Matthew Shaffer, Daniel Kuntz, William Steinhauff
Lonza Pharma and Biotech, Bend, OR

PURPOSE
An ideal target product profile for many oral formulations involves pulsatile delivery from multiparticulates (MP) of one or multiple drugs to enable patient-centric benefits such as taste masking and/or delayed release. This poster presents osmotic-rupturing MPs with a time-dependent release profile as an attractive alternative to the common pH-dependent pulsatile release profiles generated with enteric and reverse-enteric coatings. The pulsatile release profile includes a tunable lag time that arises from a simple mechanism of water intake, increased pressure on the coating, and subsequent barrier coating rupture. This mechanism of release is less prone to in vivo variability based on prandial state or interpatient GI tract differences (age, diet, disease state), making it an attractive formulation option.

RESULTS

Coating Morphology
- Ac-Di-Sol (Crocarmellose Sodium) superspandisintegrant system (top) with Ethocel/talc barrier membrane (bottom)

PH-Independent Burst Performance
- Burst time in gastric conditions (pH 2) similar to that in water
- Expelled superdisintegrant more gel-like in low pH

CONCLUSION
- Osmotic rupture is a viable delivery mechanism for taste masking or delayed pulsatile release
- pH independent burst time
- Robust in high osmolarity media
- Tune-able burst time with barrier layer thickness and composition
- Stable burst time with incorporation of pore former in barrier layer

METHODS

Background
- The tune-able time-release multiparticulate consists of base core with multiple coating layers
- The swell layer is activated by water and swells independent of pH
- The barrier membrane allows water to permeate independent of pH and ruptures when the sweller layer reaches sufficient pressure
- Upon rupture of the barrier membrane drug is released

Manufacture
- Coating was applied using a Wurster process
- Two coat layers are applied to MP core
- Sweller Layer
  - micronized super disintegrate and a binder
- Barrier Layer
  - Semi-permeable membrane with embrittling agent (Ethocel/PEG with micronized talc)

Characterization
- Soak test with time-lapse imaging
- Fast efficient screening
- High repeatability with low amount of material (=10 mg)

DISCLAIMER
All trademarks belong to Lonza or its affiliates, or to their respective third party owners. The information contained herein is believed to be correct and corresponds to the latest state of scientific and technical knowledge. However, no warranty is made, either expressed or implied, regarding its accuracy or the results to be obtained from the use of such information.