

WORCESTER POLYTECHNIC INSTITUTE

A Pathogenesis Screen Using  
*Caenorhabditis elegans* to Identify  
Virulence Factors in *Candida albicans*

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Major Qualifying Project

Margaret Chiasson, Benjamin Landry, Kurtis McCannell, Kelly Pastor

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## Abstract

Fungal infections are a serious public health concern, especially in hospitalized immunocompromised patients, due to a dearth of antifungal agents. We aimed to study fungal pathogenesis and understand aspects of the host-pathogen interaction that makes *Candida albicans* a successful pathogen. Based on the observation that *C. albicans* is able to infect *Caenorhabditis elegans*, causing visible disease and ultimately death, we screened a library of *C. albicans* mutants for changes in virulence. We identified four novel genes that affected virulence: orf19.6713, orf19.1219, *DOT4*, and *ZCF15*.

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## Table of Contents

LIST OF FIGURES .....	V
LIST OF TABLES.....	VI
<b>1. THE <i>CANDIDA ALBICANS</i> THREAT .....</b>	<b>1</b>
<b>2. LACK OF TREATMENT FOR FUNGAL INFECTIONS.....</b>	<b>1</b>
<b>3. METHODS TO IDENTIFY VIRULENCE FACTORS .....</b>	<b>2</b>
<b>4. PREVIOUSLY IDENTIFIED VIRULENCE FACTORS .....</b>	<b>2</b>
4.1. HISTIDINE KINASES – <i>SLN1</i> , <i>NIK1</i> , AND <i>HK1</i> .....	3
4.2. TRANSCRIPTION FACTORS – <i>EFG1</i> , <i>CPH1</i> , AND <i>CPH2</i> .....	3
4.2.1. Effect of <i>rbt1</i> and <i>rbt4</i> .....	4
4.2.2. Effects of Dimorphic Transition .....	4
4.3. CELL WALL PROTEINS .....	6
<b>5. HOST-PATHOGEN INTERACTIONS.....</b>	<b>6</b>
5.1. <i>CAENORHABDITIS ELEGANS</i> , A MODEL HOST FOR VIRULENCE STUDIES .....	6
5.2. <i>DROSOPHILA MELANOGASTER</i> , ANOTHER MODEL HOST FOR VIRULENCE STUDIES .....	7
5.3. VIRULENCE SCREENS USING MICROBIAL PATHOGENS .....	8
5.4. VIRULENCE ASSAY .....	8
<b>6. EXPERIMENTAL GOALS.....</b>	<b>9</b>
<b>7. MATERIALS AND METHODS .....</b>	<b>9</b>
7.1. STRAINS AND STOCKS .....	9
7.2. EGG PREPARATION.....	10
7.3. VIRULENCE ASSAY .....	10
7.4. OPTIMIZATION OF THE VIRULENCE ASSAY .....	12
7.5. SURVIVAL ANALYSIS .....	12
<b>8. RESULTS.....</b>	<b>13</b>
8.1. VALIDATION OF THE <i>C. ALBICANS</i> VIRULENCE SCREEN.....	13
8.2. IDENTIFICATION OF NOVEL GENES .....	14
8.3. SURVIVAL ANALYSIS .....	14
8.4. OTHER OBSERVATIONS .....	17
<b>9. DISCUSSION.....</b>	<b>17</b>
9.1. <i>DOT4</i> .....	18
9.2. ORF19.1219 ( <i>S. CEREVISIAE</i> CLOSEST HOMOLOG <i>RKR1</i> ).....	18
9.3. ORF19.6713 ( <i>S. CEREVISIAE</i> CLOSEST HOMOLOG <i>DEF1</i> ) .....	19
9.4. <i>ZCF15</i> .....	19
9.5. FUTURE EXPERIMENTS .....	20
<b>REFERENCES.....</b>	<b>22</b>
<b>APPENDIX A.....</b>	<b>26</b>

## List of Figures

Figure 1 .....	4
Figure 2 .....	5
Figure 3 .....	5
Figure 4 .....	11
Figure 5 .....	13
Figure 6 .....	16

## List of Tables

Table 1 .....	14
Table 2 .....	14

## 1. The *Candida albicans* Threat

In recent years, the incidence of fungal infections caused by the opportunistic pathogen *Candida albicans* has escalated, primarily due to the increase of immunocompromised patients and a dearth of antifungal therapies. Under normal circumstances, *C. albicans* lives in a balanced environment in and on the human body with endogenous healthy bacteria. However, it can cause serious infection in the mouth, skin, or uro-genital tract if this balance is disrupted. For example, the use of broad-spectrum antibiotics disrupts the natural bacterial flora, giving *C. albicans* an opportunity to proliferate and cause a serious infection (1). Additionally, neonates or patients undergoing chemotherapy, bone marrow, or organ transplants, and those with AIDS are prime targets for these infections, as their immune systems are compromised. Finally, invasive devices such as catheters, intravenous lines, and implants can also cause serious candidemia (fungal infection in the blood), because *C. albicans* is able to form biofilms on these objects. As a result, it has become the fourth leading cause of systemic blood infections, and its mortality rate is 38% (1). Currently, there are a limited number of antimycotic drugs available to treat these infections, due to toxicity and increasing antimycotic resistance (2).

## 2. Lack of Treatment for Fungal Infections

There are primarily three classes of drugs to treat fungal infections. The azole class, most notably Amphotericin B, targets the binding and synthesis of ergosterol, a cell membrane component specific to fungi. The problem with this agent is that, although it targets a fungus-specific molecule, it can also affect cholesterol, a main component of human cell membranes which is similar biochemically to ergosterol. Since this drug is utilized in high concentrations to treat candidemia, it is also toxic to human cells. Additionally, the rapid emergence of drug-resistant organisms and fungicidal versus fungistatic activity are also downfalls to this class of drugs. Azoles have been the most widely used drug for many years in treating *C. albicans* infections, but toxicity and resistance have created a demand for the development of alternatives (2).

One of the newer classes of drugs is the echinocandins (trade name – Caspofungin) which targets  $\beta$ -1,3 D-glucan synthase through noncompetitive inhibition. Without this protein, the pathogen is unable to synthesize its cell wall completely (3). Finally, the sordarin class of drugs is a strong inhibitor of *C. albicans* proteins, specifically elongation factor 2. The difference

between this drug and the other two classes is that it inhibits protein synthesis, while the others target outer structural elements of the cell (4). While these classes of drugs have worked in treating infections in the past, resistance and toxicity have become large issues in treating systemic and severe infections. Thus, researchers must continue their search for novel virulence factors which could be targets for new drug therapies.

### 3. Methods to Identify Virulence Factors

There are two distinct approaches to uncover virulence factors that could be potential targets for drugs. A candidate gene approach tests genes that have the potential of affecting virulence, while another approach is the use of an unbiased screen to sort out genes that affect virulence. An advantage of targeting specific genes is that it uses far less resources to skip ones that are not expected to affect virulence. This allows for more time to be spent investigating the suspected genes in different ways and learning about them. On the other hand, this method requires previous knowledge of the genes in question and imagination as to which could be potential virulence factors, allowing for some key factors to be missed entirely. Performing an unbiased screen is ideal, as every gene that is a factor in the virulence of the pathogen will theoretically be discovered, and knowledge of the organism's mechanisms for virulence could increase significantly. However, the number of target genes makes it difficult to test them as thoroughly. A genome-wide screen is more likely to be limited in its performance and not possible with most pathogens. The development of an unbiased assay for all strains in a gene deletion library is difficult, as the loss of some nonessential genes can affect the subject organism in ways unrelated to virulence. In addition, some virulence factors might not affect certain symptoms or certain host organisms or might affect them in multiple ways. An example is the *C. albicans* gene *IFF4* that encodes a cell wall protein, which works as a virulence factor in that it promotes adherence but as an antivirulence factor *in vivo* in that it makes the pathogen more susceptible to attack by neutrophils by alerting hosts' immune systems (5). Therefore, context of the expression of the gene affects the virulence.

### 4. Previously Identified Virulence Factors

Virulence factors identified to date fall into two broad categories: genes that affect substrate adhesion, attachment, and initial infection and genes that affect the filamentation



pathway of the organism. The presence of cell surface adhesions allows *C. albicans* to make initial contact with host cells and attach strongly. Once adhered, the pathogen secretes hydrolytic enzymes which function to digest host cell membranes as well as degrade host surface components to reinforce adhesion. Some of the most prevalent of these enzymes are known as the SAP family of proteins, or secreted-aspartyl proteases. Additionally, *C. albicans* is able to undergo cellular morphogenesis between unicellular budding cells (yeast form) and chains of filamentous cells (pseudohyphae or hyphae form). It is argued that hyphal cells promote tissue invasion and find breaks in host epithelia while the yeast form promotes propagation of the organism to the cells and uninfected areas. The ability of the organism to switch between the yeast and filamenting forms allows the organism to invade a variety of body locations, adjust quickly to changes in host environment, and evade immune responses and drug therapies (7). Together, changes in the host environment and the virulence traits described above allow for the invasion and pathogenesis of *C. albicans*.

#### **4.1. Histidine Kinases – *SLN1*, *NIK1*, and *HK1***

Studies have shown that transcription factors are important factors in the morphogenesis of *Candida albicans*, and disruptions in certain genes encoding these transcription factors lead to decreased morphogenesis and attenuated virulence. The morphology of *C. albicans* is a result of mainly environmental factors and signaling pathways that include transcription factors which regulate genes recognized as being induced during hyphal formation. Yamada-Okabe et al. showed that three histidine kinase genes, known as *CaSLN1*, *CaNIK1*, and *CaHK1*, are significant in inducing hyphal formation in *C. albicans* (8). When any of these genes were disrupted, a decrease in hyphal formation and attenuation in virulence were observed in a mouse systemic candidiasis model. These effects were most deleterious in the *cahk1Δ* null mutant, as the survival of the mice increased to 20 days, compared to its parental strain of only 5 days (8).

#### **4.2. Transcription Factors – *EFG1*, *CPH1*, and *CPH2***

In a study by Lane et al. in 2001, it was shown that filamentation, the process which produces the hyphal form of *C. albicans*, is regulated by several pathways which converge and additionally regulate known virulence genes (9). The Efg1, Cph1, and Cph2 pathways regulate the expression of *SAP5* and *SAP6*, genes that encode hydrolytic enzymes which are secreted and

assist in host cell digestion and degradation. These pathways also control the expression of *HWP1*, a gene which encodes a cell wall adherence protein in *C. albicans*.

#### 4.2.1. Effect of *rbt1* and *rbt4*

The Efg1, Cph1, and Cph2 pathways affect the transcription of *RBT1* and *RBT4* (9). In a study by Braun et al., two animal models for *C. albicans* pathogenesis showed that *rbt1* $\Delta$ <sup>-/-</sup> and *rbt4* $\Delta$ <sup>-/-</sup> strains had reduced virulence. Braun and his colleagues utilized rabbit corneal infection studies to show the reduced infection and hyphal penetration caused by these mutants in the corneas of rabbits. Then, they used a mouse systemic model to demonstrate attenuated virulence in the *rbt1* $\Delta$ <sup>-/-</sup> and *rbt4* $\Delta$ <sup>-/-</sup> strains (10).

#### 4.2.2. Effects of Dimorphic Transition

Lo et al. showed that *C. albicans* strains with disruptions in Cph1 and Efg1 could not transform into the hyphal stage and were avirulent in the mouse model (11). Wildtype *CPH1*<sup>+/+</sup> *EFG1*<sup>+/+</sup> strains produce filamentous hyphae which assist in host epithelial penetration and invasion. However, the double mutant strain cannot produce hyphae and thus remains in the budded, yeast form as shown in Figure 1 below. This strain of *C. albicans* is avirulent.

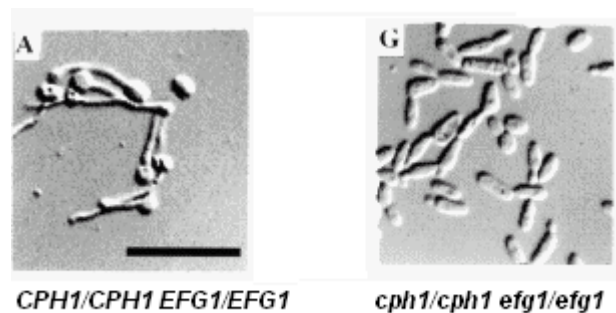


Figure 1: Morphological differences in (A) wildtype (hyphal) and (G) double mutant strains (yeast) of *C. albicans*. Adapted from Lo et al. (11)

Inoculation of  $10^4$ - $10^6$  cells of the double mutant *cph1*<sup>-/-</sup> *efg1*<sup>-/-</sup> fails to kill mice while an inoculum of  $10^7$  cells kills only half the mice after 15 days, compared to the wildtype strain, which kills the mice after 2 days at this concentration (Figure 2). Both mutations are necessary to produce an avirulent pathogen, however single mutations in the gene produce less virulent strains of *C. albicans*.

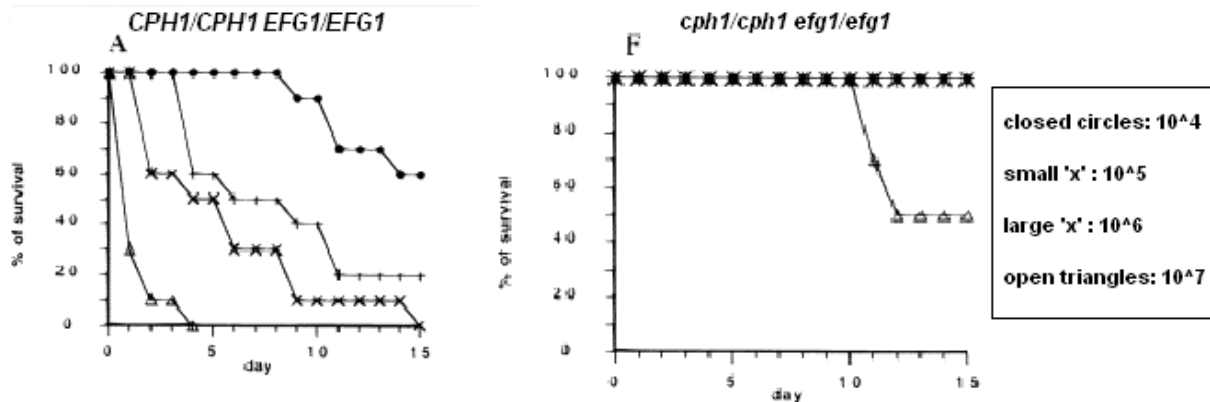


Figure 2: Survival of mice after inoculation with (A) wildtype and (F) double mutant strains of *C. albicans*. Adapted from Lo et al. (11)

Pukkila-Worley et al. demonstrated that *C. elegans* infected with *efgΔ*<sup>-/-</sup> mutants were attenuated in virulence (12). Additionally, hyphae did not develop in the host throughout the experiment. Although *cphΔ*<sup>-/-</sup> mutants were unable to make hyphae, they remained virulent upon infection. However, *efgΔ*<sup>-/-</sup> and *cphΔ*<sup>-/-</sup> double mutants resulted in remarkable attenuation of virulence in the host (Figure 3) (12).

