INDUSTRY VISIT

BIOCON SDN. BHD

INTEGRATING BIOTECHNOLOGY AND COMPUTER SYSTEMS

INTRODUCTION

23 December 2025 - Biocon Sdn. Bhd. Gelang Patah, Johor.

Computer Network and Security, and Bioinfomatics students from UTM who are taking the Technology & Information System subject were given the golden opportunity to visit the Biocon Sdn. Bhd. The purpose of this visit was to expose to the students how pharmaceutical industry uses technology and computerised system in biotechnology manufacturing.

OBJECTIVES OF THE INDUSTRY VISIT

The key objectives of this visit for students is to gain close-up exposure to biotechnology and pharmaceutical operations, gain deeper understanding on how the implementation of computer-assisted manufacturing works, observe a product's manufacturing process from start to end, and justify how computing, networking and biology work together in a pharmaceutical company.

CodeBlue. (2025, June 30). India-based Biocon Biologics' integrated insulin manufacturing and R&D facility in Johor, Malaysia [Photograph].Biocon Biologics

COMPANY BACKGROUND

Biocon Sdn. Bhd. , a leading biotechnology company specialized in manufacturing insulin hormone, is Asia's largest integrated insulin manufacturing and R&D center in Malaysia. The company's mission is to find new and affordable ways to treat diabetes, cancer and autoimmune diseases.

Biocon Sdn. Bhd. is important to pharmaceutical industry because they use innovative science to make high quality version of expansive drugs, like insulin, into a more affordable drug for accessibility. They have helped millions of patients across the globe getting the treatment they needed. The large factory allows them to produce drugs in large quantity reaching hundred thousands per shift, ensuring constant supply to its customers. Not only that, they work on new drug discoveries and help train the next generation of scientists. Ultimately, Biocon's achievements have proved that a pharmaceutical company's core mission can prioritize patients access without compromising the quality of drugs.

Biocon Sdn. Bhd. has significantly improved regional healthcare, as they collaborated with Malaysia's Ministry of Health to directly reduce import dependency. Nearly 300,000 people had benefited from more than 87 million insulin cartridges producing locally since 2016. This has measurable impact, after Biocon entered the market, costs of human insulin has dropped by more than 40% and insulinization rates improved by 30% (Biocon, n.d.).

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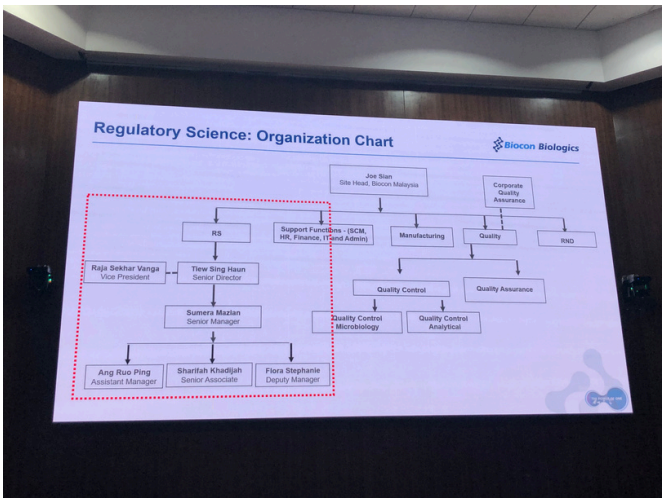
KEY OBSERVATIONS AND TECHNICAL INSIGHTS

BIOTECHNOLOGY OPERATIONS OBSERVED

We learned about how insulin is made during our tours, focusing on the fermentation of Pichia pastoris yeast. This biological activity is then followed by a strict purification and crystallization which yield the active substance in powder form. Subsequent steps are melting, high-precision filling into cartridges and assembling of insulin pens. The factory enforces also enforces very strict rules). There are strict confidentiality and Protecting IP is critical, it guarantees the safety of data and products physical safeguard through production.

