

Experimenting With Drugs in Puerto Rico ^[1]

Submitted by [Jacob Townsend](#) ^[2] on 24 July 2015 - 10:27am



Yes, I have been experimenting with drugs all summer in Puerto Rico! It's true, but probably not in the way you were thinking! In my 10 week stay at the University of Puerto Rico Mayaguez, my lab has been doing studies on near infrared spectroscopy with pharmaceutical powders. It was initially our goal to quantify low concentrations of pharmaceuticals in a powder. However, when this was attempted, there were many hurdles. The character of the powder's composition made a larger impact on the spectra than small differences in Active Pharmaceutical Ingredient (API) content.

It was necessary to shift the focus of the study towards explaining variation in pharmaceutical powders in terms of density. Pharmaceutical powders can be composed of many excipients. Different blends can have different compositions of each excipient, resulting in different densities. These different densities in the powder can greatly impact the amount of light that returns to the detector when doing Near Infrared Diffused Reflectance Spectroscopy. This has a large impact on the spectra. If there is a large difference in density in powders, it is difficult to measure small difference, for example, 1-2% difference in API concentration.

The study has been effective in providing possible explanation and experimental designs to prevent these interferences. It is possible to isolate API selective wavelength ranges, but if the area is small, it greatly decreases the precision of models created. The project has been useful in

explaining some of the challenges with using Near Infrared Spectroscopy on powders with varying densities.

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