The Alpaca Research Foundation (ARF) and the Peer Review Process

by Patricia Craven, PhD and Nancy Irlbeck, PhD

Stem cell research! The Human Genome Project! Suddenly, medical research, once the purview of scientists alone, has attracted the interest and passions of the American public. But what are the mechanisms which have been put in place to fund medical research in this country? And how are these procedures being utilized by the alpaca industry?

Somewhat less than half of all medical research conducted in the U.S.A. is federally-funded, with the remainder funded by private sources, most notably drug and biotech companies. Private research funding is subject to enormous problems related to conflict of interest, and often imposes severe restrictions on the ability of investigators to publish their findings in a timely fashion. Federal funding agencies such as the National Institutes of Health (NIH) and the National Science Foundation (NSF) adhere to a competitive peer review process for funding research projects.

The peer review process has been essential in providing us with the most spectacular advances in scientific knowledge ever imagined. When the Alpaca Registry, Inc. (ARI) established the Alpaca Research Foundation (ARF) in 1997, it was no accident that it adopted the peer review system and modeled it after federal funding agencies.

ARF accepts research proposals from investigators working all over the United States and around the world in the areas of health and husbandry, genetics, and fiber. Requests for proposals are sent out by ARF early in January to qualified investigators known to have an interest in alpaca research. Requests are also sent to Deans of Research at Veterinary Colleges and to graduate Departments of Animal Science and of Fiber and Textile Research.

Proposals received are evaluated by the ARF Board of Directors in April for a fall start date. Proposals are judged on the basis of: (a) significance to the alpaca industry; (b) scientific merit; (c) qualifications of the investigator; (d) resources available to perform the work; (e) feasibility of the project; (f) feasibility of the time line for its completion; and (g) appropriateness of the budget. Only the best proposals from the most highly-qualified investigators are approved for funding by ARF. Typically, only 30-50% of the proposals received are funded.

When evaluating a proposal for significance to the alpaca industry, we ask: "does the study address an important problem?" For example, a proposal to develop a vaccine for a disease that will only affect one small region, will not be given as high a priority as one that would affect the entire United States and the international community. Also of primary importance, investigators submitting a proposal and reviewers who evaluate proposals must have a firm grasp of the work that has been published previously so as not to fund work which is largely confirmatory or will only make a small advance on what is already known.

When evaluating scientific merit, we ask: (a) are the experiments properly designed to achieve the proposed objectives?; (b) are the methods to be employed state of the art?; and (c) are a sufficient number of animals included in each group in order to obtain statistically significant data?

The track record of the investigator and the resources that are available are important considerations. Has he or she successfully completed prior studies using the methodology which he or she is proposing to use? Is the equipment needed for the study available in the investigator's institution? Are personnel available to perform the work? In short, when evaluating a proposal, we look to see whether the investigator is going to "hit the ground running" once funds are awarded.

Feasibility of the project and of its time line are also crucial. It is no good proposing to do an ambitious study which will take five years to complete if funds are only available for one year. Has the investigator provided sufficient preliminary data?

Preliminary data demonstrates first of all that he or she is capable of doing the work, and secondly, that it is likely that if more data is obtained, the investigator will be able to answer the key questions posed in the study protocol.

The approval of the Institutional Animal Care and Use Committee (IACUC) at the investigator's institution is also essential. ARF will not issue research funds until IACUC approval of the study is obtained. The IACUC is responsible for making sure that animals are treated humanely and not subjected to unnecessary pain or stress. This is accomplished by annual protocol review and semi-annual inspections of all facilities where animal research is conducted and animals are housed. The sacrifice of animals for research is strongly discouraged by ARF.

ARF board members come from varied backgrounds and possess expertise in a variety of areas including medicine, disease/health, metabolism, nutrition, genetics, husbandry, and management. All of the current ARF board members are associated in some way with the alpaca industry whether as veterinarians who care for alpacas, owners and breeders of alpacas with expertise in research or medicine, or academicians with research interests in alpacas. Occasionally, the ARF board solicits the help of outside experts to review proposals. This collective expertise ensures that each proposal is evaluated by a qualified committee of the investigator's peers.

How, you may wonder, does the peer review process avoid becoming an "old boy network"? The answer lies in the very strict rules originally put in place by the federal government for federally-funded research and adhered to by ARF board members and other outside reviewers for ARF. Board members do not vote on proposals submitted by members of their own institution or by individuals with whom they have a close personal relationship. ARF board members are required to disclose on an annual basis all potential conflicts of interest which might in any way influence their judgement and to abstain from voting on any issue, including funding of a proposal, if a real or perceived conflict of interest exists. These procedures work exceptionally well in the review of federal grants and also work well for ARF.

A second issue which arises directly out of the nature of the peer review process is how are the rights of investigators to their intellectual property protected? Federal patent laws protect the rights of the investigator to intellectual property for a period of time. During that time, those of us who review proposals and oversee progress of the work are prohibited from discussing the research with anyone else. This is done to ensure that unpublished results do not make it into the hands of an investigator's competitor. Having said that, when submitting a proposal to ARF, investigators must provide a summary of their proposed work, which can be made public.

Moreover, ARF investigators are often invited to provide research updates to the alpaca community, typically in presentations at national meetings. The ARF board has adopted the policy that the investigator's final report must be made available to the alpaca community no later than a year after the funding period ends. Investigators who do not make the results of their work freely available to the alpaca community in a timely fashion cannot expect to compete for further ARF funding.

Once a study is completed, ARF investigators are strongly encouraged to publish the results of their work in a peer-reviewed journal as soon as possible. This is done so that other scientists can critically evaluate the results of the study and be given the opportunity to replicate it. If a research study is not published in sufficient detail so that it can be replicated, the results of that study cannot be relied on with any certainty.

Peer review of a manuscript submitted for publication is similar to peer review of a research proposal for funding, but differs in some respects. Analogous to the review of research proposals, manuscript review is completely confidential to protect the intellectual property rights of the author. Unlike peer-review of a proposal for funding, which is largely conducted by a relatively small number of people who sit on a review board, the editorial board of a peer-

reviewed journal draws on the expertise of a very large pool of scientists across the country and around the world to assist them with manuscript review. This is done to prevent the introduction of a bias into the journal. Usually two or three reviewers, who are experts in the field, are asked to review each manuscript. When reviewing a manuscript for publication, the reviewer asks: (a) does the study address a significant problem?; (b) is the methodology described in sufficient detail to allow someone else to reproduce the work?; and (c) do the results of the study support the conclusions drawn?

As you may have guessed by now, research scientists spend a significant portion of their professional lives reviewing the work of others. This is the essence of peer review. Scientists crave peer review to validate their work and have an obligation to assist in the critical evaluation of the work of others.

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The authors are members of the board of directors of ARF. For more information visit the ARF website at www.alpacaresearchfoundation.org.