

popular scientific summary

The pharmaceutical industry is one of the most important aspects of modern human society. This industry has allowed scientists to improve mankind's life and gives all patients around the world a hope to treat their disease. The pharmaceutical industry has not seen that much changes when it comes to production of small molecules and API for the past decades. However, the world is changing. New diseases, pandemics, and more demand around the world for drugs and treatment have been challenging the industry. Moreover, with the advancement within biotech and biopharmaceutical new technology are needed. In order for the industry to adapt itself with new demands and challenges, scientists have been researching and investigating new technology.

One of the areas which scientists have been investigating for the past years is increasing the production rate of companies' production lines. There are several ways to reach such a goal in order to increase the production rate to meet the demand of the public. This includes building new factories, having more working shifts in the factory and improving the production line to be more efficient. One of the ideas to improve the production rate of existing production lines is to convert existing systems to Continuous Manufacturing. Continuous Manufacturing is a mode of production which increases the production rate by compiling all units of operation in one. This action would allow the manufacturer to increase their production speed by lowering the time needed for transport, storage, and man power.

These systems would allow companies to produce more drugs and treatments in a shorter time, thus meeting the public demand in the case of drug shortage or pandemic. However, health authorities want to be sure that these systems are safe and would not harm patients by any chance. In this thesis the author is going to investigate the possibility of implementing these systems to produce biological drugs. This thesis focuses on interviewing professionals who work in pharmaceutical companies, to investigate challenges and problems to use Continuous Manufacturing. After designing a continuous process for production of trastuzumab which is used in the treatment of breast cancer, this designed process was presented to professionals for their opinion. It was understood from interviews that the CM system has some advantages in some parts of manufacturing which allow the industry to make their process safer for the patient. However, due to shortages in spare parts and implementing, these systems are not economically beneficial in a lot of cases. Due to this reason Continuous Manufacturing has not been implemented in a meaningful number around the world.