Unlocking the secrets of stem cells

BY: KELLY DIEHL, DVM, MS, ACVIM

Stem cells show remarkable potential as treatments for a variety of disorders from orthopedic injuries to organ regeneration, but we still need to answer many questions to unlock the full potential of these biological superheroes. How do we best harvest and culture stem cells? How can stem cells be used to treat disease? Which diseases might respond best to stem-cell therapy?

Stem cells fall into two broad categories: embryonic stem cells and adult mesenchymal stem cells. Adult mesenchymal stem cells are used extensively in veterinary medicine. These cells have the ability to differentiate into many different tissue types, such as heart cells, nerve cells and blood cells. Adult mesenchymal stem cells can be harvested from a variety of tissues. For veterinary purposes they are harvested from fat tissue or bone marrow. The harvested cells are sent to specialized laboratories that take the tissue, isolate the stem cells, and place them in culture media. Once the cells have multiplied several times, they are collected and injected back into the patient from whom they were harvested.

While scientists are constantly discovering new uses for stem cells, the mechanics of how stem cells actually work is not completely understood. Research suggests stem cells can differentiate into almost any cell type and replace damaged or lost cells. Stem cells also have anti-inflammatory properties mediated by the substances they release, like interferons.

An exploding field of study involves cancer stem cells or tumor-initiating cells. These newly discovered cells possess characteristics of classic stem cells, and are suspected to be important players in tumor growth and spread. Morris Animal Foundation has recently invested in groundbreaking studies examining the behavior of feline and canine cancer stem cells. The goal of these studies is to discover new cancer treatments targeted at these unique but poorly understood cells.

In veterinary medicine, stem cells commonly are used to treat orthopedic problems in horses and dogs. Morris Animal Foundation has several ongoing research projects focused on optimizing stem cell use in the treatment of orthopedic problems in these species, including tendonitis in horses and cruciate ligament rupture in dogs. Morris Animal Foundation also has funded studies looking at stem cells to treat chronic kidney disease and asthma in cats. The foundation is even funding a study looking at a stem-cell based cancer therapy in Tasmanian devils!

Although more research is needed, stem-cell based therapies hold promise for a wide range of diseases affecting all animal species. Morris Animal Foundation is proud to be at the forefront of animal-focused, stem-cell research, emphasizing our commitment to investing in the best research by the most talented scientists in the world.
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Your gifts at work

For the past 67 years, Morris Animal Foundation has been a global leader in funding studies to advance animal health. Without the help of generous donors like you, we could not fulfill our mission to improve the health of cats, dogs, horses and wildlife around the world.

Drug shows promise for oral cancer in cats

Feline oral squamous cell carcinoma (FOSCC) is the most common oral cancer in cats. Even with early detection and treatment, survival time of cats with FOSCC is short, highlighting the need to find improved strategies for this aggressive cancer. Researchers from Oregon State University tested the targeted anticancer agent dasatinib on FOSCC cell lines and found that the drug suppressed replication and spread of FOSCC cells and interrupted the cell signaling circuits that promote cancer growth. This encouraging data shows that dasatinib warrants further study as a potential treatment for oral cancer in cats.

Genetics, bladder stones and miniature schnauzers

Although some types of bladder stones in dogs can be dissolved with dietary therapy, calcium oxalate stones don’t respond to this type of treatment. Even after removal, calcium oxalate stones have a high rate of recurrence. Researchers from the University of Minnesota identified a genetic mutation that is strongly associated with calcium oxalate bladder stone formation in miniature schnauzers—a breed that is 10 to 20 times more likely to develop this condition. This finding is a critical step toward developing a genetic screening test that could provide early disease risk identification. The researchers also confirmed that dogs that form calcium oxalate stones have higher urinary calcium levels than stone-free control dogs. This suggests that treatments aimed at lowering urinary calcium levels could help prevent stone development in high-risk dogs.

Not all stem cells are alike

Regenerative therapies, such as stem cell therapy, are novel ways to address equine orthopedic problems, including tendon injuries. However, little is known about which stem cell types are optimal and how best to prepare stem cells for treatment. In an attempt to answer these questions, researchers from Virginia Polytechnic Institute and State University designed an artificial tissue-engineering device that mimics tendon injury and tendon rehabilitation in a laboratory setting. The team is using this new modeling system to study stem cells isolated from tendon, bone marrow and fat cells. Results will help identify which stem cell type is the best for treating equine tendon injuries as well as determine which culture conditions promote stem-cell tendon formation for effective therapies.

