

# PET CANDY

October 2021

**WHAT  
KIND  
OF DOG  
OWNER  
ARE  
YOU?**

**WHY YOU  
SHOULD  
FOSTER A  
PET IN NEED**

**A SCIENTIFIC  
MEASURE  
OF DOG  
YEARS**

**GOOD  
DOG  
OR BAD  
DOG?**

Why we're  
obsessed with  
**SHANNON  
GREGOIRE**

Shannon Gregoire photos courtesy of Barnes Photography

**Scientists  
Discover  
GENE THAT  
CONTROLS  
COLOR  
PATTERNS  
IN CATS**

**5  
WAYS  
TO  
ENRICH  
YOUR  
CAT'S  
LIFE**

**WHY  
PETS  
ARE THE  
NEW  
PINK!**



**much  
more**



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# Welcome to the world of *Pet Candy*

Dr. Jill Lopez

October is officially my favorite month! It has everything I love- cool weather, pumpkin lates, and of course, Halloween. I think pets must love this month, too, because it isn't too hot and it isn't too cold, it is just right. Plus, if you are a pet lover, there's so much you can do this month, from local Barktoberfests to Chilloweens. I can only imagine what cute costumed pets we will be watching on Reels this month.

We have lots of great stuff in this issue for you. First, you get to meet our assistant and all around animal lover, Shannon Gregoire. Shannon, a

senior veterinary student at Western University and a Massachusetts native, got to enjoy the beautiful New England weather with some cute farm animals for her photo shoot. In just a few months, she's going to be Dr. Gregoire and I hope that some of you get to be her clients.

In this issue, we also have some fun stuff like how to create your own pet costumes, how to embrace veterinary telemedicine, and why you should consider fostering a pet. I hope you enjoy reading it as much as we have had putting it all together.







# Why we're obsessed with Shannon Gregoire

By AM Kuska

**F**or students of all ages, the recent pandemic was, to say the least, a shock. Learning was interrupted, students were sent home to learn via Zoom calls instead, and rites of passage such as prom and even graduation ceremonies were canceled.

Many people failed to thrive in this situation, understandably, but one veterinary student is learning to shine instead. Meet Shannon Gregoire, a vet student determined to rock the world of veterinary medicine and leave an impact no-one will forget.

Shannon has a passion for horses and originally started her journey to become an equine vet. As time has gone on, however, she's taken an interest in the business side of veterinary medicine and hopes to one day run her own mixed animal practice in her home state of Massachusetts.





## Focusing on wellbeing

After the pandemic began, Shannon Gregoire realized, like many people around the world, that health came first. She has made health her priority ever since. Her health routine includes meditation when she first wakes up in the morning, taking spin-classes to work off stressful days, and hiking for exercise and stress relief.

The area she currently resides in is amazingly beautiful; spending time at the beach, hiking, or just drinking in the natural beauty of the world is like its own healing balm. She also loves horseback riding and owns 2 horses, Bella and Simba. They are waiting for her on the East Coast and she hopes to ride them again the next time she goes back home.

## Debt crisis for students

One of the biggest problems that veterinary students face is the serious debt involved with becoming a vet student.

“We need help with student debt. Student debt is a major problem with most veterinary students. Students are paying an average of \$31,979 for in-state and \$52,613 for out-of-state tuition and about 80% will graduate with debt that averages \$169,046,” she said in an interview with Vet Candy.

Debt is a serious problem for most college students, and it carries a ripple effect through the rest of the community. Large debts mean higher prices for customers in order to help pay it off, which often means veterinarians struggle despite what may seem like large salaries.