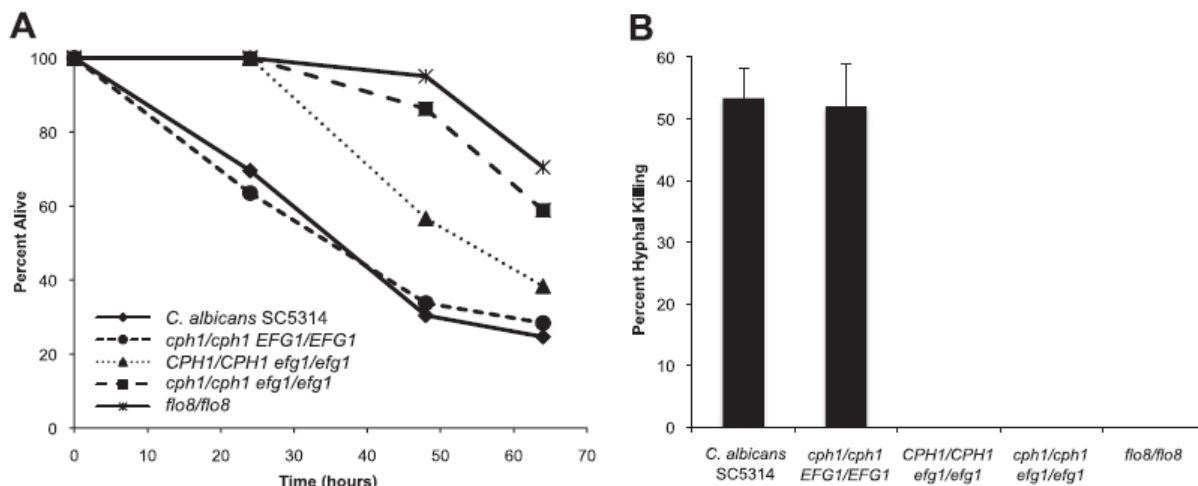


Figure 3: (A) Percent survival of *C. elegans* after infection with wildtype (SC3514) and mutant strains. (B) Percent hyphal killing of wildtype and mutant strains of SC3514. Adapted from Pukkila-Worley et al. (12)

The utilization of multiple pathways to regulate transcription of virulence genes provides an explanation for how *C. albicans* can thrive in various environments and guarantees that the organism can invade and damage host cells. These studies support the idea that transcription

factors are important players in the morphogenesis and subsequent virulence of *C. albicans*, because they amplify the effect of a single gene mutation via a regulatory cascade.

### 4.3. Cell Wall Proteins

Cell wall proteins (CWPs) are another class of virulence factors that have become important in terms of antifungal drugs. As stated before, CWPs are important for both adhesion and filamentation. It is intuitive that when *C. albicans* is in the hyphal form, it has more surface area to adhere to a host cell. An important group of cell wall proteins in *C. albicans* is the Als (agglutinin-like sequence) family (13). These are large glycoproteins that are involved in the process of adhesion to mammalian cells. Another area of interest is the GPI-anchored cell wall proteins from the Sap (secreted-aspartyl proteinase) family. These proteins are localized in the cell wall and are involved in the adhesion of *C. albicans* to cells (14). Additionally, the Sap enzyme has a role in penetration and invasion by *C. albicans* by degrading components of the host cell membrane.

## 5. Host-Pathogen Interactions

Genomic virulence screens have previously been powerful tools that allow researchers to uncover the mechanism of infection and better understand an organism's pathogenesis. Many bacterial and fungal organisms have presented a pathogenic threat to humans, so it has been of great scientific interest to understand bacterial or fungal mechanisms of infection. It is also of interest to observe what defense mechanisms the host organism employs to combat the invading bacteria or fungi. Genomic virulence screens allow researchers to identify genes required to infect the host. This information is used to identify specific infection pathways and mechanisms. Many bacterial virulence screens have been performed using the model organisms *Caenorhabditis elegans* and *Drosophila melanogaster* as hosts and the resulting findings have been crucial for the advancement of understanding mechanisms of infection (15, 16, 17, 18, 19, 20, 21).

### 5.1. *Caenorhabditis elegans*, a Model Host for Virulence Studies

*Caenorhabditis elegans* has been used as a model host for studying the effects of many pathogenic bacterial species. *C. elegans* is a small nematode with a relatively short life span, 2-3 weeks, which can be grown in a laboratory setting with ease (22). The *C. elegans* genome has

been fully sequenced and can easily be genetically modified either through modification of the wildtype genes or through RNAi knockdown. *E. coli*, the main food source for *C. elegans*, can be modified to express double stranded RNA that is specific to certain *C. elegans* genes, which knock down the gene's protein concentration to a negligible amount (22). Most pathogenic organisms can infect *C. elegans* through physiological means, being eaten by the nematode and moved to the intestinal lumen (23). This allows for the ability to screen many strains of a pathogenic organism without the need for auxiliary techniques such as injection.

Although *C. elegans* is a useful model host for virulence studies, it has its limitations because of its primitive immune system. However, aspects of its innate immune system are conserved in mammals. For example, *C. elegans* contains Toll-like receptors, but they have not been implicated in pathogenic responses (23), because *C. elegans* do not possess an acquired immune system. Therefore, the range of studies on the host side is limited to pathways resulting in cell death or the release of antimicrobial peptides. Since the host innate immune defense is relatively simple, it is possible to study the pathogenic organism's mechanisms for overcoming the host's defenses in order to establish an infection. Despite these limitations, the *C. elegans* model for infection provides a whole animal, genetic model host for rapid mutant screening.

## **5.2. *Drosophila melanogaster*, Another Model Host for Virulence Studies**

*Drosophila melanogaster* is an established model organism in which innate immunity to fungal and bacterial pathogens is studied (23). *D. melanogaster* has no adaptive immune characteristics, peripheral antigen presenting cells, or B-cells but can mount a swift and powerful immune response to attacking pathogens through Toll and IMD signaling pathways (22). The Toll pathways turn on a cascade of proteins that activate NF- $\kappa$ B-like transcription factors, while the IMD pathways turn on the Rel family transcription factor Relish (16). Both transcription factors regulate the release of antimicrobial peptides to fight the invading pathogenic organisms. This signaling pathway is homologous to the mammalian cell Toll-like receptor pathway. Therefore, *D. melanogaster* can be used as a powerful model to study innate immunity response mechanisms to various microbial pathogens.

Although *D. melanogaster* is an excellent model for microbial infection, there is a disadvantage in that very few microbial strains will infect it through physiological means. Simply feeding food laced with the pathogenic organism of interest to *D. melanogaster* larvae or introducing the organism onto the exoskeleton will not result in an infection. This problem can

be overcome by introducing the pathogenic organism directly to the thorax with a needle, bypassing *D. melanogaster*'s natural defense and allowing it to cause infection (22). This process restricts the *D. melanogaster* model of innate immunity from being used in assays when many strains of a pathogenic organism are being screened.

### 5.3. Virulence Screens Using Microbial Pathogens

Several bacterial species have been studied in the context of a pathogenic interaction. An advantage of studying bacteria is that many pathogenic species and strains have been completely sequenced, and genomic databases have been compiled. Also, bacterial genomes can be easily manipulated, and bacteria can be grown without the need for specialized laboratory equipment. Few fungi have been studied in such a manner. One well-studied and well-known fungal pathogen is *Cryptococcus neoformans*, which was demonstrated to infect and kill *C. elegans* by Mylonakis et al. in 2002 (24). This model system using *Cryptococcus neoformans* and *C. elegans* can be used to study infection mechanisms and how they relate to mammalian fungal infections. Genes identified as necessary for infection in a particular fungal species can be used as a basis for pathogenic studies done in a wider range of fungal species by looking at homologous genes.

### 5.4. Virulence Assay

An assay to rapidly screen for fungal virulence was developed by Jain et al. in 2009 (25). The advantage that this assay has over previous fungal virulence screens using *C. elegans* (25) is that it uses a diseased state, Deformed anal region (Dar), as a measure of virulence instead of death. The length of previous killing assays varied from 5 to >10 days, which would not be conducive for the purpose of screening thousands of genes (24). However, the Dar phenotype assay developed by Jain et al. incorporates a semi-qualitative aspect that is lacking in previous fungal virulence screens and reduces the assay length. The Jain et al. method for virulence detection relies on the *C. elegans* defense mechanism against yeast infection, which results in a Dar phenotype. The severity of the Dar phenotype caused by mutant strains of fungi can be compared to the wildtype strain to gain a deeper understanding of how gene deletions affect the ability of infection. Genes that are responsible for a change in the severity of the infection could lead to the study of lesser known pathways that aid in fungal infections. The method of Jain et al. (25) also reduces the length of the assay to four days, from the plating and hatching of the *C.*

*elegans* eggs to the appearance of the Dar phenotype (25). This short assay length is useful for the study of deletion libraries that contain a large number of genes. Our project aims to utilize this assay in the search for genes which encode for various virulence factors in *C. albicans*.

## 6. Experimental Goals

The goals of the virulence assay are dual fold: (1) to further the understanding of how the pathogenic organism *Candida albicans* establishes a successful infection and (2) to identify novel virulence factors as potential drug targets.

The immediate goal of the virulence screen is to further the understanding of the infectious mechanisms of *C. albicans* and how it subverts a variety of the host organism's immune defenses. A deeper understanding of how *C. albicans* is a successful pathogen will allow researchers to predict how it will survive in the host and how a change in environment will affect its ability to establish a successful infection. This knowledge could also be applied to homologous fungal species and allow for the advancement of general fungal knowledge.

Through such a screen, we are able to identify gene mutations in the *C. albicans* genome that hinder or prevent its ability to establish infection in a host organism. Further study of the genes identified will lead to the discovery of pathways and proteins that have the potential to be targeted for antifungal drug treatments. A pathway or protein that is absent in mammalian cells would be deemed a potential drug target for antifungal therapeutics. Development of such alternate ways of treating fungal infections has been recognized as a growing public health need.

## 7. Materials and Methods

### 7.1. Strains and Stocks

Stocks of N2 *C. elegans* were maintained at 16°C on Nematode Growth Agar Media (NGM) (26) plates spotted with *E. coli*. Approximately every 7 days a new stock plate was created where at least 3 adult worms were transferred to an *E. coli* spotted plate. Stocks of OP50 *E. coli* and DAY286 *C. albicans* (used as wildtype) were kept at 4°C, streaked on Luria Broth (LB) and Yeast Peptone Dextrose (YPD) plates, respectively. Each mutant strain was stored in liquid media in 96-well plates, as obtained from the Fungal Genetics Stock Center, at -80°C and thawed at room temperature before use.

## 7.2. Egg Preparation

At least three worms were transferred to an NGM plate spotted with *E. coli* and incubated for four days at 20°C. On day four, the plates were washed with 15 mL of M9 buffer which was transferred to a 15 mL conical tube and centrifuged at 900 x g for 2 minutes. After removing the supernatant, being careful not to disturb the pellet, 15 mL of a 1:4 dilution of commercial bleach (5.25%) containing 0.25 M NaOH was added to the 15 mL conical tube. The tube was gently inverted for 3 minutes and then centrifuged at 2,000 x g for 2 minutes. The supernatant was removed, and the pellet was washed with 15 mL of M9 buffer. The tube was centrifuged at 2,000 x g for 2 minutes, the supernatant was removed, and the pellet was resuspended in 500 µL of M9 buffer. The average number of eggs per µL was calculated by transferring 5 µL of the egg solution to an unspotted plate and counting the number of viable eggs. Assay plates were then spotted with the appropriate volume of the egg solution (approximately 5 µL) to yield 35 to 40 viable eggs per plate. One assay plate was prepared for each mutant strain, along with one for wildtype *C. albicans* (DAY286) with each assay.

## 7.3. Virulence Assay

Overnight cultures of the *C. albicans* strains to be assayed, DAY286, and *E. coli* (OP50) were grown at 37°C in 3 mL of YPD media (27) for *C. albicans* and LB media for *E. coli*. From each culture, 500 µL were transferred to 1.5 mL microcentrifuge tubes and centrifuged at full speed in a tabletop microcentrifuge for 1 minute. The supernatants were discarded, and the pellets were washed twice by being resuspended in 1 mL of deionized H<sub>2</sub>O (dH<sub>2</sub>O) and centrifuged at full speed in a tabletop microcentrifuge for 1 minute. After decanting the supernatant, the pellets were centrifuged again, and then any excess water was removed via micropipette. The pellets were brought to final concentrations of 200 mg/mL for *E. coli* and 10 mg/mL for *C. albicans* in dH<sub>2</sub>O. Mixtures of 0.5 µL of *E. coli*, 0.5 µL of the appropriate *C. albicans* strain, 10 µL of 50 mg/mL streptomycin, and 9 µL of dH<sub>2</sub>O were spotted in the middle of each assay plate.

The plates were incubated at 20°C and observed on days three, four, and five. Worms were counted for the presence or absence of the Dar phenotype, and severity of the Dar phenotype was compared to the DAY286 *C. albicans* positive control. Other observations, such as death and other changes in phenotype or behavior, were also noted. Figure 4 shows a visual representation of the egg preparation and virulence assay.



