

# Genodermatosis Research Foundation Newsletter

Summer 2000

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## Canine Ichthyosis: Fish Scale Disease

by Rob Hilsenroth, BVM

**W**e're all aware of the strong bond that exists between pets and people. This bond is greatly enhanced and strengthened daily by the mere act of petting and grooming our pet, bringing us closer together. Thus, any disorder that makes these interactions less enjoyable is almost invariably associated with a weakening of the animal-human bond. This is one reason why skin diseases are so devastating to owners and comprise such a large part of veterinary practice.

There are other concerns about skin conditions. Many times they make our pets uncomfortable and often are associated with unpleasant odors. As any owner of a pet with a skin disease will attest, they also cost time and money due to recurrent trips to the veterinarian.

Canine ichthyosis, more commonly known as "fish-scale disease," is a congenital disorder associated with defective shedding of the stratum corneum — the outer layer of the skin. A form of this disease, called lamellar ichthyosis, is found in Jack Russell Terriers in which there is a defect in the synthesis of the cornified envelope, which is one component of the stratum corneum. This is most likely due to a mutation in the transglutaminase 1 gene. In this disorder, the stratum corneum is retained for long periods and when it is shed, it falls off in large, thick sheets.

Exactly why a defect in transglutaminase causes lamellar ichthyosis is unknown at this time. There is reason to believe that when this enzyme is absent, the layers remain as if they are glued together and do not break apart in small flakes.

Based on pedigree analysis, ichthyosis in Jack Russell terriers is an autosomal recessive defect. Both males and females can inherit this condition with the same frequency. Because of this evidence, at the present time it is recommended to avoid breeding any dog a second time that produces a puppy with lamellar ichthyosis. In addition it is recommended not to breed any dog that has siblings with the disease. The only way to decrease the number of carriers of this genetic disease is by breeding dogs that do not have the defective gene. Because affected puppies can be recognized at birth, breeders can, over time, reduce the prevalence of the disease. However, if indiscriminate breeding occurs to meet the demand for Jack Russell Terriers, cases of lamellar ichthyosis will undoubtedly increase.

Morris Animal Foundation is supporting a study by Dr. Robert Dunstan and colleagues at Texas A&M University's Veterinary Medical Center and

*Continued on Page 7*

## Reminder About Skin Punch Biopsies

**W**hile the Standard Poodle is the only breed so far to have its own open registry for sebaceous adenitis with the Institute for Genetic Disease Control, other breeds are placed in research databases which are closed and confidential until a time in the future when the mode of inheritance in those breeds is established.

If you have a breed other than a Standard Poodle, please consider adding your SA dog to the research database. This will help in finding the mode of inheritance for your breed, and help other dogs and their owners in the future.

A GDC application form can be downloaded from their web site at: [www.vetmed.ucdavis.edu/gdc/gdc/html](http://www.vetmed.ucdavis.edu/gdc/gdc/html)

For more information, contact:

Genetic Disease Control

P.O. Box 222

Davis, CA 95617

Phone/fax: (530) 756-6773

The GRF now  
has a web site!  
The address is:  
[www.GRFoundation.net](http://www.GRFoundation.net)

Stop by to see  
what's new in canine  
genodermatosis research.



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The Genodermatosis Research  
Foundation was organized in 1990 by  
a group of dog owners, breeders and  
veterinarians with a common interest  
in genetic skin disorders in dogs.

The Foundation provides education  
and scientific support for research  
leading to the alleviation of animal  
suffering through understanding,  
diagnosis, treatment, cure and preven-  
tion of heritable skin diseases.

The GRF is a non-profit organization  
with headquarters at  
3818 22nd St. NW  
Canton, OH 44708  
Contributions are welcome.

Membership dues are \$20 annually.

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# SA in Jake, a Basset Hound

by Sharon Wooten

**J**ake is a healthy, 5-year-old, neutered Basset Hound. The first symptoms of SA were excessive amounts of loose hair in the shoulder and chest area. The skin became very pink and the hair still attached was extremely dry and brittle feeling.

