between human and animal species used in medicine research that obliges extensive clinical testing as part of authorizing use of drugs on humans (Williams, 1972; Toutain et al., 2010). According to US FDA, most drugs fail clinical testing though they passed in vitro and non-clinical testing performed on several species before approving its use in clinical research (US FDA report, 2012).

In light of this information, the best option is to use human subjects in order to establish whether the tested hypothesis is true in humans or not.

It is important to report that the protocol of the study was approved by IRB of Al-Mowasah hospital without any foreseen concern of risk on the subjects' health. The protocol was implemented without any deviations. The method of analysis as well which was carried out to measure the rhein level in the blood was properly validated according to internationally set guidelines (EMA guideline, 2012).

Rhein the active metabolite of diacerein which was measured in the collected biological fluid is light sensitive. To minimize exposure to UV, all samples and preparations were conducted under yellow light.

The data obtained for both pre glucosamine and post glucosamine administration were statistically evaluated and compared as shown in figures 15, 16 and 17. Comparing the results, the difference in all of the primary pharmacokinetic parameters was found to be insignificant ($p > 0.05$). The main pharmacokinetic parameters which are associated with bioavailability are AUC0-t and AUC0-∞, the difference in each of these parameters was insignificant ($p > 0.05$). 4 out of 6 subjects in this study had a decrease in AUC0-t parameter within a range of 22-40%, while the same is true for the decrease seen in AUC0-∞ parameter where the difference was within a range of 20-29%. This is clearly demonstrated in subject 3 where AUC0-t and AUC0-∞ decreased from 31638.9 ng/ml.hr