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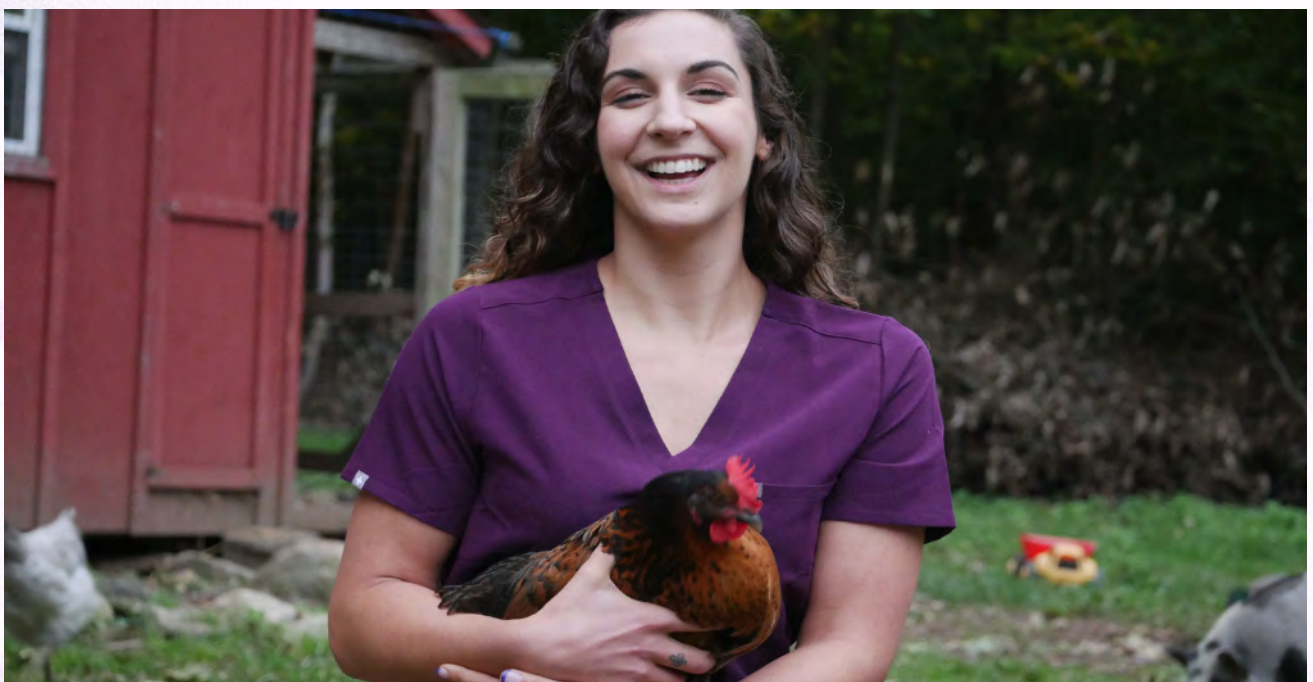
Resolving student debt could have big impacts not only for the students themselves, but for everyone involved.

### **A bright future ahead**

Shannon will officially become Dr. Shannon Gregoire in 2022. Her goal is to find ways to make the business side of the vet industry flow more smoothly. She advises those that have just started on their career path to take leadership roles, look for a great mentor, and negotiate the best possible pay.

All of these things can help a new student thrive in a changing world, as well as help address some of the more common issues of college students. She also reminds those in the pet care industry that some days are tough and sometimes it's the small wins that are important.

***Want to learn more? Check out Shannon on her new show *Simply Pets with Shannon Gregoire* – available on *Pet Candy Radio* or a podcast channel of your choice!***





A close-up photograph of a fluffy brown cat with striking blue eyes. The cat is looking slightly to the left of the camera. It is wearing a bright red, crocheted bow tie around its neck. The background is a soft, out-of-focus light brown color. In the top right corner, there is a small pink triangle.

# MAKE THESE THREE HOMEMADE COSTUMES FOR YOUR PETS

By AM Kuska





**H**alloween is coming up, but you don't have to lay down a ton of cash to get your pet a cute costume. With just a little bit of creativity, you can create an awesome costume for your pet with just a few basic crafting supplies. These are our three top favorite homemade costumes you can make for your pet.

### **The TY Beanie Baby Costume**

Everyone remembers TY Beanie Babies, those popular stuffed animals that were a craze in the 90s. If you have a cuddly, adorable dog or cat that looks a bit like a stuffy, you can turn them into a Beanie Baby by creating a replica of the Beanie Baby tag to attach to their collar.

You don't need any particular skill level for this! Simply cut out a heart that will fit comfortably on your dog or cat without bothering it, then

color it red with large white TY letters in the middle. You can make this as simple or as detailed as you like—people will get the idea.

This is an especially great costume if your pet isn't wild about wearing things, since it doesn't restrict movement and can easily be adjusted to fit the size of your furry friend.

### **The BusinessPet**

Making a tie for your dog or cat is another collar-friendly costume that won't bother your pet. All you need is a piece of wide ribbon, a hot glue gun, and a lighter to pull this one off.

Simply cut a length of ribbon off in the length you want the tie to be, plus enough to wrap around the edge of the pet's collar and  $\frac{1}{2}$  an inch or so for glue. (It's easiest to measure this by wrapping it around the collar and eyeballing



the length, but the length will vary based on the thickness of the pet's collar and the size of the pet.)

Cut the length and then make one end pointy, like a tie. If you quickly pass the cut areas through the flame from the lighter, it will melt the edges of the ribbon so it doesn't fray while your pet is on an adventure. Loop the ribbon around the collar and then hot glue the ribbon to itself on the other side. When it dries, you can slide it on and off the collar.

Next, take a small scrap of ribbon, wrap it snugly just underneath where it sits on the collar, and glue that in place. That will be the "knot" of the collar tie.

You're done! You now have a business pet ready to swagger out for trick-or-treating.

## Super Hero Cape

Finally, a super hero cape can be as simple or complex as you want. Cut a piece of fabric to fit your pet's back, then knot it around the front! You can decorate the back with a big S like Superman, or anything you please.