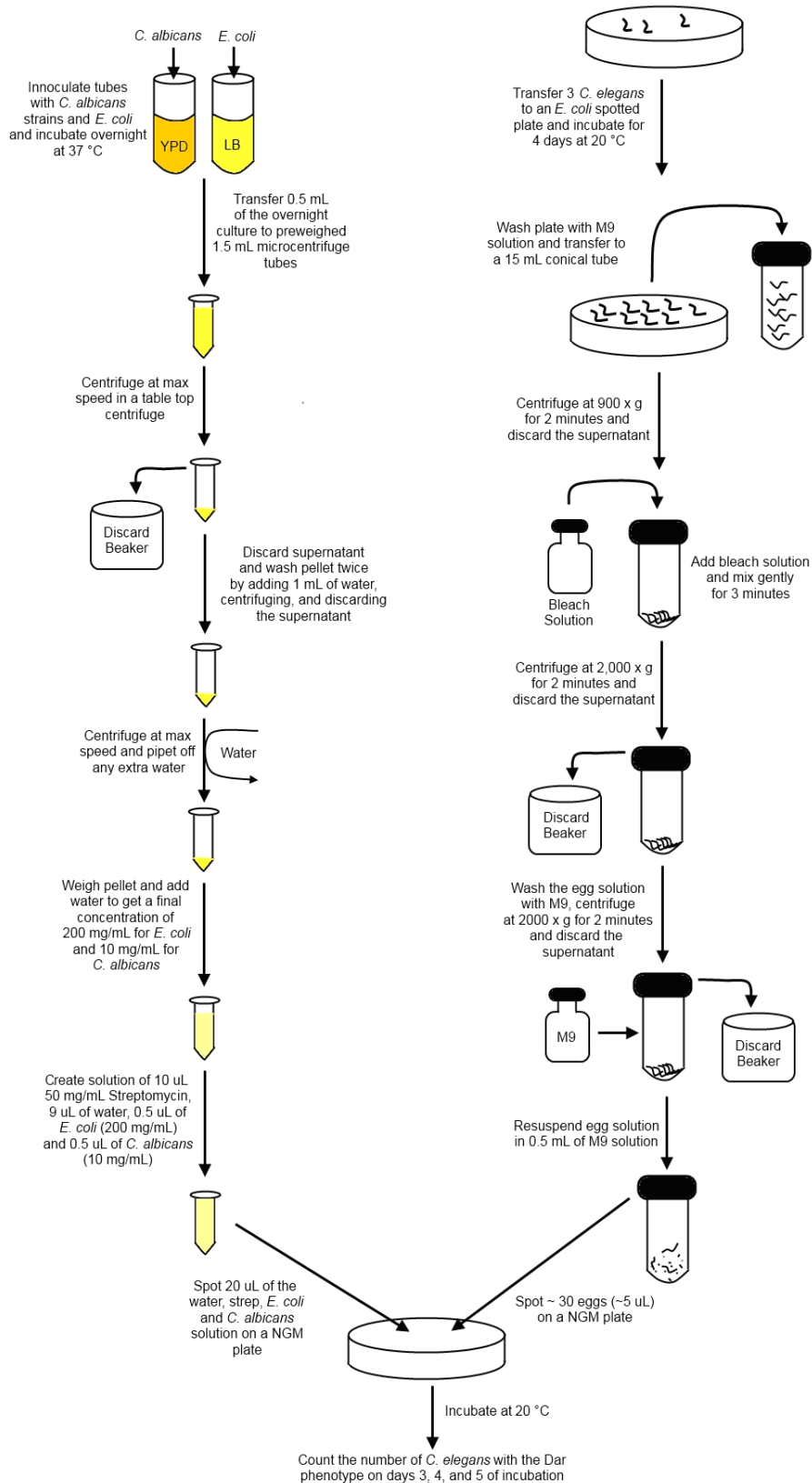


Figure 4: Virulence assay flowchart

#### 7.4. Optimization of the Virulence Assay

The virulence assay used in this study was based on that described by Jain et al. in 2009, with a substitution of *C. albicans* in place of *S. cerevisiae* as the infectious agent. *C. albicans* was chosen as the infectious agent in part because it causes a more pronounced Dar phenotype than *S. cerevisiae* and is a known human pathogen. This substitution necessitated optimization of the new assay to make it high throughput, because of the differences between the two yeast species. *C. albicans* grows at a significantly faster rate than *S. cerevisiae*, so the ratio of *E. coli* to *C. albicans* needed to be adjusted to prevent the *C. albicans* from hindering *E. coli* growth and arresting the *C. elegans* in the L1 and L2 stages. Overgrowth of *C. albicans* also impairs the ability to locate *C. elegans* in the spot. Another concern was that a high concentration of *C. albicans* could induce a false Dar phenotype by overpowering the effects of the gene deletion. Therefore, it was important to adjust the *C. albicans* concentration to get it as low as possible while still showing almost 100% Dar in *C. elegans* plated with wildtype *C. albicans*. After preliminary testing, the concentration of yeast by weight was reduced from the 20 mg/mL of *S. cerevisiae* to 10 mg/mL for *C. albicans*, the amount of each and the *C. albicans*:*E. coli* ratio were reduced. Sterile water was added to the mixture for spotting the plates in order to further dilute the yeast, to spread it out on the plates.

#### 7.5. Survival Analysis

For survival analysis, plates were prepared in triplicate for each mutant (*dot4Δ*, orf19.1219, and orf19.6713), wildtype (DAY286), and *E. coli* (OP50) as described in the Virulence Assay section. Approximately 30±5 *C. elegans* eggs were spotted on each plate as described in Section 7.2, and the plates were incubated at 20°C. The day prior to a worm transfer, plates would be spotted as described in Section 7.3 and incubated at 20°C for 24 hours. On day 3 of the survival analysis assay, the surviving worms were transferred to a corresponding spotted plate. Every two days, the worms were transferred to a new plate and the number of worms alive, dead, and dead on the edge of the plate were recorded. For data curve analysis, SPSS (IBM, Inc.) was used to generate Kaplan-Meier survival curves and to assess the significance using the Gehan-Breslow test.

## 8. Results

### 8.1. Validation of the *C. albicans* Virulence Screen

The pathogenic virulence screen was adapted from the Jain et al. paper (25) with *C. albicans* as the invading pathogen instead of *S. cerevisiae*. To validate that the Dar phenotype marking infection occurred when using *C. albicans*, several optimization experiments were performed. The concentration of *C. albicans*, *E. coli*, and streptomycin were varied prior to the spotting of the assay plates. It was observed that a mixture composed of 0.5  $\mu$ L of 10 mg/mL *C. albicans*, 0.5  $\mu$ L of 200 mg/mL *E. coli*, 10  $\mu$ L of 50 mg/mL streptomycin, and 9  $\mu$ L of water would yield a spot with optimal *E. coli* and *C. albicans* growth. The spot contains enough *E. coli* to allow the *C. elegans* to progress past their L1 stage of life. Next, the virulence screen assay was performed using the *C. albicans* strain DAY286 to determine whether this strain, the progenitor of the deletion library used in the screen, is capable of causing an infection that produced the Dar phenotype. Worms showing the Dar phenotype were observed on days 3, 4, and 5 with 100% Dar being observed by day 5 (Figure 5). Compared to Dar induced by *S. cerevisiae*, *C. albicans* produced a more prominent protrusion on the anal region of *C. elegans* and appeared in close to 100% of worms on day 3, while Dar caused by *S. cerevisiae* appeared primarily on day 4 of incubation in 80% of the worms.

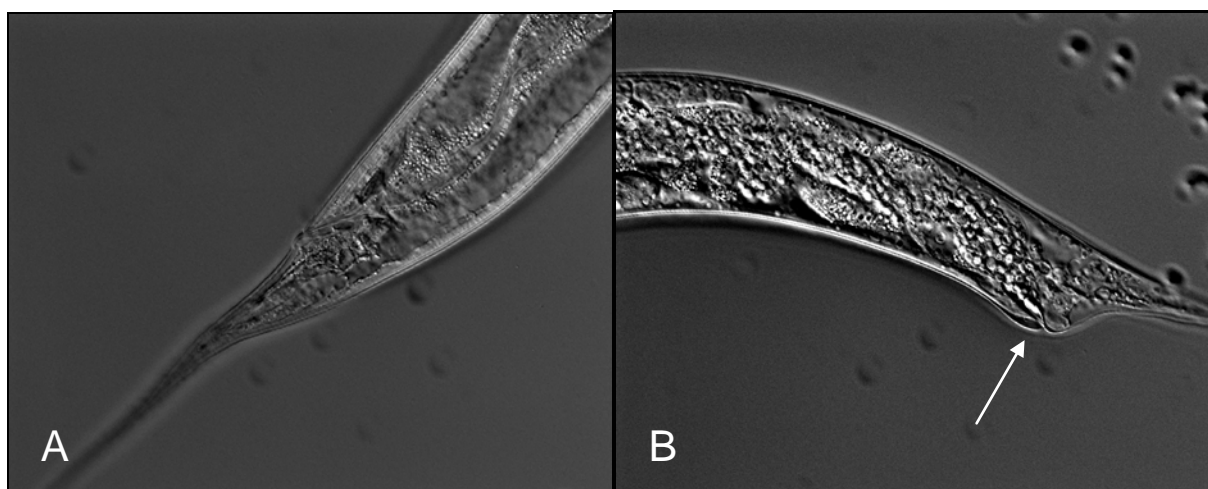


Figure 5: Photographic comparison of the Dar observed in *C. elegans* at 400X magnification, grown on (A) *E. coli* and (B) *E. coli*:DAY286 on day 4. White arrow indicates Dar phenotype.

The virulence screen was further validated by identifying previously known genes that have been associated with virulence in *C. albicans*. The mutant strains *CMP1* (orf19.6033),

*SAP8* (orf19.242), and *IFF11* (orf19.12854) showed a reduction in the prominence and presence of Dar over the 3 day observation period (Table 1).

Table 1: Percentage of Dar Phenotype on Days 3, 4, and 5 of Incubation

ORF #	<i>S. cerevisiae</i> Homolog	Day 3			Day 4			Day 5		
		Dar	Total Worms	% Dar	Dar	Total Worms	% Dar	Dar	Total Worms	% Dar
orf19.6033 ( <i>CMPI</i> )	<i>CMPI</i>	12	27	44%	14	26	54%	12	25	48%
orf19.12854 ( <i>IFF11</i> )	<i>WSC4</i> (best hit)	11	24	46%	10	20	50%	7	11	64%
orf19.242 ( <i>SAP8</i> )	<i>YPS1</i> (best hit)	19	28	68%	23	28	82%	25	27	93%

## 8.2. Identification of Novel Genes

Throughout the screen, four novel *C. albicans* genes were identified as potential virulence factors by a decrease in the presence and severity of the Dar phenotype (Table 2). To determine the function of these novel genes, the *Candida* Genome Database (<http://www.candidagenome.org/>) was consulted to find known orthologs or homologs in *S. cerevisiae*.

Table 2: Novel Genes Associated With *C. albicans* Infection

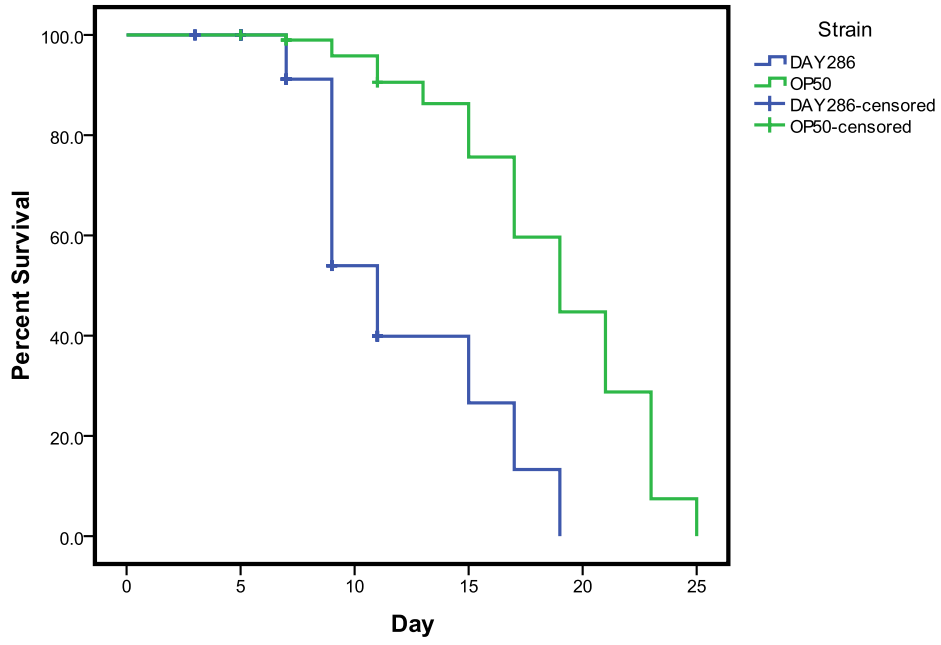
ORF #	<i>S. cerevisiae</i> Homolog	Day 3			Day 4			Day 5		
		Dar	Total Worms	% Dar	Dar	Total Worms	% Dar	Dar	Total Worms	% Dar
orf19.6713	<i>DEF1</i> (best hit)	7	23	30%	6	21	29%	2	20	25%
orf19.1219	<i>RKR1</i> (best hit)	10	28	36%	11	18	61%	13	15	87%
orf19.3370 ( <i>DOT4</i> )	<i>DOT4</i>	15	31	48%	14	29	48%	12	25	48%
orf19.2753 ( <i>ZCF15</i> )	<i>PUF2</i> (best hit)	14	30	47%	17	29	59%	18	29	62%

## 8.3. Survival Analysis

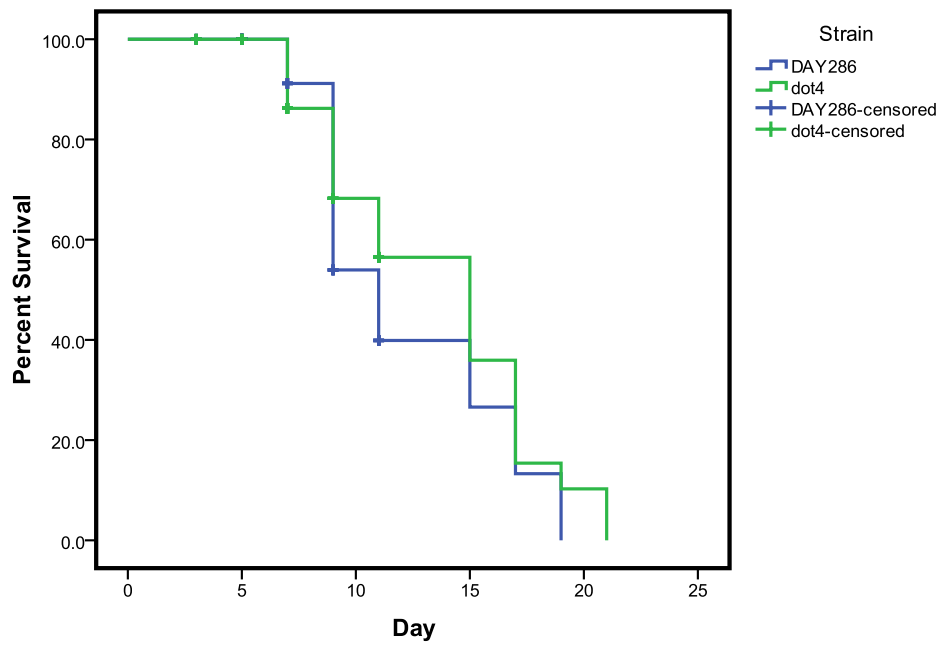
To determine whether the virulence of these mutant strains was affected, they were subjected to a killing assay as described in Section 7.5 in triplicate, along with wildtype. The results of each assay for each strain were combined by addition, and Kaplan-Meier survival curves were generated (Figure 6). With the Grehan-Breslow test, *DOT4* did not show significant deviation from regular *C. elegans* survival ( $p > 0.05$ ), but orf19.6713 (*Sc. DEF1*) and orf19.1219

(*Sc. RKRI*) did ( $p < 0.05$ ). In the latter strains, the worms survived longer than those grown on wildtype.

