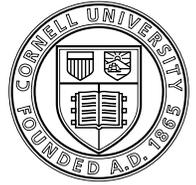


Cat Watch

April 2021 - Vol. 25, No. 4



Expert information on medicine, behavior, and health in collaboration with a world leader in veterinary medicine

THIS JUST IN

Facial Expressions

The shape of a cat's face may cloud communication efforts

Researchers in the United Kingdom devised a study to look at the impacts of human selection and animal breeding on animals' abilities to communicate via facial expressions. They used an analytical technique to understand the impact of breed variation on facial landmarks, such as for those expressing pain.

The researchers found that cats with brachycephalic faces appeared to display more "pain-like" expressions, even though these flat-faced cats were not considered to be in pain. The researchers found this particularly true for Scottish Folds, whose facial features scored higher for pain-like expressions even when compared to domestic shorthair cats that were actually in pain.

There was considerable overlap between pain scores in the domestic shorthair cats "pain" population and the neutral faces of other breeds. This suggests that pain may be more difficult to appreciate via facial expressions in some cats, including Scottish Folds and brachycephalic breeds. ■

Front. Vet. Sci.,
21 December
2020, <https://doi.org/10.3389/fvets.2020.606848>



Toxic Aflatoxin-Producing Mold

It grows on grains, which can end up in pet food

Aflatoxins are produced by the mold *Aspergillus flavus*, which can grow on corn, peanuts, and other grains. Those infected grains can end up in your pet's food, despite even good manufacturer screening processes.

At high levels, aflatoxins can cause illness, liver damage, and death. You will rarely see evidence of aflatoxins on your pet's food, but it can accumulate, especially in a pet eating the same food for a long time. If they're present in large amounts, your pet can become acutely ill.

Initial signs of aflatoxin poisoning include lethargy, loss of appetite, vomiting, jaundice (yellowish tint to the eyes, gums, and/or skin due to liver damage), unexplained bruising or bleeding, and/or diarrhea. In some cases, aflatoxins can affect blood clotting (which leads to the bruising and bleeding) and cause long-term liver problems and/or death.

When you bring your cat into the vet clinic, if your veterinarian suspects aflatoxin poisoning, he or she will ask you to bring in a sample of your pet's food. The sample will be sent off for testing, and symptomatic treatment for your pet will start right away. You should be able to supply your veterinarian with a complete history and listing of all foods and treats your pet has eaten. Obviously, stop feeding any potentially affected foods right away.

Often only certain lots will be affected (this is one of the reasons it is important to keep the information from a bag of dry food that has the lot number on it). Providing this information can lead to a recall of involved products.

There is no antidote for aflatoxin poisoning, but your veterinarian will start your cat on liver-support medications. The FDA warns that extremely severe or rapid-onset cases of aflatoxin poisoning may progress so quickly that the pet dies before receiving any treatment. Pets exposed to non-lethal doses of aflatoxin over time may survive, but can have long-term health problems, such as liver injury.

You can sign up for FDA alerts that affect animal and veterinary health at [fda.gov/about-fda/contact-fda/get-email-updates](https://www.fda.gov/about-fda/contact-fda/get-email-updates). ■

Cat food ingredients are screened for aflatoxins and other contaminants, but aflatoxin can be difficult to detect at its initial stages and may therefore slip into a batch of food, undetected.



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Study Tests for Antibiotic Resistance

Results could redefine urinary tract infection treatments

A recent study from Kansas State University looked at the concentration of a common antibiotic in the urine of cats after it was given by mouth. The study gave 11 cats three doses of 62.5 mg amoxicillin/clavulanate 12 hours apart. Urine samples were then collected when the cat voided, if possible. If any cat didn't provide three urine samples by 24 hours post treatment, a sample was taken by cystocentesis (the passage of a small needle through the abdominal wall into the bladder to collect a urine sample, a safe procedure that is commonly used in veterinary medicine). The feline volunteers were then put up for adoption.

