**Summary of meeting 19/06/2012**

Presented some designs with the highest average efficiency factors of animals, within runs and tags, based on some sets of design parameters. These were:

a) Phase 1 experiment: 2 treatments, each treatment assigned to 3 animals. Phase 2 experiment: 6 runs with 4 tags.

b) Phase 1 experiment: 3 treatments, each treatment assigned to 3 animals. Phase 2 experiment: 9 runs with 4 tags.

c) Phase 1 experiment: 2 treatments, each treatment assigned to 6 animals. Phase 2 experiment: 9 runs with 4 tags.

For the designs a) and b), the average efficiency factors were calculated from the harmonic mean of the canonical efficiency factors. In addition, the theoretical ANOVA tables generated from these two designs shows that the test for the differences between the treatment groups cannot be achieved directly, because the coefficients of the between animals variance components are not identical for the treatment and the residual mean squares in within runs stratum.

For the design c), there is confounding between treatment and tag effects. Hence tags have to be fitted in the ANOVA model before treatments. This enables us to generate the treatment mean square adjusted for tag effects.

**Pseudo code for the current simulated annealing algorithm**

Repeat 100 times{

Using simulated annealing algorithm to find the animal assignment, with the highest average efficiency factor, to the runs and tags of the Phase 2 experiment.

Save this animal assignment.

}

From these 100 animal assignments, we can then find an assignment that has the highest treatment information in the within runs stratum.

If there is confounding between treatments and tags, we will find an assignment that has the highest treatment information eliminating the tag information based on the theoretical ANOVA table.

**Plan**

**By next week**

I need to have a more systematic way to layout the design parameters to look for the optimal designs.

This can also help us to determine the minimum number of treatments and animals that we can have when assigning the animals from Phase 1 experiment to Phase 2 experiment. .

The table should also indicate whether there is a presence of confounding with the treatment and tags.

**If I have more time or later on**

The next step is to look for a new objective function which consider the both the animal and treatment assignments. This mean I will need to compute the average efficiency factors for both treatment and animal, then calculate their weighted average, i.e. O(EB, ET) = w1EB + w2ET, where w1+w2 = 1. This way may be be a better alternative than performing simulated annealing algorithm 100 times, then find the design with the highest treatment information in the within runs stratum.

Another objective function is to maximise the orthogonality between tags and treatments.

If using the new objective function still cannot reduce the confounding, I will need to choose a different set of contrasts to decompose the information. The manually defined contrasts are more to do with how the analysis is performed.