These 3 costumes are super easy ideas that won't restrict your pet's movement and don't require complex sewing or experienced crafting skills. If you want a costumed pet for Halloween, you can get started with just a few basic crafting supplies.





A PET CANDY ORIGINAL

# RENEE

Machel Show

WATCH







# 3 WAYS VETERINARY Telemedicine Makes Yours and Your **PET'S LIVES EASIER**

Lexy Farrell

Veterinary telemedicine is becoming more commonly used for a lot of pet parents because it not only has the ability to make their lives easier, but can also make their pet's life easier. You can now seek professional medical advice online in real-time.

If your vet doesn't offer a telemedicine service, there are online companies that do.

Three ways veterinary telemedicine makes yours and your pet's lives easier:



## 1 No more commuting

If you have a vet that you love but they are a 30-minute drive from your house, that isn't always easy. We all live busy lives where an extra hour may not be feasible. With veterinary telemedicine services, you can get back that hour and talk to a vet online! Whether you use an online service like Fuzzy or your regular vet offers telemedicine services, you can save time driving there and still receive the care you and your pet need.

*Note: if you are using an online service. They may not be able to diagnose and medicate your pet since they have never met in person.*

## 2 Less stress

While not having to physically go to your vet's office can take some of the stress off you, more importantly, it can take the stress off your pet. Most pets don't enjoy going to the vet and it can be a stressful thing for them. Take away that unnecessary stress by using veterinary telemedicine. No more getting in the car, driving to your vet, and having a nervous pet crying the entire time.

## 3 Save time

If you have a general question about your pet and the receptionist at your vet's office isn't able to answer it, they will most likely make you wait by the phone until your vet is available - that could take hours. With veterinary telemedicine, you can use online services to speak to a vet expert in real-time and get the advice you were looking for in minutes. Online services are the best option if you have general questions and aren't looking for a diagnosis.

Save yourself time and stress by using veterinary telemedicine services! They are a great way to cut out that hour commute you face every time your pet needs their vet, plus you can ask the experts general questions in half the time it would take to get through to your regular vet. If your regular vet offers telemedicine services, you should give it a try and save yourself - and your pet - the stress of going to your vet in person.

“  
***We all live busy lives where an extra hour may not be feasible. With veterinary telemedicine services, you can get back that hour and talk to a vet online!***  
”



# GOOD DOG OR BAD DOG



**W**hen dog-parents spend extra time scratching their dogs' bellies, take their dogs out for long walks and games of fetch, or even when they feel constant frustration over their dogs' naughty chewing habits, they are gradually shaping their dogs' personalities. Dogs, like people, have moods and personality traits that shape how they react to certain situations. New findings from Michigan State University went where few researchers have gone before: they reveal that, just like humans, dogs' personalities likely change over time.



“When humans go through big changes in life, their personality traits can change. We found that this also happens with dogs - and to a surprisingly large degree,” said William Chopik, professor of psychology and lead author. “We expected the dogs’ personalities to be fairly stable because they don’t have wild lifestyle changes humans do, but they actually change a lot. We uncovered similarities to their owners, the optimal time for training and even a time in their lives that they can get more aggressive toward other animals.”

Additionally, Chopik found that dogs’ personalities can predict many important life outcomes. For example, canines’ personalities will influence how close they feel to their owners, biting behavior, and even chronic illness.

The research, published in *Journal of Research in Personality*, is one of the first - and the largest - studies of its kind to examine changes in dogs’ personalities. Chopik surveyed owners of more than 1,600 dogs including 50 different breeds. Dogs ranged from just a few weeks old to 15 years and were split closely between

male and female. The extensive survey had owners evaluate their dogs’ personalities and answered questions about each dog’s behavioral history. The owners also answered a survey about their own personalities.

“We found correlations in three main areas: age and

personality, in human-to-dog personality similarities and in the influence a dog’s personality has on the quality of its relationship with its owner,” Chopik said. “Older dogs are much harder to train; we found that the ‘sweet spot’ for teaching a dog obedience is around the age of six, when





it outgrows its excitable puppy stage but before it's too set in its ways."

One trait that rarely changes in age with dogs, Chopik said, was fear and anxiety.

Honing in on the saying, "dogs resemble their owners," Chopik's research showed dogs and owners share specific personality traits. Extroverted humans rated their dogs as more excitable and active, while owners high in negative emotions rated their dogs as more fearful, active, and less responsive to training. Owners who rated themselves as agreeable rated their dogs as less fearful and less aggressive to people and animals.

The owners who felt happiest about their relationships with

their dogs reported active and excitable dogs, as well as dogs who were most responsive to training. Aggression and anxiety didn't matter as much in having a happy relationship, Chopik said.

