



# MSBCS Life Line

AN INITIATIVE OF  
MATS SCHOOL OF BIOLOGICAL AND CHEMICAL SCIENCES (MSBCS)

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Mrs. Anshu Wani Award Winner-Quiz Competition



Dr. Anshu Wani Award Winner-Quiz Competition



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Farewell Party of M.Sc. (Semester IV) Chemistry Students

## UPCOMING EVENTS

National Seminar on  
**PROGRESSIVE RESEARCH IN  
BIOLOGICAL & CHEMICAL  
SCIENCES (NSPRBCS)**  
**"BIO-CHEM 2018"**  
**24-25<sup>th</sup>, Aug 2018**

## "TRANSMISSION OF HUMAN INFECTION WITH NIPAH VIRUS"

Nipah virus infection (NiV) is a viral infection caused by the Nipah virus. Symptoms from infection vary from none to fever, cough, headache, shortness of breath, and confusion. This may worsen into a coma over a day or two. Complications can include inflammation of the brain and seizures following recovery. The Nipah virus is a type of RNA virus in the genus Henipavirus. It can both spread between people and from other animals to people. Spread typically requires direct contact with an infected source. The virus normally circulates among specific types of fruit bats.

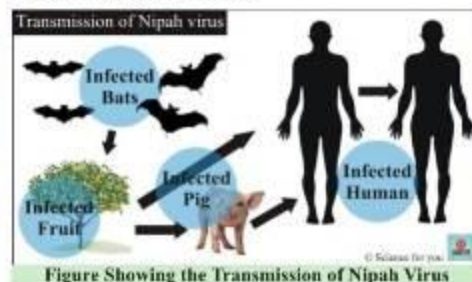


Figure Showing the Transmission of Nipah Virus

## SIGNS AND SYMPTOMS

The symptoms start to appear within 3–14 days after exposure. Initial symptoms are fever, headache, drowsiness followed by disorientation and mental confusion. These symptoms can progress into coma as fast as in 24–48 hours. Encephalitis, inflammation of the brain, is a potentially fatal complication of nipah virus infection. Respiratory illness can also be present during the early part of the illness. (11) Nipah-case patients who had breathing difficulty are more likely than those without respiratory illness to transmit the virus. (12) The disease is suspected in symptomatic individuals in the

context of an epidemic outbreak.

## DIAGNOSIS

Laboratory diagnosis of Nipah virus infection is made using reverse transcriptase polymerase chain reaction (RT-PCR) from throat swabs,



cerebrospinal fluid, urine and blood analysis during acute and convalescent stages of the disease. IgG and IgM and antibody detection can be done after recovery to confirm Nipah virus infection. Immunohistochemistry on tissues collected during autopsy also confirms the disease. Viral RNA can be isolated from the saliva of infected persons.

## PREVENTION AND CURE

As of now, there is no particular vaccine available purely for the treatment of Nipah Virus. The only way to treat this virus is through intensive supportive care. Since drinking raw date palm sap bitten by a bat can also cause NiV, it is safe to say that you should stay from consuming date palm for some time. Hospitals also need to raise awareness about symptoms and transmission to avoid human-to-human infections in such settings. Detection is another issue with NiV and anyone who feels the symptoms should get tested thoroughly from a recognized facility.

Dr. Amit Kumar Dutta  
Faculty, MSBCS



"The meeting of two personalities is like the contact of two chemical substances :  
If there is any reaction, both are transformed."



## DNA FINGERPRINTING: PRINCIPLES AND TECHNIQUES OF DNA FINGERPRINTING



It has been a subject of human interest since primitive times when man used to hunt for his food with the help of animal's foot prints. Science of fingerprinting was first used by Sir William Herschel as a method of identification in 1858. In India the science of fingerprints was discovered by chance during a murder investigation in Jalpaiguri in 1897.

Alec Jeffreys (1984) invented the DNA fingerprinting technique at Leicester University, United Kingdom. Dr. V. K. Kashyap and Dr. Lalji Singh started the DNA fingerprinting technology in India at CCMB (Centre for Cell and Molecular Biology) Hyderabad.

