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## RetroMAD1®

WORLD'S FIRST BIO-SYNTHEZIZED IMMUNE MODULATORY SUPPLEMENT  
FOR PETS

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Saving lives by applying recent advancement in genomics and proteomics on infectious  
diseases that have no cure today

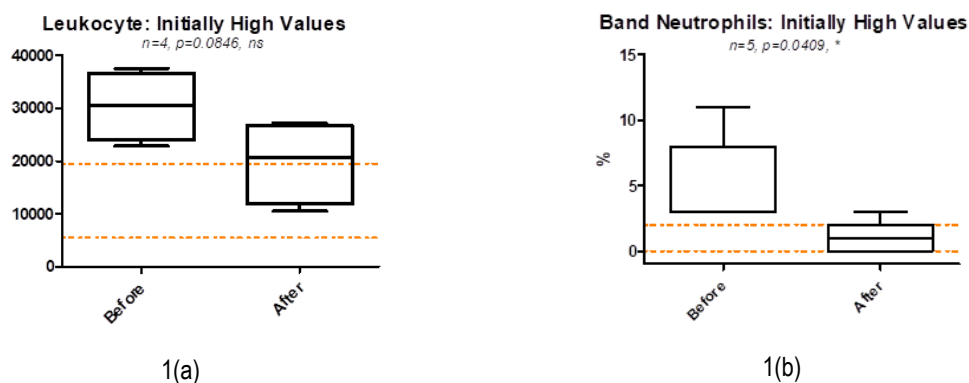
## RetroMAD1® A NOVEL IMMUNO-MODULATORY SUPPLEMENT FOR PET HEALTHCARE

RetroMAD1 is a novel proprietary recombinant protein that is shown to have immune modulatory activity in pets. It is designed and bio-synthesized from 3 different peptides that occur naturally as immune modulators in animals and edible herbs. The key principal peptide, **MAP30**, is bio-synthesized from the genes of the seed of the bitter melon. MAP30 has been scientifically proven to be a powerful immune modulator by up-regulating lymphocytes and down-regulating inflammatory processes in sick animals. By deliberately fusing MAP30 with 2 other peptides that are produced by the immune system of animals allowed the novel protein, **RetroMAD1**, to have unique benefits that MAP30 alone does not have. These unique benefits have been confirmed by our pre-clinical studies:

1. RetroMAD1 resists digestion in the gut and appears in the blood within 1 – 1.5 hour after oral administration and maintains in the blood for 4 – 6 hours;
2. RetroMAD1 penetrates the cells where it exerts its beneficial effects;
3. RetroMAD1 withstands temperatures up to 40°C without being denatured.

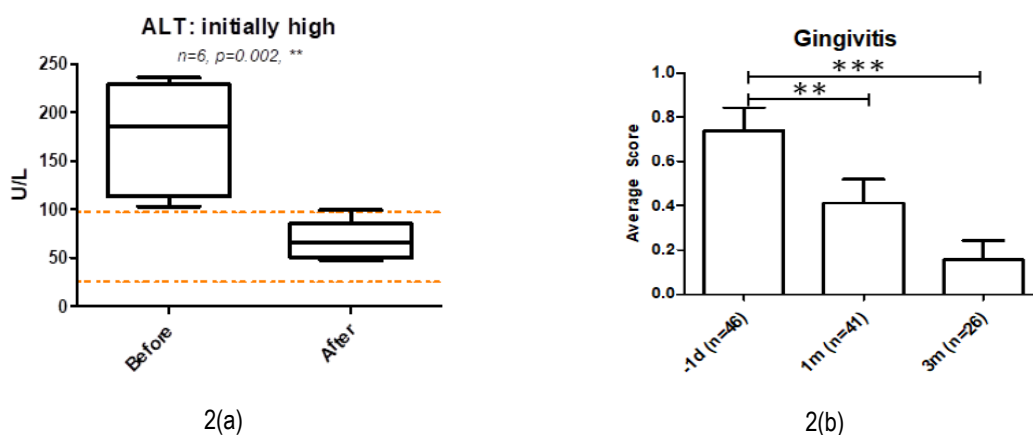
A clinical study supervised by the Federal University of Rio de Janeiro, Brazil and published in the Archives of Veterinary Science and Medicine in December 2019 (Arch Vet Sci Med 2019; 2 [4]: 041-057), demonstrated that cats suffering from the immune-suppressive disease called feline leukaemia and treated with RetroMAD1 over a 30-day period had significantly normalized their immune regulatory function (Fig. 1) which in turn aided the cats to survive significantly longer than feline leukemic cats that were untreated.

**Fig 1: Normalization of Leucocytes 1(a) and Neutrophils 1(b) in feline leukemic cats treated with RetroMAD1 at 1.2mg/kg/day**



The same study demonstrated RetroMAD1's beneficial role in repairing a dysfunctional inflammatory process (Fig. 2).

**Fig 2: Normalization of inflammatory processes of the liver 2(a) and of the gum 2(b) in cats afflicted with feline leukaemia and treated with RetroMAD1 at 1.2mg/kg/day**



In the clinical study, the immune modulatory effect of RetroMAD1 improved the cats' survival rate from feline leukaemia from 0% to 70%.

Our animal studies in mouse, rat, cat and monkey have repeatedly confirmed RetroMAD1's high safety margin and zero toxicity even in pregnant subjects and their offspring. For example, in a study in cats, the onset of liver toxicity was shown to be 400 mg/kg/day. This gives RetroMAD1 a high safety margin of at least 66 times the recommended dose.

## RetroMAD1®: A NOVEL IMMUNO-MODULATORY SUPPLEMENT FOR PET HEALTHCARE

Its intellectual property resides at 3 levels:

1. The insertion of the respective genes of the 3 peptides in the correct sequence into the DNA of a GRAS-status micro-organism that constitutes the **Master Seed**;
2. The exacting bio-processing conditions that allow the expression of the protein, RetroMAD1, at very high yield;
3. The correct molecular folding of the protein to activate its immune modulatory properties while creating unique benefits that are not found in MAP30 alone.

Bioprocessing has several advantages over chemical synthesis and extraction process of MAP30 from the herb:

	Biovalence technology	Chemical Synthesis	Extraction from herb
Protein Yield	Very High	Not High	Not High
Quality	Pure = Standardized = consistent efficacy	Pure = Standardized = consistent efficacy	Impure = Not standardized = inconsistent efficacy
Impact on the environment	No chemical or bio-hazardous waste. The "waste" can be used as bio-fertilizer	Chemical hazardous waste that further adds to the cost of waste disposal	
Intellectual property	Difficult to copy	Easy to copy	

RetroMAD1's aqueous formulation is ideally suited for **oral** administration, making it an ideal all-round pet health supplement; with targeted indications for pets recovering from major illnesses.

RetroMAD1 is commercially available today as an **easy-to-use, oral supplement with supportive benefits**. It has obtained product registration approval in Malaysia (country of origin of manufacture) as an oral animal supplement.

RetroMAD1 has also officially obtained "no-objection" letters from the relevant regulatory authorities in **Hong Kong, Japan, Romania (E.U. member state), Singapore** and **Taiwan**.

## OTHER UNIQUE BENEFITS



### ➤ Easy storage and handling:

- Stable at ambient temperature for up to 24 months.
- Stable up to 40°C for up to 1 month.

*Biovalence Technologies proprietary refolding step of the chimeric fusion proteins ensures structural stability*