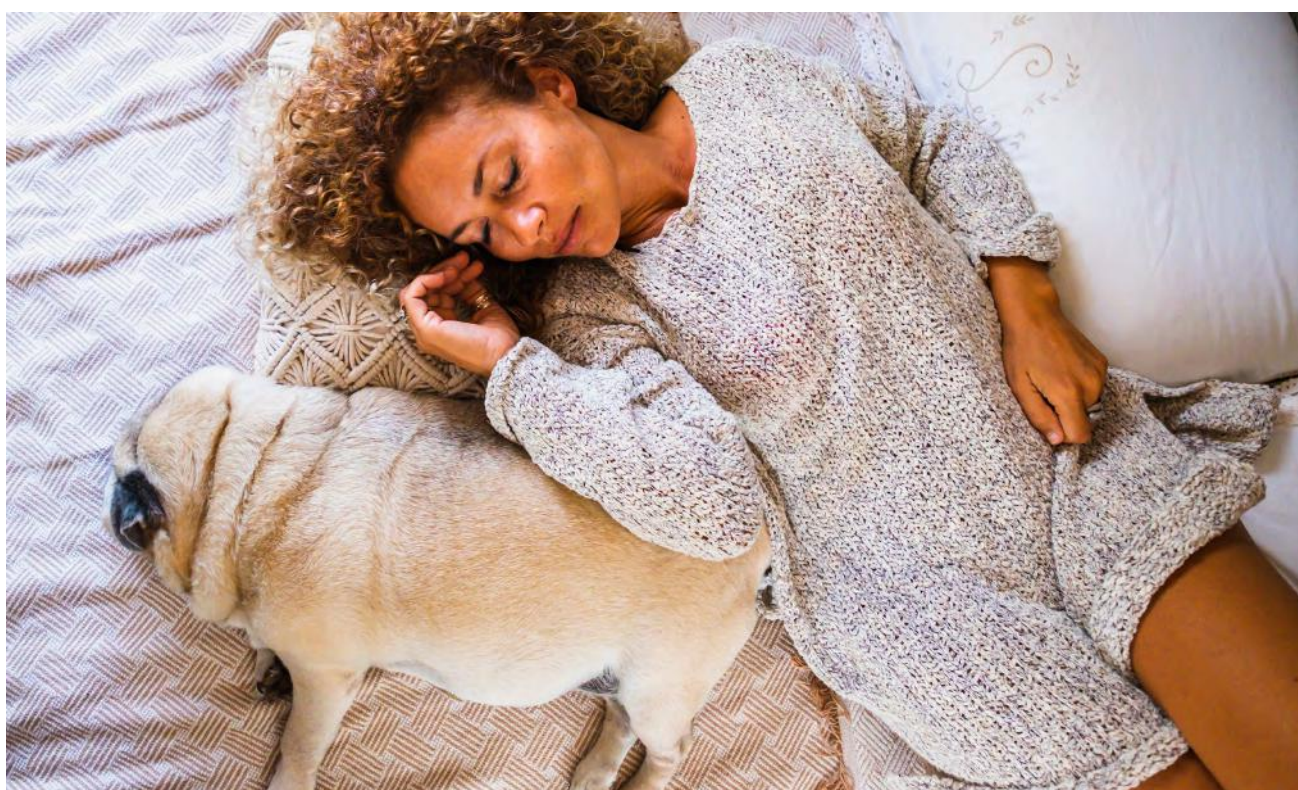
"There are a lot of things we can do with dogs - like obedience classes and training - that we can't do with people," he said. "Exposure to obedience classes was associated with more positive personality traits across the dog's lifespan. This gives us exciting opportunities to examine why personality changes in all sorts of animals."

Chopik's findings prove how much power humans have over influencing a dog's personality. He explained that many of the reasons a dog's personality

changes are a result of the "nature versus nurture" theory associated with humans' personalities.

Next, Chopik's research will examine how the environment owners provide their dogs might change those dogs' behavior.

"Say you adopt a dog from a shelter. Some traits are likely tied to biology and resistant to change, but you then put it in a new environment where it's loved, walked and entertained often. The dog then might become a little more relaxed and sociable," Chopik said. "Now that we know dogs' personalities can change, next we want to make strong connection to understand why dogs act - and change - the way they do."







# What Kind of Dog Owner Are You?

AM Kuska

No matter what breed of dog you have, chances are you have a specific ownership style when it comes to your dog. Here are three basic approaches to dog ownership. Which one are you?





## Laid Back

You believe in a more free-range method of letting your dog be a dog. You let your dog off leash as much as possible and make a point of letting him greet other dogs whenever you can. If your dog makes a mess, you're pretty easy-going about it. You'll just clean it up and move on to the next thing.

You don't need your dog to be a show animal to know he's perfect. He's everything a dog should be.

## Family Style

Your dog is definitely one of the family. He even has his own closet full of clothing and a spot on the couch. You view your dog as just as important a member as the people making up your family – and you may show that by spending huge amounts of money on your pet's own custom furniture, Gucci collar, and extra grooming.

When vacation rolls around, you take your dog with you just like a member of the family—and if he can't go for whatever reason, you find him a resort of his own to enjoy.

