

Role of Veterinary Pharmacologists in Academia in the 1990s

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Introduction

The topic to which I have been asked to address is the role of the academic veterinary pharmacologist in the 1990s. As will become evident, there are many approaches to this topic and I doubt that a consensus could ever be achieved. There are numerous needs for veterinary pharmacology, with limited financial and manpower resources available to meet them.

The previous speakers have addressed the role of veterinary pharmacologists in industry and the FDA. A major role of the academician is obviously to train individuals to meet these needs. However, who provides the funding to support this training? Is this the responsibility of the university or of the "consumer" of the university's product, the employer? With limited financial and personnel resources, does the individual faculty member follow the AAVPT's priorities or the individual university's strategic plan? Stated in another fashion, to whom does a faculty member owe loyalty; to the university or to one's discipline? These factors must be appreciated if the role of the pharmacologist envisioned by the AAVPT is ever to materialize.

The Academic Environment

An examination of any recent issue of the "Help Wanted" section of JAVMA would provide a fairly accurate job description of the "typical" pharmacology faculty position in a modern veterinary college. The applicant is expected to be involved in the teaching, research and service programs of the university and be capable of independently maintaining an extramurally funded research program which will train quality graduate students. Secondly, in most universities, there are only two to three bonified pharmacologists available to meet all of the needs of the discipline at that university. It is upon this stage that one must examine the role of the veterinary pharmacologist in the modern academic setting.

Most individual faculty members will tend to gravitate toward one of these primary missions at the

expense of the others. Depending on the university, administrative pressure will also exist to excel in a specific area. For a junior non-tenured faculty member, the focus of one's career will often be along the path with the greatest probability for achieving promotion. As a result of this pressure, most faculty members will concentrate efforts on teaching professional students, an inviolate institutional responsibility, and research. If the individual's primary appointment is in a clinical department (e.g. an ACVCP board certified individual?), then efforts will be focussed on teaching and service. It is my hypothesis that once when an individual elects to follow one of these paths early in a career, that major shifts in emphasis will not occur later. Therefore, if the role of the veterinary pharmacologist is to be changed to more adequately address the needs of industry or the FDA, then this must be accompanied by a program whose structure is consistent with achieving university standards for promotion and tenure.

Another reality of modern academic life is that faculty members engaged in research are usually expected to generate extramural funding to support ALL costs of doing research once seed money is exhausted. For many universities, this includes the costs of supplies, services (e.g. animal per diem, analytical and computer support), technical help, graduate student stipends and university indirect costs. These are the allowed costs which are awarded in typical NIH/NSF research grants and large industrial grants from human pharmaceutical companies. Unfortunately, except for the FDA Minor Species program and analytical methodology contracts, most veterinary pharmacology grant support does not begin to cover the real costs of doing the research. A significant portion must be cost-shared by the veterinary school in competition with other programs. In many cases, the established extramurally supported programs require cost sharing for the basis of the award and thus deplete the revenues available for supporting pure veterinary projects. At some institutions such as NCSU,

university supported graduate student stipends are only awarded to individual faculty whom can demonstrate stable research funding for the duration of the training program. This requires multi-year commitments. Thus, independent of the individual faculty member's desires or dedication to the field, it may be very difficult for a university to maintain a program in veterinary pharmacology without extramural support. This is due both to the money that the extramural grants bring in as well as to the leverage they provide in helping to justify and secure long term university program support. This is especially important when programs are reviewed by external expert panels whom often consider the level of extramural support as a primary indicator of program quality and peer acceptance.

The training of graduate students involves a similar commitment. It is this author's contention that a research program must first be established in order to provide a credible training environment. These concerns were fully defined and discussed in my paper at the Sixth Biennial AAVPT Symposium in Blacksburg.

With the establishment this year of the American College of Veterinary Clinical Pharmacology, the role of the veterinary pharmacologist in academia will be expanded. It is anticipated that a faculty member specializing in this discipline would have duties divided between teaching and clinical service, with the training of residents and clinical research being an integral part of the service component. In order to provide a credible training environment, the faculty member must provide sufficient case load and have funds to support the additional studies required for the resident to complete the training obligations. Some of this funding may be derived from income generated by the clinical pharmacology service itself. Ancillary programs must also be available in pharmacology, analytical chemistry and statistics to support this training program.

Another role of the academic veterinary pharmacologist is in continuing education at the university, local, state, national and international levels. This duty can become overwhelming and significantly impact on other scholarly activities. However, one could argue that this should be a primary role of an academician. The problem is that if a faculty member is to become and remain an "expert" in a field of scholarly endeavor, the person is required to attend and present at the meetings of the relevant discipline. This may typically involve

three to four different research forums depending on the field. As a personal example, my research area involves drug and xenobiotic transport through skin. In order to remain competitive in this field, I or my graduate students MUST attend toxicology, pharmaceutical science, and dermatology meetings in addition to special topic symposiums. When one adds to this attending AAVPT and AVMA meetings, how much time is there realistically left for continuing education without seriously sacrificing teaching, service or research activities?

Finally, added to these duties are service on various university committees and scholarly review activities. These include editorial board service, ad hoc manuscript reviews, as well as serving on peer-review and expert panels. Since many of these duties are similar to those of pharmacologists in industry and government, they will not be dealt with further.