The urine was tested to determine whether the drug concentration reached recommended levels to neutralize *E. coli*, a bacterium that is responsible for many cases of feline urinary tract infections (UTI). In all cases, the antibiotic concentration in the urine reached this minimum level. These results may alter the current guidelines for the testing of bacterial sensitivity (i.e., ability of an antibiotic to neutralize bacteria) in the urine of cats with UTI.

A weakness of the study is that these were all healthy cats. More research is needed to determine whether these urinary drug concentrations are found in cats with naturally occurring urinary tract infections after oral dosing. ■

<https://onlinelibrary.wiley.com/doi/10.1111/jvim.15991>



New Drug Uses Monoclonal Antibodies

Initial research shows frunevetmab may treat arthritis pain

Finding reasonable and effective treatments for arthritic pain is an important area of research for good reason. Between 60 to 90% of cats show osteoarthritic changes on radiographs, and 40% show clinical symptoms of osteoarthritic pain at some point in their lives. This pain is not just due to inflammation, but to a multitude of factors involving nerves and joints.

Pain acts locally via neurogenic inflammation. But it also has systemic effects, including cognitive ones, explained Duncan Lascelles BSc, BVSc, PhD, Professor of Translational Pain Research and Management at North Carolina State University, in a VetGirl seminar. His research is looking at creating monoclonal antibodies against nerve growth factor (NGF). Damaged tissue increases NGF production, which, in turn, attracts inflammatory cells.

Monoclonal antibodies against something like NGF are species specific. For cats, the current version is frunevetmab, a felinized monoclonal antibody. Studies have shown that one injection of these compounds leads to an improvement in comfort and mobility for at least eight weeks. While more studies need to be done, early research suggests that arthritic cats do better on frunevetmab than on non-steroidal anti-inflammatory (NSAIDs), which have been the mainstay drugs for osteoarthritis.

Use of monoclonal antibodies against NGF has shown side effects in humans. ■

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Welcoming a Rescue Cat

Gradual introductions make for happy cats

Watching your new rescue cat, or a stray you brought into your home, blossom and become part of your family is rewarding. With proper care and attention, your new kitty will quickly feel welcomed and loved. But if you already have one or more cats, each addition should be considered carefully.

Cats are territorial, and adding a new cat will change the feline dynamics in your home. To prevent fights and more stress, give the cats time to get acclimated to each other before the newcomer is allowed free rein in the house.

Create a Home Base

“Introducing a rescue cat to your other cat(s) should be done carefully to avoid any aggression,” says Pamela J. Perry, DVM, PhD, ACVB, behavior resident at Cornell’s College of Veterinary Medicine. “I typically recommend confining one of the cats—usually the newcomer—to a room supplied with all necessary resources (food and water dishes, litter boxes, resting areas, perches, toys, etc.) for the first two weeks.”

This allows your new cat to get used to the sights, smells, and sounds of your home while you start bonding. Spend some time in his room each day interacting with him according to his comfort level. A bold cat might enjoy play and petting from the start. A shy cat may need time to settle in before he wants to be handled, but you can start by sitting near and talking to him.

Your cats can start getting familiar with each other before they can interact directly. “During this time, the owner can exchange odors and pheromones by rubbing the cheek of each cat with a separate cloth and giving the cloth to the other cat to investigate,” says Dr. Perry. “Owners should watch for any aggression or fear reactions during this exchange.”

As the new cat settles in, you can try swapping the cats’ locations to allow the newcomer time to explore the house and your other cat(s) a chance to sniff all the stuff in his room.

Mealtime

Everyone loves food! Dr. Perry has

Don’t Forget!

Your new cat should be tested for feline leukemia (FeLV) and feline immunodeficiency virus (FIV) before you let him interact with other cats.

advice to use food to help smooth over introductions. She says, “The cats can be fed on opposite sides of the door to the confinement room at a distance that allows both cats to remain calm enough to eat. Then every couple of days, the dishes should be moved closer to the door. This allows each cat to acclimate to the presence of the other while teaching them to associate each other with something pleasurable, like eating.”

Supervised Free Time

After the two-week acclimation period, you can start allowing both cats to roam freely together. Start out by only letting them interact when you are around to supervise. Watch for signs of stress or aggression. You may need to make adjustments to litterbox and food/water bowl locations once all of the cats are intermingling.

