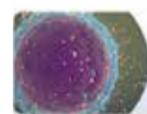


# MONOCLONAL ANTIBODIES: A New Treatment Option For Canine Atopic Dermatitis

**Monoclonal antibody therapy is the fastest growing therapeutic area in human medicine. In recent years, research has focused on how these therapies can be translated to animal health. Specifically, Zoetis has invested in bringing an innovative biological therapy to the treatment of canine atopic dermatitis.**

While many therapeutic options are available for canine atopic dermatitis, there is room for improvement. Dog owners are seeking treatments that allow greater flexibility to suit their needs and lifestyles—and with few side effects. Treatment protocols may need to be customized for dogs suffering from an acute condition compared to dogs with seasonal allergies or those affected year-round. Special consideration may need to be given to dogs with atopic dermatitis that are under 12 months of age, those already on medications (such as NSAIDs) that limit additional therapies or those with co-existing diseases (such as neoplasia or serious infections) that may impact therapeutic options.



**Harnessing the power of the immune system**

Monoclonal antibodies (mAbs) are developed in a laboratory from a single cell line and, when administered to patients, target and neutralize specific antigens. Unlike some biological therapies such as vaccines, mAbs mimic the activity of the animal's own naturally produced antibodies without provoking an immune response from the host.

## Stopping the itch cycle before it starts

To create an effective mAb therapy, you first have to determine the specific target(s) of most relevance to the disease process. Research over the past decade has shown that cytokines play an important role in the cycle of itch and inflammation in canine atopic dermatitis. Cytokines are proteins produced by cells

that act as messengers between cells to promote and drive allergic inflammation.

Research at Zoetis has focused on the pruritogenic cytokine interleukin (IL)-31. A key function of IL-31 is to stimulate the neuronal itch pathway by activating peripheral sensory nerves in areas of allergic dermatitis. Additionally, the most recent research would suggest that IL-31 may have effects on the immune functions and its possible role in other inflammatory diseases.<sup>1</sup>

A study has shown that IL-31 can be identified in the serum of dogs with atopic dermatitis, but not in healthy dogs; and when IL-31 is injected into laboratory dogs, pruritic behaviors are induced.<sup>2</sup>

Through this research, Zoetis has discovered and manufactured an anti-IL-31 monoclonal antibody that will target and neutralize only this cytokine to rapidly and effectively help reduce clinical signs of canine atopic dermatitis. Because of the exquisite specificity in the targeting of IL-31, other cellular functions and immune responses are not adversely affected.

## Introducing Canine Atopic Dermatitis Immunotherapeutic\*

A conditional license from the USDA was granted to Zoetis in August 2015 for Canine Atopic Dermatitis Immunotherapeutic\*, a new treatment for canine atopic dermatitis. Veterinary dermatologists across the United States have since been using this product—an injectable monoclonal antibody that aids in the reduction of clinical signs associated with atopic dermatitis in dogs.

**“This is a first-of-its-kind antibody therapy in veterinary medicine to help break the itch cycle and provide relief for dogs that suffer from atopic dermatitis. It also helps pet owners enjoy their pets and avoid daily medications for itch relief,”** said Andrew Hiller, BVSc, MANZCVS, Dipl ACVD, Veterinary Specialty Operations and Medical Lead Allergy, Dermatology at Zoetis. This anti-IL-31 mAb was initially developed in the mouse. However, mouse