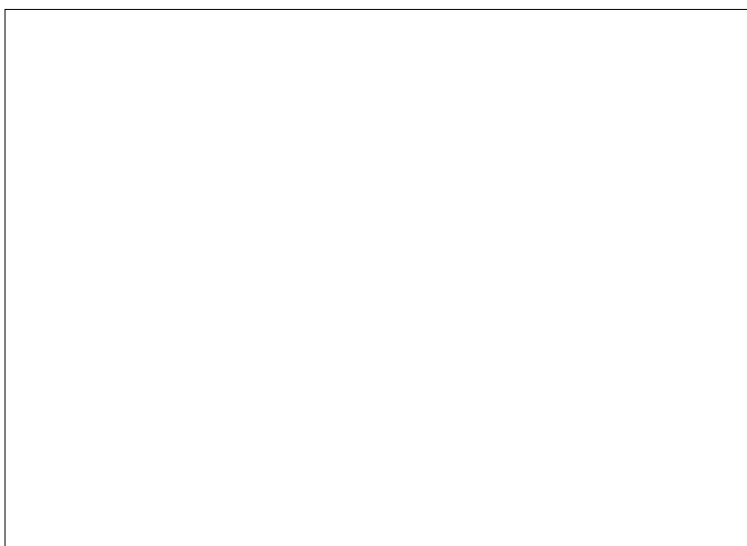
Initially my vet suspected thyroid problems, which proved negative. He then thought maybe there was a diet or stress problem. For two weeks Jake was treated with Derm-caps, antibiotic (for a hot spot) and weekly baths with an oatmeal-based shampoo. The hot spot cleared up, and Jake smelled much better, but there did not seem to be any improvement with the hair loss. I don't think it became any worse, just not any better. The biopsy was done after this two-week period. With the positive results there was a recommendation of some types of medication. My vet was strongly against using any of the medication recommended due to the possibility of the side effects. The vet did put Jake on a higher dose of antibiotic (due to another hot spot), and recommended trying some natural oils and vitamins.

Jake now is currently getting cod liver oil, zinc, DMSO derivative and wheat germ, all mixed with about 1/2 cup of cat food daily. I have also been spraying him weekly with a 50/50 water and baby oil mix, leaving in on him 1 to 2 hours, then bathing him first with dish soap (Palmolive), then with oatmeal based dog shampoo. The final wash and conditioning is done with Nioxin Cleanser and Nioxin Scalp Treatment. I have noticed that the hair loss at bath time is not quite as extensive now and the skin does not seem to be quite as pink. Jake's hair is still very thin, especially on the top of his head. There definitely is regrowth where the biopsies were done. The improvements are slight, but it at least it is something.

This is my first experience with SA (and I hope, my last), I had no idea a disease like this existed. It was unknown also to my vet.

I have no genetic information on Jake, and no existing records of his breeders.

Jake is still a very easy going, happy dog. Other than the above-mentioned "hot spots" on his neck and shoulder and the hair loss, Jake is doing great. I haven't noticed any changes in his personality, or his habits. 🐾



This photo shows hair loss and irritation on the back of Jake's head.

# DNA Bank for Heritable Skin Diseases Affecting the Akita Is Established

Funding from the Genodermatosis Research Foundation has been given to the Comparative Dermatology Laboratory at Texas A&M University to start a DNA bank for Akita dogs. The funding was sent to the laboratory at the request of the Akita Club of America which provided the funding through the generosity of Ms. Linda Wroth of Richmond, Calif., and others.