Considerations for Kittens

“Kittens are much more playful than adult cats, which may bother an older cat,” cautions Dr. Perry. Your cat may not find the new little urchin’s antics as adorable as you do.

“It is particularly important to provide the kitten with ample outlets for play behavior. Select toys that flutter, bounce, or move erratically to encourage the kitten to stalk, chase, and pounce on them. Rotate the toys every few days to maintain interest in them,” says Dr. Perry. Providing plenty of play time for your new kitten will both keep him mentally stimulated and tire him out, making him less likely to bother your older cats.

Make sure that your older cat can get away from the kitten if she needs to. She should be able to eat and sleep in peace. After playtime, the kitten can be put in a time out in his confinement room or a large dog crate set up with everything he needs. This will give your other cat a much-needed break.

Taking your time introducing a new rescue cat to your other cats can be inconvenient at first, but it is well worth it to have a smooth, calm transition period. With patience, everyone can meet on their own terms and live in harmony. ■



Remember, your new cat isn't sure who you are. Give her time to settle in. Sit near her, talk with her, but allow her to make the approach.

Andrew Deer / iStock Photos

Living With Lymphoma

Therapies can add months to years of quality life

Lymphoma is cancer of the lymphocytes, a type of white blood cell that produces antibodies and protects your cat from infections. When lymphocytes become cancerous and start dividing out of control, they can go rogue and start to destroy normal tissues too. This is the most common type of cancer in cats, responsible for about 30% of all cancer cases.

Fortunately, lymphoma usually responds well to chemotherapy, which can get your cat back to feeling like her normal self. While many people fear chemotherapy, worrying about side effects, cats seem to tolerate chemotherapy much better than humans do. They rarely experience the nausea, poor appetite, and malaise that some people associate with chemotherapy.

The Lymphatic System

The lymphatic system is a network of vessels and tissues that stretches throughout your cat's entire body. In addition to the lymph nodes and thymus gland, lymph tissue is found in the spleen, liver, heart, kidneys, and bone marrow. The lymph system delivers nutrients to the body, transports wastes and cellular debris, absorbs fat from the intestinal tract, and processes and removes infectious agents.

Lymphocytes often hang out in lymph nodes and the thymus, but also circulate throughout the body via the lymphatic vessels and the bloodstream.

Types of Feline Lymphoma

Lymphoma can show up anywhere. Because lymphocytes can travel through the blood and lymph vessels, lymphoma is considered a systemic disease even if problems are only being observed in one part of the body. Common symptoms include weight loss, poor appetite, and lethargy, but exact symptoms and potential outcome vary based on the primary location of the cancer.

Intestinal or alimentary lymphoma is responsible for 50 to 70% of cases. It often appears in older cats, and exposure to tobacco smoke is a risk factor. Affected cats usually show GI signs such as weight loss, diarrhea, and vomiting. Some cats have a decreased appetite, while others show an increased appetite or no change. Infection with feline leukemia virus (FeLV) or feline immunodeficiency virus (FIV) can be risk factors.

Other types of lymphoma include:

Mediastinal lymphoma: FeLV is strongly linked to this type of lymphoma, and 80% of cats with it are FeLV positive. Found in the cat's chest, it was once the most common type of lymphoma in cats, but increased education about FeLV and vaccinations have drastically reduced the incidence of mediastinal lymphoma. This variation typically shows up in cats under 5 years old, and affected cats may have trouble breathing due to fluid buildup in the chest or may vomit frequently.

Renal lymphoma: Affected cats show signs of kidney failure such as

weight loss, decreased appetite, increased thirst, and vomiting. The kidneys will often become enlarged. FeLV is a risk factor, and 50% of affected cats are FeLV positive. Renal lymphoma often spreads to the central nervous system and brain, which can result in neurological signs like stumbling, walking in circles, or seizures.

Nasal lymphoma: Cats with lymphoma in their nose often have swelling in their muzzle and face, discharge from the nose, and frequent sneezing. Nasal lymphoma is unique in that it sometimes is completely localized to the one area.