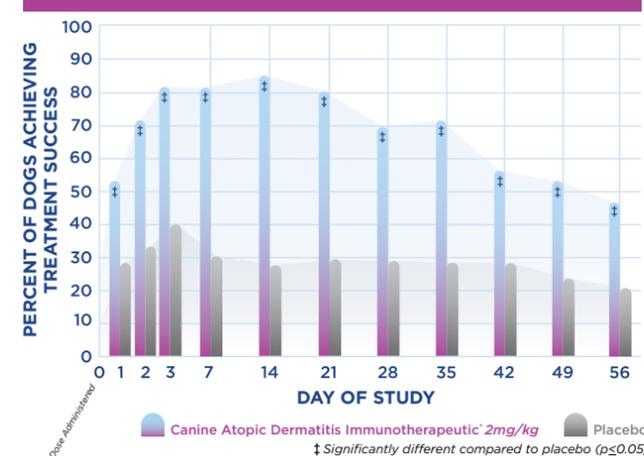
antibodies are recognized as “foreign” proteins by dogs and will be rapidly eliminated by the immune system, thus losing efficacy. This anti-IL-31 mAb has been engineered to mimic dog antibodies, a process referred to as “caninization.” As a result, the mAb is not seen as “foreign” and is accepted by the dog’s immune system, thus maintaining efficacy even when used repeatedly over the long term.



**Fast, safe and long-lasting relief for canine patients**

Once injected in the patient during an office visit, Canine Atopic Dermatitis Immunotherapeutic\* begins to reduce clinical signs of atopic dermatitis within one day. On average, patients will experience 30 days of relief of itch and the clinical signs of atopic dermatitis. Dogs may receive additional monthly treatments, as needed, for continued relief.

## TREATMENT SUCCESS<sup>3</sup> (>20 mm reduction of owner-assessed pruritus VAS)



Along with itch relief, the mAb also leads to improvement in skin condition, giving the skin a chance to heal.

\*This product license is conditional. Efficacy and potency test studies are in progress.

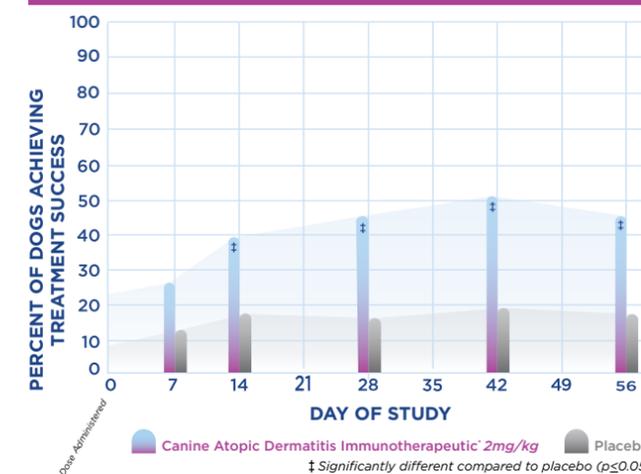
<sup>1</sup>Cornelissen C, Lüscher-Firzlaff J, Baron JM, Lüscher B. Signaling by IL-31 and functional consequences. *Eur J Cell Biol.* 2012;91(6-7):552-566.

<sup>2</sup>Gonzales AJ, Fleck TJ, Humphrey WR, et al. IL-31-induced pruritus in dogs: a novel experimental model to evaluate anti-pruritic effects of canine therapeutics. *Vet Dermatol.* 2016;27(1):34-e10.

<sup>3</sup>Data on file, Study Report No. C863R-US-12-018, Zoetis LLC.

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## TREATMENT SUCCESS<sup>3</sup> (veterinarian-assessed 50% CADESI-03 reduction vs. baseline)



Canine Atopic Dermatitis Immunotherapeutic\* is safe for dogs of all ages. Since the mAb mimics the dog's own antibodies, it is eliminated via normal protein degradation pathways that do not involve the kidneys or liver, thus avoiding potential side effects associated with traditional pharmacotherapy.

There are no known drug interactions or contraindications, thus the mAb can be administered with other common medications, including parasiticides, antibiotics, antifungals, corticosteroids, vaccines, allergen-specific immunotherapy, antihistamines and other antipruritics, such as oclacitinib and cyclosporine.

## Want to learn more?

Visit [canineantibodytherapy.com/vpn](http://canineantibodytherapy.com/vpn) for more information about how Canine Atopic Dermatitis Immunotherapeutic\* can help relieve the clinical signs of atopic dermatitis and improve the quality of life for dogs with atopic dermatitis as well as for their owners.