## Professional

You care a lot about your dog and value spending time with him. This is evident by the amount of training you have lavished on your dog. While other dogs are collapsing displays at the pet store with their super extended flexis, your dog is sitting quietly by your side.

Weekends are spent competing and evenings spent at classes teaching your dog fun new things. There's no doubt you have the best dog. You've got a whole wall of awards and certifications to prove it.

Everyone is a little different in how they approach showing love for their dog. You may show it by having a full room of awards for your pet, or not expecting anything of him at all. Dog ownership is different no matter who you are.



A **PET CANDY** ORIGINAL

# SIMPLY PETS

WITH  
**SHANNON GREGOIRE**

**WATCH**







# Cavalier King Charles Spaniels Carry More Harmful Genetic Variants Than Other Breeds

**R**ecent dog breeding practices have loaded up cavalier King Charles spaniels with disease-causing mutations, including variants linked to the common heart condition myxomatous mitral valve disease (MMVD). Erik Axelsson of Uppsala University and colleagues published these new findings on September 2nd in the journal *PLOS Genetics*.

The past 300 years of dog breeding have created an incredible diversity of breeds with various

sizes, shapes, and abilities. Unfortunately, this process has also caused many breeds to become more inbred and more likely to inherit genetic diseases. The study's researchers wanted to know whether recent breeding practices had increased the number of disease-causing variants in dogs. They sequenced entire genomes from 20 dogs from eight common breeds, such as beagles, German shepherds, and golden retrievers. They found that the cavalier King Charles spaniel,





which experienced the most intense breeding, carried more harmful genetic variants than the other breeds they examined.

The researchers also looked for genetic variants in the cavalier King Charles spaniel genomes linked to MMVD. In this condition, the mitral valve in the heart degenerates, allowing blood to leak from the left ventricle back into the left atrium. They identified two genetic variants linked to the disease, which appear to regulate a gene that codes for a common protein in the heart muscle. The findings offer a potential explanation

for why the cavalier King Charles spaniel is predisposed to develop the disease.

The especially large number of potentially harmful genes in the genomes of cavalier King Charles spaniels, compared to other dogs, likely resulted from its breeding history. Records suggest that small spaniel-type dogs have existed for at least 1,000 years and were popular at royal courts for several hundred years throughout Asia and Europe, including at the court of King Charles II (1630-1685). These spaniels experienced several “bottlenecks,” where only a small percentage of the population passed on their genes to the next generation. The bottlenecks may have made the harmful genes more common in the cavalier King Charles spaniel genome before the dog achieved recognition as a breed in 1945.

Axelsson adds, “We find that recent breeding may have led to an accelerated accumulation of harmful mutations in certain dog breeds. In the Cavalier King Charles spaniel specifically, one or several of these mutations affect heart muscle protein NEBL and may predispose this breed to devastating heart disease.”







# 5 Ways to Enrich Your Cat's Life

Renee Machel

Unpopular opinion here - I let my cat go outside! She's been supervised since she was a kitten. She does not like harnesses. We have a privacy fence surrounding the backyard, she's tiny, and she's never shown any interest in even attempting an escape. She slowly became comfortable meandering the entirety of the yard.

We monitor the skies and let our dog out with her at times as a deterrent. Of course we use and recommend proper parasite control.

Her favorite time to go out is at dawn to hunt crickets. She'd like to go out at dusk, but I prefer not to since we're trending toward

more dark than light if she stays out there for an hour. However, on occasion she's retrieved other creatures that will postpone you getting to work since you'll be trying to catch and release a tree frog or bird!

She loves to chase toy helicopters outside too!

Obviously, as all you professionals know, every cat is different and every home/yard is different. This may not work for yours, but there are tons of creative ways to get your kitty some exploration outside! I find great joy, relaxation, and satisfaction in sitting outside with my pets.





Various scratching posts and some are beautiful! Check out the one I made for [Pet Candy here](#). I love this scratcher that I made because you can create one that pairs perfectly with your decor. We have a plastic “wicker like” hamper for the dog’s toys in the living room which has proven to be one of her top places to stretch out near and scratch - along with cardboard kitty houses and carpeted towers with twine on the legs. She likes both vertical and horizontal scratching

options. Occasionally we’ll sprinkle a little catnip on a post she’s stopped visiting for an extra treat, which entices her to start using it again.

Perhaps the most important is 1:1 playtime! Her favorite toy since she was a kitten is a yellow felt “fishing line” that is barely hanging in there! With two of its “fish” left on the line after 9 years of play, it’s her “woobie,” “binky,” or whatever you want to call it!



Her go-to, favorite type of mice are from ONE store – again, for over 9 years. This ONE type of mouse is her all-time favorite. I can't even tell you which store, because we have to ensure a steady supply for Penelope!

