Lama Medical Research Group Report
Camelid Community 2005

Report by Hilary Ware, GALA representative and LMRG Chair

The **Lama Medical Research Group** reviewed and discussed seven new camelid projects for possible funding this year through the Morris Animal Foundation (**MAF**). Those participating were Dr. Kim Schwanky for the Canadian Llama and Alpaca Association(**CLAA**); Dr. Julie Ann Jarvinen, the Alpaca Research Foundation (**ARF**); Dr. Scot Lubbers, Willamette Valley Llama Foundation (**WVLF**); Dr. Rob Pollard, Llama Association of North America (**LANA**); Hilary Ware, Greater Appalachian Llama and Alpaca Association (**GALA**) and Debbie Ullrich, SOC committee member. We stay connected and informed about MAF through the Executive Committee members for the Llama/Alpaca Division, Drs. Allan Dewald and Patrick Long.
This year Morris has introduced two new categories for submission of proposals, beyond the established investigators category. These are designed to attract more researchers and greater numbers of projects. They are "First Award" and "Fellowship Grant" categories. All divisions of MAF received increased requests for funding while there has been a decrease in funds available. The proposals submitted to the Camelid division totaled $480, 938 this year. Morris Animal Foundation and the camelid community, via donations, will be funding new proposals in the amount of $66,820.

For each of the seven proposals submitted, MAF used several outside reviewers in addition to the experts on the Scientific Advisory Board. Two camelid proposals received the nod, pending clarification of some endpoint goals by the researchers.

New Studies Approved:
Identifying Markers and Populations for Study of Inherited Traits in South American Camelids, Juan Carlos Marin, PhD. Universidad Mayor, Santiago, Chile. This is a one year study for $19,320.
The researcher proposes to…"identify and collect biological samples from populations of alpacas, llamas, guanacos and vicunas that are well-suited to study specific traits of interest, such as choanal atresia, fiber quality, eye color and polydactyly and to begin the process of identifying the genetic basis of observed variability. This study will support an already considerable effort to collect samples and information by Chilean scientist[s] and their colleagues and additionally will provide the first direct measure of the differences in the genetic makeup of No.American and So. American herds of alpacas and llamas."

A First Award proposal, *Discovery of Microsatellites in Alpacas,* Kylie Munyard,BSc, PhD, Murdoch University, Murdoch, Western Australia. This is a two year study for $91,521 total.
"Currently the density of coverage of markers on the Alpaca genome map is not as high as is desirable for maximum likelihood of linking traits to gene(s). The objectives of this proposal are to 1) discover between 100 and 200 new polymorphic tetranucleotide microsatellite markers for inclusion on the alpaca radiation hybrid map; and 2) to develop an identity/parentage test that will be able to distinguish between two animals with a >99% probability."

Ongoing Studies:
Dr. Warren E. Johnson, PhD, National Cancer Institute-Fredrick, MD. *An Integrated (Coding Gene and Microsatellite Marker) Radiation and Hybrid Map of the Alpaca.* 1st year fully funded by ARF; 2nd year: $97,000, to be partially funded by ARF. Total for three years $287,000. Now in third year.
"There are few genetic resources or tools that have been developed for camelid species, thereby severely limiting study efforts. Until now, we have only had ~80 genetic markers to use in searching for genetic items in llamas and alpacas. This was felt by knowledgeable individuals to be an insufficient number of markers to properly pursue significant research. Previously an item such as the "Minute Chromosome" was investigated with a MAF project at the U. of Minn., with no clear answers. Cecelia Penado, at the genetics lab at U.C. Davis, also had commented on the presence of the "tiny" chromosome. There were several other things as well, including choanal atresia investigations, which did not uncover useful information. A general consensus was reached that we would not further pursue individual genetic items until we had more markers available. With this current project, there is a promise of obtaining 1600 type I and type II markers, as the investigators are constructing an integrated, high resolution, whole-genome alpaca map of coding gene and microsatellite markers. Some of the markers are slowly evolving and others evolve rapidly.
This should facilitate the study of deleterious and desired traits, take fuller advantage of genetic discoveries made in other species, including humans, and to encourage a wide range of future studies by bringing camelids into the forefront of genomic studies."

Dr. Geof Smith, DVM, PhD, No. Carolina State University, *Bioavailability and Pharmacokinetics of Oral Omeprazole in Llamas.*
Research completed except for some plasma sample analysis. Researchers will be submitting the findings of this study to the *Journal of Veterinary Internal Medicine Forum* (oral presentation). Dr. Smith would like to do further research at some point to confirm his findings from this helpful study. Results will be generally known after his oral presentation.

Completed Studies:
Drs. Chris Cebra and Susan Tornquist, DVMs, Oregon State University, *Glucose Tolerance and Insulin Sensitivity in Crias.*
"We hypothesized that crias were better than adult camelids at lowering blood sugar. Adult camelids are known to have difficulty at this, but crias with their high-carbohydrate milk diet and simple digestive system should have a more efficient system to use blood sugar, or would be at greater risk for diabetes-like disorders. Our trials confirmed that crias have better mechanisms for lowering blood sugar. However, this was only confirmed in healthy crias and some sick crias may still be at risk for severe increases in blood sugar."

Drs. David Anderson, Richard Sams, Cliff Monahan, DVMs, Ohio State University, reported by Dr. Jeffrey Lakritz, DVM. *Pharmacokinetics of Fenbendazole and Ivermectin impregnated feeds in Alpacas.*
A manuscript describing the results of trials dosing with fenbendazole oral solutions (10%) and 1.8% mini-pellets is planned for submission this summer.Those results cannot therefore be divulged at this time. Researchers suggest further study is needed for efficacy of use of fenbendazole in treatment of meningeal worm, i.e. beyond normal anthelmintic use.

Organizational reports:
The Alpaca Research Foundation (ARF) funded five new projects totaling approximately $87,290 for 2004-2005. They also contributed to three MAF projects including the alpaca genome project (mentioned above) and Dr.Geof Smith's study on omeprazole. Fundraising to date has resulted in receipt of approximately $72,000; additional amounts are pending. The ARF has also sent out an out-of-cycle request for proposals to investigate the prevalence of bovine viral diarrhea virus infection in alpacas.

A WVLA fundraiser resulted in ~$26,000 to add to their residual funds. At this time, no decision has been made regarding which projects to support. They will likely wait to see which MAF projects are selected for funding and what proposals are submitted to the WVLA.

This year GALA provided $8000 to support the omeprazole study.
LAMAS (Llama Association of the Middle Atlantic States) contributed $500 to the West Nile Virus study by Dr. Michelle Kutzler at Oregon State University, $500 to the *P. tenuis* study through MAF and $100 to the Jack Moore Memorial Fund at Ohio State University.
The Vermont and Maine state associations contributed $1,770 to the MAF program honoring veterinarians and supporting research at the same time. There is a total of $520 thus far in the Jack Moore Memorial Fund administered through the ILR.

Respectfully submitted,
Hilary Ware, Chair LMRG