New tuberculosis test helps reduce disease impact in elephants

Tuberculosis (TB) is a highly infectious bacterial disease and major emerging health concern for Asian and African elephants. The current gold standard for diagnosing TB in elephants is culturing nasal samples from suspect cases. However, this method can take up to eight weeks for results and has poor sensitivity, meaning that the test does not do a good job at finding TB even when it is present. Researchers from Colorado State University developed a new, rapid screening test with an internal control to monitor for false negative samples. This new test provides earlier and confident TB diagnosis so that isolation practices or antibiotic therapy can be initiated sooner—reducing the risk of disease spread to other elephants as well as other species, including humans.
This past spring, veterinarians had to take swift action to respond to another respiratory disease outbreak in the thick forests of Africa. Fewer than 900 mountain gorillas live in two isolated populations in Africa—one in Uganda’s Bwindi Impenetrable National Forest and one in the Virunga Conservation Area, which spans the borders of Rwanda, Uganda and the Democratic Republic of the Congo. For these mammals, even mild respiratory diseases if left untreated can turn into severe pneumonia, a concerning scenario particularly for a species already under threat from extinction.

Gorillas are highly social animals, living in close-knit families ranging from 5 to 55 individuals. We’ve all experienced how fast a cold can spread through a school classroom or workplace. A similar situation occurs with mountain gorillas. Increased human contact, including park personnel who provide “in the wild” veterinary care for the gorillas, also raises concerns about the risk of transmission of airborne pathogens between species.

One such group of pathogens is paramyxoviruses, including metapneumovirus and respiratory syncytial virus—common human viruses that cause respiratory tract infections and can survive unchanged as an aerosol, leftover from a cough, for up to three hours. Researchers believe these same viruses could be a health concern for wild gorillas.

Morris Animal Foundation responded to this concern by supporting the research and training of Dr. Laurie Harris of the University of California, Davis. Dr. Harris and her team explored the causes and potential routes of transmission of respiratory illness in mountain gorillas, as well as risk factors associated with disease spread.

The team compared viruses found in mountain gorillas with viruses found in humans and golden monkeys, looking for potential pathogen spillover among species. Initial results found evidence of pathogen transmission between humans and gorillas. Researchers also identified environmental and family group social dynamics associated with the development of respiratory illness in gorillas.

Respiratory disease is a leading cause of death in gorillas. Results of Dr. Harris’s study will help improve disease prevention and management strategies to protect the mountain gorillas, especially in conservation areas where humans and wildlife come into regular contact with each other.

Join us on Facebook at www.facebook.com/morrisanimal.
Pet lovers worldwide Unite to Fight Pet Cancer!

BY: LESLIE HANSEN AND KELLY DIEHL, DVM, MS, ACVIM

In the past three months, during our Unite to Fight Pet Cancer campaign, we’ve heard from so many of you that pet cancer is personal, and you’ve risen to the occasion.

Not only were we able to realize a $50,000 matching gift from the Blue Buffalo Company, but we were able to share life-saving resources with thousands of pet lovers through our Pet Cancer checklist. And, nearly 300 animal lovers from around the world strapped on their virtual walking shoes and participated in Morris Animal Foundation’s second annual Unite to Fight Pet Cancer Virtual Walk. The picture below shows some of our staff participating, too!

“We really appreciate everyone’s support in our fight against pet cancer,” said Kate O’Brien, director of events, Morris Animal Foundation. “It’s truly amazing to see people from all over the country—from all over the world, really—come together, creating a virtual community united to make a difference in the lives of pets. It’s inspiring.”

Participants came from across the United States, and from around the world including France and Canada. This year’s top fundraising team was the Golden Retriever Lifetime Study volunteer team, coming in strong with $11,625 dollars raised. Runners-up were the home team, Morris Animal Foundation’s own Liz Nahon ($2,524), followed by Lynn Stark ($1,925), Elizabeth Bernstein ($1,645), and Jennifer McFarling ($1,634). (Be sure to check out Liz Nahon’s testimonial about why this cause is so important to her on the next page).

Our efforts in the area of pet cancer and other critical animal health areas will continue all year long.

Cancer doesn’t have to take the pets we love. That is a belief that we all share. We couldn’t do it without you. Your kindness, generosity and love of animals makes what we do possible. +

Thank you for taking a stand against pet cancer.
Liz’s testimonial: 
**What walking means to me**

Sunday was a truly beautiful day here in Denver. With her harness on and bright orange bandana ready to show off, Peanut took to the neighborhood streets where she proudly drew the attention of several onlookers who wanted to know, “What does that bandana mean?”

My husband, Josh, Peanut and I were excited to explain to everyone exactly what we were doing—we were fighting pet cancer!

Thanks to the support of our friends and family, we raised more than $2,500, which will help ensure that Morris Animal Foundation has the support needed to fund the most critical science needed to improve animal health.

After quite a long walk in the 90 degree weather, Josh and I decided it was time to retreat back to the house. As we headed to the front door and we prepared to go inside, I stopped and looked at Peanut, panting in the breeze. I thought to myself how wonderfully lucky we are. I thought to myself how many other loving families aren’t as lucky as us and lose their furry family members way too soon. I was so glad that we were able to do something together to fight back against pet cancer.