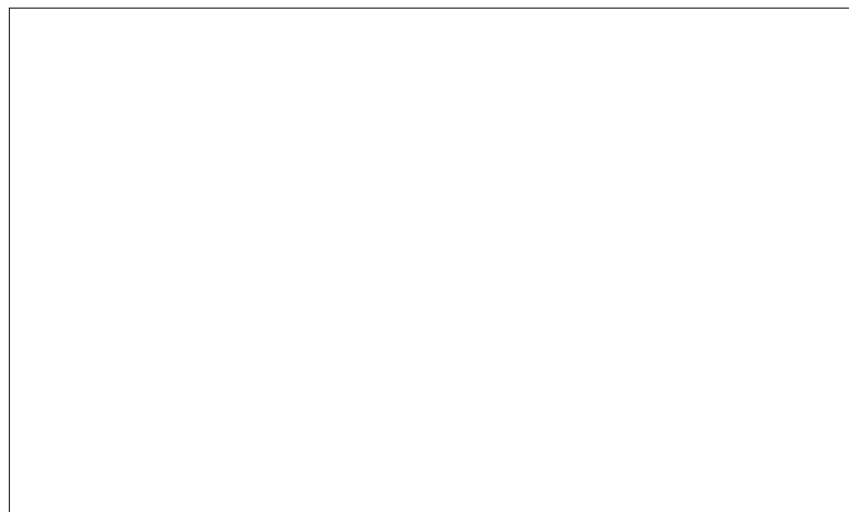
The purpose of the bank is to serve as a repository for serum and DNA from Akitas with the three most common skin diseases that affect the breed: sebaceous adenitis; a distinctive form of the autoimmune disease, pemphigus foliaceus; and uveodermatologic syndrome (also known as Vogt-Koyanagi-Harada-like Syndrome). The latter a multi-systemic disease, is associated with inflammation and loss of pigmentation of the nose and an inflammatory reaction of the eyes that can lead to blindness if left untreated.

Ultimately, we hope to accumulate a sufficient volume of samples from affected dogs to try to identify DNA-based markers that will serve as either a definitive test or at least give a likely indication which dogs are free, carriers or potentially affected with each of these three diseases.

We also believe that providing funding for the accumulation of samples before a major grant is written is the most time- and ultimately, cost-effective means of doing genetic disease research that requires screening the DNA from a large number of dogs. Having a library of relevant DNA accumulated before the major funding for a study is provided will allow us to "hit the ground running" with our research rather than wait for a year or more after a major grant has been obtained while samples are collected.

If you have an Akita with any of these three diseases please contact us and we will tell you how to participate in the study. We can obtain DNA from blood or even from old biopsy samples. We thank the Akita Club of America and its members for their support and willingness to provide samples from their dogs.

Please contact Robert W. Dunstan, DVM, MS; or Kelly M. Credille, DVM, PhD, Comparative Dermatology Laboratory, Department of Veterinary Pathobiology, Texas A&M University, College Station, TX 77843-4467. The phone number is (409) 845-2651; the e-mail is: [rdunstan@cvm.tamu.edu](mailto:rdunstan@cvm.tamu.edu).



SA-affected Akita owned by Carol Davis Tonge of Cheshire, England.

## An SA Essay

by Linda Harris

Keoki, my Standard Poodle, was first diagnosed with SA at the age of eight years. He lost a great deal of coat during a six-week period. I began baby oil baths with a two-hour soaking almost at onset. After the last bath that showed hair loss, I increased the duration between baths to two-, then three-, then four-week intervals. Within four months, his coat was in good shape though he had lost nearly 50 percent of its former thickness.

Keoki's SA appears to be cyclic. Ten months after the first loss of hair, when he once again began looking like a Standard Poodle, he started losing hands-ful of hair. I increased the frequency of his baths to once a week and also started him on three vitamin tablets per day.

After six weeks, he stopped losing his coat. This time his ears, the top of his head, large patches on his legs and sides were totally bare. He looked like a molting elk in the spring. I continued the therapy as I had before, slowly lengthening the time between baths. Now, three months later, he has a beautiful, soft, black coat. Curiously, all the grizzle in his coat is gone except for his muzzle and a few hairs down the center of his back. His coat is now wavy except for the curly knot on top of his head. He has no odor except the faint smell of baby oil. Though I use diluted detergent soap, I finish with a gentle pet shampoo and separate conditioner. There are no longer any bald spots, though his coat remains at 50 percent of its original thickness.

His chronic ear infections are gone along with the forest of thick hair in his ears. I started using Alpha Keri bath oil in this cycle. I rub it undiluted onto his paws and muzzle. This makes it easier to use the short clipper blade because it softens the scales that cling to the hair. Obviously, I don't know when his next cycle will be, nor its severity, but I do believe in continuing his baths at no less than once a month. All in all, he's a healthy, happy, strange-looking Standard Poodle.

