Multiple Dose Platforms for Once-Daily Administration of Ciprofloxacin or Verapamil

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The aim of this work was to develop a gastric retentive multiple dosing pulsatile platform delivery system. Delivery of the APIs ciprofloxacin and verapamil from the multiple platforms was investigated, for potential treatment of infections or cardiovascular disease, respectively. The release rates of the API containing capsules (n=6) were determined using a USP type II apparatus (Hanson SR-PlusTM Dissolution Test Station, Hanson Research Corp., Chatsworth, CA) at a paddle speed of 50 rpm in 900 mL of a 0.1N HCl buffer solution (pH 1.2) at 37±0.5 °C. The dissolution data obtained were plotted as percent cumulative drug released versus time. The time of 50% drug release of pulse release (T50%) was also calculated by extrapolation on the time axis of each individual release curve. Average and standard deviations for T50% were determined. Ciprofloxacin capsules displayed two T50% pulse release times of 0.3 and 12.8 hours, with the capsule demonstrating immediate floatation. Verapamil capsules showed three T50% pulse release times of 0.3, 8.5, and 17 hours, also with the capsule demonstrating immediate floatation. From this *in vitro* study, two-pulse release of ciprofloxacin and three-pulse release of verapamil aiming to mimic twice-daily and thrice-daily dosing regimens respectively were demonstrated. Implications for the use of the multiple dose platforms are discussed and compared with current multiple-daily and once-daily dosing regimens for both of drugs. By adjusting the time of administration and pulse time to the circadian pattern, the multiple pulse platforms offer a promising direction for chronotherapeutics.

Biography

Dr. McConville earned his Ph.D. at the University of Strathclyde, Scotland in 2002 in the area of chronopharmaceutics. He moved to Austin, TX in 2002 as a post-doctoral fellow before being appointed to Assistant Professor. He joined the faculty at the University of New Mexico in June 2012 as an Associate Professor. His research interests include: nanotechnology, pulmonary targeting, and chronopharmaceutics. Dr. McConville is also an Adjunct Professor in the Department of Pharmaceutical Technology at the University of Bonn, Germany and has published more than 40 papers in the field of pharmaceutics.