Multicentric lymphoma: In this cancer, lymph nodes throughout the body are affected. You may notice that your cat's lymph nodes are enlarged when you pet her. Common lymph nodes that owners notice are on the neck under the chin, in front of the shoulder blade, in the armpits, in the groin, and behind the stifles (knees). FeLV and FIV can both predispose cats to this type of lymphoma.

Diagnosis

Because of the nonspecific signs that often come with lymphoma, your veterinarian will start by doing a general workup to look for clues to what is causing your cat's symptoms. This may include a complete blood count (CBC), chemistry panel, FIV/FeLV test, urinalysis, radiographs (x-rays), and/or an abdominal or thoracic ultrasound.

Once your veterinarian has identified either a tumor or suspicious lymph nodes, she will likely recommend a biopsy or fine needle aspirate (FNA) to get a definitive diagnosis. A surgical biopsy is often best, as it retains the microscopic "architecture" of the tumor, which can help the pathologist determine its most likely cause.

An FNA is the cheapest and least invasive method, however. To do an FNA, the veterinarian will insert a needle into either a tumor or a suspicious lymph node and extract cells for evaluation under a microscope.

Sounds simple, but this method doesn't always give a definitive answer because the sample FNA provides is small and perhaps not representative of what is going on in the whole tumor. In addition, not all areas of the body are accessible to FNA. That said, FNA can be a good place to start, especially when a full biopsy is not an option.

If a decision is made to seek a biopsy to rule out intestinal lymphoma, an

Palliative Care

If chemotherapy is not an option, you can still provide your cat with relief. Prednisone alone will not usually induce remission in feline lymphoma, but it decreases inflammation and reduces symptoms. Some cats can stay comfortable and achieve a good quality of life for several months on this drug. Your veterinarian may prescribe other treatments or medications to relieve your cat's specific symptoms.



Ksenia Soboleva | iStock Photo



Sonographic image of a small intestinal lymphoma in a cat.

endoscopic biopsy may be an option. Endoscopy requires anesthesia so your cat will sit still while a tiny flexible fiberoptic camera is passed into her gastrointestinal tract to inspect it and to obtain tissue samples, but it is less invasive than obtaining biopsies via laparotomy (surgical incision into the abdominal wall). Biopsies obtained via endoscopy and laparotomy appear to be equally effective at providing useful diagnostic information.

Grading

When a sample is sent to a lab for histopathology (analysis under a microscope) and determined to be lymphoma, the pathologist will give it a grade based upon a number of factors, including cell size, appearance, and architecture. The grade indicates how aggressive the cancer appears to be and is useful for determining the best treatment option for your cat and her prognosis.

Low-grade or small-cell lymphomas have cancer cells that divide more slowly. This grade is less malignant and usually more responsive to chemotherapy.

High-grade or large-cell lymphomas have rapidly dividing cancer cells and are more aggressive. These cases are more difficult to treat.

In addition, a reference lab can do special stains on your cat's blood to identify whether her lymphoma involves T-cells or B-cells (types of lymphocyte), which may affect treatment decisions. The downside is that it can be expensive.

Treatment

Lymphoma is never really "cured." The goal of treatment is to get the cat into remission, or a state where she has no symptoms of illness and there are so few cancerous lymphocytes in her body that they aren't detected. The cancer cells are still around, however, and may take off again in the future. Many cats

with lymphoma achieve full or partial remission with treatment.

Chemotherapy is the mainstay of lymphoma treatment because it can target cancer cells wherever they are in the cat's body. The most successful protocols use multiple drugs. This allows the veterinarian to use lower doses of each drug, minimizing side effects, while also attacking the lymphoma from multiple angles. If a cat shows side effects to a medication, your veterinarian will adjust the treatment protocol to ensure her comfort. Approximately 70 percent of cats achieve complete remission for varying periods of time, with a median remission time of 265 days. Cats that maintain full remission for one to two years (about one third of feline lymphoma patients that are treated) may survive for significantly longer periods of time (i.e., years). During complete remission, cats can live high-quality, fairly normal lives.

