

# Personalized Medicine Using Additive Manufacturing

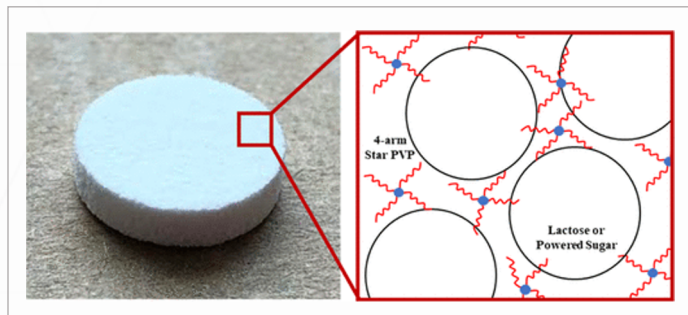
**VTIP 19-046: “Star, Branched, and Graft Polymers in Binders for Inkjet Additive Manufacturing for Personalized Dosage Tablets”**

## THE CHALLENGE

A major problem posed by the pharmaceutical industry is giving effective dosages while not giving excessive amounts of a particular drug. An estimated 80% of side effects in humans and animals are a direct result of inaccurate dosing because varying weights in patients. Additive manufacturing has emerged as a very promising method to provide patients with customizable, rapidly produced tablets while reducing the probability of side effects. It is a new field and thus requires significant research and effort to optimize the processes implemented.

## OUR SOLUTION

Timothy Long and his team have developed a method for manufacturing personalized dosage tablets with different polymer architectures. They used linear, 4-arm star, and graft polyvinyl pyrrolidone as polymeric binders for the additive manufacturing process. These methods open the door for a wide range of polymer architectures to be used in binder formulations to achieve a stronger printed tablet for personalized dosage medicine. With further investigation, the development of additive manufacturing of personalized dosage pharmaceuticals has the potential to revolutionize manufacturing of oral tablets.



A personalized tablet created using these new additive manufacturing techniques.



Printing was conducted on a Z-Corp Spectrum Z510 3D printer as seen above.



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