RMSM REU 2016: Done. Research in Pharmaceutical Sciences: In Progress... “A Near Infrared Summer” [1]

Submitted by Alberto E Serrano Vargas [2] on 5 August 2016 - 11:21am


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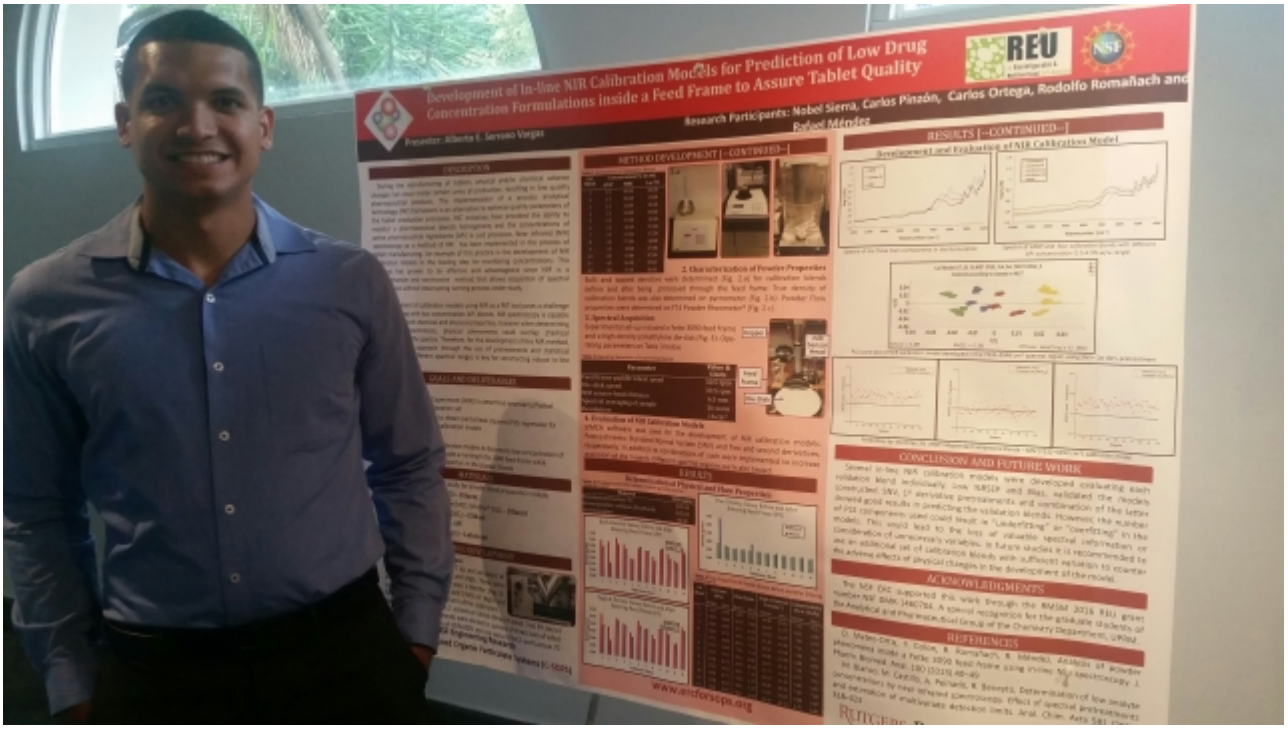

During this summer REU I have been working on a project titled: The development of NIR calibration models for prediction of low acetaminophen (APAP) concentrations inside a feed frame in real-time. This project is an example of Process Analytical Technology (PAT) framework for pharmaceutical applications. PAT is part of a guidance proposed by the FDA in 2004 to improve and control quality parameters in pharmaceutical processes through real-time analysis. Near Infrared Spectroscopy is the technique we used for this study because it perfectly complies with

the goals of PAT and have a high sensitivity for the detection of many organic compounds. NIR allows for the monitoring of pharmaceutical processes in a non-destructive and non-invasive way. Therefore, it is perfect for the in-line analysis (*i.e.*, no sample extraction is required) of a running process in real-time.

The end goal of our project was to assure tablet quality, and this has a significant importance because tablets are the most common drug delivery method. Over 70% of all pharmaceuticals sold and distributed worldwide are in the form of tablets.

NIR spectra were obtained from the pharmaceutical blends inside a running feed frame. The samples were taken on this specific part of the operation (feed frame) because this device represent the closest stage to the final compression, and the formulations of the blends inside this device are the most representative of those found in the tablets (end product). Therefore, by implementing this type of analysis we can potentially control/improve the quality parameters in this crucial step of tablet production.

As I mentioned in my past blog: the RMSM REU has been an experience that has helped me grow both as a student and as a researcher. I am very thankful for the opportunity it gave me to carry out a research project in the pharmaceutical sciences area. The contribution of pharmaceuticals worldwide is outstanding, and having a small part to that contribution this summer gives me a great satisfaction. However, I hope my contribution does not end today, but continuous to flourish throughout both my academic and professional career.

Tags:

- #RSMS #UPRM #REU #NSF #SummerResearch [3]

Links
[1] https://www.cienciapr.org/en/blogs/soft-matter/rmsm-reu-2016-done-research-pharmaceutical-sciences-progress-near-infrared-summer [2] https://www.cienciapr.org/en/user/alberto-elwin [3] https://www.cienciapr.org/en/tags/rsms-uprm-reu-nsf-summerresearch