## It's SA Hair!

*(Sung to the tune of, well, you know.)*

She asks me why  
I'm just a flaky guy  
I'm flaky noon and night  
Skin that's a fright  
I'm scaly high and low  
Don't ask me why, Don't know  
It's not for lack of care  
I'm an SA-bare... doggie

Gimme a dog with hair  
Long beautiful hair  
Poodle hair, Akita hair,  
Lhasa hair or Dachshund  
Give me short or long hair  
Single coat or double  
Here doggie, there doggie  
Everywhere doggie doggie  
HAIR (hair, hair hair)  
Blow it, show it  
Long as oil can grow it, My hair

Let me soak in the oil  
And get washed of all soil  
Give a home to the fleas in my hair  
Good-bye to the scales  
And farewell to the smells  
There ain't no cure  
For the flaky, the stinky, the icky,  
And the absence  
Of my...  
HAIR (hair, hair hair)  
Blow it, show it  
Long as oil can grow it, My hair

Oh, say can you see  
My skin if you can  
Then I've got SA!!!

On the floor  
On the chair  
On the couch  
Everywhere  
It drops by itself

*I never have to cut it..  
It falls out by  
itself...*

(With  
apologies to  
Gerome  
Ragni and  
James Rado,  
lyricists)



## The Use of Essential Oils in the Treatment of Sebaceous Adenitis

by Jenny Drastura

Our household has three Lhasa Apsos diagnosed with Sebaceous Adenitis. The first was diagnosed at age two after more than a year of treatment for other conditions. At the time of diagnosis (September 1997), her torso and tail were almost completely bald and covered with a black, tarry substance with a mold-like odor. Hair on the head and legs was thinned out dramatically.

Treatment consisted of 50/50 baby oil and water soaks, followed by three to four baths with Dawn detergent to get the oil out, then a bath with an oat mella shampoo to get the detergent out. We then rinsed her with Jhirmack E.F.A. conditioner. Her condition improved after only several baths. Her outer coat started to grow back, but no undercoat returned. At first we did the baths every week, then every two weeks. We can usually get by now with one bath per month.

Since her diagnosis, a littermate was diagnosed at age 4. Her mother, who had a "non-affected" biopsy at age 10, developed SA at age 12-1/2! An informal check of the other offspring found them to be free of any signs as of December 1999. There are seven more biological littermates (two litters, same breeding) that still have a 50 percent chance of developing SA, and all have a 100 percent chance of carrying the gene (assuming the mode of inheritance is the same as in Standard Poodles). If the sire develops SA, theoretically all the offspring will develop SA also.

### Essential Oils

There is no question that the baby oil/water soaks were helping the first affected girl's skin, but we were concerned about saturating her with a petroleum product that had to be washed out with a harsh, drying detergent. In early 1998 we consulted Brent Reed, owner of New Earth Resources in Huntington, W.Va., who is very knowledgeable about alternative therapies. He suggested using olive oil instead of baby oil. Olive oil has been used externally for its disinfectant and healing properties for thousands of years, and internally for other ailments as well.

He also introduced us to essential oils. The use of these oils to affect a psychologic or physiologic response is called *aromatherapy*. The oils are administered by diffusion (breathing in); by massage or topical application; or internally (rare). The name "essential oils" comes from *quinta essentia*, or quintessence, and was first described in "modern" medicine by Paracelsus in the 16<sup>th</sup> century. The term *aromatherapy* was first coined in 1937 by R.M. Gatafosse, who compiled the work of many scientists in the field at that time. He concluded that, "... besides their antiseptic and bacterial properties... essential oils possess anti-toxic and antiviral properties, have powerful vitalizing action, an undeniable healing power and extensive therapeutic properties." After all, plants produce the oils to defend themselves against invading microorganisms.

Essential oils are obtained from plants by distillation, mechanical separation or solvent extraction. They come from flowers, buds, fruits, peels, leaves, bark, roots, seeds and resins. You can find both natural and synthetic oils, and there are proponents of both. The important thing is to buy from a reputable supplier, and make sure the entire botanical name (genus and species) is listed so you are sure you have the right component.