DNA- fingerprinting (also called DNA typing or DNA profiling). It is a technique of determining nucleotide sequences of certain areas of DNA which are unique to each individual. Each person has a unique DNA fingerprint.

Unlike a conventional fingerprint that occurs only on the fingertips and can be altered by surgery, a DNA fingerprint is the same for every cell, tissue and organ of a person. It cannot be changed by any known treatment. The ideal way to distinguish an individual—from other people would be his or her entire genomic DNA sequence.



### Principle of DNA Fingerprinting:

By their differences, about 0.1% or  $3 \times 10^6$  base pairs (out of  $3 \times 10^9$  bp) provide individuality to each human being. Human genome possesses numerous small noncoding but inheritable sequences of bases which are repeated many times. These sequences occur near telomere, centromeres, Y chromosome and heterochromatic area. The area with same sequence of bases repeated several times is called repetitive DNA.

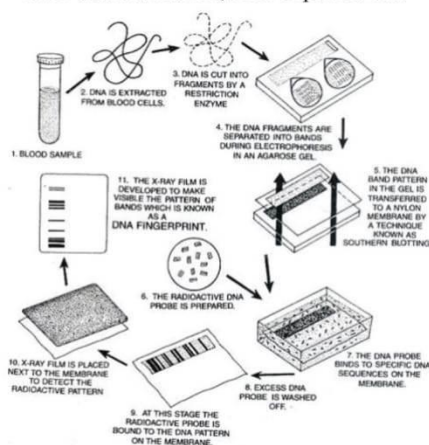
They can be separated as satellite from the bulk DNA during density gradient centrifugation and hence called satellite DNA. In satellite DNA, repetition of bases is in tandem. Depending upon length, base composition and numbers of tandemly repetitive units, satellite DNAs have subcategories like microsatellites and mini-satellites. Satellite DNAs show polymorphism. The term polymorphism is used when a variant at a locus is present with a frequency of more than 0.01 population.

Variations occur due to mutations. While mutations in genes produce alleles with different expressions, mutations in noncoding repetitive DNA have no immediate impact.

These mutations in the noncoding sequences have piled up with time and form the basis of DNA polymorphism (variation at genetic level arises due to mutations). DNA polymorphism is the basis of genetic mapping of human genome as well as DNA fingerprinting.

### Technique for DNA Fingerprinting:

- (i) The DNA is extracted from the nuclei of white blood cells or of spermatozoa or of the hair follicle cells that cling to the roots of hairs that have fallen, or been pulled out.



- (ii) The DNA molecules are first broken with the help of enzyme restriction endonuclease (called chemical knife) that cuts them into fragments. The fragments of DNA also contain the VNTRs.
- (iii) The fragments are separated according to size by gel electrophoresis.
- (iv) Fragments of a particular size having VNTRs are multiplied through PCR technique. They are treated with alkaline chemicals to split them into single stranded DNAs.

- (v) The separated fragments of single stranded DNA are transferred onto a nylon membrane.
- (vi) Radioactive DNA probes having repeated base sequences complementary to possible VNTRs are poured over the nylon membrane. Some of them will bind to the single stranded VNTRs. The method of hybridization of DNA with probes is called Southern Blotting, after the name of the inventor, E.M. Southern (1975). The nylon membrane is washed to remove extra probes.
- (vii) An X-ray film is exposed to the nylon membrane to mark the places where the radioactive DNA probes have bound to the DNA fragments. These places are marked as dark bands when X-ray film is developed. This is known as autoradiography.
- (viii) The dark bands on X-ray film represent the DNA fingerprints (= DNA profiles).

### Applications of DNA Fingerprinting:

#### (i) Individuality:

Like skin finger printing (dermatoglyphics), DNA finger printing can help to distinguish one human being from another with exception of monozygotic twins,

#### (ii) Paternity/Maternity Disputes:

DNA finger printing can identify the real genetic mother, father and the offspring,

#### (iii) Human Lineage:

DNA from various probables is being studied to find out human lineage,

#### (iv) Hereditary Diseases:

The technique is being used to identify genes connected with hereditary diseases,

#### (v) Forensics:

DNA finger printing is very useful in the detection of crime and legal pursuits. DNA fingerprinting has proved that Dhanu, the human bomb, was the real murderer of Shri Rajiv Gandhi, the former Prime Minister of India,

#### (vi) Sociology:

It can identify racial groups, their origin, historical migration and invasions. Genography is the study of migratory history of human species.

