

# Industry Visit to Biocon Sdn Bhd : Integrating Biotechnology and Computing Systems

THURSDAY

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## Introduction

On 23rd December 2025, students from Computer Science (Bioinformatics) and Computer Science (Computer Network & Security) visited Biocon Sdn. Bhd. in Gelang Patah, Johor Bahru. The purposed of this visit is to expose to the students on how computing systems connected with modern biotechnology.



## Company Backgrounds

Biocon Sdn Bhd Johor, a subsidiary of Biocon Biologics India, was established in 2011 as the largest foreign investment in Malaysia's biotechnology sector, exceeding USD 600 million.

Located in Iskandar Puteri, the facility is a fully integrated insulin manufacturing hub, producing everything from drug substance to final insulin pen packaging.

Recognized by the Malaysia Book of Records as the first and largest integrated insulin manufacturer in Malaysia, it serves as a global "Center of Excellence".

With the partnership Ministry of Health, Biocon has supplied over 100 million insulin cartridges locally, reducing import dependence and strengthening healthcare resilience.

## Objectives of the Industry Visit

- Operation Exposure: Gaining a first-hand look at large-scale insulin production, from the initial fermentation to the final packaging.
- Understanding the "Lab-to-Market" Flow: Observing how a biological "drug substance" is transformed into a consumer-ready "drug product."
- Quality & Standards Awareness: Learning about their Grade-level environments (Grade A to D) and SOPs required in pharmaceutical manufacturing.
- Industry Economics: Understanding the high stakes of biotech, including batch costs and time-to-market (TAT) pressures.



# KEY OBSERVATIONS & TECHNICAL INSIGHTS

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Photo from <https://www.biocon.com/more/biocon-malaysia/>

The visit provided a close-up view of the insulin manufacturing machine. The operations prioritize sterility, precision and strict adherence to protocol since the students also need to wear their cleanroom suits when they want to enter manufacturing building. Students also get to know the process in the insulin manufacturing process such as fermentation, crystallization, formulation and filling. Students also observed that the operation is within controlled cleanroom environment. The consistent use of Grade A cleanroom standards and full cleanroom suits by all personnel underscored the industry's fundamental commitment to safety and product quality.

The manufacturing process also is deeply integrated with advanced computing systems :

- **Computer-Assisted Manufacturing** : A central computer system controls the big tanks where insulin is made. It automatically manages the temperature, pH and oxygen levels to create perfect conditions
- **Resources Planning Systems** : An Enterprise Resource Planning (ERP) software such as SAP manages orders, materials and production schedules. It connects to a Laboratory Information Management System (LIMS). It tracks all quality tests and results automatically
- **Machine Monitoring System** : Sensors on machine collect data. Computers can analyze the data to predict when a machine needs maintenance so Biocon can prevent machine breakdown and stop production of insulin

Resources : <https://www.appsruntheworld.com/customers-database/customers/view/biocon-india>

## Lab-to-Market Translation

This industrial visit helped students understand how laboratory research is transformed into commercial pharmaceutical products. Insulin production begins at the laboratory stage and goes through several controlled manufacturing processes before becoming a final product ready for public use. Throughout this process, validation and testing are carried out to ensure the product is safe, effective, and of high quality. Regulatory requirements are strictly followed, and proper documentation is used to track and monitor each production batch. This ensures consistency, reliability, and quality in large-scale pharmaceutical manufacturing.

## Integration of Computing, Networks, and Biology

The visit also showed how computing systems, networks, and biological processes work together in the biotechnology industry. Computing systems are used to control important conditions such as temperature and pH during production. Laboratory machines are connected to software systems that automatically collect and analyze data. Networking allows data to be shared between machines and management systems, helping to improve efficiency, coordination, and overall product quality.

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From this industrial visit to **Biocon, Johor Bahru, Malaysia**, students gained a deeper understanding of biotechnology industry operations. Students get their opportunity to be exposed and in touch with the real-world applications of computing and information systems that run into a large range of production. For instance, the workers instruct the machines to do their specific jobs like purifications, fermentation and freezing processes to increase the qualities and quantities of the medical substances. At the same time, it reduces the costs and saves plenty of time and human resources to produce high quality products. This aware the students of how crucial that IT supports biological and engineering processes, as well as show the example that IT technologies can actually collaborate with biology in a special way.

## Skills and Knowledge Development

Biocon explained and helped the students in understanding their automated manufacturing systems as a high amount production company. In addition, Biocon briefly expresses the knowledge of data management and quality control systems in every drop of substances, from one microliter to one kiloliter.

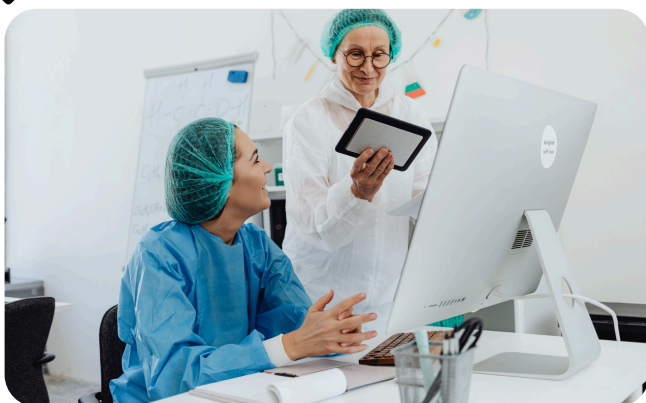
Through the visit, Biocon shows their professionalism in communication with every worker, which builds teamwork and workplace discipline to ensure the quality of their production. They prioritize the awareness of industrial ethics and standards of the workers that build a strong bond between every worker and the superiors. Those are the keys that made Biocon today's success.



Photo from <https://www.biocon.com/more/biocon-malaysia/>

## Relevance to Academic Studies & Career

This visit reinforced concepts learned in the **Technology and Information System** course, particularly like system integration, data management and technology-driven decision making. The experience also broadened students' career perspectives, highlighting big opportunities in Biotechnology IT support, Industrial data analytics and Pharmaceutical manufacturing system.



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To conclude, the industrial visit to **Biocon Sdn Bhd** provided valuable exposure to the integration of technology, information systems, and biotechnology. The experience will definitely enhance the students' technical knowledge, understanding the real-world applications that are essential in preparing their future career plans.

Last but not least, the students show their appreciation to **Biocon Sdn Bhd** staffs, the lecturers, and organisers for making this industrial visit a success.