It is believed that essential oils might work best in synergy. Brent selected eight essential oils for us to use with the "carrier oil" – the olive

oil. He also suggested that we add pure aloe vera to the mixture, as this substance is also known to have healing qualities.

This is the mixture we are now using on our three SA dogs:

½ cup olive oil

½ cup water

1 tablespoon aloe vera gel

30-40 drops of the essential oil mixture

The essential oil mixture:

*Tea tree oil* – anti-bacterial and anti-fungal; stimulates immune system; a broad-spectrum antibiotic

*French lavender* – helps in the treatment of inflammatory skin conditions, promotes healing

*Lemon* – antiseptic, anti-bacterial, astringent

*Bergamot* – topical for wounds; used to control dandruff in humans

*Roman chamomile* – for dermatitis; conditions and encourages hair growth in humans

*Ylang ylang* – antiseborrheic, antiseptic

*Sandlewood* – antiseptic, anti-bacterial, insecticidal; once used as a pharmaceutical disinfectant

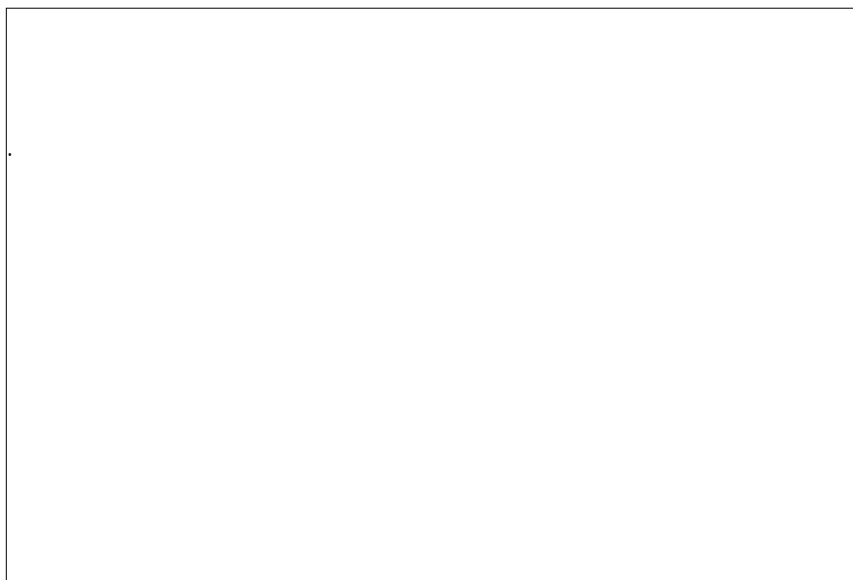
*Juniper berry* – antiseptic, parasiticide

We spray the mixture on each dog for 30 minute to an hour. An advantage to this mixture over baby oil is that it is substantially easier to wash out. We have been using liquid Ivory soap for one bath, then an oat mella shampoo for the next bath. Then we apply the Jhirmack E.F.A. or Cindra conditioner. A more diluted oil mixture can also be used between baths for lesions.

We have just discovered an all-natural product called "Ecover Natural Dish-washing Detergent, made in Belgium and distributed by Ecover Inc. in Huntington Beach, Calif. After just a few uses, we feel this may be even better than Ivory in removing the oil, not to mention gentler on their skin.

The Lhasa who has had SA for almost four years gets a bath once a month; we are still giving the other girls a bath twice a month since they have been more recently diagnosed.

(continued on Page 6)



SA in 12-year-old Lhasa Apso bitch. Hair fell out on top of back only, but lesions were everywhere on her body.

# Breeder Responsibilities

by George Padgett, DVM

Remember that all times you are breeding a whole dog —10,000 genes worth! This includes conformation, temperament and working qualities. The breeder:

1. Should have established breeding goals for their line (defined their ideal dog so they know what they are breeding for and can select an appropriate test mate.
2. Should have established a "selection" method to use in selecting the test "mate."
3. Should have arrived at a hierarchy or degree of disagreeableness of traits known to occur in their breed which may apply to their dogs (all may not involve the health of their dogs).
4. Should know traits that occur in the line and that potentially could occur in the animal to be tested or are known to be in the animal to be tested.

