than 500 medium to large businesses across industries. The Data Centre and Hosting services are supported by Malaysia's largest and most comprehensive network provider, Telekom Malaysia Berhad (TM). With a global network infrastructure that spans across the world, the TM global network also provides data, bandwidth and voice services which enable businesses to get connected more effectively.

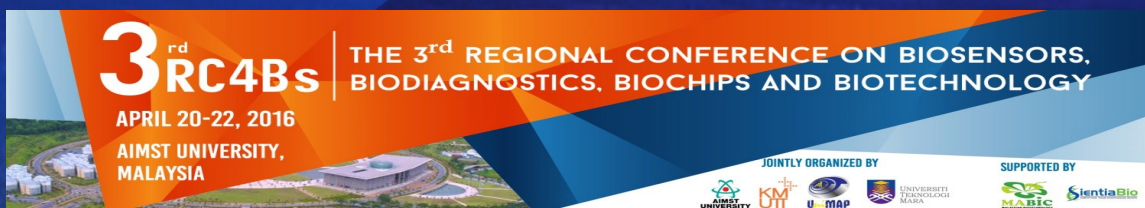
The objective of the visit was to get the hands on training with the data center and network equipment and understand network connectivity. The students were given a summary and brief explanation on the data center management system.

The students were then brought to the data center to have an idea about the data center and the equipment installation. We were then brought to the Network Management System facilities and were given briefing on the system related to the monitoring and management of the network system. The students were also given hands on experience to try on the log system.



## Upcoming Events

Faculty of Applied Sciences is organizing the '3<sup>rd</sup> Regional Conference on Biosensor, Biodiagnostics, Biochips and Biotechnology 2016 (3<sup>rd</sup>RC4Bs-2016)' which will be held from April 20-22, 2016, at the beautiful campus of the AIMST University, Malaysia.



### 'AIMST University Business Carnival' Let's Bustle with Fun



Date: 11<sup>th</sup> & 12<sup>th</sup> May, 2016. Organisers: AIMST Business Club & Student Affairs Division.  
Advisors: Mr. Ravindran, Mr. Thiagu, Ms. Letcimei Desai, Dr. Yeoh Shwu Chyi & Ms. Kalaiselvie

The AIMST Business Carnival was designed by AIMST Business Club in association with AIMST Student Affairs Division to introduce and inculcate dynamic revolution into AIMST Business Club and set a new outlook for AIMST, FBM and work entirely in a professional business-orientated dimension. Further, it acts as an advertisement frontier for our business faculty in particular and AIMST University in general.

The objective of the business carnival is to provide a stage for Faculty of Business and Management to perform learning in entirely new dimension by applying all the knowledge they have obtained and sharpen their skills and ability to do things in many alternative and creative ways. The business carnival is also a platform to gain business experience as a whole including sales, marketing, information technology usage, explore business, finance and event management skills.

- ◆ To conduct marketing activities in a very large scale to attain profit and fill club coffers for further events.
- ◆ To nurture teamwork culture among students of different faculties in preparation for the grand event.
- ◆ To promote in-school courses available to high school students and as a stepping stone for more joint venture programs between inter-universities
- ◆ To provide students a fun, stress releasing entertainment and learning experience to cherish sweet memories of their university life.

#### Expected Outcome:

The AIMST Business Carnival 2016 could be the most effective way to enhance revenue for AIMST Business Club coffers. Definitely promising the most outgoing experience for every AIMSTers apart from assisting our senior AIMST Business Club committee members embrace practical experience, laying the foundation for their future career prospects in the business world and build strong bonding between inter-faculty students.

#### The list of activities planned for the Business Carnival day:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Career Talk</li> <li>• Bikers Exhibition</li> <li>• Friendly Campus Walk</li> <li>• Sales &amp; Lucky Draw</li> <li>• Fictional Exhibitions: Anatomy Lab &amp; Robotic Lab</li> </ul> | <ul style="list-style-type: none"> <li>• Food Fair</li> <li>• Games &amp; Entertainment Booths</li> <li>◆ Treasure hunt</li> <li>◆ Inter-faculty Tele-match</li> <li>◆ Indoor entertainments</li> <li>◆ Outdoor Sports for elderly category</li> </ul> |
|--|--|



**'ALL WORK AND NO PLAY MAKES JACK A DULL BOY'**

Let's have an event filled with celebration and lots of food & entertainment.

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