Ms. VARGHOBHI MUKHERJEE  
M.Sc. (SEM- II) Biotech



## FAST FOOD- AN EASY OPTION FOR A BUSY FAMILY



Fast food is a mass-produced food that is prepared and served very quickly. The food is typically less nutritionally valuable compared to other foods and dishes. While any meal with low preparation

time can be considered fast food, typically the term refers to food sold in a restaurant or store with preheated or precooked ingredients, and served to the customer in a packaged form for take-out/ take-away.

Fast food restaurants are traditionally



distinguished by their ability to serve food via a drive-through. Outlets may be stands or kiosks, which may provide no shelter or seating, or fast food restaurants (also known as quick service restaurants). Franchise operations that are part of restaurant chains have standardized foodstuffs shipped to each



restaurant from central locations.

Fast food began with the first fish and chip shops in Britain in the 1860s. Drive-through restaurants were first popularized in the 1950s in the United States. The term "fast food" was recognized in a dictionary by Merriam-Webster in 1951. According to the National Institutes of Health (NIH), fast foods are quick alternatives to home-cooked meals. They are also high in saturated fat, sugar, salt and calories. Eating too much fast food has been linked to, among other things, colorectal cancer, obesity and high cholesterol.

The traditional family dinner is increasingly being replaced by the consumption of takeaway, or eating "on the run". As a result, the time invested on food preparation is getting lower and lower, with an average couple in the United States spending 47 minutes and 19 seconds per day on food preparation in 2013.

The concept of ready-cooked food for sale is closely connected with urban developments. Homes in emerging cities often lacked adequate space or proper food preparation accoutrements. Additionally, procuring cooking fuel could cost as much as purchased produce. Frying foods in vats of searing oil proved as dangerous as it was expensive, and homeowners feared that a rogue cooking fire "might easily conflagrate an entire neighbourhood".

Thus, urbanites were encouraged to purchase pre-prepared meats or starches, such as bread or noodles, whenever possible. In Ancient Rome, cities had street stands - a large counter with a receptacle in the middle from which food or drink would have been served. It was during post-WWII American economic boom that Americans began to spend more and buy more as the economy boomed and a culture of consumerism bloomed. As a result of this new



desire to have it all, coupled with the strides made by women while the men were away, both members of the household began to work outside the home. Eating out, which had previously been considered a luxury, became a common occurrence, and then a necessity. Workers, and working families, needed quick



service and inexpensive food for both lunch and dinner. This need is what drove the phenomenal success of the early fast food giants, which catered to the family on the go (Franklin A. Jacobs). Fast food became an easy option for a busy family, as is the case for many families today.

Ms. NEHA BANO  
M.Sc. (SEM- II) Microbio

## "FAKE DIAMONDS HELPED TO FIND THE HOTTEST TEMPERATURE EVER RECORDED ON EARTH"



About 36 million years ago, an asteroid slammed into Canada and created a fake diamond, which over the millennia degraded and transformed into an shiny black rock. Now geologist

have used that gem to conform a new temperature recorded for the earth surface that is (237°C) degree Celsius.

It is not the view of the geologist, but it is accurate. We know that (diamonds) subtitles only forms above 2370 degree celcius. So we know that upon impact at least a smaller chunk

of the surface reached that point, that is 4298F, that's half of the temperature of sun. And we only know this because, that

burst of heat capacity and created a fake diamond, otherwise known as cubic zirconia. Cubic zirconia hardly occurs, because it hardly occur farhenite in its natural part and it is unstable. It decomposes into other very easily.



related to the crystalline form. Thus the fake diamond is not carbon based but it is found to

be the fake diamond helped to find the hottest temperature on earth.



