

# NEWSLETTER

(2019-2020)

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## NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF BIOTECHNOLOGY

### Message from HOD Desk



The Department of Biotechnology was established in 2012, is one of the most dynamic departments of Noida Institute of Engineering & Technology. I am really elated to tell that the department stands on the strength of experienced and well qualified faculty who are very dedicated to teaching and involved in up-gradation of knowledge. Their research experience will help to cultivate the future of our students. With great demand in industry and great placement opportunities, the department stands tall and proud. Our students are not only academically sound and disciplined but they also organize various events through various clubs and societies to showcase their talents under non – technical, technical, and cultural forums.

#### VISION

To become a prime influencer in the field of Biotechnology and provide a vibrant learning environment to the students that will have a transformative impact on the society in terms of academics, research, and entrepreneurship.

#### MISSION

**M1:** - To create educational experience targeted on a deep understanding of interdisciplinary sciences & engineering with the focus on development of industry aligned skills.

**M2:** - To expertise in research, innovation and entrepreneurship supporting the overall growth of the biotechnology academia and industry.

**M3:** - To inculcate leadership qualities in students to handle competitive edge, social & ethical challenges for a better world.

#### PEO's

**PEO 1:** Students will acquire knowledge and skills in the frontier areas of biotechnology and will be able to solve societal problems individually and in teams.

**PEO 2:** Students will be able to think creatively and ethically about the use of biotechnology to address local and global problems.

**PEO 3:** Students will be able to implement the engineering principles to biological systems for development of industrial applications, as well as entrepreneurship skills to start biotech industry.

#### PSO's

**PSO1:** To apply knowledge of basic sciences and biotechnological techniques to modify living organisms.

**PSO2:** To design, optimize, analyse & scale up bioprocesses to develop useful products with societal consideration.

**PSO3:** To generate, analyse & interpret biological data using Insilco & other relevant approaches.

# DEPARTMENT HIGHLIGHTS

- Department of Biotechnology got the accredited from National Board of Accreditation (NBA) in the month of July 2k19 for 3 years.
- Kavita Chauhan of third year of batch (2017-2021) came first in a National Project Competition held at Sharda University for her innovation idea of "Digitalization of Sugarcane Mills. It was basically based on the idea to digitalize sugarcane market through online application platform and thus provide direct connection between farmers and government/private institution and hence transparency in its distribution.



- Swarnima, Tahseen Fatima, Anushka Yadav and Ilma Sarfaraz of first year passed Cambridge Business English Certification (BEC).
- Department organised a non-technical event for its student on 9th August 2019 which included "Card Making", "Fireless Cooking" and "Rakhi Making" competition.



- Department arranged industrial visit for its 2nd year students (2018-2022 batch) to Coca-Cola happiness factory moon beverages limited, Greater Noida on August 26, 2019, under the supervision of Ms. Meenu Agarwal, Ms. Shweta Sharma, Mr. Deepak Gola, Ms. Ayushi Verma, assistant professors of the department. The industry has acquired expertise in manufacturing and supplying of soft drinks like Coca-Cola, Thumbs up, Limca etc. Students not only learned about Coca-Cola history, it's brand value and the process of manufacturing, but also Coca-Cola happiness factory secret ingredient was their way of imparting knowledge with fun.



- Department of Biotechnology organized a Guest Lecture by Dr Pawan K. Dhar, Professor, Dean, School of Biotechnology, JNU, New Delhi on the topic entitled as "Synthesis of novel proteins" on 20th September 2019. Students learned about artificial expression of pseudo genes into novel and functional proteins. This approach can be further used to make novel enzymes, transcription factors, receptor proteins which could be very useful in finding better treatment approaches.



- Department of biotechnology organized a technical event on the occasion of World Students' Day which is marked as the birthday of Dr. A. P. J. Abdul Kalam. It was held on 19<sup>th</sup> October 2019 by DNA society of the department which includes Debate competition, quiz and extempore. The event was coordinated by Dr. Ayushi Verma and Dr. Rashmi Mishra along with the student coordinators namely Arjun Pathak and Ravneet Kaur.



- Students from the department of biotechnology participated in the 3<sup>rd</sup> National Conference on Biotechnology and Bioengineering Innovation and Advancement for Sustainable Future at Sharda University in November 2019. The conference was two days long which included various guest lectures on various topics by experts followed by poster presentation and oral presentations. Ambuj Kumar, Mohd. Arif and Anshika Srivastava of N.I.E.T. (Department of Biotechnology) secured third position in poster presentation on the topic “computational analysis of Cancer”. Overall, the students got well exposure of the research work and ideas in the field of biotechnology.