Josh and I hugged Peanut tight and we thanked her for being such a trooper in the hot weather and we thought of the hundreds of other pet lovers around the country who also took their animals for a walk to raise awareness for this very deserving cause.

Because of them, fewer families will feel the pain of losing their furry family member to pet cancer.

“It’s truly amazing to see people from all over the country—from all over the world, really—come together, creating a virtual community united to make a difference in the lives of pets. It’s inspiring.”
When people first enrolled their dogs in the Morris Animal Foundation Golden Retriever Lifetime Study (the largest observational study ever conducted in dogs), they knew they would have to fill out an annual questionnaire. At 200 questions, the questionnaire is detailed, but each question serves a purpose.

Sometimes the questions are straightforward, and sometimes they’re slightly unconventional, which might make you wonder. For example, owners are asked about their dog’s swimming habits; specifically, how often does your dog go swimming in warm weather? In cold weather? For swimming, ambient air temperature is needed to calculate how much energy your dog is using.

Health habits, such as exercise, are an important study variable. Getting precise measurements on energy output as it relates to health is one piece of the giant puzzle of interlocking factors that could influence cancer development.

Another important study variable is diet. The questionnaire section on diet and feeding practices is 23 pages long. The questions on feeding practices are detailed. Owners aren’t just asked if they give their dogs vegetables as part of their diet, owners are asked what vegetables they give, the frequency, the amount, the source and the preparation (raw? steamed? microwaved?). The questions cover everything from types of treats given to how many people in a given household are feeding the dog on a regular basis. It’s easy to stack up snacks when more than one person is giving treats!

The influence of diet on cancer development is an unanswered question not just in dogs but in all species, including humans. The diet data gathered in the study will help researchers look for potential patterns or associations between feeding habits, cancer and other health concerns.

Since the effect of the environment on health also is a major study focus, it isn’t surprising that the questionnaire contains many questions on home living conditions. For example, owners must give a detailed description of all fuel sources used for cooking and heating in the household. This group of questions is to see if any trends emerge between cancer risk and exposures to particulates generated by different fuels.

As our study participants, both veterinary and pet parents, sit down every year to fill out their questionnaires, the details they provide will have a significant impact on cancer treatment and prevention not just in golden retrievers, but in all breeds of dogs and across multiple species, including humans.

Thank you to our Loyal Friends, Aerie and Linda!

When Aerie Day and his wife, Linda McCormick, learned about the Golden Retriever Lifetime Study at Morris Animal Foundation, deciding to enroll their golden retrievers, Zoeey and Beka, was an easy decision. “For us it was a no-brainer. We were on board immediately,” said Aerie.

But it was a visit to North Carolina State University’s College of Veterinary Medicine and seeing the impact of Morris Animal Foundation’s support first-hand that compelled the couple to get even more involved.

“I realized the importance of the work being done both on a research and medical level,” said Aerie. “Also, I was shocked at the level of funding needed to support studies critical to the advancement of veterinary medicine.

We immediately began our monthly support of the foundation.”

Aerie, Linda and more than 250 Loyal Friend monthly donors to Morris Animal Foundation make possible the critical funding needed to make an impact on animal health. Be sure to select the Loyal Friends monthly giving option when mailing in your gift today! Or, go online to www.morrisanimalfoundation.org/monthly-giving. You also can call us directly at 1-800-243-2345 and we’ll be happy to assist you in setting up your monthly donation.
National Pet Memorial Day – honoring our animal family members

By: Carol Borchert

When a friend or family member, or even ourselves, loses a companion animal to age or illness, we want to be able to say the right thing, and to do the right thing. We want to honor and acknowledge the loss in a way that recognizes grief while ensuring remembrance. National Pet Memorial Day, held this year on Sept. 13, is one opportunity for Americans across the country to join together in remembrance of our beloved pets. But there are many ways we can memorialize a beloved pet, to bring joy from grief, and happy memories from loss.

Pictures

Pictures are a great and easy way to memorialize a pet. You can frame individual photos, make a scrapbook, or create an online album to capture wonderful times. Small photo books make a thoughtful gift to a friend or family member who is grieving the loss of a pet.

Plant a tree

Many of us have rich memories of walking our dogs through parks and forests, and can bring to life in our minds the pure delight our dogs (or our cats) took in being outdoors. Planting a tree in honor of a lost companion animal leaves a living legacy to the memory of your pet.

Create a memory box

A memory box may hold your pet’s special toys, collar, leash, water bowl, or any other item your pet coveted. You also can create a shadow box to hang on the wall with your pet’s collar, photos, training certificates and other small keepsakes. This is a great project for kids, too.