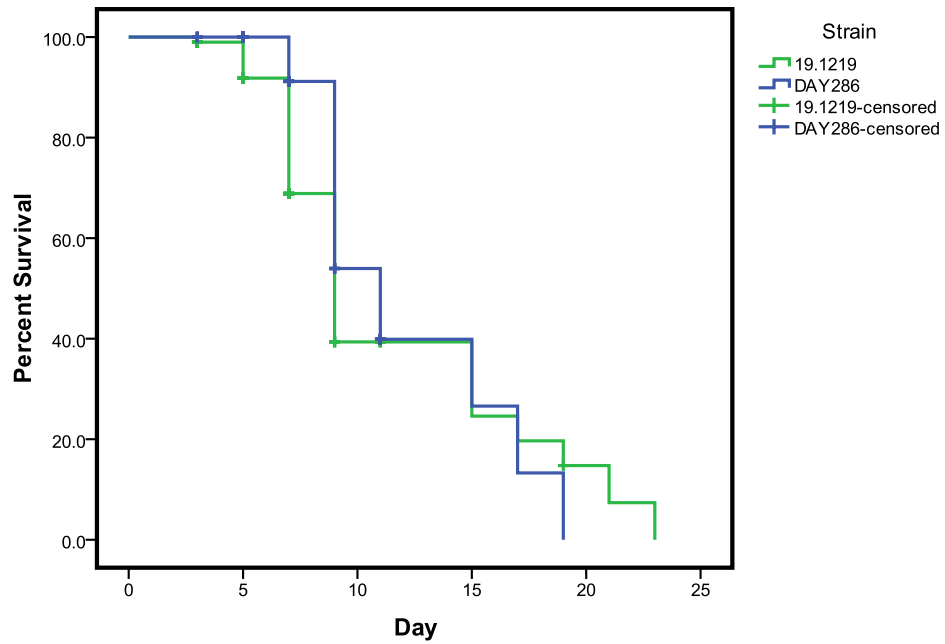
(A) *DAY286* and *OP50* ( $p < 0.01$ )



(B) *DAY286* and *dot4* ( $p > 0.05$ )



(C) DAY286 and orf19.1219 (*Sc. RKRI*) ( $p < 0.05$ )



(D) DAY286 and orf19.6713 (*Sc. DEF1*) ( $p < 0.05$ )

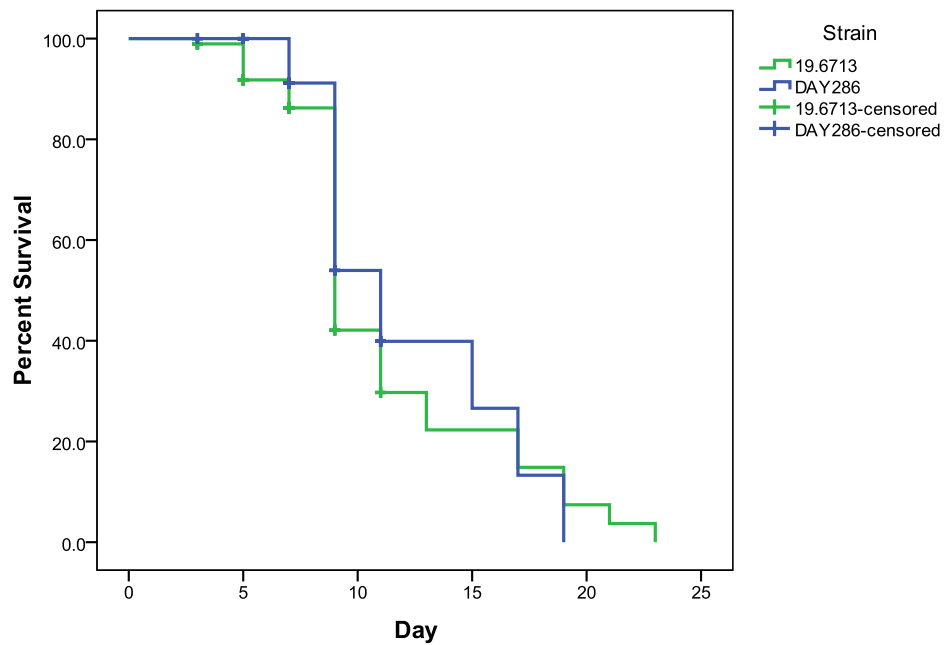


Figure 6: Kaplan-Meier survival curves of (A) only *E. coli*, (B) *dot4*, (C) orf19.6713 (*Sc. DEF1*), and (D) orf19.1219 (*Sc. RKRI*), versus DAY286 *C. albicans*.

#### 8.4. Other Observations

While observing *C. elegans* infected with each mutant, any perceived differences from wildtype in behavior or phenotype besides Dar were also noted. Vulval swelling, as described by Jain et al. (25), was common in worms that were in the later stages of development. The presence of vulval swelling was observed on day 3 of the assay, though it increased over time and appeared to correlate somewhat with the severity of Dar. Interestingly, oral swelling was observed in two worms that were infected with the orf19.1219 mutant during a survival curve assay. No behavioral differences seemed to be significant or common.

### 9. Discussion

The virulence assay that was developed was determined to be a valid method for identification of virulence factors in *C. albicans*. The Dar phenotype observed in *C. albicans* was similar to that seen in the *S. cerevisiae* model. Observing more prominent and earlier symptoms suggests that *C. albicans* is better at establishing an infection in *C. elegans* than *S. cerevisiae*. This is not unexpected, as *C. albicans* is a pathogen and *S. cerevisiae* is not. In modifying the assay methods for *C. albicans*, a lesser concentration of *C. albicans* is necessary for infection. The *C. albicans* virulence screen was further validated, as it showed a decrease in the severity and presence of the Dar phenotype with mutant strains that were lacking expression of genes that were previously known as virulence factors. This showed that our assay was sensitive enough to detect a partial reduction in virulence.

The genes presented in Table 2 have been identified in our screen as potential virulence factors of *C. albicans*. Mutations in these genes cause a decrease in the number of worms showing the Dar phenotype, which indicates disease. However, based on the screen alone, we cannot speculate as to whether the mutants are more or less virulent. Dar is considered to be protective in that it helps *C. elegans* fight the disease, much like a fever. The mutants can be considered more virulent in the sense that the worms are unable to mount a response against the pathogen to fight the infection, and the fungus rapidly overtakes the worms. On the other hand, the mutants can be considered less virulent in the sense that they do not cause disease at all in the worms, thus showing no Dar. Here, we present information on each of the genes we have identified throughout our screen. We speculate as to how mutations in these genes may affect the virulence of *C. albicans*.

### 9.1. *DOT4*

While the function and importance of *DOT4* in *C. albicans* has yet to be studied, evidence from *Saccharomyces cerevisiae* suggests that it plays a significant role in sub-telomeric gene silencing and chromatin modification as a ubiquitin protease (28). Dot4 is primarily located in the nucleus and interacts with the silencing protein Sir4 in order to deubiquitinate histone H2B. As a result of this deubiquitination, methylation of lysine residues 4 and 79 on H3 is prevented, and transcription of genes located near the telomeres is blocked (28, 29).

In *dot4* $\Delta$  cells, silencing is disrupted, as the protein is unable to deubiquitinate H2B. The resulting monoubiquitination of H2B results in the methylation of H3, K4, and K79, which leads to open chromatin. Thus, transcription can occur, and genes located near the telomeres are expressed. Since *dot4* $\Delta$  cells showed a reduction in the Dar phenotype, it can be surmised that the genes transcribed could affect virulence by influencing dimorphism, adhesion, or an unknown pathway in *C. albicans*. As seen in Figure 6B, there was no significant difference in death rates between *dot4* and wildtype. This could be explained as the sub-telomeric genes that are opened to transcription machinery might not be associated with virulence but rather growth. When these genes are expressed, growth is slowed, and it takes longer to establish a successful infection.

### 9.2. *orf19.1219* (*S. cerevisiae* closest homolog *RKR1*)

The molecular functions and biological processes of *orf19.1219* is unknown in *C. albicans*; however, there is information regarding the most similar gene and its protein product in *S. cerevisiae*, *RKR1*. In *S. cerevisiae*, the product of *RKR1* is a conserved nuclear RING domain protein which is a vital component of a protein ubiquitination pathway that modulates chromatin structure, function, and transcription. Rkr1 interacts with Rtf1 to form the Paf1 complex. This complex is required for several histone modifications and transcription elongation (30). Upon the interaction of these two proteins, histone H2B is ubiquitinated, allowing for the methylation of H3 at K4 and K79. As a result of methylation, the chromatin is open, and transcription of the sub-telomeric genes is permitted (31).

Cells lacking functional Rkr1 show impaired sub-telomeric gene silencing (30). In *rkr1* $\Delta$  cells, monoubiquitination of H2B K123 is unable to take place, and the histone remains deubiquitinated. As a result, H3, K4, and K79 are not methylated, and the DNA remains tightly



coiled, hindering the ability of transcriptional machinery to dock and transcribe. The genes located near the telomeres are not expressed and thus are silenced. In our study, orf19.1219 cells showed a reduction in the Dar phenotype. This suggests that the genes located near the telomeres may affect virulence by influencing dimorphism, adhesion, or an unknown pathway in *C. albicans*.

### 9.3. orf19.6713 (*S. cerevisiae* closest homolog *DEF1*)

There is no ortholog of orf19.6713 in *S. cerevisiae*. The closest homolog is *DEF1*, which has its own ortholog in *C. albicans*, *DEF1/orf19.7561*. Studies in *S. cerevisiae* indicate that Def1 has various functions. Previously, it was identified for its role in transcriptional repair and degradation of RNA polymerase II in chromatin. When RNA pol II is stalled at DNA lesions, Def1 forms a complex with Rad26 to enable the ubiquitination and proteolysis of RNA pol II when the DNA is unable to be fixed quickly (32).

Recently, research indicates that Def1 is involved in telomere maintenance. It has been shown to interact with Rrm3, a helicase, to assist in transcriptional elongation of telomeres. In *def1Δ* mutants, telomeres were shortened by approximately 200 base pairs compared to wildtype cells. Yong-Bin et al. shows that this shortening is not a result of a defect in the telomerase recruitment pathway; rather, they argue that Def1 is involved in telomere protection (33). However, there has been no follow-up study describing the mechanism of how this protein functions to protect telomeres.

While *DEF1* has several functions, our working model is that its role in telomere maintenance is most significant to our screen's analysis due to the fact that *DOT4* and *RKR1* play roles in telomere silencing and overall chromatin structure. If the telomeres are not protected as well, it is possible that *C. albicans* will lose its viability over time through damage or a loss of genomic DNA during replication.

### 9.4. *ZCF15*

In 2005, *ZCF15* was discovered in a screen for zinc cluster proteins. Although its exact function in *C. albicans* has yet to be determined, proteins with zinc cluster domains are generally involved in DNA recognition (34). The closest homolog of *ZCF15* is *PUF2* in *S. cerevisiae* (35). Puf2, along with the other Puf proteins, binds to 3' untranslated regions of mRNAs to modulate expression. Specifically, Puf2 associates with mRNAs encoding membrane proteins as well as

proteins involved in transmembrane transport and vesicular trafficking (36). If *ZCF15* has a similar function, one can speculate that it may modulate expression of certain cell membrane proteins of *C. albicans*. These membrane proteins can include those involved in adhesion or the excretion of hydrolases, thus affecting the virulence of the organism.

### 9.5. Future Experiments

The first step in further study of the genes identified in our screen is to make mutant strains containing deletions in the genes. The strains in the library utilized in our screen contained transposon-generated mutants. As a result, one cannot be certain that the transposon inserted itself correctly within the gene, causing a disruption. Additionally, it may have inserted itself elsewhere in the genome, and the decreased Dar phenotype could be a result of that disruption. Thus, it is necessary to completely delete each gene in separate strains and reconfirm the decreased Dar phenotype in these strains.

