PK-BK simulators from Pharmechanics

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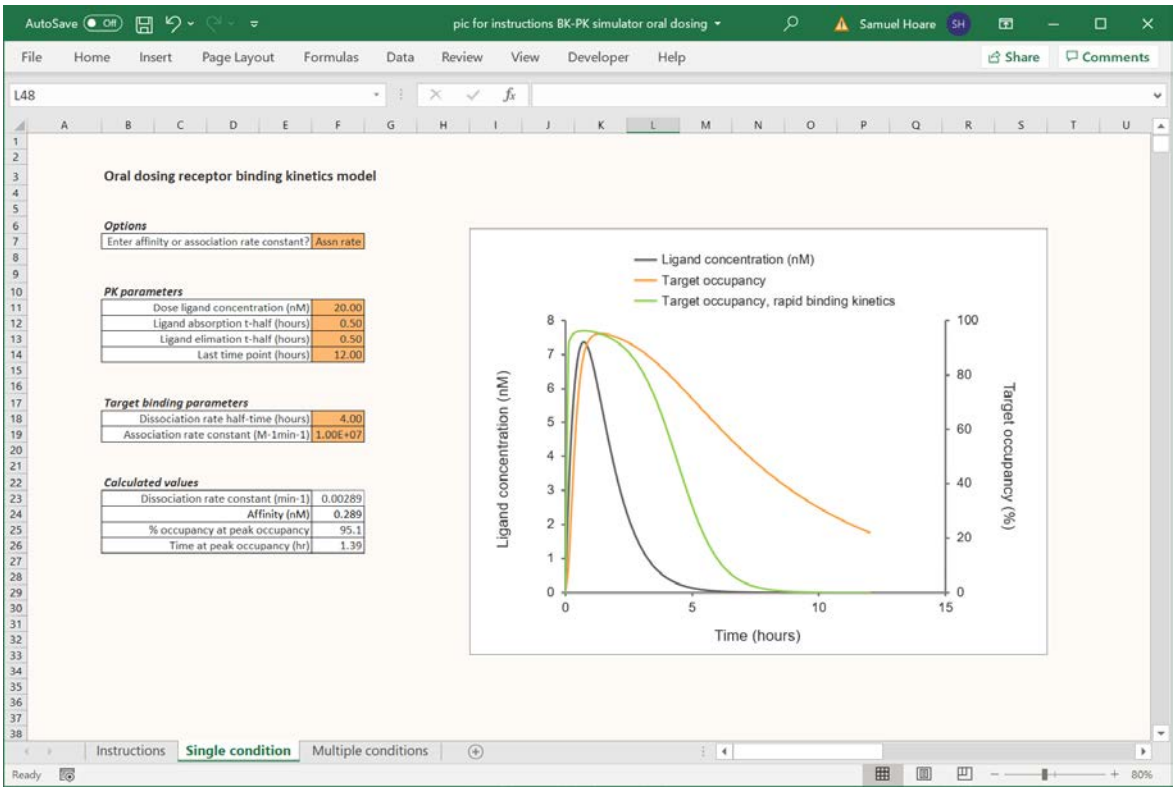
In evaluating the impact of binding kinetics on in vivo occupancy, we want to know how binding kinetics interacts with pharmacokinetics in defining the duration and magnitude of target occupancy. We have developed a couple of Excel-based simulators to enable you to do this quickly and simply (https://www.pharmechanics.com/binding-kinetics-with-pk-simulation). The simulator combines pharmacokinetics – the change of drug concentration over time – with binding kinetics – the rates of drug binding to the target. Data are entered by simply entering values into the orange fields, which then updates the graph:



The grey line is the concentration of drug changing over time. The orange line is target occupancy, governed by both the drug concentration and by the kinetic binding constants. You will note there is an extra curve on the graph, in green. This represents a ligand that dissociates rapidly from the target but with the same affinity as the ligand in orange. This rapid dissociation curve provides a visual baseline for assessing the effect of the dissociation rate on target occupancy.