Painting

Many artists will create paintings of your companion animal from a photo. These beautiful, artistic creations can capture your pet’s personality in a different way.

Videos

Edit down a few minutes of video to create a lively tribute to your pet. It’s a fun way to capture their “voice,” how they move, and their play with others.

Contribute to a charitable organization

At Morris Animal Foundation, our memorial card program provides an easy and thoughtful way to memorialize a beloved pet while supporting science that advances animal health. It’s another way to create a living legacy in your pet’s name. A memorial card also is a heartfelt way to reach out to a friend or family member who has lost a pet.

We can remember our pets in so many ways, but mostly we remember them in our hearts. On National Pet Memorial Day, we come together as animal lovers across the nation to remember those we have loved and lost, and those memories we want to last.

If you would like to learn more about the Morris Animal Foundation memorial card program, visit http://www.morrisanimalfoundation.org/ways-to-donate/memorial-gifts.html. You also can call us directly at 1-800-243-2345 and we will be happy to assist you in sending your memorial card today.
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PLEASE CALL YOUR VETERINARIAN TO ASK PET HEALTH QUESTIONS.

Our staff is unable to provide veterinary medical advice. The opinions of study investigators may not necessarily be those of your companion animal’s veterinarian.

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MAKE YOUR GIFT COUNT, EVEN MORE!
Did you know that many employers will match tax-deductible charitable contributions made by their employees to nonprofit organizations, including Morris Animal Foundation? This is an easy way to make an even greater impact for a very deserving cause. Be sure to ask your human resources department for a giving form and please include Morris Animal Foundation’s EIN #84-6032307.

UPCOMING EVENTS

PetSafe Black Tie and Tails Gala • Knoxville, TN • August 8
3,000 Strong Celebration • Denver, CO • September 18-21
Indy K9 Cancer Walk • Indianapolis, IN • September 20
Elk Grove K9 Cancer Walk • Elk Grove, CA • October 11

For more information or to register, please visit www.morrisanimalfoundation.org/events or call 800.243.2345.

For the love of all dogs!

BY: ROXANNE DAVIS AND JEAN VORE

Morris Animal Foundation’s approach to canine health is investing in diseases and health conditions that have a broad impact on a wide-range of breeds. Sometimes specific high-risk breeds are highlighted in our health research, especially in genetic studies, with the hope that findings will eventually help other breeds.

Thank you to all the wonderful breed organizations that support Morris Animal Foundation. As a national organization, the Foundation has relied on these powerful groups and associations to be the grassroots network that shares the message and spreads the word about advances being made in veterinary medicine through funded studies.

Breed Organizations Support Spotlight:

The Australian Shepherd Health & Genetics Institute

The Australian Shepherd Health & Genetics Institute is dedicated to providing breed health information to people with Aussies as well as supporting the best research focused on our breed’s health issues. For a number of years we have partnered with Morris Animal Foundation to sponsor top-flight research. The foundation has an astounding team of scientific reviewers and an exacting grant approval process designed to identify quality science with the potential to produce real benefits for companion animals and wildlife.

C.A. Sharp, President
Australian Shepherd Health & Genetics Institute, Inc.

The Newfoundland Club of America Charitable Trust

The Newfoundland Club of America Charitable Trust is very proud to be a partner with Morris Animal Foundation. Being a partner in research is a key to advancing the health of future generations of Newfoundlanders by developing a better understanding of disease processes and genetic inheritance. Morris Animal Foundation has an excellent network of researchers and financial resources to aid in animal research. The donors to the NCA Charitable Trust and our NCA members are committed to advancing the health of our Newfoundlanders, and through collaboration with Morris Animal Foundation we are able to accomplish that goal.

Clyde E. Dunphy, DVM
NCA Trust Board Chairman

Thank you to all the wonderful breed organizations that support Morris Animal Foundation.
Special animals that have touched their families’ lives

The pets in this section were honored through qualifying donations made between March 16, 2015, through June 15, 2015. These gifts will be used to invest in science that creates a brighter world for animals.

With your gift of $200 or more per pet, you can include a special pet in the “In loving memory” section of AnimalNEWS. We will do our best to include the pet’s photo when you send it along with your donation.

For donations of $500 or more, the pet’s name and family name will be added to our Pet Memorial Wall located in Morris Animal Foundation’s Denver headquarters. We will also send a special commemorative keepsake to the family.

For more information about tribute options, or to make your gift, visit the “Ways to Donate” section of our website, morrisanimalfoundation.org, and click on Memorial and Honor Gifts, or use the envelope included in AnimalNEWS.

In loving memory
At Morris Animal Foundation, we understand the love between people and their pets and the significance of losing these wonderful companions.

Pets are part of our families, and this section honors the special animals that have touched their families’ lives.

FALL 2015