As previously discussed, it is unknown from our screen whether or not the mutants are more or less virulent in causing infection in *C. elegans*. Further experiments are needed to determine whether virulence is amplified or attenuated based on how the genes affect virulence traits of the organism. Two experiments that can be performed easily are filamentation and adhesion assays. One can compare the filamentation and adhesion of wildtype to each mutant strain. A greater amount of filamentation and/or adhesion suggests a more virulent organism, as these are the two main virulence traits of *C. albicans*. A lesser amount of filamentation and/or adhesion will indicate a less virulent organism.

While there were survival curves performed in our research, it would be beneficial to repeat the survival analysis. Since performing the first survival assay, another gene (*ZCF15*) was identified and thus needs to be included in the assay. Survival curves will show whether or not worms grown on the mutant strains can survive longer than worms grown on wildtype *C. albicans*. These results can be related to virulence of strains. For example, if the worms grown on a mutant strain survive longer, it can be hypothesized that the mutant strain is less virulent. If the worms grown on a mutant strain die more quickly than those grown on wildtype, it is suggested that the mutant strain is more virulent. In our initial survival analysis, worms grown on plates with mutant strains orf19.1219 and orf19.6713 survived longer than wildtype, suggesting these mutant strains are less virulent.

Experiments which explore the expression of genes can also be useful for follow-up investigation. A microarray can be a useful tool to utilize, especially in analyzing *DOT4*, orf19.1219, and orf19.6713, as these genes are involved in telomere maintenance. This technique will show which genes are upregulated or downregulated in the mutants in comparison to those expressed in wildtype. Once these genes are identified, one can research what pathways they are involved in and determine more specifically if they are involved in virulence pathways.

While Zcf15 has a domain which generally interacts with DNA, its homolog in *S. cerevisiae*, Puf2, modulates RNA expression. Thus, it must be determined where this protein is functioning in *C. albicans*. A ChIP assay can be utilized to determine if it is binding to DNA and which genes it is affecting if so. Also, the gene *ZCF15* can be sequenced to determine if it contains an RNA-binding domain, as it could potentially bind RNA as well. If the protein is binding to mRNA to modulate expression, an RNA microarray can be useful in determining of which proteins *ZCF15* is enabling or inhibiting the transcription.

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## Appendix A

This section includes the raw data collected on days 3, 4, and 5 of the assay, showing the number of total worms and the number of worms displaying the Dar phenotype for each strain assayed. Day 3 data is colored purple, day 4 data is colored green, and day 5 data is colored red. Strains that were not assayed contain N/A and are colored blue. All plates used in the assay were obtained from the Fungal Genetics Stock Center (<http://www.fgsc.net/>). The plates are arranged in the following order: C/JN TF Plate, 2nd Set TF Plate 1, 2nd Set TF Plate 2, VB GKO Plate 1, VB GKO Plate 2, VB GKO Plate 3, VB GKO Plate 4, VB GKO Plate 5, DS TF Plate, SFY Plate, CWP Plate 1, CWP Plate 2, Miscellaneous Plate, Kinase Plate 1, and Kinase Plate 2.



CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.6817	CJN242	A1	19	3	22	86%	13	3	16	81%	13	2	15	87%
orf19.3809	CJN256	A2	18	1	19	95%	13	0	13	100%	11	0	11	100%
orf19.7247	CJN267	A3	26	1	27	96%	17	0	17	100%	22	0	22	100%
orf19.1141	CJN299	A4	26	2	28	93%	24	0	24	100%	17	0	17	100%
orf19.4433	CJN305	A5	16	1	17	94%	20	0	20	100%	9	0	9	100%
orf19.5908	CJN308	A6	15	0	15	100%	14	0	14	100%	8	0	8	100%
orf19.715	CJN322	A7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12215	CJN334	A8	13	1	14	93%	13	1	14	93%	10	0	10	100%
orf19.12786	CJN348	A9	20	0	20	100%	15	1	16	94%	5	0	5	100%
orf19.4972	CJN393	A10	38	2	40	95%	25	1	26	96%	26	0	26	100%
orf19.173	CJN395	A11	28	0	28	100%	26	1	27	96%	13	0	13	100%
orf19.4125	CJN396	A12	23	1	24	96%	20	0	20	100%	N/A	N/A	75+	~90
<b>DAY 286</b>		WT	28	2	30	93%	23	2	25	92%	17	1	18	94%

CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4766	CJN401	B1	16	2	18	89%	19	0	19	100%	20	0	20	100%
orf19.3187	CJN403	B2	27	5	32	84%	18	2	20	90%	21	0	21	100%
orf19.3986	CJN411	B3	24	2	26	92%	20	0	20	100%	23	0	23	100%
orf19.668	CJN419	B4	20	3	23	87%	23	0	23	100%	16	0	16	100%
orf19.5026	CJN427	B5	26	3	29	90%	21	0	21	100%	16	0	16	100%
orf19.467	CJN432	B6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4318	CJN434	B7	16	7	23	70%	26	0	26	100%	27	0	27	100%
orf19.7359	CJN442	B8	32	6	38	84%	28	0	28	100%	25	0	25	100%
BLANK		B9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.723	CJN459	B10	25	3	28	89%	17	0	17	100%	16	0	16	100%
orf19.7518	CJN491	B11	25	2	27	93%	15	0	15	100%	16	0	16	100%
orf19.2745	CJN494	B12	33	4	37	89%	24	2	26	92%	24	0	24	100%
DAY 286		WT	28	2	30	93%	23	2	25	92%	17	1	18	94%

CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7583	CJN495	C1	30	1	31	97%	24	1	25	96%	18	0	18	100%
orf19.5729	CJN506	C2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.757	CJN511	C3	24	4	28	86%	21	0	21	100%	18	0	18	100%
orf19.3127	CJN517	C4	29	1	30	97%	22	4	26	85%	22	0	22	100%
orf19.4568	CJN518	C5	25	3	28	89%	29	0	29	100%	25	0	25	100%
orf19.1135	CJN523	C6	27	0	27	100%	21	0	21	100%	19	0	19	100%
orf19.1187	CJN524	C7	14	3	17	82%	16	0	16	100%	11	0	11	100%
orf19.5548	CJN528	C8	22	3	25	88%	30	0	30	100%	22	0	22	100%
orf19.3308	CJN531	C9	20	8	28	71%	25	0	25	100%	18	0	18	100%
orf19.2647	CJN544	C10	33	2	35	94%	25	0	25	100%	15	0	15	100%
orf19.6182	CJN548	C11	23	1	24	96%	17	0	17	100%	12	0	12	100%
orf19.431	CJN563	C12	26	1	27	96%	18	0	18	100%	13	0	13	100%
<b>DAY 286</b>		WT	25	2	27	93%	21	1	22	95%	21	0	21	100%

CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7318	CJN571	D1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.538	CJN577	D2	20	2	22	91%	22	0	22	100%	17	0	17	100%
orf19.1497	CJN582	D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1255	CJN592	D4	24	3	27	89%	22	0	22	100%	17	0	17	100%
orf19.3305	CJN593	D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4573	CJN598	D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.9191	CJN608	D7	22	2	24	92%	24	0	24	100%	21	0	21	100%
orf19.1007	CJN609	D8	25	0	25	100%	25	1	26	96%	17	0	17	100%
orf19.228	CJN799	D9	30	2	32	94%	28	1	29	97%	20	0	20	100%
orf19.5338	CJN801	D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4767	CJN803	D11	15	1	16	94%	15	0	15	100%	15	0	15	100%
orf19.4776	CJN805	D12	15	1	16	94%	19	0	19	100%	16	0	16	100%
<b>DAY 286</b>		WT	25	2	27	93%	21	1	22	95%	21	0	21	100%

CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4778	CJN807	E1	4	0	4	100%	2	0	2	100%	3	0	3	100%
orf19.13396	CJN809	E2	6	0	6	100%	6	0	6	100%	2	0	2	100%
orf19.2356	CJN811	E3	6	2	8	75%	3	0	3	100%	3	0	3	100%
orf19.9326	CJN815	E4	8	2	10	80%	5	0	5	100%	5	0	5	100%
orf19.909	CJN817	E5	7	2	9	78%	7	0	7	100%	3	0	3	100%
orf19.2054	CJN831	E6	2	1	3	67%	4	2	6	67%	5	0	5	100%
orf19.226	CJN854	E7	7	0	7	100%	2	0	2	100%	0	0	0	0%
orf19.798	CJN856	E8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.889	CJN857	E9	10	0	10	100%	5	0	5	100%	1	0	1	100%
orf19.2331	CJN863	E10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2315	CJN864	E11	5	0	5	100%	2	0	2	100%	3	0	3	100%
orf19.1178	CJN866	E12	12	0	12	100%	4	0	4	100%	2	0	2	100%
<b>DAY 286</b>		WT	9	1	10	90%	8	0	8	100%	4	0	4	100%

CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.2393	CJN872	F1	4	1	5	80%	3	0	3	100%	0	0	0	0%
orf19.2399	CJN874	F2	8	0	8	100%	5	0	5	100%	1	0	1	100%
orf19.2458	CJN878	F3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3088	CJN885	F4	4	1	5	80%	3	0	3	100%	2	0	2	100%
orf19.2612	CJN908	F5	7	1	8	88%	3	0	3	100%	3	0	3	100%
orf19.2674	CJN911	F6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1358	CJN913	F7	3	1	4	75%	3	0	3	100%	1	0	1	100%
orf19.1496	CJN922	F8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3193	CJN926	F9	6	1	7	86%	3	0	3	100%	2	0	2	100%
orf19.33	CJN928	F10	5	0	5	100%	0	0	0	0%	0	0	0	0%
orf19.1589	CJN932	F11	5	0	5	100%	2	0	2	100%	0	0	0	0%
orf19.1565	CJN941	F12	8	1	9	89%	4	0	4	100%	1	0	1	100%
<b>DAY 286</b>		WT	9	1	10	90%	8	0	8	100%	4	0	4	100%

CJN TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3405	CJN943	G1	9	0	9	100%	3	0	3	100%	0	0	0	0%
orf19.3407	CJN945	G2	11	0	11	100%	6	0	6	100%	4	0	4	100%
orf19.1694	CJN958	G3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1729	CJN966	G4	6	2	8	75%	5	1	6	83%	2	0	2	100%
orf19.1826	CJN975	G5	6	1	7	86%	3	0	3	100%	0	0	0	0%
orf19.3683	CJN979	G6	7	1	8	88%	4	0	4	100%	3	0	3	100%
orf19.3753	CJN983	G7	6	0	6	100%	2	0	2	100%	1	0	1	100%
orf19.3835	CJN993	G8	1	3	4	25%	4	1	5	80%	0	0	0	0%
orf19.6781	CJN997	G9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6845	CJN1001	G10	8	0	8	100%	4	0	4	100%	1	0	1	100%
orf19.685	CJN1003	G11	10	3	13	77%	5	2	7	71%	3	0	3	100%
orf19.7025	CJN1007	G12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	9	1	10	90%	8	0	8	100%	4	0	4	100%

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.10169	IS08-7	A1	41	1	42	98%	18	1	19	95%	25	6	31	81%
orf19.10244	JMR074	A2	30	4	34	88%	27	0	27	100%	21	0	21	100%
orf19.10244	JMR075	A3	31	3	34	91%	19	0	19	100%	11	1	11	100%
orf19.10261	JMR085	A4	26	7	33	79%	33	1	34	97%	22	0	22	100%
orf19.10261	JMR086	A5	23	3	26	88%	26	1	27	96%	26	0	26	100%
orf19.10266	RLS16	A6	16	1	17	94%	19	0	19	100%	14	0	14	100%
orf19.10266	RLS80	A7	24	1	25	96%	12	0	12	100%	8	0	8	100%
orf19.10266	RLS81	A8	20	6	26	77%	20	0	20	100%	10	0	10	100%
orf19.10326	J869-9	A9	30	5	35	86%	23	2	25	92%	15	0	15	100%
orf19.10326	J869-11	A10	19	0	19	100%	14	1	15	93%	17	0	17	100%
orf19.10530	JA54-3	A11	12	0	12	100%	7	0	7	100%	8	0	8	100%
orf19.10530	JA54-5	A12	21	4	25	84%	14	1	15	93%	8	0	8	100%
<b>DAY 286</b>		WT	22	5	27	81%	18	1	19	95%	9	0	9	100%



2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.10553	HK81-2	B1	31	5	36	86%	26	3	29	90%	22	0	22	100%
orf19.10553	HK81-3	B2	25	0	25	100%	13	0	13	100%	15	0	15	100%
orf19.10553	RLS5	B3	19	2	21	90%	18	0	18	100%	7	0	7	100%
orf19.10553	RLS6	B4	28	0	28	100%	26	1	27	96%	23	0	23	100%
orf19.10701	RLS84	B5	25	7	32	78%	25	3	28	89%	6	0	6	100%
orf19.10938	RLS50	B6	11	5	16	69%	24	4	28	86%	17	0	17	100%
orf19.10938	RLS51	B7	22	4	26	85%	25	1	26	96%	14	0	14	100%
orf19.10999	HN71-5	B8	23	0	23	100%	20	2	22	91%	13	0	13	100%
orf19.10999	HN71-7	B9	26	1	27	96%	19	2	21	90%	16	0	16	100%
orf19.10999	RLS13	B10	32	2	34	94%	25	3	28	89%	13	2	15	87%
orf19.10999	RLS14	B11	27	5	32	84%	18	1	19	95%	15	0	15	100%
orf19.11346	RLS28	B12	24	3	27	89%	28	2	30	93%	8	1	9	89%
<b>DAY 286</b>		WT	22	5	27	81%	18	1	19	95%	9	0	9	100%

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.11346	RLS29	C1	22	2	24	92%	16	1	17	94%	7	0	7	100%
orf19.11357	RLS7	C2	28	2	30	93%	22	2	24	92%	18	0	18	100%
orf19.11357	RLS8	C3	29	2	31	94%	19	1	20	95%	16	0	16	100%
orf19.11700	RLS18	C4	16	1	17	94%	16	2	18	89%	9	0	9	100%
orf19.11700	RLS19	C5	23	2	25	92%	15	3	18	83%	11	0	11	100%
orf19.1217	JI41-8	C6	27	5	32	84%	19	1	20	95%	9	1	10	90%
orf19.1217	JI41-12	C7	12	0	12	100%	9	0	9	100%	5	0	5	100%
orf19.1217	RLS109	C8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1217	RLS110	C9	29	2	31	94%	17	2	19	89%	14	0	14	100%
orf19.12185	JMR089	C10	11	0	11	100%	8	0	8	100%	8	0	8	100%
orf19.12185	P462-12	C11	26	2	28	93%	22	1	23	96%	13	0	13	100%
orf19.12185	RLS38	C12	19	1	20	95%	25	1	26	96%	15	0	15	100%
<b>DAY 286</b>		WT	22	5	27	81%	18	1	19	95%				

