Name

Professor

Course

Date

Process Integration and Control

The issue of continuous bioprocessing is tackled by the article. It provides essential information to understand which factors should be modulated in order to achieve continuous bioprocessing. Developing technologies provide opportunities for improvement of the ways of bio processing. The article shares that bioprocessing has been always done by batch, and that recent discoveries in the different fields of science has unlocked a critical component which will enable continuous bioprocessing.

The research mentions 3 approaches about the topic. The major methodology of the proposed framework for continuous bioprocessing revolves around modular approach. This method would allow worn parts to be easily replaced, while allowing efficiency of the different process involved in the biomaterial production. The adaptation approach meant that units of operations are modified in order to create a continuous and faster cycle. This also meant the seamless integration of the operating units with each other.

 The field of biopharmaceutical manufacturing has seen a wide array of benefits for humanity and the scientific field. The specificity of bioavailable materials has been understood by science, thereby giving people the capability to produce biomaterials at the desired parameters. The article mentions 2 devices that are relevant for continuous bioprocessing. These 2 devices can be used in modular set-up such as the ATF or Alternating Tangential Filtration, and the AWS or Acoustic Wave separators. These devices provide essential factors that allow certain molecules to be extracted.

A major take away that I have from the article is the Diafiltration process. This process is a fairly new method that is essential for the creation of all biopharmaceutical drug substances. It allows for better refinement of the bioavailable materials. This process is carried out in multiple stages wherein the membranes in each stage are arranged us such away that specific molecules will be taken without going through other rigorous processes. In this method, the use of a Diluent is essential in order to pass the right molecules in the various stages.

This subject matter has a big implication about the processing of biopharmaceutical products. The capacity for continuous bioprocessing would create a more efficient way of delivering important types of medicines. Biopharmaceutical is a branch of medicine that highlights extraction of naturally occurring molecules that have the capacity to heal what synthetic medicines cannot. Many types of molecules are created by nature, and these molecules can be a solution to various diseases conditions. Continuous bioprocessing would allow humans to extract important substances from nature, which would allow opportunities for people to heal and be happy. The scientific community has a responsibility to expand understanding of various processes involved in chromatography and bio manufacturing processes.

The different approaches in the study provide a framework of understanding the importance of various processes involved bioprocessing. Scientists are continually creating ways of interpreting and monitoring the different processes, and technology has allowed for greater control. The developments in various fields of science have contributed to each other in order to create more complex ways of molecule extraction such as capillary electrophoresis, high performance liquid chromatography, and cytometry. I think that a major topic involved in this subject matter is the use of Artificial Intelligence. The use of complex software has a large contribution on processing and gathering specific data about the small molecules of interest. Artificial intelligence in software can be programmed to detect miniscule changes, and define important factors involved in the processes of bio manufacturing.