

## Recognition, Management & Genetic Findings in Feline OCD

In humans, obsessions are constantly recurring thoughts which intrude into a person's mind and cause anxiety unless acted upon. Compulsions are those actions that result from the obsession, and the act of performing them brings temporary relief.

Unfortunately, the obsessions all too frequently reappear, and the cycle is propagated. A diagrammatic representation of this obsessive-compulsive disorder (OCD) cycle may be found on the website [www.ocdhelp.org/ocdfacts.html](http://www.ocdhelp.org/ocdfacts.html).

### Feline Compulsive Disorders

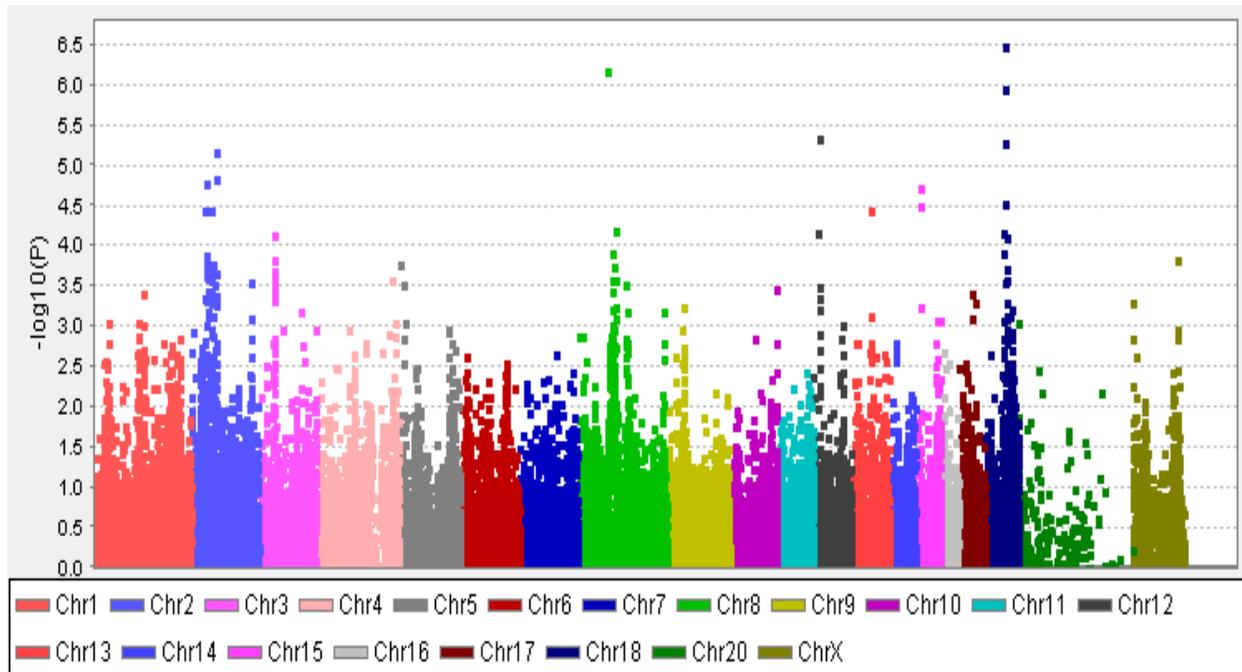
Feline compulsions seem to derive from normal behaviors such as ingestion and grooming. They are, in effect, natural behaviors gone awry and seem to have both genetic and environmental factors underlying their expression. The two most common feline compulsive disorders are wool sucking and psychogenic alopecia. Feline hyperesthesia and hoarding are two less common feline OCD-like behaviors.