Her other favorite type of play is rough housing. Few cats play like she does, it's very dog-like. Wrestling with you and your hand, as if it were prey, she flips all around. You can even slide her across the floor and she comes back for more. She leaves behind teeth indents on your wrist and scratches on your arm, but never too hard to break skin. She'll rough house with you for 20 minutes or more, leaving you nearly as tuckered out as she is!

So there you have it, my TOP ways to enrich both of your lives. Research shows that these simple ways positively impact a cat's wellbeing, reducing stress and inappropriate behaviors that follow. Plus, of course, they bring you closer to your feline friend and enhance your wellbeing too.





A PET CANDY ORIGINAL



# COOKING WITH SHAY

WATCH





# Why You Should Foster a *Pet in Need*

by Shannon Gregoire

Have you ever considered fostering a pet before? Maybe you're unsure if adoption is right for you at this time. Maybe your living situation could be changing frequently. Here are a couple of my top considerations to think about when applying to be a foster parent:



**T**he biggest thing to consider would be the species and size you want to foster. Are you looking for a cat or dog or even an exotic species? Are you looking for a puppy/kitten, an adult, or an older dog? What size pet are you looking for – small, medium, or large? What personality or breed types would fit into your home and lifestyle so that you could care for them best? These are all super important because a foster who lives in a third floor, one bedroom apartment would have very different answers from someone with a huge fenced backyard and house.

Another big consideration is how attached you might get to this foster – does that mean you are looking to adopt? What does that look like financially? Are you willing to take on healthcare costs, food, toys, and other financial obligations? Are you prepared to have them for the next 5, 10, or even 15 years? It is very possible that you will foster and create an amazing bond with the animal who is sharing your home, but if you decide to adopt them, make sure you are prepared to do so.



The next consideration is the lifestyle impact of having a foster pet. Now, some pets like cats and some reptiles are pretty low-maintenance, unless they're very young, but dogs require more of a time requirement. Are you looking to foster a small dog who can walk with you to get coffee in the mornings and is easy to transport? Or

are you looking for a bigger dog that would be able to go on hikes with you and takes up more space?

Another consideration is immune status and existing animals in the home. If you are fostering an animal being rescued from overseas, it could be potentially risky - those





animals may have diseases that humans can get. That being said, usually only immunocompromised individuals would be affected, but very young children, elderly, or pregnant women should also proceed with caution. Usually most shelters have a lot of local animals who are more likely to have less risk, plus shelters in both circumstances do their best to mitigate disease risk and treat the pets, but it is still a risk.

Fostering animals is truly a rewarding experience. Even though you don't become their forever home, you have the chance to positively impact their lives and provide a loving home until they find their person. As with any animal decision, it is a huge responsibility to care for a life other than your own, so make sure that inviting an animal into your home is right for you and the animal.





# Scientists Discover Gene That Controls Color Patterns in Cats

Members of the Felidae family, more commonly referred to as cats, come in a variety of sizes and a range of fur colors and patterns.


Tigers with black stripes on an orange or white background roam the grasslands of Southeast Asia and India. Spotted cheetahs chase antelope through the shrubland in Africa. Jaguars, with their rosette patterned coats, stalk down prey throughout South and Latin America. And domesticated cats

of many coat colors and patterns bask in the sunlight of living rooms across the world.

Scientists agree that hair follicle cells are the source of the black, brown, yellow, and red pigments that color hair or fur. However, when and where the process of establishing the color pattern takes place has been less clear until recently. A team of scientists at the [HudsonAlpha Institute for Biotechnology](#) identified molecules that regulate the establishment of coat color patterns





A close-up photograph of a tortoiseshell cat's face. The cat has dark brown and black fur with characteristic orange and red patches. Its eyes are a striking green color. The cat is looking slightly to the left of the camera. It is peering through a vertical green wooden slat. The background is a soft-focus green, suggesting foliage.

in cats. The results are published in *Nature Communications*.

Prior studies have shown that, in tabby cats, stripes are evident in the fetal cat as soon as pigment is produced by cells within the hair follicle called melanocytes. After birth, newborn cats have the same coat pattern and color that they will have for their entire life. For example, cheetahs are born with the same number of spots as they will have in adulthood; the spots just grow in size. As hair falls out, new hair of the same color replaces it.

The origin of coat color is well known, but the mechanisms that initiate coat color patterns are less understood. Complex arrangements of alternating patches of light and dark hair, as seen in the cheetah, jaguar, or ocelot, are called periodic color patterns. Such patterns are difficult to study because they have no real counterpart in model organisms.

In the early 1950s, the computing pioneer Alan Turing theorized that molecules that inhibit and activate each other could





create periodic patterns in nature if they travel through tissue at different rates. This theory, called the Turing reaction-diffusion mechanism, means that coat color patterns that form during development could be controlled by activator and inhibitor molecules. The activator molecules simultaneously color a nearby cell and trigger the production of inhibitors that travel to distant cells and shut off pigment production.