The Changing Environment of the 1990's

The discussion up to this point has been focussed on the present role of veterinary pharmacology. How will this change in the new decade and beyond? Again, I must present this from a personal perspective and my guesses and interpretations are probably as good or as bad as anyone else. In veterinary medicine, a major force of change in educational objectives and methods are sweeping the veterinary schools in response to the strategic planning process initiated by the Pew Foundation. Additionally, the animal welfare movement and the introduction of products derived from biotechnology are forcing changes in the way veterinary pharmacology must perform. Earlier speakers addressed these latter events and thus I have only to underscore their potential impact. The full integration of computers into our curriculum is also upon us. The Pew initiatives have resulted in numerous program changes and a push toward a problem based approach to the veterinary curriculum. Finally, the veterinary profession is pushing toward an increasingly active role in comparative biomedical research, an emphasis which must be integrated with the needs of the veterinary profession. The first impact of this change is that additional time is required to fully adapt to and implement these initiatives. However, these changes are occurring in all three realms of the academic environment making the amount of effort required a significant fraction of ones activities.

The rapid advances in analytical methodology, computers and biotechnology have a unique impact on veterinary medicine because they add new products and techniques to the field without replacing existing drugs. For example, as quinoline antibiotics and bioactive peptides are introduced, sulfonamides continue to remain a primary therapeutic agent in food animals. The veterinary pharmacologist must learn the new techniques as well as keep abreast of the existing drugs in order to adequately teach the professional student. A similar situation occurs with keeping abreast of the regulatory environment and integrate these changes with paradigm shifts in human clinical pharmacology.

This latter dichotomy is especially pertinent. I am sure that one of the concerns and frustrations of my industrial and regulatory colleagues is that a primary responsibility of the academic sector should be to train veterinarians who are aware of and follow the legal guidelines of drug usage. A major component of this is the adherence to approved label guidelines, which leave little flexibility to the veterinarian prescribing the drug. One could argue that the whole practice of determining drug dosages using therapeutic drug monitoring (TDM) techniques violates the regulatory statutes and is only legal under the guidelines of the extralabel drug use policy. However, the current educational focus on veterinary pharmacology is based on a comparative approach in which the human species provides significant directions. The emphasis on problem solving further aggravates this situation. That is, most academicians would want to practice veterinary clinical pharmacology like it is practiced by our human colleagues. If one is doing active research in pharmacology, this is a necessity for continued survival. What does one do when these two approaches collide? Similarly, how does one tell a second year veterinary student that the same drug can be available as Rx or OTC preparations in veterinary medicine when such potent compounds are only available Rx in humans, despite the fact that concerns for residues are paramount to the food animal practitioner.

I believe that in order for veterinary pharmacology to remain a viable force in veterinary medicine, academic pharmacologists must be involved in the mainstream of research in these areas. First, actively contributing to these emerging technologies is the only way to fully keep abreast of them. If we are to train scientists capable of making contributions, they must be trained in a laboratory working and

contributing to this field. If we want to keep a veterinary orientation to this work, then funds must be available at the level necessary to train graduate students already possessing the DVM. The problem facing the academician is how to fund this endeavor.

Possible Directions and Solutions

Existing sources of long term federal and industrial support are not aimed toward veterinary pharmacology. Most program support from NIH and NSF are in specific disciplines (e.g. oncology, reproduction, gastrointestinal diseases, etc), a portion of which may involve comparative pharmacology. Once when an individual becomes active in these endeavors, the commitment becomes overwhelming and little time is left for veterinary pharmacology. The only solution to this problem is to develop industrial or federal programs aimed primarily at supporting basic research in veterinary pharmacology. If industry and regulatory agencies feel that the veterinary schools have lost their "veterinary" orientation, programs must be funded to allow faculty to concentrate all of their efforts in these areas. The FDA supported Minor Species Program is an example. Similar consortium agreements must be maintained and funded at a level commensurate with the typical NIH Program Grant.

Another approach is to establish regional Centers of Excellence as promoted by the Pew Process. Centers for basic and applied research in veterinary pharmacology would seem to be appropriate and would become the training centers for our future generation of graduate students and ACVCP diplomates. These could be meshed with a college's other areas of strength (e.g. infectious disease, toxicology, oncology) by focussing pharmacologic research into these disciplines. This latter approach would appear to be optimal since the investment in the program would be greatly leveraged by the other sources of support.

Summary

In conclusion, there is a great potential for veterinary pharmacologists to be active in all three sectors of professional involvement; industry, government and academia. The burden is placed on academia to respond to these needs and develop training programs which meet the needs of the "consuming" sectors; namely industry and the regulatory agencies. However, these programs must

mesh with the individual university's strengths and strategic goals, or be able to successfully compete with them for a limited source of funds.

The AAVPT is at a point in its growth when future directions must be defined. However, simultaneously a plan to identify resources to support these goals and aspirations must also be formulated. This is especially true if the College of Veterinary

Clinical Pharmacology is to remain viable. Understanding university administrators may commit faculty positions to this area, however, the burden of supporting the research and training programs must come from the outside. I challenge the AAVPT to respond to this challenge and formulate its own strategic plan for guiding the growth of the discipline of veterinary pharmacology into the 21st century.