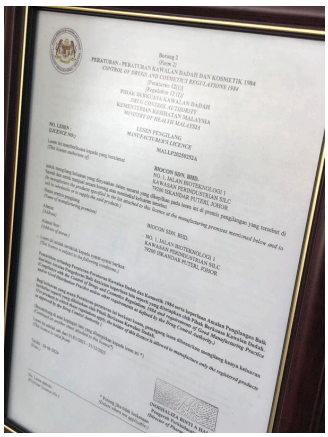
LAB TO MARKET TRANSLATION

Bringing lab research to the marketplace as a commercial product (like insulin) is bound to be time-consuming and require lots of testing and regulation. Not a single stage of the change is spared documentation according to pharmaceutical guidelines. This stage requires significant data traceability so that the end product is safe, effective and ready for worldwide distribution.



ROLES OF COMPUTING AND INFORMATION SYSTEMS

The factory utilises Computer-Assisted Manufacturing (CAM) for mass production control. Resource planning and machine surveillance solutions that ensure machinery is always operating at its best. Linked databases and sensors track each batch ensuring that automation increases efficiency and lowers the possibility of contamination to ensure purity and cleanliness of the products.



INTEGRATION OF COMPUTING, NETWORKING AND BIOLOGY

Computer systems assist the biological processes by monitoring as fermentation evolves. The connectivity between laboratory equipment and software systems facilitates real-time data transfer across the network, which is needs to be integrated into large scale pharmaceutical production. These data are later sent to a database for research and backup purposes.

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LEARNING OUTCOMES, REFLECTION AND CONCLUSION

LEARNING OUTCOMES

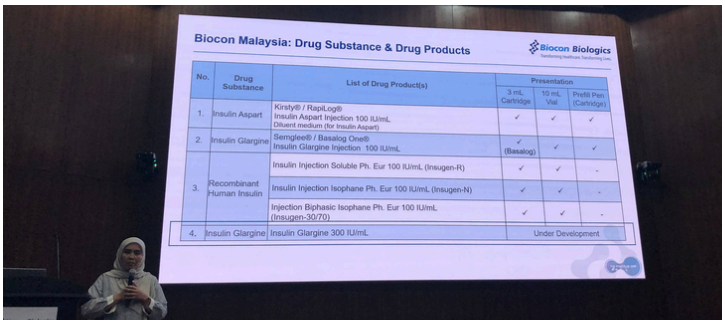
From this industrial visit, we have gained lots of valuable insights into how the a biotechnology industry operates in the real world environment. We obtained deeper understanding on how the company integrates advanced technologies and automated processes to ensure their products are of high quality, safe and accessible to everyone.

Biocon Biologics. (n.d.). Insulin manufacturing facility in Malaysia [Photograph]. Biocon Biologics.

Other than that, we discovered all employees uphold strict work protocols to ensure factory cleanliness and ensure their products remain uncontaminated in all processes from start to end. This is important to manufacture high-quality products to gain the trust of prospective stakeholders.

CONCLUSION

Overall, this industry visit provided a very meaningful learning experience that were totally different with classroom learning because we can experience real life work environment. It helped us tp understand the reality of the real work environment and the industry's need for knowledgeable and disciplined graduates. This kind of exposure is really important for us as students can have an early impression before stepping into the real world after graduating.



The representatives of the company helped us to apply theoretical learning with real-world applications in the industry. They were helpful to us explaining how "regulatory science" plays a crucial role in maintaining each departments' communication and ensuring all products are in compliance with local government's policies.

SKILLS & KNOWLEDGE DEVELOPMENT

This industrial visit has helped us develop soft skills such as effective communication, teamwork, professionalism and problem-solving skills needed in an industry. The way how these professionals disseminate valuable information to us students shows the importance of active communication in a work environment. Their usage of computing technologies to enhance their manufacturing processes has galvanised us to appreciate the use of computing in daily lives.

APPRECIATION

We would like to express our gratitude and appreciation to Biocon for accepting our request to visit their industry.They were really passionate about sharing with us the knowledge and skills needed to enter the workforce in the future. Their efforts and patience are greatly appreciated during the tour.

Company logo.

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