## Obligations of Breeder

1. Register all animals that are known or potential carriers with an appropriate open disease registry.
2. Test mate all offspring retained for breeding or sold as show quality in order to assure knowledge of the pathway of the gene in question.
3. Thoroughly explain to any purchaser of potential breeding stock (show quality) that the defective gene may be present and what will be required to eliminate the gene.
4. Thoroughly assure yourself and the breed that "pet quality" animals are not shown and used for breeding. (a) Require a spay/castration agreement (b) Do not issue papers until the animal is spayed or castrated. (c) Require a deposit, sufficient to pay the spay or castration, to be returned when evidence is presented that the job is done. (d) Require that the spay or castration be completed *before* this animal would be likely to be used as a breeder (7-9 months). 🐾

From "Dr. George A. Padgett Quotes," GDC publication.

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## Essential Oils

(continued from Page 5)

Some of these oils may be irritating to an individual's skin, so it is best to use sparingly at first. Also, some essential oils cannot be used on pregnant bitches or in some cases, along with other medications or with some medical conditions. It is best to consult a qualified practitioner in selecting the oils.

We have no scientific evidence that this method works better than oils with mineral oil bases, and admittedly, it costs a little more. But it is easier to wash out, and if we do the baths on a regular basis, we see few lesions. Also, they don't seem to lose much coat at the lesion site, and the grow-back seems to be faster for the hair that does fall out. Since we started using the essential oil mixture, none of the dogs have had any significant skin infections.

Their golden coats have grown back a little harder, stiffer, than their original coats, and have grown back a darker gold. The outer coats are in fairly good shape; the undercoats are either not growing back or are sparse.

The girls also receive Lipiderm with omega-3 and omega-6 fatty acids daily with their food, as internal fatty acids have been shown to reduce pruritis and dermatitis associated with flea and food allergies and bacterial skin infections.

All three girls are quite presentable and show few signs of SA to the untrained eye. We are quite pleased with their progress, and like most SA dogs, they have no clue that they have a problem with their skin. For that, we are grateful! 🐾

Source:

Schoen, Allen M. DVM, MS, and Susan G. Wynn, DVM. *Complementary and Alternative Veterinary Medicine*. Mosby: St. Louis, 1998.

Note: The inclusion of this article in the GRF newsletter does not necessarily condone this method of treatment for SA.

## A beloved Rottie with SA

by Miranda Moore

Jack was a 5-year-old neutered male Rottweiler. We don't know where Jack came from because he came to us when he was 1 year old. A friend of mine gave him to us as a wedding present.

My husband, Pete, was in the army at Ft. Huachuca, Ariz., and I worked in Tucson. We had a house in Whetstone with four acres for Jack to run around. He was a joy to take care of and he really was in love with my husband. I was an okay substitute if Pete wasn't around.

A year after we were married Pete was sent to Korea for a year. I knew I needed to get a handle on Jack because he just wouldn't listen to me. Jack and I enrolled in obedience classes, and after we mastered that, we started agility training. His temperament really helped change people's attitudes toward Rottweilers.

I remember taking Jack to the vet for a check up when he was 2 years old and being told that he needed a good brushing. I brushed him every week. Since Rotties have short hair, I had no idea I should do it more often.

When Pete came home from Korea, we moved to Ft. Lee, Va. Jack became mostly an inside dog. This is when the large amount of hair loss became noticeable. I remember thinking it was just a change in weather and he was shedding. I became pregnant last spring and, coincidentally, that is when I first remember Jack started smelling bad. I blamed it on my heightened sense of smell. During the summer Jack started shaking his head and scratching his ears and crying. After trying various solutions to clean his ears with no results, I took Jack to the vet. He told me I needed to clean the ears more often. Pete and I managed to clean Jack's ears every other day.

After Baby John was born, we noticed Jack was getting white circles around his eyes. It moved to his face and the back of his head. Then he started losing hair at a much faster rate so, I took Jack to the vet. He said there were lots of possibilities, so we started out by eliminating them. (We also have a female Miniature Dachshund who had no problems.) The vet took skin scrapings to look for mites and found none. He then pulled out some hairs to do a culture, thinking that it might be a type of fungus. This culture was going to take a few weeks to grow, so he sent us home with antibiotics, Derm-caps, shampoo and a fatty acid spray to put on after baths. I was supposed to bathe him twice a week.