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.12185	RLS39	D1	23	3	26	88%	15	1	16	94%	13	0	13	100%
orf19.1219	RLS22	D2	10	18	28	36%	11	7	18	61%	13	2	15	87%
orf19.1219	RLS23	D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12238	JMR044	D4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12238	JMR045	D5	17	2	19	89%	17	0	17	100%	11	0	11	100%
orf19.12276	JMR040	D6	20	3	23	87%	12	1	13	92%	9	0	9	100%
orf19.12276	JMR041	D7	13	1	14	93%	9	0	9	100%	10	0	10	100%
orf19.12307	RLS46	D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12307	RLS47	D9	18	1	19	95%	15	0	15	100%	8	0	8	100%
orf19.12344	JMR087	D10	21	0	21	100%	16	0	16	100%	20	0	20	100%
orf19.12465	RLS11	D11	32	2	34	94%	20	0	20	100%	12	0	12	100%
orf19.12465	RLS12	D12	17	1	18	94%	16	0	16	100%	9	0	9	100%
<b>DAY 286</b>		WT	22	5	27	81%	18	1	19	95%				

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.12573	JJH11	E1	18	4	22	82%	23	3	26	88%	22	1	23	96%
orf19.12573	JJH12	E2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1259	RLS21	E3	23	0	23	100%	9	1	10	90%	5	0	5	100%
orf19.12598	RLS17	E4	11	2	13	85%	11	2	13	85%	11	0	11	100%
orf19.12794	G376-1	E5	19	0	19	100%	12	0	12	100%	12	0	12	100%
orf19.12794	G376-2	E6	21	3	24	88%	17	1	18	94%	13	1	14	93%
orf19.12803	RLS131	E7	20	2	22	91%	6	0	6	100%	9	0	9	100%
orf19.12803	RLS132	E8	20	4	24	83%	12	0	12	100%	16	0	16	100%
orf19.12832	GE92-1	E9	11	1	12	92%	16	0	16	100%	13	0	13	100%
orf19.12832	GE92-6	E10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12832	K036-9	E11	24	2	26	92%	17	0	17	100%	17	0	17	100%
orf19.12893	EO34-5	E12	9	6	15	60%	15	0	15	100%	4	0	4	100%
<b>DAY 286</b>		WT	11	9	20	55%	6	1	7	86%	10	0	10	100%

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.12893	EO34-6	F1	22	1	23	96%	18	1	19	95%	13	1	14	93%
orf19.12900	HM74-2	F2	3	3	6	50%	7	0	7	100%	9	0	9	100%
orf19.12900	HM74-3	F3	7	3	10	70%	11	0	11	100%	14	0	14	100%
orf19.12953	D966-1	F4	12	2	14	86%	9	0	9	100%	6	1	7	86%
orf19.12953	D966-2	F5	9	0	9	100%	7	0	7	100%	9	0	9	100%
orf19.12998	JMR088	F6	20	0	20	100%	13	0	13	100%	6	0	6	100%
orf19.12998	L213-4	F7	23	3	26	88%	19	1	20	95%	N/A	N/A	N/A	N/A
orf19.13111	JMR035	F8	23	1	24	96%	13	1	14	93%	N/A	N/A	N/A	N/A
orf19.13111	JMR036	F9	20	2	22	91%	12	0	12	100%	N/A	N/A	N/A	N/A
orf19.13277	RLS76	F10	19	0	19	100%	15	1	16	94%	N/A	N/A	N/A	N/A
orf19.13277	RLS77	F11	8	1	9	89%	10	0	10	100%	N/A	N/A	N/A	N/A
orf19.13331	JMR062	F12	10	0	10	100%	7	0	7	100%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	16	2	18	89%	11	0	11	100%	N/A	N/A	N/A	N/A

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.13331	JMR063	G1	13	1	14	93%	14	0	14	100%	N/A	N/A	N/A	N/A
orf19.13459	GR52-1	G2	21	3	24	88%	11	1	12	92%	N/A	N/A	N/A	N/A
orf19.13459	GR52-3	G3	20	0	20	100%	12	0	12	100%	N/A	N/A	N/A	N/A
orf19.13584	RLS48	G4	17	0	17	100%	12	1	13	92%	N/A	N/A	N/A	N/A
orf19.13584	RLS49	G5	14	2	16	88%	10	0	10	100%	N/A	N/A	N/A	N/A
orf19.13607	RLS78	G6	25	2	27	93%	14	2	16	88%	N/A	N/A	N/A	N/A
orf19.13607	RLS79	G7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.13772	HQ12-3	G8	15	0	15	100%	12	0	12	100%	N/A	N/A	N/A	N/A
orf19.13772	HQ12-7	G9	19	0	19	100%	13	0	13	100%	N/A	N/A	N/A	N/A
orf19.13772	RLS31	G10	14	3	17	82%	14	1	15	93%	N/A	N/A	N/A	N/A
orf19.13772	RLS32	G11	10	0	10	100%	5	0	5	100%	N/A	N/A	N/A	N/A
orf19.14004	RLS42	G12	9	3	12	75%	7	0	7	100%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	16	2	18	89%	11	0	11	100%	N/A	N/A	N/A	N/A

2nd set TF Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.14004	RLS43	H1	24	2	26	92%	26	4	30	87%	19	3	22	86%
orf19.14005	RLS82	H2	22	2	24	92%	18	3	21	86%	15	2	17	88%
orf19.14005	RLS83	H3	32	0	32	100%	18	0	18	100%	12	0	12	100%
orf19.14046	ID27-1	H4	23	3	26	88%	16	1	17	94%	13	2	15	87%
orf19.14046	ID27-3	H5	26	1	27	96%	20	0	20	100%	22	0	22	100%
orf19.14093	RLS105	H6	19	1	20	95%	24	2	26	92%	18	0	18	100%
orf19.14093	RLS106	H7	25	4	29	86%	20	2	22	91%	16	0	16	100%
orf19.14139	JMR046	H8	29	3	32	91%	16	1	17	94%	12	0	12	100%
orf19.14139	JMR047	H9	15	7	22	68%	8	4	12	67%	12	1	13	92%
orf19.14185	RLS36	H10	21	8	29	72%	13	2	15	87%	3	2	5	60%
orf19.14185	RLS37	H11	17	1	18	61%	16	0	16	100%	13	0	13	100%
Day 286	Day 286	H12	29	2	31	94%	16	0	16	100%	12	0	12	100%
<b>DAY 286</b>		WT	29	2	31	94%	16	0	16	100%	12	0	12	100%

2nd set TF Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1464	JG54-7	A1	29	1	30	97%	19	0	19	100%	14	1	15	93%
orf19.1464	JG54-8	A2	24	4	28	86%	13	0	13	100%	13	0	13	100%
orf19.1476	JMR090	A3	22	4	26	85%	9	1	10	90%	12	0	12	100%
orf19.1476	RLS107	A4	19	1	20	95%	14	1	15	93%	5	0	5	100%
orf19.1476	RLS108	A5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1499	RLS9	A6	32	2	34	94%	18	1	19	95%	13	1	14	93%
orf19.1499	RLS10	A7	23	7	30	77%	19	0	19	100%	13	0	13	100%
orf19.1533	GA15-2	A8	18	1	19	95%	15	0	15	100%	9	0	9	100%
orf19.1533	GA15-3	A9	13	1	14	93%	14	0	14	100%	10	0	10	100%
orf19.1576	RLS20	A10	18	4	22	82%	10	0	10	100%	8	3	11	73%
orf19.1685	JMR049	A11	6	0	6	100%	8	4	12	67%	12	1	13	92%
orf19.1973	JMR053	A12	15	1	16	94%	10	2	12	83%	9	1	10	90%
<b>DAY 286</b>		WT	29	2	31	94%	16	0	16	100%	12	0	12	100%



2nd set TF Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1973	JMR054	B1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2012	HL11-1	B2	15	1	16	94%	14	0	14	100%	12	2	14	86%
orf19.2012	HL11-3	B3	10	0	10	100%	14	0	14	100%	8	1	9	89%
orf19.2105	JMR091	B4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2747	HK21-1	B5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2747	HK21-3	B6	12	1	13	92%	7	0	7	100%	7	0	7	100%
orf19.391	JMR038	B7	14	1	15	93%	12	1	13	92%	10	0	10	100%
orf19.391	JMR039	B8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4524	HM72-4	B9	24	2	26	92%	17	2	19	89%	9	0	9	100%
orf19.4524	HM72-5	B10	5	0	5	100%	8	0	8	100%	8	0	8	100%
orf19.4869	FJS23	B11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5871	JC25-6	B12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	29	2	31	94%	16	0	16	100%	12	0	12	100%

2nd set TF Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5871	JC25-7	C1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6011	RLS44	C2	23	2	25	92%	11	2	13	85%	16	2	18	89%
orf19.6011	RLS45	C3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6109	JMR069	C4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6109	JMR070	C5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6904	GR08-2	C6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7017	JMR092	C7	N/A	N/A	N/A	N/A	2	7	9	22%	4	4	8	50%
orf19.7017	JMR093	C8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7098	RLS135	C9	9	1	10	90%	9	2	11	82%	4	0	4	100%
orf19.7098	RLS136	C10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7317	JMR078	C11	8	1	9	89%	7	0	7	100%	4	0	4	100%
orf19.7317	JMR079	C12	9	0	0	100%	13	0	13	100%	12	0	12	100%
<b>DAY 286</b>		WT	29	2	31	94%	16	0	16	100%	12	0	12	100%

2nd set TF Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7319	RLS3	D1	23	1	24	96%	22	0	22	100%	20	0	20	100%
orf19.7319	RLS4	D2	17	3	20	85%	19	1	20	95%	20	0	20	100%
orf19.7371	RLS26	D3	22	0	22	100%	21	0	21	100%	21	0	21	100%
orf19.7371	RLS27	D4	26	2	28	93%	27	1	28	96%	27	0	27	100%
orf19.7372	IU75-1	D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7372	IU75-3	D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7372	RLS56	D7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7372	RLS57	D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7374	RLS1	D9	24	2	26	92%	24	1	25	96%	23	0	23	100%
orf19.7374	RLS2	D10	18	3	21	86%	19	2	21	90%	20	1	21	95%
orf19.7381	J793-2	D11	19	4	23	83%	21	1	22	95%	20	0	20	100%
orf19.7381	J793-4	D12	21	1	22	95%	21	0	21	100%	19	0	19	100%
<b>DAY 286</b>		WT	27	1	28	96%	26	0	26	100%	26	0	26	100%

2nd set TF Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7385	IN73-1	E1	25	4	29	86%	28	0	28	100%	28	0	28	100%
orf19.7385	IN73-2	E2	26	0	26	100%	26	0	26	100%	22	0	22	100%
orf19.7612	GG91-1	E3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7612	GG91-5	E4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7622	RLS133	E5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7622	RLS134	E6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.8586	G555-2	E7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.8586	G555-4	E8	25	2	27	93%	24	0	24	100%	21	0	21	100%
orf19.8634	JMR061	E9	24	2	26	92%	25	0	25	100%	23	0	23	100%
<b>BLANK</b>		E10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>BLANK</b>		E11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>BLANK</b>		E12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	27	1	28	96%	26	0	26	100%	26	0	26	100%

2nd set TF Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4288	HW25-2	F1	24	3	27	89%	26	0	26	100%	25	0	25	100%
orf19.4288	HW25-8	F2	21	2	23	91%	21	1	22	95%	21	0	21	100%
orf19.2963	J120-1	F3	25	2	27	93%	25	0	25	100%	23	0	23	100%
orf19.2963	J120-3	F4	21	1	22	95%	21	1	22	95%	19	0	19	100%
orf19.2623	FB35-1	F5	19	0	19	100%	17	0	17	100%	16	0	16	100%
orf19.2623	G709-2	F6	22	4	26	85%	23	1	24	96%	21	0	21	100%
orf19.4884	AI54-1	F7	24	1	25	96%	24	0	24	100%	22	0	22	100%
orf19.4884	ES09-4	F8	17	4	21	81%	18	2	20	90%	19	1	20	95%
BLANK		F9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		F10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		F11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		F12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DAY 286		WT	27	1	28	96%	26	0	26	100%	26	0	26	100%

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1795		A1	20	1	21	95%	21	0	21	100%	11	0	11	100%
orf19.1795		A2	30	2	32	94%	21	0	21	100%	13	0	13	100%
orf19.7291		A3	14	1	15	93%	7	0	7	100%	4	0	4	100%
orf19.7291		A4	18	2	20	90%	20	0	20	100%	10	0	10	100%
orf19.6760		A5	26	2	28	93%	22	1	23	96%	22	0	22	100%
orf19.6760		A6	24	0	24	100%	12	0	12	100%	9	0	9	100%
orf19.4669		A7	12	0	12	100%	8	0	8	100%	9	0	9	100%
orf19.4669		A8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5037		A9	34	0	34	100%	13	0	13	100%	18	0	18	100%
orf19.5037		A10	21	0	21	100%	23	0	23	100%	12	0	12	100%
orf19.11450		A11	10	0	10	100%	10	0	10	100%	5	0	5	100%
orf19.11450		A12	26	0	26	100%	12	0	12	100%	6	0	6	100%
<b>DAY 286</b>		WT	22	0	22	100%	18	0	18	100%	8	0	8	100%