Mr. AVINANDAN PANDA  
M.Sc. (SEM- IV) Chemistry



## EDUCATION SYSTEM

It's absolutely true that the future and overall development of any country depends upon the fact that how educated it's citizens are. Though gaining a professional degree is not possible but what actually matters is the basic education. that is, one should know how to read and how to write India has shown significant improvement in education since 1947 until today . However, we believe that there is always some room for improvement in every field as my point of view there are some reforms that should be taken in consideration.



### ● Skill Based Learning

- Colleges or school should be allowed to provide skill based training and more perfect area of interest too.

### ● Focus on Rural Education

### ● The future of India lies there only

### ● Free Basic Computer Skills Classes

● Nowadays this I must say is for oxygen to every individual and education is nearly incomplete without having basic training.

TEACHERS TRAINING - BY up gradation towards New things

...SUBSIDIES AND GRANTS FOR PROFESSIONAL COURSES

Educate Parents

- so they do not force their children for career which do not actually interest them.

HEALTH EDUCATION

SMART CLASSES

E-LIBRARIES MAKING SPORTS COMPULSORY

Remember, the education system of ancient India has always market its impression all over the world. So why not achieve another milestone is education- "with positive attitude"-.

**Mr. PRASHANT SINHA**  
B.Sc. (SEM- IV) Microbio

**Mr. SIDDHANT NANDI**  
B.Sc. (SEM- IV) Biotech

## "GIANT ANCIENT FROGS MIGHT HAVE SNACKED ON BABY DINOSAURS"

Beelzeuffo, named as the ancient, dietly often called the lord of files was a devilish frog indeed. The species which lives in the island of



(Madagascar) around 70 million year ago, was likely the biggest frog that ever hopped about the earth and according to the new research of modern cousins (Beelzebufo- ampinga) may have had jaws powerful enough to obliterate small

dinosaurs.

Most of in North America think of frogs like floppy, relatively fragile like, but who snack on flies and other critters but a frog that chews on more formidable prey is not as wild as it sounds.

Odern South American frog, have more physiological similarities with Beezeblurb, because their mouth are so large and often called (Paceman frogs). The researcher found that even tiny horned frogs, with head less than 5cm across, have bite forces of 30 Newton or around 6.6 pound, in case u r wondering, can inflict a bite force of 1300 Newton with our strongest teeth. When all the mechanical aspects are equal, sizes have more power, that's why it does this type of biting to the dinosaurs.

**Ms. SANTOSHI PATEL**  
M.Sc. (SEM- IV) Chemistry

## "AVOID THESE FOODS TO AVOID CANCER"

Have you ever heard of carcinogen? Have you ever thought that eating potato chips could lead to cancer? Yes you read right carcinogen is a substance that promote carcinogenesis, the process where the normal cell turns into cancer cells. We all like fast food, but this is the fastest way to get cancer. If you do not really want to be a cancer patient, you should stay away from this nonsense like hydrogenated oils, French fries, microwave popcorn, refined sugar, red meat, processed meat etc.

Cancer is recognized worldwide to be a major health problem affecting millions of people each year. I have written about cancer causing food which you are already eating, then you are in danger of



cancer and you have to stop it. Eating nutritional diet that is helpful in fighting cancer can help you. Cancer refers to the uncontrolled cell division that lead to tumor or abnormal cell growth. So how to prevent cancer from food? We need cancer fighting foods with antioxidants and natural anti-inflammatory phytonutrients. Food that help to prevent cancer are leafy vegetables, berries, carrot juice, beetroot juice, wheatgrass juice etc.

To prevent cancer, you need all the essential nutrients. All these juices help you reduce the risk of your cancer, give you nutrients and change your lifestyle.

**Mr. YOGESHWAR PATEL**  
M.Sc. (SEM-IV) Chemistry

### DISCLAIMER

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We welcome Articles/ Short stories/ Poems/ NEWS Stories & innovative writings related to Biological & Chemical Sciences from the Students & Staff of MSBCS. The work can be mailed to us on email id- [dr.akdutta@matsuniversity.ac.in](mailto:dr.akdutta@matsuniversity.ac.in)

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