- On 14<sup>th</sup> November 2019, Dr. Fahad Khan, and Dr. Rashmi Mishra of Department of Biotechnology along with Dr. D P Bhatt and student coordinators of kathoutliyan, theatre club of NIET, Greater Noida coordinated a street play on “Evolution of science and cleanliness drive”. The event

was organized by by Noida Institute of Engineering & Technology, Greater Noida in collaboration with Swadeshi Science Movement, Delhi. The performance was held at two places, DM office premises and Pocket 3 market, Greater Noida. In the street play, students covered the ancient science in daily life just like the work of the great Indian mathematician Aryabhata achievements. Along with this, street play also covered the life events of Dr. APJ Abdul Kalam to establish a connect between science and native audience i.e., common people of the city. By Swachhata Abhiyaan, students showed how political leaders work for the cause and how the civilised class of the society acts against the cleanliness drive which then be concluded with a monologue. The event was highly appreciated by DM and all dignitaries.



## Achievements

- Vaibhav Litoria of biotechnology third received a cash prize for being the Branch Topper of Second Year.
- N.I.E.T acknowledges Dr. Rashmi Mishra, Dr. Pratibha Pandey, and Dr. Fahad Khan of department of biotechnology by providing an incentive for publishing maximum number of research paper in SCI and Scopus Index Journal.





# STUDENT ARTICLES

## **Beef consumption and import in Georgia: an overview**

Georgia beef industry has been increasing gradually over the years as beef cattle is being raised in almost all counties of the state and as the result, state economy has large impact on it. The major primary livestock in Georgia are beef product which have great significant on agricultural branch and been considered as the priority branch in the state as well. Also, the wide increase in inventory of beef products in Georgia has ranked the state among the top enterprises during past years. But despite such a remarkable framework, lack of indignation has unanswered about the consumption and import of beef products in the state. However, there are various surveys, agricultural census reports available, but some questions are still unresolved. Top beef cow sale percentage were found in the state which were Bartow, Walker, Morgan Tattall, and Burke; percentages of desired beef products in Georgia were-grass-fed beef, environmentally friendly beef, organic and conventional beef, these results were taken from consumer responses of retail products. In import segment, we have focused on which are the counties that import beef and beef products like European Union (peculiarly from Germany), India etc. Recently niche beef markets, such as organic and grass-fed beef, have been emerging due to producers trying to capture a greater percent of the retail dollars. The purpose of this study is to analyze the willingness to pay for environmentally friendly beef. A state-wide survey of 988 people was performed to obtain data on the demographics and buying habits of beef consumers. A censored profit model was used to analyze the survey data to determine the mean willingness to pay for environmentally friendly beef product. Interestingly people with higher education were concerned about the effect beef production had on the environment. And those that did realize the previous effect, and already purchased niche beef products were more likely to pay a premium for environmentally friendly beef. Regulatory policies pertaining to beef imports are analyzed based on an econometric model of the livestock sector.

By: Shruti (3<sup>rd</sup> year)

## **Recombinant human insulin**

Recombinant human insulin was one of the first products of biotechnology. It was developed in response to the need for a consistent and sufficient worldwide supply. Recombinant human insulin replaced the animal insulins and semisynthetic insulins obtained by modification of animal insulins. Bioequivalence studies were required for regulatory approval. Three reference products were independently established during these procedures: Humulin® (Eli Lilly and Co), Novolin® (NovoNordisk) and Insuman® (Sanofi). Numerous brand names have been used during the commercial development of recombinant human insulin formulations. In this review, three current brand names are used for consistent identification. Human insulin for Humulin and Insuman are produced by fermentation in bacteria (*Escherichia coli*) and for Novolin in yeast (*Saccharomyces cerevisiae*). Production of recombinant human insulin starts with the insertion of a gene encoding the precursor protein pre-pro-insulin into a DNA vector that is transferred into a host. During the product synthesis, the culture and fermentation conditions are controlled tightly to optimise yields. A fusion protein obtained by fermentation is converted to bioactive human insulin by post-translational processing. The final step in the manufacturing process is the multi-step purification of human insulin until the necessary high extent of purification is obtained. This is followed by crystallisation of the final product and pharmaceutical manufacture of the different insulin products.

By: Ansh Rana (3<sup>rd</sup> Year)

## **Bt cotton**

Bt cotton is a genetically modified pest resistant plant cotton variety, which produces an insecticide to combat bollworm. Bt cotton was first approved for field trials in the United States in 1993, and first approved for commercial use in the United States in 1995. Bt cotton was approved by the Chinese government in 1997.

In 2002, a joint venture between Monsanto and Mahyco introduced Bt cotton to India. In 2011, India grew the largest GM cotton crop at 10.6 million hectares. The U.S. GM cotton crop was 4.0 million hectares, the second largest area in the world, followed by China with 3.9 million hectares and Pakistan with

By 2014, 96% of cotton grown in the United States was genetically modified and 95% of cotton grown in India was GM. India is the largest producer of cotton, and GM cotton, as of 2014.