#### *Wool Sucking*

This behavior, which involves primarily Oriental breeds of cats, involves sucking and chewing on woolen and synthetic substrates. In that sense, it appears to be the feline equivalent of Doberman blanket sucking. Cats with the wool sucking compulsion may progress to ingesting cloth, hair, plastic, shoelaces, electric chords, paper, and even wood. At this stage the condition is sometimes termed "pica". Wool sucking can be detrimental to the health cat because it can lead to physical issues, notably intestinal obstruction; it is also a considerable nuisance and expense for the cat owner. We conducted a large WFF funded study of both Siamese and Birman cats to elucidate environmental factors that may lead to their expressing this behavior. Our study bore out our hypothesis that early environmental stressors, such as early weaning, may be associated with an increased risk of wool-sucking. Furthermore, our study was the first of its kind to show that the development of wool-sucking behavior is differentially affected in Siamese and Birman cats by early environmental conditions.

The fact that Oriental breeds are primarily affected—with Siamese accounting for 50% of affected cats—suggest strongly that genetic features are involved. We have plotted genealogies of affected cats, and there seems to be a dominant mode of inheritance of this disorder, perhaps with incomplete penetrance. In collaboration with Drs. Leslie Lyons and Barbara Gandolfi and our genetic team at UMass, we conducted a genetic study (GWAS) of Siamese and Birman cats (100 of each, half affected, half controls) and came up with some intriguing findings that warrant further study (which is ongoing). It was the Birman cohort that shed most light on the condition as they were all purebred cats. Cats that owners described as Siamese were not genetically a uniform group (per MDS plot) and were thus not employed in the statistical analysis of the genetic results. In the Birmans, we found two genes great interest. The first, NCALD, is a gene that encodes for a member of the neuronal calcium sensor family of calcium-binding proteins. Most recently, calcium has been found to be intimately involved in the propagation of OCDs. A second gene, RRM2B, is a gene that encodes the small subunit of a P53-inducible ribonucleotide reductase. The gene itself is linked with depression,

migraine, and learning difficulties, and so has central nervous functions. We would like to investigate these two genes further, and are on the cusp of doing that.



### *Psychogenic Alopecia*

This condition is very similar to the human compulsion known as trichotillomania. Basically, it is a displaced grooming behavior that assumes compulsive proportions with the continuous stripping out of the cat's hair coat in a classical ventral pattern. It occurs primarily in cats with an anxious temperament and, in our experience, is always initiated by an acutely stressful experience. Once again, Oriental breeds are over-represented, and like human OCD, it often arises in early adulthood and is most common in females. Genealogies seem to indicate a dominant mode of inheritance with incomplete penetrance.

### *Feline Hyperesthesia*

There are people who regard feline hyperesthesia syndrome as a grooming compulsion, and certainly it can present that way. It sometimes responds to classical anti-obsessional drugs. It has also been suggested that it is a result of a viral infection affecting the muscles on either side of the spine. However, of late, I strongly believe that feline hyperesthesia is a condition resulting from complex partial seizure activity as some cases progress to overt tonic-clonic seizures and many respond well to anticonvulsant therapy. Also, severe though occasional aggression is sometimes associated with the condition. Like psychogenic alopecia, the onset of feline hyperesthesia is usually associated with an environmental stressor. It affects cats typically in the 2-6 year age range and seems to target Oriental breeds or their crosses. Feline hyperesthesia is another one of those conditions that seems to blur the distinction between a compulsion and a partial seizure.

## Feline Compulsive Behavior Treatment

Treatment is along the same lines as it is for dogs, by addressing underlying stresses and enriching the environment. In addition, the same arsenal of drugs is helpful to treat feline compulsive disorder, including anti-depressants and anticonvulsants.

## Conclusion

Feline compulsive disorders have many factors in common with human OCDs. Some have compelling similarities in terms of face validity (psychogenic alopecia appears like trichotillomania in people (so-called hair pulling disorder). Both wool sucking and psychogenic alopecia have predictive validity in terms of their response to anti-obsessional medication. Determining the genes involved in compulsive disorders in cats and other animals will shed light on the neuronal pathways driving the behaviors. This, in turn, will open avenues for new therapeutic interventions as well as permitting the development of tests for genetic susceptibility. For animals, tests for genetic susceptibility would be valuable breeders and would be helpful for human doctors and patients alike.