The hair culture didn't grow anything in three weeks, so we were referred to a dermatologist. It took almost two months to get an appointment, and in that time I continued with the same regime.

This entire time Jack continued to get worse. He had giant bald patches on his muzzle, the back of his head and all the way down his back to the tail. His chest and legs weren't affected. He also had scabby-looking flakes about the size of a nickel. When they came off, so did all the hair around it. We sensed there was a definite change in his mood; he seemed very depressed. He didn't want to play anymore with our doxie or us. When Jack started not eating well, I resorted to putting baby food or tuna in his bowl along with his Pedigree crunchies and pills.

The dermatologist took a blood sample and three punch biopsies. I continued the same treatment until we got the results back two weeks later. Jack's white blood cell count was high and the biopsy showed it was clearly sebaceous adenitis. The dermatologist recommended that we give Jack evening primrose oil, vitamin A and Derm Caps. He told us to spray Jack down with Alpha Keri bath oil mixed with water (half and half), put

him in a crate for one hour and wash him several times with Ivory dishwashing liquid.

I did this treatment for one month, and it did not make his condition better. In fact, he began losing hair on his ears, chest and legs. His ears hurt him so badly he wouldn't let me touch them, even when I put a muzzle on him. Our vet said what was happening to his ears was related to the SA and there wasn't anything else we could try. He was also convinced that there was another disease going on that wasn't showing up yet.

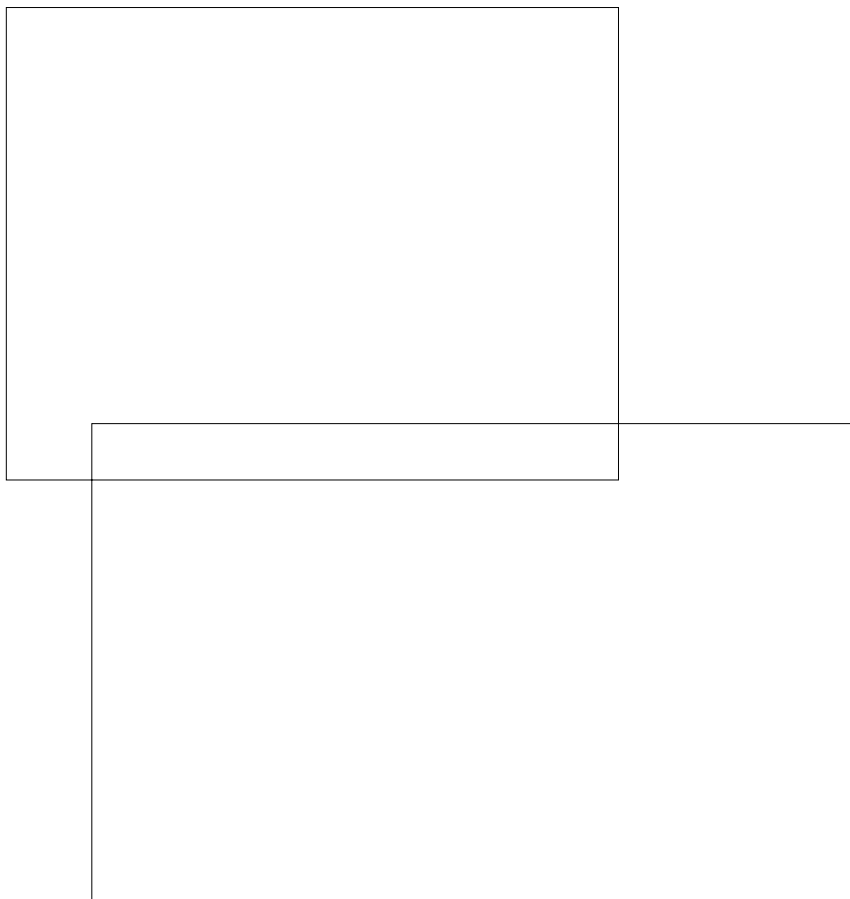
Jack's hearing became worse. To get his attention we had to yell or clap. He growled at our doxie, although he used to run and play with her. He stopped greeting us at the door. Sometimes when he slept, he cried softly, and his breathing was so soft, sometimes I shook him to make sure he was just asleep.