“The genes that control simple color variation, like albinism or melanism, are the same in all mammals for the most part,” says animal morphology expert [Greg Barsh](#), MD, PhD, HudsonAlpha Faculty Investigator, Faculty Chair, and Smith Family Chair in Genomics.

“However, the biology underlying mammalian color pattern has long been a mystery, one in which we have now gained new insight using domestic cats.”

Barsh and HudsonAlpha senior scientists Chris Kaelin, PhD, and Kelly McGowan, MD, PhD, [previously](#) showed that a gene called *Endothelin 3* is expressed at the base of hair follicles in tabby cat markings and plays a key role in the development of the tabby pattern. Because the tabby markings are apparent in developing hair follicles, the group hypothesized that establishment of color pattern must occur at or before hair follicle development. They set out to determine exactly when, where, and how patterns are established in developing fetal cats.

McGowan and Kaelin developed partnerships with several feral cat trap-neuter-release programs, collecting fetal tissue that would have otherwise been discarded during spay procedures. McGowan studied the fetal cat skin tissue and found stripe-like alterations in epidermal (skin) thickness early in fetal development. The patterns of epidermal thickness resembled tabby fur patterns in





in pattern formation,” says Kaelin.

“Several of the molecules, including *Dkk4*, are known to function coordinately as activators and inhibitors, exactly as Alan Turing predicted 70 years ago.”

Further experiments also showed that *Dkk4* is linked to other color patterns in cats. In the Abyssinian cat, the apparent absence of dark tabby markings, a trait referred to as “Ticked”, accentuates the alternating color bands present on individual hairs. The team discovered that all Ticked cats carry loss-of-function mutations in *Dkk4*.

“In Abyssinian cats with the Ticked phenotype, the consensus has been that there is an absence of the dark tabby markings,” says Barsh. “Based on our new findings, we propose that instead the typical tabby markings have increased in number and decreased in size to the extent that they are just not readily apparent.”

adult animals.

“Our findings from the morphological studies suggest that even before melanocytes enter the epidermis, the cells are predestined to signal for a specific fur color,” says McGowan. “By understanding the developmental window and cell type in which color pattern establishment occurs, we were able to dive deeper and discover the molecules involved in pattern development.”

Building on this new finding, Kaelin used single-cell gene

expression analysis on fetal cat skin cells just prior to the time at which the thick and thin patches become apparent. Through this analysis, the team determined that epidermal expression of a gene called Dickkopf 4 (*Dkk4*) marks areas of fetal skin that give rise to hair follicles which later produce dark pigment. *Dkk4* is an inhibitor of Wnt signaling, which helps determine cell fates and spurs cell growth during development in many animals.

“Our analysis identifies a network of molecules involved

Taken together, the results presented in this study confirm a direct role for *Dkk4* in cat color pattern establishment. Coat color and pattern variation is an important platform for studying gene action and interaction. Previous work in Barsh’s lab has shown that coat-color genes are involved in many other important biological pathways, some having relevance to human health.

*To learn about the history of this project, read Barsh’s “Behind the Paper” blog post [here](#).*





# Why Pets are the New Pink!

by AM KUSKA

If you've noticed a lot more people walking their dogs lately, you're not imagining things. Pets have soared in popularity recently, with animal shelters getting cleaned out of strays, puppies from litters booked out for years, and even more exotic pets becoming normalized.





Pets are more popular than ever this year - and part of the reason is that we're spending more time at home. Quarantine, working from home, and even spells of illness have made homes feel empty, especially if you lived alone to begin with.

Study after study has shown that pets are good for both our physical and emotional wellbeing. They can not only help reduce stress and anxiety, but also help to make you feel less lonely. These are all big reasons people are adopting pets, even if they weren't much of a pet person to begin with.





## Pets are here to stay

While the new pet boom started with the pandemic, Spencer Williams, CEO of popular pet company West Paws, says popularity in pets is likely here to stay.

“This trend of more pets in the home, spending more time with pets, taking better care of them is going to continue for a long time,” he said in an interview with CNN Business. “I think the pet space in particular is going to see years of significant

growth that started around the [pandemic.]”

It’s normal for people to nest at home during tough times – and 2020 has been some of the toughest we’ve seen in recent years. People who have never owned pets before are seeing the need for a furry, feathered, or scaly friend, and are learning the joys of pet ownership for the first time.

Pets are amazing creatures and it’s great that so many people are finding the joy in pet ownership for the very first time.







# *A Scientific Measure of Dog Years*

How old is your tail-wagging bundle of joy in human years? According to the well-known “rule of paw,” one dog year is the equivalent of 7 years. Now, in a study published July 2 in the journal *Cell Systems*, scientists say it’s wrong. Dogs are much older than we think and researchers devised a more accurate formula to calculate a dog’s age based on the chemical changes in the DNA as organisms grow old.

Dogs share the same environment as their owners and receive almost the same standard of health care as humans, providing a unique opportunity for scientists to understand aging across species. Like humans, dogs follow similar developmental trajectories that lead them to grey and become more

susceptible to age-related diseases over time. However, how they age on a molecular level is more complicated—aging rapidly at first and slowing down later in life.