Some chemotherapy drugs can be administered by mouth in either pill or liquid form, while others are given by injection (usually into a vein). The two most common oral drugs are prednisone/prednisolone (a steroid that has a variety of other uses) and chlorambucil. These medications can even be given at home. Injectable chemo drugs include doxorubicin, vincristine, and cyclophosphamide, and many others that may be used depending upon response, availability, and the potential side effects of each. The exact protocol will depend on your cat's individual case and your veterinary oncologist's preferences.

Treatment frequency and duration vary widely based on the protocol being used and how the cat responds to treatment. Oral medications may be given at home daily or every couple days, and some may be given for the rest of the cat's life. Injectable drugs require a veterinary visit and are usually given less frequently (weekly or every few weeks). Treatment duration can range from six months to two years.

Some cats may need a few rounds of treatment before symptoms improve, but others can get relief as quickly as 24 hours after their first chemo treatment. Remission is achieved in 70% of cats with low-grade intestinal lymphoma treated with chemo and in 25 to 50% of cats with high-grade intestinal lymphoma treated with chemo.

If your cat comes out of remission, or her lymphoma comes back, changing

What You Can Do

- ▶ Bring your cat in for regular veterinary checkups, including bloodwork: once a year for young cats, every six months for cats over 10 years old.
- ▶ Keep your cat indoors and away from cats who may be infected with FeLV or FIV.
- ▶ Don't smoke, especially around your cat.
- ▶ Vaccinate outdoor and indoor-outdoor cats against FeLV.
- ▶ Pay attention to subtle changes in your cat's health or behavior and report them to your veterinarian.
- ▶ Keep all recheck appointments for a cat undergoing chemo or in remission. Chemo can cause bone marrow suppression and make her vulnerable to infections.

to a different chemo protocol will often be successful in getting her back in remission. If a patient comes out of remission repeatedly, however, her lymphoma may become resistant to all treatment options.

Surgery is generally only useful for debulking large lymphoma tumors whose physical presence are negatively impacting a cat's health. Surgery will not cure lymphoma.

Radiation therapy can be beneficial in conjunction with chemo in some cases, especially for nasal lymphoma.

Response to treatment can be unpredictable in feline lymphoma. Some cats will, unfortunately, do poorly while others thrive for several years after treatment. The type of lymphoma, how sick your cat is at the time of diagnosis, FeLV status, grade of the cancer, and therapy instituted all play a role in your cat's outcome, but the only way to know for sure how your cat will respond to chemo is to try it.

However, remember that 50 to 70% of cats respond well to chemotherapy. Life after a diagnosis of feline lymphoma can be comfortable and stress-free for your cat, giving you more quality time together, in some cases for considerable periods of time. ■

Fighting the Fleas Around Us

Topical flea control gets an A for effectiveness

Everyone hates to find a flea crawling on their cat. The typical response is immediate: a bath followed by an effective topical, such as a monthly spot-on treatment. The catch is that you should consider the unseen fleas, too. The one flea you saw is backed up by hundreds more.

If you treat your animals with an effective antiflea product, but neglect to prevent recurring infestation in the environment, you won't resolve the problem.

"Skunks, raccoons, squirrels, and other wildlife can seed your backyard with fleas. If you have a cat who goes outside, or a dog, they can bring one or two fleas inside, and suddenly you'll have thousands of fleas," says William H. Miller Jr. VMD DACVD, Professor Emeritus of Medicine, Section of Dermatology at the Cornell University College of Veterinary Medicine.

Tackle Your Home

Keeping the home flea-free is even more important than keeping the cat clean. Fleas—as eggs, larvae, and pupae—spend up to 90% of their time off the pet, usually on the carpet or furniture. The fleas you see on your pets are just the tip of the iceberg.

Once your cat is treated, work on your home. Immediately. Eggs can hatch within a day or two. Thoroughly vacuum, under furniture and beds, chair cushions, and every inch of the upholstery. Pay attention to cracks, crevices, and corners where flea eggs may have been deposited.



Indoor cats can be exposed to fleas by housemates who go outside and give the fleas a ride in.

After vacuuming, seal the vacuum bag and remove it from the house. If you use a bagless vacuum, start with an empty container and immediately remove it when you finish, carefully dumping it (outside!) into a sealable plastic garbage bag—and seal it.