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.6970		B1	16	0	16	100%	8	0	8	100%	6	0	6	100%
orf19.6970		B2	21	0	21	100%	15	1	16	94%	12	0	12	100%
orf19.10248		B3	24	0	24	100%	15	0	15	100%	8	0	8	100%
orf19.10248		B4	17	0	17	100%	10	0	10	100%	12	0	12	100%
orf19.9791		B5	10	0	10	100%	21	0	21	100%	12	1	13	92%
orf19.9791		B6	23	0	23	100%	23	0	23	100%	14	0	14	100%
orf19.6952		B7	16	0	16	100%	16	0	16	100%	15	1	16	94%
orf19.6952		B8	38	0	38	100%	27	0	27	100%	15	0	15	100%
orf19.9364		B9	28	1	29	97%	19	0	19	100%	20	0	20	100%
orf19.9364		B10	26	0	26	100%	23	0	23	100%	15	0	15	100%
orf19.4966		B11	35	0	35	100%	20	1	21	95%	17	0	17	100%
orf19.4966		B12	18	1	19	95%	13	0	13	100%	13	0	13	100%
<b>DAY 286</b>		WT	22	0	22	100%	18	0	18	100%	8	0	8	100%

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7479		C1	21	3	24	88%	16	0	16	100%	12	0	12	100%
orf19.7479		C2	28	2	30	93%	12	0	12	100%	14	0	14	100%
orf19.7412		C3	25	1	26	96%	7	0	7	100%	6	0	6	100%
orf19.7412		C4	30	1	31	97%	19	0	19	100%	8	0	8	100%
orf19.5328		C5	19	1	20	95%	19	1	20	95%	20	0	20	100%
orf19.5328		C6	17	0	17	100%	26	0	26	100%	14	0	14	100%
orf19.1857		C7	54	4	58	93%	6	0	6	100%	12	0	12	100%
orf19.1857		C8	35	1	36	97%	17	1	18	94%	26	0	26	100%
orf19.8907		C9	33	0	33	100%	5	0	5	100%	14	0	14	100%
orf19.8907		C10	19	0	19	100%	9	0	9	100%	8	0	8	100%
orf19.14178		C11	27	1	28	96%	16	0	16	100%	16	0	16	100%
orf19.14178		C12	27	1	28	96%	15	0	15	100%	13	0	13	100%
<b>DAY 286</b>		WT	12	0	12	100%	24	2	26	92%	24	0	24	100%



VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4746		D1	19	1	20	95%	10	0	10	100%	14	0	14	100%
orf19.4746		D2	16	0	16	100%	10	0	10	100%	14	0	14	100%
orf19.3995		D3	16	1	17	94%	7	0	7	100%	5	0	5	100%
orf19.3995		D4	18	0	18	100%	9	0	9	100%	7	0	7	100%
orf19.8635		D5	16	0	16	100%	16	0	16	100%	10	0	10	100%
orf19.8635		D6	21	0	21	100%	11	0	11	100%	9	0	9	100%
orf19.3171		D7	20	1	21	95%	11	0	11	100%	7	0	7	100%
orf19.2723		D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.768		D9	18	0	18	100%	9	0	9	100%	7	0	7	100%
orf19.768		D10	17	0	17	100%	9	0	9	100%	14	0	14	100%
orf19.3208		D11	12	0	12	100%	15	0	15	100%	15	0	15	100%
orf19.3208		D12	22	0	22	100%	13	0	13	100%	14	0	14	100%
<b>DAY 286</b>		WT	12	0	12	100%	24	2	26	92%	24	0	24	100%

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1409		E1	9	0	9	100%	5	0	5	100%	1	0	1	100%
orf19.1409		E2	15	0	15	100%	7	0	7	100%	3	0	3	100%
orf19.564		E3	19	0	19	100%	7	0	7	100%	5	0	5	100%
orf19.564		E4	9	0	9	100%	6	0	6	100%	4	0	4	100%
orf19.856		E5	6	0	6	100%	4	0	4	100%	1	0	1	100%
orf19.856		E6	22	2	24	92%	18	2	20	90%	13	0	13	100%
orf19.11598		E7	17	0	17	100%	13	0	13	100%	3	0	3	100%
orf19.11598		E8	10	0	10	100%	4	0	4	100%	2	0	2	100%
orf19.4284		E9	11	1	12	92%	9	0	9	100%	3	0	3	100%
orf19.4369		E10	25	0	25	100%	16	0	16	100%	14	0	14	100%
orf19.4369		E11	14	0	14	100%	6	0	6	100%	6	0	6	100%
orf19.7389		E12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	22	1	23	96%	13	0	13	100%	10	2	12	83%

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7389		F1	15	0	15	100%	3	0	3	100%	2	0	2	100%
orf19.4668		F2	6	0	6	100%	5	0	5	100%	0	0	0	0%
orf19.9508		F3	5	0	5	100%	3	0	3	100%	1	0	1	100%
orf19.9508		F4	16	2	18	89%	6	0	6	100%	6	0	6	100%
orf19.3171		F5	19	0	19	100%	7	0	7	100%	9	0	9	100%
orf19.2723		F6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5011		F7	12	5	17	71%	16	0	16	100%	11	0	11	100%
orf19.5011		F8	3	0	3	100%	6	0	6	100%	0	0	0	0%
orf19.9364		F9	7	0	7	100%	2	1	3	67%	1	0	1	100%
orf19.9364		F10	15	1	16	94%	18	0	18	100%	8	0	8	100%
orf19.4284		F11	14	2	16	88%	14	1	15	93%	6	1	7	86%
orf19.4658		F12	7	0	7	100%	6	0	6	100%	3	0	3	100%
<b>DAY 286</b>		WT	22	1	23	96%	13	0	13	100%	10	2	12	83%

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4658		G1	39	0	39	100%	32	0	32	100%	N/A	N/A	N/A	N/A
orf19.1509		G2	32	0	32	100%	23	0	23	100%	N/A	N/A	N/A	N/A
orf19.1509		G3	30	0	30	100%	30	0	30	100%	N/A	N/A	N/A	N/A
orf19.1593		G4	15	0	15	100%	22	0	22	100%	N/A	N/A	N/A	N/A
orf19.1593		G5	28	0	28	100%	23	0	23	100%	N/A	N/A	N/A	N/A
orf19.695		G6	25	0	25	100%	31	0	31	100%	N/A	N/A	N/A	N/A
orf19.695		G7	17	0	17	100%	18	0	18	100%	N/A	N/A	N/A	N/A
orf19.6036		G8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6036		G9	22	0	22	100%	30	0	30	100%	N/A	N/A	N/A	N/A
orf19.3014		G10	24	0	24	100%	19	0	19	100%	N/A	N/A	N/A	N/A
orf19.3014		G11	20	0	20	100%	21	0	21	100%	N/A	N/A	N/A	N/A
orf19.3701		G12	21	0	21	100%	24	0	24	100%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	12	0	12	100%	16	0	16	100%	N/A	N/A	N/A	N/A

VB GKO Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3701		H1	25	0	25	100%	28	0	28	100%	N/A	N/A	N/A	N/A
orf19.4763		H2	19	0	19	100%	22	0	22	100%	N/A	N/A	N/A	N/A
orf19.4763		H3	27	0	27	100%	16	0	16	100%	N/A	N/A	N/A	N/A
orf19.5495		H4	26	0	26	100%	22	0	22	100%	N/A	N/A	N/A	N/A
orf19.5495		H5	27	0	27	100%	34	0	34	100%	N/A	N/A	N/A	N/A
orf19.1805		H6	20	0	20	100%	21	0	21	100%	N/A	N/A	N/A	N/A
orf19.1805		H7	24	0	24	100%	16	0	16	100%	N/A	N/A	N/A	N/A
orf19.13950		H8	24	0	24	100%	25	0	25	100%	N/A	N/A	N/A	N/A
orf19.13950		H9	13	0	13	100%	14	0	14	100%	N/A	N/A	N/A	N/A
orf19.12265		H10	19	0	19	100%	22	0	22	100%	N/A	N/A	N/A	N/A
orf19.12265		H11	21	0	21	100%	21	0	21	100%	N/A	N/A	N/A	N/A
orf19.5571		H12	24	0	24	100%	29	0	29	100%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	12	0	12	100%	16	0	16	100%	N/A	N/A	N/A	N/A

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5571		A1	24	1	25	96%	18	0	18	100%	12	0	12	100%
orf19.7614		A2	23	3	26	88%	26	1	27	96%	26	0	26	100%
orf19.7614		A3	16	2	18	89%	13	2	15	87%	12	0	12	100%
orf19.10359		A4	12	1	13	92%	11	0	11	100%	11	0	11	100%
orf19.10359		A5	23	0	23	100%	20	0	20	100%	19	0	19	100%
orf19.2990		A6	26	5	31	84%	28	3	31	90%	30	1	31	97%
orf19.2990		A7	27	1	28	96%	25	0	25	100%	22	0	22	100%
orf19.4257		A8	28	2	30	93%	22	2	24	92%	18	0	18	100%
orf19.4257		A9	24	2	26	92%	18	0	18	100%	17	0	17	100%
orf19.2237		A10	19	0	19	100%	13	0	13	100%	10	0	10	100%
orf19.2237		A11	21	1	22	95%	21	0	21	100%	19	0	19	100%
orf19.771		A12	32	3	35	91%	28	2	30	93%	23	0	23	100%
<b>DAY 286</b>		WT	25	2	27	93%	25	0	25	100%	23	0	23	100%

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.771		B1	32	3	35	91%	29	1	30	97%	26	0	26	100%
orf19.6729		B2	23	3	26	88%	23	1	24	96%	22	0	22	100%
orf19.6729		B3	19	2	21	90%	19	0	19	100%	14	0	14	100%
orf19.3396		B4	24	0	24	100%	21	0	21	100%	20	0	20	100%
orf19.3396		B5	16	1	17	94%	15	1	16	94%	12	0	12	100%
orf19.2237		B6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2237		B7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3563		B8	22	5	27	81%	20	4	24	83%	19	0	19	100%
orf19.3563		B9	25	2	27	93%	27	0	27	100%	25	0	25	100%
orf19.2033		B10	17	6	23	74%	15	0	15	100%	13	0	13	100%
orf19.2033		B11	29	4	33	88%	30	1	31	97%	26	0	26	100%
orf19.11973		B12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	25	2	27	93%	25	0	25	100%	23	0	23	100%

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3171		C1	8	2	10	80%	7	0	7	100%	5	0	5	100%
orf19.3171		C2	12	1	13	92%	11	0	11	100%	11	0	11	100%
orf19.769		C3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.769		C4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5251		C5	14	0	14	100%	9	0	9	100%	5	0	5	100%
orf19.5251		C6	16	2	18	89%	16	1	17	94%	15	0	15	100%
orf19.7381		C7	11	2	13	85%	10	0	10	100%	7	0	7	100%
orf19.7381		C8	9	2	11	82%	9	0	9	100%	8	0	8	100%
orf19.3202		C9	13	0	13	100%	6	0	6	100%	4	0	4	100%
orf19.3202		C10	13	2	15	87%	12	1	13	92%	11	0	11	100%
orf19.1825		C11	19	0	19	100%	16	0	16	100%	12	0	12	100%
orf19.1825		C12	16	1	17	94%	17	0	17	100%	16	0	16	100%
<b>DAY 286</b>		WT	17	1	18	94%	16	0	16	100%	15	0	15	100%



VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5571		D1	13	2	15	87%	14	0	14	100%	14	0	14	100%
orf19.5571		D2	15	1	16	94%	15	0	15	100%	12	0	12	100%
orf19.580		D3	11	0	11	100%	10	0	10	100%	10	0	10	100%
orf19.580		D4	9	0	9	100%	6	0	6	100%	5	0	5	100%
orf19.3764		D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.9081		D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.9081		D7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5365		D8	5	1	6	83%	6	0	6	100%	4	0	4	100%
orf19.5365		D9	12	2	14	86%	13	1	14	93%	9	0	9	100%
orf19.3012		D10	10	4	14	71%	12	2	14	86%	14	0	14	100%
orf19.3012		D11	11	2	13	85%	12	0	12	100%	7	0	7	100%
orf19.5445		D12	14	3	17	82%	15	2	17	88%	17	0	17	100%
<b>DAY 286</b>		WT	17	1	18	94%	17	0	17	100%	17	0	17	100%

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5445		E1	25	4	29	86%	27	2	29	93%	27	1	28	96%
orf19.6261		E2	22	3	25	88%	23	0	23	100%	23	0	23	100%
orf19.6261		E3	24	7	28	86%	26	3	27	96%	24	0	24	100%
orf19.3009		E4	24	2	26	92%	25	0	25	100%	23	0	23	100%
orf19.3009		E5	20	2	22	91%	22	0	22	100%	20	0	20	100%
orf19.10169		E6	22	3	26	85%	23	0	26	88%	25	0	25	100%
orf19.10169		E7	24	2	25	96%	25	0	25	100%	24	0	24	100%
orf19.2763		E8	23	1	24	96%	16	0	16	100%	14	0	14	100%
orf19.2763		E9	25	1	26	96%	26	0	26	100%	23	0	23	100%
orf19.2392		E10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2392		E11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4893		E12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	21	1	22	95%	20	0	20	100%	20	0	20	100%

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4893		F1	19	2	21	90%	21	0	21	100%	19	0	19	100%
orf19.2348		F2	18	1	19	95%	18	0	18	100%	16	0	16	100%
orf19.2348		F3	23	3	26	88%	24	2	26	92%	25	1	26	96%
orf19.2653		F4	17	5	22	77%	19	2	21	90%	17	0	17	100%
orf19.2653		F5	14	2	16	88%	15	1	16	94%	13	0	13	100%
orf19.5292		F6	21	0	21	100%	20	0	20	100%	18	0	18	100%
orf19.5292		F7	25	4	29	86%	27	1	28	96%	27	1	28	96%
orf19.4457		F8	24	1	25	96%	20	0	20	100%	19	0	19	100%
orf19.4457		F9	16	3	19	84%	17	2	19	89%	18	1	19	95%
orf19.6194		F10	19	3	22	86%	21	1	22	95%	16	0	16	100%
orf19.6194		F11	25	1	26	96%	25	0	25	100%	23	0	23	100%
orf19.5094		F12	23	0	23	100%	22	0	22	100%	19	0	19	100%
<b>DAY 286</b>		WT	21	1	22	95%	20	0	20	100%	20	0	20	100%

