

## Evaluation of Microgen's D-125 for Control of Enveloped Viruses including HIV 2 on Surfaces

Written by Benjamin Tanner, Ph.D, 4/15/08

### Author Background:

Benjamin Tanner is the president of Antimicrobial Test Laboratories, a commercial microbiology laboratory. He holds a Ph.D. in Microbiology and Immunology and has worked in the disinfectant industry for several years. He is the author of the book, "Legal Aspects of Infectious Diseases." Before launching Antimicrobial Test Laboratories, he worked as a microbiologist for the Clorox Company (Oakland, CA), developing disinfectants and other antimicrobial consumer products.

### Purpose:

The purpose of this evaluation is to describe the applicability of Microgen's DISNFX D-125™ product to control of enveloped viruses on environmental surfaces. This document also sets out to characterize the expected activity of DISNFX D-125™ against HIV 2.

### Introduction:

Microgen, Inc sells a disinfectant called DISNFX D-125™ which is a dilutable, quaternary ammonium disinfectant. Quaternary ammonium disinfectants have the advantage, in general, of robust activity against enveloped viruses. Some of the most clinically relevant bloodborne pathogens are enveloped viruses, including HIV 1 and 2, as well as Hepatitis B and C virus.

### Evidence to Support Activity of D-125™ Specific to HIV 2 and Bloodborne Enveloped Viruses:

- 1) Quaternary ammoniums are generally held to be very effective against a host of enveloped viruses. Recent studies confirm this.<sup>1</sup>
- 2) In 1988, a study was carried out by Gibraltar Biological Laboratories, Inc. (Fairfield, New Jersey) wherein D-125™ was tested against one of the original HIV Oleske/Gallo virus pools (Robert Gallo is credited with the discovery that HIV causes the disease AIDS).<sup>2</sup>
- 3) D-125™ has a long and rich testing history against Human HBV. Efficacy has been validated via the Morphological Alteration Destruction Test - MADT (in vitro)<sup>3</sup> which has been used and relied on by USEPA, USFDA, CDC and the Department of Labor – Occupational Safety and Health Administration (OSHA). In addition, D-125™ was used as the 'Predicate' formulation in the updating the Bloodborne Pathogen Rule [29 CFR 1910.1030 (d) (4) (ii) (A) dated February 28, 1997]. Ultimately, OSHA accepted Microgen's petition to expand the blood borne pathogen rule to include products with HBV and HIV efficacy.
- 4) The USEPA has recently issued guidance to manufacturers of disinfectant products in which it is stated that activity against an enveloped virus (such as HIV 1) is sufficient to prove activity against one of its close relatives (such as HIV 2). Since D-125™ has been proven effective against HIV 1, then it can also reasonably be expected to be active against HIV 2.

**Evidence to Support Activity of D-125™ Against a Wide Range of Enveloped Viruses:**

- 1) The United States Environmental Protection Agency (USEPA) approved the product label for D-125™, specifying that the product disinfects more than 20 enveloped viruses. This strongly suggests that the product has robust efficacy against enveloped viruses in general:

<b>Enveloped Viruses Claimed on D-125 Product Label in the U.S.<sup>4</sup></b>
canine coronavirus
canine distemper virus
canine herpesvirus
equine herpesvirus
equine influenza virus A
infectious peritonitis virus
hepatitis C virus
herpes simplex 1
herpes simplex 2
hepatitis B virus
HIV-1
Infectious bovine rhinotracheitis virus
influenza A virus (3 strains)
influenza B virus
Influenza C virus
measles virus
Newcastle disease virus
parainfluenza virus type 1
pseudorabies virus
respiratory syncytial virus
transmissible gastroenteritis virus
vaccinia virus
vesicular stomatitis virus

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## Discussion and Conclusions:

Quaternary ammonium-based disinfectants are widely held to be effective against enveloped viruses on contaminated environmental surfaces. Microgen's D-125 disinfectant has demonstrated broad efficacy against enveloped viruses in more than 20 independent laboratory tests (all tests were executed by laboratories subject to regular third party certification and governmental audits).

D-125 was also one of the first disinfectants to be tested for activity against HIV 1, using an early viral pool from Robert Gallo. Thus, this product can reasonably be assumed to be efficacious against bloodborne enveloped viruses and HIV 2, even if it has not yet been tested specifically against this pathogen. Additionally, D-125 has been demonstrated to inactivate HIV in more than one study<sup>4,5</sup>.

To achieve disinfection of enveloped viruses on environmental surfaces, the D-125 product should be applied liberally and allowed sufficient contact (per label instructions).

## References:

1. Shirai, J., Kanno, T., Tsuchiya, Y., Mitsubayashi, S., and Seki, R. Effects of Chlorine, Iodine, and Quaternary Ammonium Compound Disinfectants on Several Exotic Disease Viruses (2000). *Journal of Veterinary Medical Science*. 62(1), 85-92.
2. Gibraltar Biological Laboratories Report #48565, Study #11A-1014C-178. 11/15/1988. Fairfield, New Jersey.
3. Prince, D., Prince, H., Thraenhart, E., Muchmore, E., Bonder, E., and Pugh, J. Methodological Approaches to Disinfection of Human Hepatitis B Virus (1993). *Journal of Clinical Microbiology*. 31(12) 3296-3304.
4. Microgen D-125™ USEPA Master Label. May 17, 2007. Downloaded 4/15/08. (<http://www.microgeninc.com/milestones/PDF/D-125%20Master%20Label.pdf>)
5. Prince, H., Prince, D., Prince, R. Seymour and S. Block. *Disinfection Sterilization, and Preservation*, Fifth Edition. Chapter 25: Principles Of Viral Control And Transmission, P.428, Table 25-20.