I think if it had been just a hair loss problem we could have lived with it; in fact, we did. But because of his ears and his depression, we decided to put Jack down. It was a tremendously hard decision. With all the information we found on the Internet and from the GRF, at least we knew there was hope and we gave it a good try.

The suffering a dog endures can never really be measured by the ones who love them because they are a part of the family. Jack will forever be loved and missed. 🐾

*Note:* Akitas have a systemic form of SA, with fever, malaise and weight loss. Perhaps the Rottweiler has a similar variation.

We at the GRF offer our sincere condolences to the Moores.



**Left:** Jack, before and after developing SA. Note hair loss on top of head and on muzzle.

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## Canine Ichthyosis

*(continued from Page 1)*

the University of Memphis entitled, "Defining the Molecular Basis of Canine Cornification Abnormalities."

Their study is aimed at discovering the molecular basis of two phenotypically different heritable diseases of the stratum corneum of dogs.

(1) The first disease under investigation is in Norfolk Terriers and is associated with a defect in keratin synthesis.

(2) The second is a disease attacking Jack Russell Terriers, associated with a defect in cornified envelope synthesis.

In the first phase of their study, Dr. Dunstan and his team are investigating if Jack Russell Terrier ichthyosis is the same as human lamellar ichthyosis. The second phase is to find the canine gene for transglutaminase and see if it, too, is defective. The third phase of their study is to find a cure for lamellar ichthyosis.

The knowledge gained from this study will be used to better understand other diseases of dogs in which the skin produces too much dandruff, such as seborrhea of Cocker Spaniels, and sebaceous adenitis of standard poodles, akitas and a number of other breeds.

Ultimately, the study may answer a question that is asked by many dog owners: "Why does my dog have dry skin?" By understanding dogs with lamellar ichthyosis, Dr. Dunstan is not only helping Jack Russell Terriers as a breed, but may also help other dog breeds that suffer from dry, scaly skin. 🐾

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## Web Sites of Interest

### Home Therapy for SA

[www.pageweb.com/vipoodle/hmrxa.htm](http://www.pageweb.com/vipoodle/hmrxa.htm)

### Survey of SA Dog Owners

[webpages.marshall.edu/~drastura/SAsurvey.html](http://webpages.marshall.edu/~drastura/SAsurvey.html)

### Institute for Genetic Disease Control

[www.vetmed.ucdavis.edu/gdc/gdc/html](http://www.vetmed.ucdavis.edu/gdc/gdc/html)

## Reality Check: Breeds Known (so far) to Have SA

Airedale Terrier  
Akita  
American Eskimo\*  
**Basset Hound\***  
Beagle\*  
Bichon Frise\*  
Border Collie\*  
Cairn Terrier  
Chesapeake Bay Retriever\*  
Chow Chow\*  
Collie  
Dachshund  
Dalmatian  
English Cocker\*  
English Springer Spaniel  
German Shepherd Dog  
Golden Retriever  
Great Pyrenees\*  
Havanese  
**Heeler**  
Irish Setter  
Labrador Retriever  
Lhasa Apso  
Maltese  
Miniature Pinscher  
Mixed Breeds  
Old English Sheepdog  
Poodle, Standard  
Poodle, Miniature  
Poodle, Toy  
**Rottweiler\***  
St. Bernard  
Samoyed  
Shetland Sheepdog  
Shih Tzu  
Vizsla  
Weimaraner

*Please share your photos and stories of dogs with genetic skin conditions, for inclusion in a future newsletter and web site!*

*Note: Photos taken with digital cameras do not reproduce well in print media, but are fine for the web site.)*

## Want to participate in canine skin research?

- ; Add my name to the mailing list for a free subscription.
- ; Here's my contribution for skin research and education.
- ; I want to be a member of GRF. Cost is \$20 for individual or family.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State/Country \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_

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*Return to:* GRF, 3818 22nd St. NW, Canton, OH 44708

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### Genodermatosis Research Foundation

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