Winn Celebrates Milestones in Feline Health

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Winn's impact on feline medicine over four decades has been undeniable. It all began at a time when so few were even paying attention to cat health research. Although cat owners and veterinarians may not realize it, everyone with a cat benefits in some way from research supported by Winn virtually every day. Winn's influence on advances in feline health has been broad and important; veterinarians today have a better understanding of most major feline diseases than they did 40 years ago.

Often, Winn's funding provided the seed money that enabled a small idea to grow into work that made fundamental changes to feline medicine. Many young researchers received their first grant funding from Winn, because the foundation realizes the importance of encouraging new researchers to take an interest in feline health problems. Winn-funded research ranges from basic science investigations to projects with immediate clinical impact.

This is a good time to take a look back at the cream of the crop—those projects that have made the most impact on feline health and well-being. Here is Winn's very own dozen best of the best.

CATS HAVE BLOOD GROUPS

In the 1960s, feline red blood cells were first recognized as belonging to at least two distinct groups, and the AB blood group system was named. However, it was not until the 1980s that significant investigation into feline blood types was carried out, and the importance of blood type in transfusion reactions and hemolytic disease of newborns (neonatal isoerythrolysis, also known as "fading kitten syndrome") was recognized. Urs Giger, PhD, DrMedVet, MS, FVH, DECVIM, DACVIM, and his colleagues at the University of Pennsylvania were the first to conduct surveys of feline blood types in the United States. They discovered that blood type A is the most prevalent, with the important exception of certain pedigreed breeds in which blood type B is very common. Giger also determined the inheritance pattern of feline blood groups and the mechanism of neonatal isoerythrolysis, making it possible to avoid fading kitten syndrome in newborn kittens at risk. Today, more than 20 years later, veterinarians and cat breeders understand the importance of feline blood types and know how to avoid potentially fatal transfusion reactions and also avoid neonatal isoerythrolysis (which results when kittens are born of parents with different blood types).

FELINE IMMUNODEFICIENCY VIRUS

Examples of lentiviruses, such as human immunodeficiency virus (HIV), were well known in primates, but the existence of a lentivirus that infects cats was not known until the mid-1980s. At that time, Niels Pedersen, DVM, PhD, Janet Yamamoto, PhD, and their colleagues at the University of California, Davis, identified a "T-lymphotropic virus" in a cattery in California that caused an immunodeficiency-like syndrome. The discovery was published in *Science* in February 1987. Later renamed feline immunodeficiency virus (FIV), it is now known as an important cause of illness in cats, with a worldwide distribution. Rapid in-clinic test kits to diagnose FIV infection are now commonly used. Immunologist Yamamoto was also instrumental in the development of the first FIV vaccine, released in 2002.

TAURINE AND FELINE HEALTH

While it has long been known that taurine is an essential amino acid in the feline diet and that taurine deficiency can lead to blindness from retinal damage, the role of taurine in heart health was not discovered until the 1980s. At that time, thousands of cats died every year from dilated cardiomyopathy (DCM), a disease characterized by an enlarged heart with poor muscle contractions. A team of researchers at the University of California, Davis, led by Paul Pion, DVM, DACVIM, discovered that most cases of DCM in cats were related to taurine-deficient diets. The initial research was published in the August 1987 issue of the premier journal *Science*. More published research followed that confirmed the original hypothesis, and eventually led to an increase in the amount of taurine pet food manufacturers incorporate into feline diets. Since that change was made, DCM has, thankfully, become a rare disease and the lives of many cats have been spared.

MEASURING BLOOD PRESSURE IN CATS

While non-invasive measurement of arterial blood pressure in cats was first described in the veterinary literature in the 1970s, it remained primarily a research tool and was not commonly used in clinical practice. In the late 1980s, interest in measuring feline blood pressure increased as associations between high blood pressure (hypertension) and both heart disease and kidney disease were recognized. Philip Fox, DVM, MSc, DACVIM, DECVIM, DACVECC, of the Animal Medical Center in New York showed in 1988 that blood pressure could easily be measured in cats with the correct blood pressure cuff sizes. Today, high blood pressure is diagnosed in about 20 percent of cats with chronic kidney disease using readily available equipment. Cats undergoing anesthesia also have their blood pressure monitored. Identification and treatment of hypertension in cats helps avoid serious consequences, such as loss of vision or stroke-like events. The lives of countless senior cats have been improved and extended by management of high blood pressure.

FELINE LEUKEMIA VIRUS

Identified in 1964, feline leukemia virus (FeLV) is now known to be one of the most important infectious causes of illness in cats worldwide. Since the 1960s, a great deal has been learned about the transmission of FeLV and the importance of testing to identify infected cats. Winn-funded researchers helped develop in-clinic tests that enable veterinarians to screen cats for FeLV in minutes. Testing and identification of infected cats is the cornerstone of disease control, and has enabled multi-cat facilities, such as catteries, to become FeLV-free.

EARLY-AGE ALTERING OF KITTENS

The traditional age to spay and neuter ("alter") cats is about six months of age, although it may be as late as one year of age in some countries. Unfortunately, many cats have at least one litter of kittens before they are altered, thereby contributing to the serious problem of homeless pets. In the early 1990s, Mark Bloomberg, DVM, MS, DACVS, and W. Preston Stubbs, DVM, DACVS, at the University of Florida, conducted the first health and behavior studies on kittens altered at seven weeks of age and compared them to kittens altered at seven months of age. Their work proved that earlier spay/neuter was safe and feasible, and formed the basis for further research that established the best anesthetic and surgical protocols for early-age altering. Since these first studies were published, other short-term and long-term studies have validated the safety of early-age altering, and have given shelters another tool to fight the needless deaths of homeless pets.

