Benzathine benzylpenicillin

Environment, Water

There are many people around the globe who would benefit from an injectable drug designed to release small amounts of medication over the course of a month. This is particularly necessary for people suffering from bacterial meningitis as they are required to receive injections on a regular basis. Additionally, there are countless other populations that would benefit from the availability of injectable medication. This type of medication dispension is useful for third world populations since they don’t have access to doctors on a regular basis.

An injection that lasts for one month would ensure that these people were receiving necessary medication on a regular basis. At the same time, an injectable form of medication increases patient compliance since they are only responsible for getting the injection once a month instead of on a more regular basis. Similarly, injectable forms of medication allow patients to receive constant therapeutic levels of drug maintenance that ensures they get well.

Finally, making medication available in injection form eliminates the need to refrigerate drugs and also reduces the number of trips a patient must make to a clinic to receive necessary medication. Therefore, this researcher aims to look at benzathine benzylpenicillin and its usefulness as an injectable drug. The lab already purchases benzathine benzylpenicillin but it is not in pure form. As a result, the job of this researcher would be to coat the benzathine benzylpenicillin with different polymers in order to slow down the dissolving process.

If successful, this process would improve the lives of sick people all over the world who are required to receive frequent doses of penicillin. Penicillin is

known to be unstable in liquid formations (Ogunleye, et al, 2004). Therefore, the first goal this researcher would have is to work with one type of polymer that uses heat rather than water. This polymer will be used to coat the penicillin so particles will not clump up. It is essential to develop a way to keep penicillin particles from clumping so they can be released on a consistent basis after the initial injection.

Further, benzathine benzylpenicillin will be injected using a needle and PVA is hydrophilic so clumping must be avoided in order to successfully inject the medication. The polymer this researcher will use is called polyvinyl alcohol. Establishing a way to prevent penicillin from clumping will contribute much to the research being conducted around the possibilities and benefits of using injectable benzathine benzylpenicillin. The second aim this researcher has is to develop a way to slow down the dissolving process of the benzathine benzylpenicillin in order to ensure that it releases constant dosages for an entire month.

The main goal in slowing the dissolving process is to achieve a minimum level of concentration in order for the drug to be effective at a low level for a very long time. Discovering a way to slow this process is essential for may patients, particularly those suffering from bacterial meningitis because benzathine benzylpenicillin cannot be given orally as the gastric acid and absorption of the intestinal tract is too slow to deem the oral form of the drug effective (Shaheen, 2004).

There are several steps this researcher will take in preparing penicillin to be coated in order to make an injectible form of benzathine benzylpenicillin successful and worthwhile. After successfully determining the polymer

concentrations that would be most effective, this researcher would use a fluid bed coater to apply the polymers to the penicillin. A fluid bed coater looks like an upside down bottle where the drug particles are dried as they travel in a clockwise circular motion. The penicillin will go into the machine and the polymers will go into a spray gun.

The penicillin will be blown up into the upside down bottle and as it passes the spray gun it will be coated with the two different polymers. The inside of the bottle is hot so that the penicillin can dry before being sprayed with the polymers subsequent times. This process goes on until the researcher stops the machine. This allows the researcher to control how much polymer is allowed to coat the penicillin. The final step in this process is a dissolution test on the polymer coated penicillin. This researcher will place the penicillin in water (used as a medium of blood) and stir until dissolved.

Then, this researcher will use a visible spectrospectry to determine the concentration of the drug in the water. This process allows the researcher to figure out how much of the drug was dissolved based on the amount of polymer coating the penicillin. In order to calculate the exact concentration, a sample of the water is placed in a cubbet and a UV light is shined on the sample. Concentration rates are determined based on how much light is able to come through, what type of light is coming through and the wavelength of the light coming through.

Any given molecule has a characteristic spectrum for a specific concentration of the drug, so by looking at the spectrum you can find drug concentration. This researcher is right for the job based on an in depth understanding of benzathine benzylpenicillin and the process it must go

through to become safe and effective as an injectible drug. Additionally, this researcher is enthusiastic about the possibilities such an injectible drug will have to positively impact the lives of many people required to take constant doses of medication.

The penicillinfamilyof medication is an important tool in the arsenal for fighting illness (Wright, 1999). They are of low toxicity, they are highly effective and they are easily distributed through the body (Wright, 1999). This work won’t be accomplished quickly and there will be challenges along the way. However, this researcher is willing to persevere in order to discover new and innovative ways to make drug administration easier and more effective for people required to take benzathine benzylpenicillin.

When a correct mixture of polymers is discovered and dissolution is slow, this researcher will consider the project a success. Ogunleye, D. S. ; Kolawale, J. A. ; Okaroh, I. & Okeniyi, S. O. Effects of Thawing Methods on the Stability of Cloxacillin Sodium and Benzathine Benzyl Penicillin Injections. Nigerian Journal ofHealthand Biomedical Sciences 2004, 3, 51 – 55. Shaheen, Rubina. Penicillins. Indian Journal for the PracticingDoctor2004, 1, 11 – 12. Wright, Alan J. The Penicillins. The Mayo Clinic Proceedings, 1999, 74, 290 – 307.