Reviewer's report

Title: Comparative Absorption of Curcumin Formulations

Version: 1  Date: 9 December 2013

Reviewer: Dong Liang

Reviewer's report:

The authors presented a cross-over, 4-period pharmacokinetic study evaluating the apparent absorption of curcuminoids from 4 curcumin formulations. In general, the experiment was well executed, and the data was clearly interpreted. The followings are specific comments for the authors to address with respect to their studies:

1. The pharmacokinetic sampling of 0-12 hours was a deficiency in the study design. Plasma levels of the unconjugated curcuminoids were not in their elimination phases. Curcurmin half-life was estimated to be 6-7 hours in humans, thus at least 24 hour sampling is needed for pharmacokinetic characterization. Authors may want to discuss this point briefly in the Discussion section.

2. The LC-MS/MS method was referenced from a prior study by Cuomo [Ref# 26], who adopted an assay method by Liu [Ref# 21]. The method by Liu is for rat plasma, not for human plasma. Thus, at minimum, the authors should provide their validation data which includes linearity, precision and accuracy. Furthermore, it is a concern to this reviewer that the standard curves consisted only 3 concentration points.

3. Table 1 (was miss labeled in the text) should only show the MRM ion pairs used for the quantification, i.e., curcumin m/z 369.1 -->285.1; tetrahydrocurcumin m/z 373.2 -->137.1, and so on.

4. "Statistical Analysis" indicated a Nonlinear Mixed Effects Model of population pharmacokinetic analysis, but the model analysis was not presented in the Result section.

5. "Sample Preparation": "...and 50 uL of methanol" should be removed.

6. In the Result section, "Figure 2" should be "Figure 4 & 5", and "Table 1" should be "Table 2".

7. The authors should provide more discussion with respect to significantly increased oral absorption (45.9-fold) of total curcuminoids from the CHC formulation as compared with the CS formulation. What was the reason of this improvement? Was an increased solubility of curcuminoids in the GI tract, or improved permeability in the GI tract due to the excipients in the CHC formulation, or potential inhibition of the transporters?

8. "Figure 5" legend: Please indicate dose levels.
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.