**Hypothesis:**

We hypothesize that the systemic availability of buprenorphine following oral transmucosal administration is less than the 116.3% previously reported, and that buprenorphine produces analgesia as measured by an increase in thermal threshold in a manner dependent on arterial plasma concentration.

**Proposed research to accomplish:**

We will compare the effects of buprenorphine in six male adult healthy cats when administered transmucosally or IV. Each cat will receive both treatments in a randomized order with a minimum of two weeks between each treatment. Blood samples will be collected at regular intervals for 24 hours following administration from three different sampling sites (internal carotid, jugular, and medial saphenous). Thermal threshold data will be recorded at regular intervals for 24 hours following administration. Blood samples will be submitted to an analytical lab for analysis, and then the data will be interpreted. Thermal Threshold data will be statistically analyzed and interpreted.

**What actually happened/brief discussion of results:**

Experimental procedures went well; all cats did their best to participate and tolerated the procedures well. They will most likely be transferred to another protocol soon. Thermal Threshold data was statistically analyzed by Dr. Kass; various comparisons of averages were made, and at this point the most important conclusions seem to be that thermal threshold temperature is affected by route. The data also indicates that base skin temperature may dependent on route, so further analysis is needed to investigate this change; we may analyze it as a covariate if this significance does not appear warranted by the raw data (unexpected result, since did not expect change in skin temperature over experiment). Currently, blood sampling data has been processed by Dr. Stanley and will be analyzed by Dr. Pypendop and myself this month, in time for the Oct 31st MAF deadline. It appears that two papers will result from this study: the first is the proposed topic, assessing buprenorphine’s analgesic effects and PK/PD properties; the second is comparing drug concentrations at different sampling sites for a drug given transmucosally, with buprenorphine as the measured drug and the sampling sites as the three sites we sampled in this study. Hopefully, once the blood data is analyzed, we will be able to make recommendations to other researchers about where to sample cats to obtain blood that most accurately approximates drug systemic availability when the drug is given transmucosally.