Doing a steam cleaning of any carpets or rugs helps destroy flea eggs. Carefully mop non-carpeted floors to pick up any eggs or larvae in cracks or along baseboards. Wash all your pet bedding, drapery, and anything else you can.

Pesticides

With severe or long-standing infestations, you may need to go a step further and consider a pesticide treatment. The two steps to this process are: 1) killing adult fleas and 2) preventing the development of larvae and eggs.

Insect growth regulators (IGRs), such as methoprene and hydroprene, can

break the flea lifecycle and are not known to harm people or pets. IGRs disrupt the growth and reproduction cycle of many insects, including fleas.

When a flea larva ingests or contacts with methoprene, it still grows normally, and spins a cocoon, but does not pupate. Therefore, no adults emerge from the cocoon. Adult fleas are not affected by the growth regulator, but when they die, they will not be replaced by newly maturing adults. However, because adults are not affected, an insect growth regulator alone will not help you quickly control existing flea problems.

If you end up going the pesticide spray route, plan on having all your pets out of the house for at least a few hours. If the timing works, schedule them for a flea bath at the groomer's during the spraying. Shut cupboards and plan to wash all pet food, water bowls and litterboxes thoroughly after the treatment. Toys should also be washed or replaced.

Severe infestations in your home that cannot be controlled should be handed over to a professional. While "flea bombs" you can buy at a hardware store work, they're usually not appropriate for your home. They are better suited for a shed or garage where no one lives and there is no food stored.

Do not use D-limonene, a citrus peel extract, around cats. While it is toxic to adult fleas, many cats will have severe adverse reactions to it.

Outside Orders

Even if your outdoor cat or dog does not have direct contact with wildlife, if they

What You Should Do

- ▶ Use a topical flea-control product if any animals go outside the home
- ▶ Don't stretch time between applications; those guidelines are based on clinical studies
- ▶ If you see one flea, figure there are hundreds more
- ▶ Weigh the efficiency of chemical versus natural choices when battling an infestation

Natural Flea Predators

Insect parasite nematodes—a parasitic worm—can help control fleas outdoors. Studies show that these nematodes are most effective against fleas in moist, sandy soils. Flea control with nematodes on grass is not highly effective. They work best on bare soil surfaces that have adequate moisture.

Mary McMullen of the University of Florida Extension explains that these nematodes are microscopic, unsegmented round worms that live in the soil and infect many soil-dwelling pests. The third larval stage carries *Xenorhabdus* species bacteria, which kills the pest (in this case the flea). The juvenile nematode enters the pest's body either through body openings or by piercing the pest's body wall. Once the bacteria are introduced into the pest, the pest usually dies within 24 to 48 hours. The nematode then reproduces, and its offspring feed off the carcass until they reach the third larval stage and exit, ready to infect another pest. It may take six to eight weeks before you notice a true decrease in the flea population, so while nematodes may work at controlling fleas if used correctly, there are faster options out there.

go to the same areas that wildlife does in your yard, they can pick up fleas. Fleas and wildlife like crawl spaces, like under shrubbery or in outdoor sheds or even your garage.

Fleas prefer warm, moist areas that are protected from direct sunlight. You need to block those areas off from your pets and the local wildlife if you have a major flea problem.

Mow your lawn short, which is less attractive to wildlife and fleas. Rake up leaves and lawn debris.

You can discourage fleas from occupying your yard by using plants that repel them. Commonly recommended plants that are pet safe include rosemary, thyme, sweet basil, and marigolds. Note that these plants do not kill fleas; they are unpleasant to fleas, so hopefully the fleas choose to move away. Fleas also avoid catnip and most mint plants.

Your best bet in dealing with fleas is to be vigilant. Use cat-safe preventatives, and initiate treatment as soon as you see even one flea on your cat. Discuss the use of topical-spot treatments and other options with your veterinarian.

If you have any house animals that go outside, you'll need to treat your inside-only cats to keep control of flea activity. Fleas are smart, and they can easily jump from canine carriers to feast on any resident felines. ■

Diatomaceous Earth

We won't grade it as an F, because diatomaceous earth (DE), a silica-based dust, has the potential to destroy the exoskeletons of flea eggs and flea larvae, ultimately killing them, but its effectiveness is debatable.