SAFE ADMINISTRATION OF ORAL MEDICATION

In 2000, David Twedt, DVM, DACVIM, and his colleagues at Colorado State University reported on serious inflammation and scarring of the esophagus of cats associated with oral administration of the antibiotic doxycycline in tablet or capsule form. Twedt's research confirmed that tablets or capsules given to cats may remain in the esophagus for more than five minutes—long enough for certain drugs such as doxycycline and clindamycin to cause esophageal damage. The simple act of giving a cat a drink of water or a small treat immediately after the pill or capsule to induce swallowing effectively ensures the medication reaches the stomach without lingering in the esophagus. These findings have changed the way oral tablets and capsules are given to cats, and have increased the desire of veterinarians and cat owners to find safer and more palatable ways of medicating cats.

DIABETES MELLITUS AND DIET

Diabetes mellitus results when the pancreas does not produce sufficient insulin for the body to properly convert glucose into energy, or the body is resistant to the effects of insulin. It is a commonly diagnosed disease in cats. For many years, the prevailing wisdom regarding nutrition for diabetic cats centered on the use of high-fiber diets, which are used for human and dogs with the disease, because fiber has been shown to minimize the impact of dietary carbohydrates on blood sugar. But researchers began to suspect that since cats are obligate carnivores, a low-carbohydrate/high-protein diet might be another approach for controlling diabetes in cats. In 2003, Deborah Greco, DVM, PhD, DACVIM, and her colleagues at Colorado State University found that for some diabetic cats, the high-protein diet can be an effective alternative. Studies using a canned high-protein/low-carbohydrate food with and without the starch blocker acarbose found the diet enabled many cats to discontinue insulin injections. Those who still needed insulin required a much lower dose. The use of high-protein/low-carbohydrate diets represents one of the most important recent advances in treating diabetes in cats.

FELINE ASTHMA TREATMENT

Feline asthma is a very common cause of lower respiratory tract disease. It can range from mild with intermittent signs to very severe with life-threatening consequences. Therapy for feline asthma has traditionally been based on oral bronchodilators and corticosteroids, as well as injectable corticosteroids. These medications sometimes have serious side effects. In addition, some owners find it quite difficult to administer oral medications to their cat. This results in inadequate dosing of medication and poor control of the asthma. Many people who suffer from asthma take their medications in an inhaled form. The ability to use metered dose inhalers in cats instead of oral or injectable medications reduces the risk of side effects, improves disease control, and provides a quick way to give medication to acutely and seriously ill cats in an emergency. However, no one had verified the efficacy of aerosolized medications in cats until Rhonda Schulman, DVM, DACVIM, and her colleagues at the University of Illinois, Urbana, found in 2004 that medication was indeed delivered to the lower airways in therapeutic doses. Their work revolutionized treatment, and today many asthmatic cats are medicated at home with metered dose inhalers using a facemask and spacer system designed specifically for cats.

POLYCYSTIC KIDNEY DISEASE

Polycystic kidney disease (PKD) is one of the most common inherited diseases in humans. It was first identified in Persian cats in the 1980s. David Biller, DVM, DACVR, of Kansas State University and Leslie Lyons, PhD, of the University of California, Davis, identified feline PKD as an autosomal dominant genetic trait. Their work described the pathology associated with the defect and enabled affected cats to be detected using ultrasound imaging of the kidneys. It soon became apparent that a large percentage of certain breeds of cats were affected by the disease, which causes chronic kidney failure. In 2004, Lyons and her colleagues identified a mutation in the feline PKD1 gene associated with the disease in cats. A DNA test is now available using a simple cheek swab that enables breeders to reduce the prevalence of the genetic mutation over time and produce kittens free of PKD.

HYPERTROPHIC CARDIOMYOPATHY

Cardiomyopathy means disease of the heart muscle, and today, hypertrophic cardiomyopathy (HCM) is the most common heart disease seen in cats of all types. Many cats live normal lives with HCM, but others will suffer devastating consequences such as heart failure and death. From the experiences of breeders and owners of many pedigreed cat breeds, it was suspected that HCM is familial in cats, as it often is in people. Mark Kittleson, DVM, PhD, DACVIM, and his colleagues at the University of California, Davis, determined that HCM is an autosomal dominant inherited disease in Maine Coon Cats, and established guidelines for diagnosis of HCM using ultrasound imaging of the heart. In 2004, Kathryn Meurs, DVM, PhD, DACVIM, and her colleagues at Washington State University, along with Kittleson and his colleagues, discovered the first genetic mutation causing HCM in Maine Coon Cats. In 2007, Meurs and her team discovered a different mutation causing HCM in Ragdoll cats. A simple DNA test using a cheek swab is now available for both breeds. Research in other cat breeds is ongoing, because it appears that there may be many different mutations causing HCM. Combined with ultrasound screening, the genetic tests enable breeders to produce healthy kittens free of HCM. Finding the genetic mutations that cause disease may one day open the door to improved treatments for cats afflicted with HCM.

FELINE INFECTIOUS PERITONITIS

One of the most enigmatic and heart-breaking diseases affecting cats, especially kittens, is feline infectious peritonitis (FIP). Although it is caused by a form of coronavirus, FIP defies the rules normally ascribed to infectious diseases. Winn-funded research over the past 15 years has been the basis of many of the important discoveries about the natural biology and pathology of feline coronavirus. Although definitive tests and effective treatments are still lacking, veterinarians now have a better understanding of how to diagnose and manage FIP in multi-cat environments. Winn has funded the best researchers and the most inventive coronavirus projects at institutions around the world, including the University of California, the University of Tennessee, the University of Milan, the University of Edinburgh, the University of Zurich, and Utrecht University. Through the Bria Fund for FIP Research, established in 2005, Winn is committed to future efforts to fully unravel the puzzle of FIP.