Strains of the bacterium *Bacillus thuringiensis* produce over 200 different Bt toxins, each harmful to different insects. Most notably, Bt toxins are insecticidal to the larvae of moths and butterflies, beetles, cotton bollworms and flies but are harmless to other forms of life. The gene coding for Bt toxin has been inserted into cotton as a transgene, causing it to produce this natural insecticide in its tissues. In many regions, the main pests in commercial cotton are lepidopteran larvae, which are killed by the Bt protein in the genetically modified cotton they eat. This eliminates the need to use large amounts of broad-spectrum insecticides to kill lepidopteran pests (some of which have developed pyrethroid resistance). This spares natural insect predators in the farm ecology and further contributes to non-insecticide pest management.

By: Ambuj (3<sup>rd</sup> Year)

### **FOOD TECHNOLOGY**

Food technology is a branch of food science that deals with the production processes that make foods. The application of food science helps in manufacturing safe, wholesome, and nutritious food products. The study of food technology is to develop new methods and systems for keeping food products safe and resistant from contaminants such as bacteria and other micro-organisms. Food processing helps in preservation, enhances the flavour, and reduces the toxins in the food product which results in better distributional efficiency and easy marketing of the food product. The modern food processing techniques is the key to flourishing supermarkets we have today. Extra nutrients can be added while processing the food and processed food is less susceptible to spoilage. Some of the techniques used are spray drying, juice concentrates, freeze drying and the introduction of artificial sweeteners, colorants, and preservatives. Of late, many products such as dried instant soups, reconstituted fruits and juices, and self-cooking meals were developed for the convenience of working people. The food processing industries are involved in processes such as primary and secondary processing, preservation, quality management, packaging and labelling of a variety of products such as dairy

products, fish products, fruit & vegetable products, meat & poultry products, confectionery products, and food grains. Food science is the basic science and applied science of food; its scope starts at overlap with agricultural science and nutrition and leads through the scientific aspects of food safety and food processing, informing the development of food technology.

By: Divyanshi Singhal (2<sup>nd</sup> year)

### **Drug Discovery**

In medicine, biotechnology and pharmacology, drug discovery is the process by which new candidate medications are discovered. Historically, drugs were discovered by identifying the active ingredient from traditional remedies or by serendipitous discovery, as with penicillin. More recently, chemical libraries of synthetic small molecules, natural products or extracts were screened in intact cells or whole organisms to identify substances that had a desirable therapeutic effect in a process known as classical pharmacology. After sequencing of the human genome allowed rapid cloning and synthesis of large quantities of purified proteins, it has become common practice to use high throughput screening of large compounds libraries against isolated biological targets which are hypothesized to be disease-modifying in a process known as reverse pharmacology. Hits from these screens are then tested in cells and then in animals for efficacy. Modern drug discovery involves the identification of screening hits, medicinal chemistry, efficacy/potency, metabolic stability (to increase the half-life), and oral bioavailability.

Modern drug discovery involves the identification of screening hits, medicinal chemistry and optimization of those hits to increase the affinity, selectivity (to reduce the potential of side effects), efficacy/potency, metabolic stability (to increase the half-life), and oral bioavailability. Once a compound that fulfills all these requirements has been identified, the process of drug development can continue. If successful, clinical trials are developed. Discovering drugs that may be a commercial success, or a public health success, involves a complex interaction between investors, industry, academia, patent laws, regulatory exclusivity, marketing and the need to balance secrecy with communication.

By: Vaibhav (3<sup>rd</sup> Year)

# BEYOND CLASSROOM

The students of biotech department showcase their talent beyond classroom through their paintings.



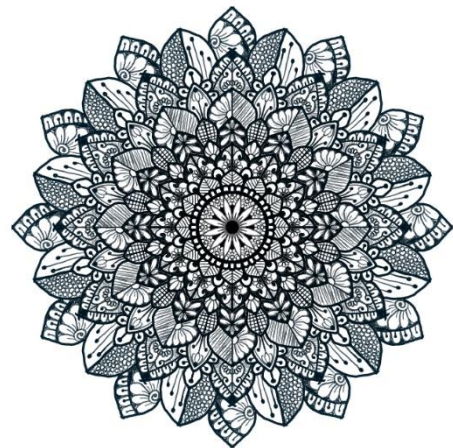
**Shivansh (3<sup>rd</sup> Year)**



**Md. Arif (3<sup>rd</sup> year)**



**Archana (2<sup>nd</sup> Year)**



**(Megha Misra 2<sup>nd</sup> Year)**

## Editorial Board Members

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