If you choose to use it, apply it to carpets, along baseboards, and on cat-scratching posts. Leave it down for a few hours and then vacuum it up. You will need to repeat this weekly. If you decide to try this, only use food-grade DE products (some people use food-grade DE to improve skin and hair health, as a toothpaste, and as a treatment for constipation).

While not toxic if eaten, breathing the dust from food-grade DE can irritate the lungs. Block pets out of the areas you are treating until after you vacuum. DE can be tried outside as well. It can't hurt.

Why Cats Are Crazy for Catnip

Not just for fun! Catnip acts as a mosquito repellent

About 60 to 70% of cats react playfully to catnip. Some rub their face on it and go to sleep. Other cats toss it, roll on it, chew on it, exhibiting wild play around the house. A recent study found that catnip may also protect cats from mosquito bites.

"Anyone who has ever sat in the field to observe animals ambushing prey knows just how difficult it is for them to keep still when there are many biting mosquitoes around," says Iwate University biologist Masao Miyazaki. "It does not seem unreasonable, therefore, to argue that there is a strong selection pressure" to keep away annoying bugs.

How They Decided

According to an article on sciencemagazine.org, catnip (*Nepeta cataria*) and silver vine (*Actinidia polygama*) are plants that contain chemical compounds called iridoids, which protect the plants against aphids. They are also the key to the euphoria produced in cats. In silver vine, the compound is nepetalactol. The related compound in catnip is nepetalactone. (Never heard of silver vine? It's an Asian plant that many cats find even more intoxicating than catnip!)

To determine the physiological effect of these compounds, Miyazaki spent five years studying the plants. When 25 lucky pet cats were chosen to pick a packet with their chosen substance, each one grabbed the silver vine choice every time. A group of 30 feral cats, plus some big cats (one leopard, two lynxes, and two jaguars), showed the same results. Dogs and mice, on the other hand, ignored the special packets.

The researchers measured beta-endorphins—one of the hormones that naturally relieves pain and induces pleasure by activating the body's opioid system—in the bloodstream of five cats five minutes before and after exposure to nepetalactol. The researchers found that levels of this "happiness hormone" became significantly elevated after exposure to nepetalactol, compared with

controls. Five cats that had their opioid systems blocked did not rub on the nepetalactol-infused pouches and did not experience the "high."

Mosquito Repellent

The researchers found that, along with the feline fun effects, these compounds also act as mosquito repellents, so cats rolling on them are somewhat protected from mosquito bites.

The next set of research projects was focused on the mosquito repellent activity of iridoids. The researchers conducted a mosquito challenge, similar to those in which people put a treated arm in a container with mosquitoes to count how many bites they get. For the cat study, sedated cats who had been treated with nepetalactol had their heads slipped into a chamber with mosquitoes. The treated cats got 50% fewer mosquito bites than the untreated ones did.

Most scientists and pet owners assumed the only reason that cats roll around in catnip was for the euphoric experience, but "our findings suggest instead that rolling is rather a functional behavior," says Miyazaki.

The researchers speculate that cat ancestors might have rubbed their bodies against the plants by chance, enjoyed the feeling, and kept doing it. It is not clear, though, whether it was the euphoric response the cats had—or the insect-repelling properties of the plant—that kept them rolling. ■

<https://www.sciencemag.org/news/2021/01/why-cats-are-crazy-catnip>



Most cats are attracted to the scent of a catnip plant.

Progressive Retinal Atrophy

This inherited disease will result in blindness

Q I have a 2-year-old male Abyssinian cat that I just found out has two copies of abnormal PRA rdAC gene. He is otherwise healthy and very happy, but we are very concerned, of course. Will you please recommend a supplement that would best aid his eyes, in hopes of prolonging the progression to blindness in the future? My veterinarian has advised me to supplement with as much taurine as possible.