“In terms of how physiologically mature a 1-year-old dog is, a 9-month-old dog can have

puppies. Right away, you know that if you do the math, you don’t just times seven,” says senior author Trey Ideker (@TreyIdeker) of the University of California, San Diego. “What’s surprising is exactly how old that one-year-old dog is—it’s like a 30-year old human.”







DNA, which codes who we are for both humans and dogs, doesn't change much throughout the course of life - but chemical marks on the DNA, called methylation marks, do. Ideker considers these marks like wrinkles in the genome. "I tend to think of it very much like when you look at someone's face and guess their age based on their wrinkles, gray hair, and other features," he says. "These are just similar kinds of features on the molecular level."

The researchers studied 104 Labrador retrievers spanning from few-week-old puppies to 16-year-old dogs with the help of two canine experts, Danika Bannasch of the University of California, Davis, and Elaine Ostrander of the National Institutes of Health. They compared the changes in the methylation pattern to humans.

The comparison revealed

a new formula that better matches the canine-human life stages:  $\text{human age} = 16 \ln(\text{dog age}) + 31$ . Based on the new function, an 8-week-old dog is approximately the age of a 9-month-old baby, both being in the infant stage where puppies and babies develop teeth. The average 12-year lifespan of Labrador retrievers also corresponds to the worldwide life expectancy of humans, 70 years.

"I like to take my dogs on runs, and so I'm a little bit more sympathetic to the 6-year-old now," says Ideker, who realized that his dog is pushing 60 according to the new calculation.

In both species, they found that the age-driven methylation largely happens in developmental genes that are hotly fired up to create body plans in utero and regulating

childhood development. By the time one becomes an adult and stops growing, "you've largely shut off these genes, but they're still smoldering," says Ideker. "If you look at the methylation marks on those developmental genes, they're still changing."

Focusing on the smoldering developmental genes, the team developed a clock that can measure age and physiological states across different species, while other methylation-quantifying age-predicting methods only do well in one species. Ideker also noted that future investigation in different dog breeds with various lifespans could provide more insight into the new clock. The clock may not only serve as a tool to understand cross-species aging, but may also apply as clinical practice for veterinarians to take proactive steps to treat animals.





# How Inventor Stephanie Young is Keeping Our Pets Safe

AM KUSKA

Sometimes, veterinary school just isn't in the cards for aspiring students. When Stephanie Young entered Texas A&M, it was with every intention of pursuing a career in medicine. At first, she wasn't sure if that would be with people or animals—but as time went on, she realized she definitely wasn't the right person for treating human patients.

She switched her focus to animals, but also realized early on that while she loved problem solving and figuring out what was wrong with pets, treating them also wasn't quite the right fit for her.

An incident that occurred before she even started at Texas A&M guided her on the path that was right for her. In the veterinary world, it's standard practice to leave a healthy pet with no red flags

alone without any monitoring to recover after surgery.

The animal is checked on regularly to make sure they are fine, but vitals aren't monitored because pets tend to destroy the equipment as soon as they wake up. On this occasion Stephanie was cleaning near a kennel when she realized an animal wasn't moving at all. She called a vet over and they discovered it wasn't breathing.

Despite every effort, the pet passed away. It was devastating, but it also made Stephanie realize what she truly wanted to do—solve the big problems the veterinary world is suffering from.

A life-changing internship helped cement her life mission. She switched from focusing on problem solving pets, to inventing products meant to





make things better and safer for everyone involved.

The first result was SkyPaws, an invention designed to help veterinary staff monitor animals all the time, not just when a vet tech can pop in. The device is designed so that it fits easily on a harness, but is not so easily chewed into pieces. It allows pets to be monitored fully and completely, so that the pet can be treated if its vitals start to dip.

Although SkyPaws is still in development, it has already saved one life. When Stephanie's dog was out chasing squirrels, it suddenly and inexplicably collapsed. Stephanie put a prototype SkyPaw on to try and sleuth out what was wrong and discovered a temperature of 109. Realizing it was heat stroke, she quickly cooled her pet off before rushing Atasa to the emergency room.

If she was not able to immediately cool her dog, Atasa likely would have died. As it was, Atasa escaped with 2 days spent recovering in the ICU.

Stephanie's invention could save thousands of lives, not to mention help problem solve situations in whole new ways. It was a long road to get there and it wasn't always high points. In the beginning of her journey, Stephanie worked long hours and pushed herself to the breaking point.

Eventually, it got so bad that she would burn-out and sleep whole days away. She has learned that managing mental health is one of the most important aspects of entrepreneurship and is now careful to take breaks whenever she needs them.

Stephanie is a brilliant inventor and there is no doubt she will continue to bring great new products to the world that improve animal lives.

*Follow her journey on Linked In:  
Stephanie Young*