Commentary

Animals for Biomedical Research

Biomedical research is escalating. New knowledge is being gained at an unprecedented rate, and innovations are being introduced into the clinical arena at an unheard of frequency. In nuclear medicine, for example, the last 10 years have witnessed the evolution of cardiovascular studies and the development of single photon and positron emission tomography. Monoclonal antibodies and other receptor-specific radiopharmaceuticals are beginning to be used to study the physiology and metabolism of several organs, including the brain, the most mysterious organ of all. Similar exciting changes have occurred in other areas of diagnostic imaging, including the introduction of real-time ultrasound, nuclear magnetic resonance imaging, and cardiovascular computed tomography. Parallel changes, such as organ transplants, in utero surgery, and the identification and treatment of metabolic disorders are occurring at a rapid rate in several other areas of clinical medicine. Over the past three decades, investigational laboratories and research institutes have been built and staffed in institutions across this country, so that currently there is no country that can match our capability for biomedical research at both fundamental and applied levels. As we reap the dividends of our 30-year investment in biomedical research, we should feel confident of continued success. So why are the times so unsettling?

Many changes are occurring in biomedical research. Of great potential significance is the decline in federal funding of the biomedical research effort, and the increasing infusion of research support from industry into the academic community. The effects of this funding shift on the autonomy of the research effort and the freedom to publish research results are impossible to foretell; probably they will be analyzable only retrospectively. Manpower shortages in certain areas of clinical research, including diagnostic imaging in general and nuclear medicine in particular, continue to be a problem that shows no sign of resolution in the near future.

Most individuals working in the biomedical research environment are conscious of the difficulties described above. They may not, however, be aware of the third problem surfacing rapidly in biomedical research—the potential unavailability of animals for biomedical research.

Over the years, animals have been absolutely essential to the research that has led to most of the breakthroughs in clinical medicine. Animal research has been critical to identification of the role of insulin in diabetes, the development of interventional angiography as a replacement for major surgery in cardiovascular disease, the manufacture of a variety of chemotherapeutic agents for cancer therapy, the surgical correction of pulmonary circulation in "blue babies," and countless other developments that have saved thousands of lives and improved the quality of life for several thousand more. In nuclear medicine, every new radiopharmaceutical and imaging technique is evaluated and improved extensively with animals before application to humans. One might even question whether nuclear medicine would have evolved as a major clinical specialty, had it not been for animal experimentation.

In certain research situations it is sometimes possible to replace animals by alternate experimental models such as tissue culture, mathematical algorithms, and computer programs. In most instances, however, animals are required because the alternate models do not provide the biologic complexity necessary to study the physiology of selected tissues and organ systems.

When animals are used, the researcher almost always appreciates the need for compassion not only for the sake of the animals, but also because the rules of the institution require it. Every institution engaged in animal research is required to abide by the provisions of the Animal Welfare Act passed by Congress in 1966. In addition, every institution receiving support from the National Institutes of Health is required to appoint an Animal Care and Use Committee to ensure the humane treatment of animals used in research. Most institutions participating in animal research are inspected periodically by the American Association for Accreditation of Laboratory Animal Care to verify compliance with procedures outlined in the *Guide for the Care and Use of Laboratory Animals* prepared by the Institute of Laboratory Animal Resources of the National Research Council.

On rare occasions, problems may arise with respect to the humane treatment of animals in a particular research laboratory. Invariably these problems are self-correcting by peer pressure from the experimenter's colleagues out of compassion for the animals and concern for the accreditation status of the institution. In most, if not all institutions, research animals are housed, fed, and cared for in a manner at least equal, if not superior to, the conditions in publicly-supported animal welfare shelters. It is from these shelters that most research animals are obtained.

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In spite of the many mandated and voluntary controls to ensure the humane treatment of research animals, efforts have arisen over the past couple of years to impede, if not altogether prevent, the use of animals in biomedical research. These efforts have been directed principally at the passage of local and state laws to prevent the transfer of animals from welfare shelters to research laboratories. These so-called "pound laws" have been introduced in many states, and several have been passed. The most restrictive law so far was passed in Massachusetts in 1983; in that state animals from in-state welfare shelters cannot be used in biomedical research, and beginning next year the law will be extended to out-of-state animal shelters as well. The Massachusetts law has been the prototype for pound laws introduced in many state legislatures over the past year; some of these were defeated, others were passed with a number of modifications, and several were held over to the next session of the legislature. The current status of pound-law legislation in any particular state can be obtained from the National Association for Biomedical Research, 1275 K Street, N.W., Suite 900, Washington, D.C. 20005.

It is ironic that the proponents of pound-law legislation accentuate the very problem they are trying to correct. Pound laws do not exclude animals from biomedical research; they only prevent the use of animals from welfare shelters. Researchers can continue their research, but animals have to be purchased from commercial suppliers at greatly increased cost.

When a pound law is enacted, what happens to the animals left at the welfare shelters that otherwise would be used in research? Since over 90% of shelter animals are euthanized, they are killed in all likelihood. Hence, pound laws increase the price of biomedical research and handicap its progress while at the same time increasing the number of animals killed. The logic of pound law legislation is difficult to fathom.

Recently, a new thrust to the animal rights movement has been provided by fringe elements that are referred to collectively as the Animal Liberation Front. These elements, working in a clandestine fashion and sheltered by more legitimate animal rights groups, have raided biomedical research laboratories and stolen animals, destroyed records, vandalized computers, and defaced laboratory property. They have also threatened institutional researchers, administrators and their families. These actions have caused a tightening of security measures at many research institutions at considerable cost and inconvenience to everyone, including biomedical researchers.

The animal rights movement is well-funded and appears to be gaining momentum across the country. The only effective counter-measure is the education of elected officials and the public about the necessity for continued use of animals in biomedical research. The individuals who can best provide this education are biomedical researchers working with the people who benefit most from the research, namely physicians and patients. Now would not be too early for these individuals within each state to develop an appropriate public educational program on the role of animals in biomedical research. Otherwise, we may find ourselves saddled with a series of laws that will seriously handicap continued progress in biomedical research.

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