Technology plays an important role in today's pharmaceutical market, and spectral technology is often used to meet the many regulations and standards that accompany pharmaceutical products. American's rely on the Food and Drug Administration (FDA) to ensure that prescription drugs and over-the-counter medications are both safe and effective for use. That is why the FDA has set standards to monitor the quality of pharmaceuticals using Current Good Manufacturing Practice (CGMP) guidelines[1]. Though many consumers are unaware, CGMPs help monitor pharmaceutical processes by insisting on the latest technology for safety and effectiveness.

The Purpose of CGMPs

CMPGs monitor every aspect of pharmaceutical production. From product design to process control, these guidelines provide specific systems for quality testing and safety. Drug manufacturers must adhere to these guidelines to assure consumers the purity, identity, strength, and quality of the medications they use every day.

Spectral analysis is a commonly used analytical tool in pharmaceutical production and management. Spectrophotometers can be used to detect impurities, quantify active pharmaceutical ingredient (API) levels, differentiate molecular elements, and monitor product degradation in drug formulations. These factors are a key part of meeting CGMPs and require the latest technology to implement these procedures.

Latest Advancements in Technology

Spectral technology offers many applications in pharmaceutical analysis, and like all technology, new advancements are continually being develop. The "C" in CGMP stands for "current," so technology must be able to adhere to this standard. Spectrophotometers have undergone significant advancement in the past several decades and these new changes reflect the ever-growing needs of the pharmaceutical industry. Benchtop, portable, and handheld models have allowed for advanced spectral analysis to take place not only in the developmental laboratory, but also allowing for continual monitoring in both large and small pharmacy settings.

The ability to continually monitor pharmaceutical product quality is detrimental in abiding by the CGMP guidelines[2]. The FDA inspects pharmaceutical manufacturing facilities worldwide and reports products defects and recalls both publically and industry wide. These inspections address potentially dangerous or possibly "adulterated" drugs and this process is backed by the law to ensure that drug manufacturers are in compliance. Spectral analysis provides a way for these companies to efficiently and effectively monitor their products at an affordable cost.

Benefits of Continuous Processing

As spectral technology continues to advance, many pharmaceutical companies choose to go above and beyond what is required by the FDA in order to increase production and reduce waste. New procedures in spectral technology include continuous processing[3], which can lower the amount of waste and increase quality in comparison to batch control processing. This technology is relatively new and not many in the pharmaceutical industry are familiar or experienced with this technology. However, it has been given a lot of attention lately as experts in continuous processing claim how it can "lower raw material and waste costs; [and reduce] environmental emissions and energy consumption, as well as overall unit operations and operational costs." With the benefits continuing to add up, many pharmaceutical research and industry dollars are being invested into new technology. Since spectral technology offers the most affordable method of continual processing, it is often the first place many of these corporations look.

Full article with photos available here:

https://www.hunterlab.com/blog/color-pharmaceuticals/meeting-cgmp-guidelines-in-pharmaceuticals-with-spectral-technology/