A Thank you for getting in touch, and I am sorry to hear this news, although very happy that your cat is doing well today. Progressive retinal atrophy (PRA) is a group of genetically mediated degenerative diseases that causes the photoreceptor cells of the retina to deteriorate, ultimately leading to blindness. Perhaps a brief review of what we know about this condition would help.

The retina is a light-sensitive layer of cells at the back of the eye that contains cells called photoreceptors. These cells convert the light that enters the eye through the pupil to electrical signals that are transmitted to the brain and ultimately processed as vision.

The two main types of photoreceptor cells are rods and cones. Rods are responsible for vision during low light conditions, and cones are responsible for detecting color. Cats have many more rod than cone cells in their retina, so while they are good at seeing things



The Abyssinian cat dates back to Egypt 4,000 years ago and has a distinctive tabby coloring with individual hairs banded with different colors. The elegant, playful Abyssinian has earned the nicknames "Runway Model of the Cat World" and "Clowns of the Cat Kingdom."

in dim light, their color visual acuity is not nearly as good (cone cells do not work well under low light). PRA causes gradual deterioration of these rod and cone cells over time, leading to blindness.

There are two forms of PRA in cats: an early onset form in which the photoreceptor cells develop abnormally and result in blindness at an early age (i.e., in kittens, called retinal dysplasia) and a later onset form in which affected cats most commonly lose their vision later in life, between 2 and 5 years of age. Both of these forms have been well documented in the Abyssinian breed.

With retinal dysplasia, both rods and cones are usually equally affected, resulting in complete blindness, while with later onset PRA, the rod cells usually degenerate first, so night vision is affected first. Ultimately though, the cone cells also deteriorate over time with this condition, leading to complete blindness.

There are two known genetic mutations associated with PRA, the PRA RdY gene mutation that leads to retinal dysplasia and the PRA rdAC mutation that is found in cats with later onset PRA. Cats with two copies (one from each parent) of the PRA rdAC gene will become blind and can pass this mutation on to their offspring. Cats with only one copy of this mutation do not become blind, but they are carriers of the mutation and can pass it on to their offspring, if they are bred.

Unfortunately, there is no cure for PRA. While there has been suggestion that supplementation with antioxidants may slow the progression, there is currently no strong evidence that this is the case. While taurine supplementation is not likely to harm your cat (as long as doses are not too high), I am sorry to say that it is not likely that taurine will change the course of the disease.

The good news is that cats can tolerate blindness fairly well as long as their environment is consistent and safe. Your cat can have a high quality of life as long as you work with your veterinarian to take appropriate precautions. It is, of course, important that cats with PRA not be bred to prevent the inheritance of this unfortunate condition.

I hope that this is helpful, and please continue to work closely with your veterinarian to assure the best care for your boy. Send us an update when you can, and best regards from all of us here at the Cornell Feline Health Center. ■



This column is written by Bruce Kornreich, DVM, PhD, DACVIM, Director of the Cornell Feline Health Center and Editor-in-Chief of CatWatch. You can write to Dr. Kornreich

at catwatcheditor@cornell.edu or CatWatch, 535 Connecticut Ave., Norwalk, CT 06854. We welcome digital photos of your cat to consider for use with your question.

Coming Up ...

- ▶ Feline Heartworm Woes
- ▶ Inflammatory Hepatobiliary Diseases
- ▶ Limb Amputation Decisions
- ▶ Aggressive-Cat Attacks

© HAPPENING NOW...

COVID Cats—Local 24 in Memphis, Tenn., reports that a house cat in Arkansas and a tiger at a refuge in Minnesota recently tested positive for SARS-CoV-2 infections, and veterinarians are reminding anyone who has or might have COVID-19 to limit close contact with cats.

Price Wars—According to *Pet Industry News*, Chewy and Amazon are tied for low-price leaders when it comes to pet products, according to the 4th Annual

Price Wars study, which evaluates prices at 14 online retailers. The report found an average price difference of 8% between Amazon and Chewy and other retailers including Kroger, Walmart, Home Depot and Target.

Lawsuit Looms—A lawsuit filed in Tampa accuses a 78-year-old woman of breaking the condo-association rules by feeding "stray cats/animals" in and around the Tampa Racquet Club Condominium, says CBS Miami. ■