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5094		G1	16	3	19	84%	17	0	18	94%	15	0	15	100%
orf19.271		G2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.271		G3	11	1	12	92%	10	0	10	100%	8	0	8	100%
orf19.1759		G4	13	1	14	93%	12	0	12	100%	10	0	10	100%
orf19.1759		G5	17	3	20	85%	15	1	16	94%	13	0	13	100%
orf19.12603		G6	21	0	21	100%	20	0	20	100%	15	0	15	100%
orf19.12603		G7	20	6	26	77%	23	2	25	92%	21	0	21	100%
orf19.6032		G8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6032		G9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7201		G10	10	3	13	77%	7	0	7	100%	5	0	5	100%
orf19.9115		G11	13	0	13	100%	12	0	12	100%	9	0	9	100%
orf19.9115		G12	16	1	17	94%	15	1	16	94%	12	0	12	100%
<b>DAY 286</b>		WT	19	2	21	90%	20	0	21	95%	17	0	17	100%

VB GKO Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1005		H1	16	3	19	84%	17	0	17	100%	15	0	15	100%
orf19.1005		H2	23	3	26	88%	25	1	26	96%	22	0	22	100%
orf19.4369		H3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4369		H4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7389		H5	23	2	25	92%	22	0	22	100%	19	0	19	100%
orf19.7389		H6	12	3	15	80%	13	1	14	93%	9	0	9	100%
orf19.4519		H7	9	3	12	75%	9	1	10	90%	7	0	7	100%
orf19.4519		H8	21	6	27	78%	25	2	27	93%	25	0	25	100%
orf19.2660		H9	14	1	15	93%	14	1	15	93%	12	0	12	100%
orf19.2660		H10	24	4	28	86%	25	0	25	100%	21	0	21	100%
orf19.4529		H11	19	2	21	90%	18	0	18	100%	14	0	14	100%
<b>DAY 286</b>		WT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	19	2	21	90%	20	0	21	95%	17	0	17	100%

VB GKO Plate 3			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7472		A1	20	2	22	91%	20	2	22	91%	8	2	10	80%
orf19.7472		A2	22	4	26	85%	23	3	26	88%	6	2	8	75%
orf19.6344		A3	19	2	21	90%	19	2	21	90%	3	1	4	75%
orf19.6344		A4	26	3	29	90%	29	0	29	100%	10	1	11	91%
orf19.4428		A5	30	3	33	91%	33	0	33	100%	9	0	9	100%
orf19.1614		A6	29	2	31	94%	29	2	31	94%	5	2	7	71%
orf19.1614		A7	22	4	26	85%	24	2	26	92%	4	1	5	80%
orf19.4369		A8	27	7	34	79%	29	5	34	85%	2	1	3	67%
orf19.4369		A9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3818		A10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.8837		A11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.11598		A12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	20	2	22	91%	22	0	22	100%	5	0	5	100%

VB GKO Plate 3			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3906		B1	26	2	28	93%	18	2	20	90%	0	0	0	0%
orf19.3906		B2	14	0	14	100%	5	0	5	100%	0	0	0	0%
orf19.7016		B3	15	3	18	83%	11	1	12	92%	4	1	5	80%
orf19.7016		B4	20	3	23	87%	7	0	7	100%	2	0	2	100%
orf19.7400		B5	24	3	27	89%	8	0	8	100%	3	3	6	50%
orf19.9331		B6	18	4	22	82%	11	0	11	100%	5	2	7	71%
orf19.9331		B7	18	3	21	86%	7	1	8	88%	3	0	3	100%
orf19.6185		B8	16	2	18	89%	8	1	9	89%	6	2	8	75%
orf19.6185		B9	11	0	11	100%	5	0	5	100%	4	0	4	100%
orf19.3678		B10	27	6	33	82%	12	3	15	80%	8	3	11	73%
orf19.3678		B11	23	2	25	92%	14	2	16	88%	4	0	4	100%
orf19.4535		B12	29	4	33	88%	15	0	15	100%	0	0	0	100%
<b>DAY 286</b>		WT	20	2	22	91%	22	0	22	100%	5	0	5	100%

VB GKO Plate 3			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7194		C1	13	4	17	76%	13	4	17	76%	4	1	5	80%
orf19.7194		C2	19	3	22	86%	18	1	19	95%	10	1	11	91%
orf19.5001		C3	20	4	24	83%	18	4	22	82%	6	2	8	75%
orf19.5001		C4	13	2	15	87%	13	2	15	87%	7	2	9	78%
orf19.4244		C5	22	5	27	81%	23	1	24	96%	10	1	11	91%
orf19.4244		C6	18	4	22	82%	17	2	19	89%	1	2	3	33%
orf19.658		C7	26	3	29	90%	20	2	22	91%	9	2	11	82%
orf19.658		C8	21	2	23	91%	12	2	14	86%	1	2	3	33%
orf19.8326		C9	12	3	15	80%	11	0	11	100%	6	0	6	100%
orf19.8326		C10	16	2	18	89%	15	0	15	100%	8	0	8	100%
orf19.6194		C11	11	0	11	100%	10	0	10	100%	4	0	4	100%
orf19.6194		C12	21	1	22	95%	18	1	19	95%	10	1	11	91%
<b>DAY 286</b>		WT	17	3	20	85%	14	2	16	88%	4	1	5	80%





VB GKO Plate 3			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5866		E1	36	19	55	65%	14	6	20	70%	N/A	N/A	N/A	N/A
orf19.5866		E2	24	9	33	73%	16	3	19	84%	N/A	N/A	N/A	N/A
orf19.2938		E3	27	11	38	71%	18	4	22	82%	N/A	N/A	N/A	N/A
orf19.2938		E4	34	22	56	61%	30	10	40	75%	N/A	N/A	N/A	N/A
orf19.9115		E5	26	14	40	65%	19	10	29	66%	N/A	N/A	N/A	N/A
orf19.271		E6	7	2	9	78%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12706		E7	25	15	40	63%	23	10	33	70%	N/A	N/A	N/A	N/A
orf19.12706		E8	12	10	22	55%	13	3	16	81%	N/A	N/A	N/A	N/A
orf19.6850		E9	32	6	38	84%	14	6	20	70%	N/A	N/A	N/A	N/A
orf19.1252		E10	24	11	35	69%	14	5	19	74%	N/A	N/A	N/A	N/A
orf19.1252		E11	19	6	25	76%	17	5	22	77%	N/A	N/A	N/A	N/A
orf19.5352		E12	19	10	29	66%	14	6	20	70%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	20	17	37	54%	18	12	30	60%	N/A	N/A	N/A	N/A

VB GKO Plate 3			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5352		F1	24	12	36	67%	9	5	14	64%	N/A	N/A	N/A	N/A
orf19.7451		F2	30	14	44	68%	12	8	20	60%	N/A	N/A	N/A	N/A
orf19.7451		F3	8	4	12	67%	4	1	5	80%	N/A	N/A	N/A	N/A
orf19.7401		F4	21	7	28	75%	19	1	20	95%	N/A	N/A	N/A	N/A
orf19.7401		F5	29	4	33	88%	15	4	19	79%	N/A	N/A	N/A	N/A
orf19.9115		F6	18	16	34	53%	21	3	24	88%	N/A	N/A	N/A	N/A
orf19.271		F7	25	5	30	83%	15	3	18	83%	N/A	N/A	N/A	N/A
orf19.1394		F8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1394		F9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2901		F10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2901		F11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6737		F12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	20	17	37	54%	18	12	30	60%	N/A	N/A	N/A	N/A





VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4872		A1	22	0	22	100%	18	0	18	100%	10	0	10	100%
orf19.4513		A2	17	1	18	94%	17	1	18	94%	9	0	9	100%
orf19.4513		A3	25	5	30	83%	22	0	22	100%	2	0	2	100%
orf19.6971		A4	27	4	31	87%	20	0	20	100%	8	0	8	100%
orf19.6971		A5	22	4	26	85%	18	3	21	86%	8	1	9	89%
orf19.2270		A6	25	9	34	74%	19	1	20	95%	5	0	5	100%
orf19.3190		A7	17	5	22	77%	15	2	17	88%	3	0	3	100%
orf19.3190		A8	20	3	23	87%	20	2	22	91%	2	0	2	100%
orf19.7410		A9	11	12	23	48%	15	5	20	75%	6	1	7	86%
orf19.7410		A10	25	5	30	83%	20	2	22	91%	12	0	12	100%
orf19.4440		A11	21	4	25	84%	19	2	21	90%	8	2	10	80%
orf19.13704		A12	26	4	30	87%	20	2	22	91%	14	1	15	93%
<b>DAY 286</b>		WT	27	3	30	90%	17	2	19	89%	4	0	4	

VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.13704		B1	25	0	25	100%	21	0	21	100%	10	0	10	
orf19.6365		B2	22	4	26	85%	17	1	18	94%	14	0	14	
orf19.6365		B3	24	0	24	100%	20	2	22	91%	8	0	8	
orf19.4116		B4	22	6	28	79%	24	2	26	92%	0	0	0	
orf19.4116		B5	22	3	25	88%	22	3	25	88%	4	0	4	
orf19.3678		B6	25	2	27	93%	24	1	25	96%	7	0	7	
orf19.3678		B7	18	2	20	90%	17	1	18	94%	3	0	3	
orf19.7381		B8	25	5	30	83%	21	1	22	95%	4	1	5	
orf19.7381		B9	25	2	27	93%	20	2	22	91%	11	0	11	
orf19.3844		B10	22	0	22	100%	16	0	16	100%	1	0	1	
orf19.3844		B11	20	1	21	95%	13	1	14	93%	8	0	8	
orf19.1331		B12	18	3	21	86%	18	0	18	100%	7	1	8	
<b>DAY 286</b>		WT	27	3	30	90%	17	2	19	89%	4	0	4	

VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1331		C1	25	8	33	76%	23	1	24	96%	8	2	10	80%
orf19.1276		C2	22	3	25	88%	21	1	22	95%	11	0	11	100%
orf19.1276		C3	12	0	12	100%	2	0	2	100%	0	0	0	0%
orf19.5761		C4	16	1	17	94%	16	0	16	100%	6	0	6	100%
orf19.5761		C5	18	1	19	95%	18	1	19	95%	5	0	5	100%
orf19.7576		C6	22	4	26	85%	21	1	22	95%	11	1	12	92%
orf19.7576		C7	25	8	33	76%	24	2	26	92%	14	0	14	100%
orf19.813		C8	21	2	23	91%	21	2	23	91%	11	0	11	100%
orf19.813		C9	22	4	26	85%	22	0	22	100%	10	0	10	100%
orf19.1907		C10	4	0	4	100%	4	0	4	100%	0	0	0	0%
orf19.1907		C11	18	3	21	86%	18	3	21	86%	11	0	11	100%
orf19.4846		C12	18	1	19	95%	14	2	16	88%	6	0	6	100%
<b>DAY 286</b>		WT	26	2	28	93%	23	1	24	96%	12	0	12	100%



VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4846		D1	18	0	18	100%	14	0	14	100%	10	0	10	100%
orf19.4543		D2	22	1	23	96%	20	1	21	95%	11	0	11	100%
orf19.4543		D3	22	0	22	100%	20	0	20	100%	8	0	8	100%
orf19.4518		D4	25	1	26	96%	21	1	22	95%	13	1	14	93%
orf19.4518		D5	22	2	24	92%	22	2	24	92%	8	2	10	80%
orf19.4823		D6	24	2	26	92%	21	2	23	91%	9	2	11	82%
orf19.4823		D7	15	2	17	88%	14	0	14	100%	4	0	4	100%
orf19.7447		D8	13	1	14	93%	12	0	12	100%	6	0	6	100%
orf19.7447		D9	16	0	16	100%	14	0	14	100%	10	0	10	100%
orf19.7324		D10	14	1	15	93%	12	0	12	100%	6	0	6	100%
orf19.7324		D11	14	1	15	93%	13	0	13	100%	6	0	6	100%
orf19.2350		D12	17	2	19	89%	14	0	14	100%	8	0	8	100%
<b>DAY 286</b>		WT	26	2	28	93%	23	1	24	96%	12	0	12	100%

VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.2350		E1	22	3	25	88%	19	3	22	86%	10	1	11	91%
orf19.10841		E2	20	2	22	91%	18	2	20	90%	9	1	10	90%
orf19.10841		E3	26	2	28	93%	22	2	24	92%	11	1	12	92%
orf19.5664		E4	21	5	26	81%	17	3	20	85%	9	2	11	82%
orf19.7610		E5	25	8	33	76%	22	3	25	88%	1	0	1	100%
orf19.7610		E6	27	3	30	90%	17	5	22	77%	3	0	3	100%
orf19.248		E7	20	2	22	91%	18	2	20	90%	9	0	9	100%
orf19.248		E8	22	5	27	81%	22	4	26	85%	11	0	11	100%
orf19.425		E9	22	4	26	85%	22	2	24	92%	11	3	14	79%
orf19.425		E10	8	0	8	100%	6	0	6	100%	0	0	0	0%
orf19.4243		E11	21	1	22	95%	18	2	20	90%	8	0	8	100%
orf19.1628		E12	22	4	26	85%	19	3	22	86%	14	2	16	88%
<b>DAY 286</b>		WT	25	0	25	100%	22	0	22	100%	14	0	14	100%

VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1628		F1	23	0	23	100%	18	2	20	90%	5	0	5	100%
orf19.3707		F2	22	0	22	100%	18	3	21	86%	14	0	14	100%
orf19.3707		F3	20	1	21	95%	15	3	18	83%	8	0	8	100%
orf19.829		F4	21	0	21	100%	18	0	18	100%	9	0	9	100%
orf19.829		F5	25	2	27	93%	20	3	23	87%	12	0	12	100%
orf19.3254		F6	22	3	25	88%	20	2	22	91%	11	0	11	100%
orf19.3254		F7	22	8	30	73%	15	5	20	75%	3	0	3	100%
orf19.1291		F8	26	2	28	93%	17	2	19	89%	13	1	14	93%
orf19.1291		F9	21	2	23	91%	14	2	16	88%	9	0	9	100%
orf19.6365		F10	21	1	22	95%	15	1	16	94%	8	0	8	100%
orf19.6365		F11	23	5	28	82%	20	2	22	91%	4	1	5	80%
orf19.2061		F12	22	0	22	100%	16	1	17	94%	14	0	14	100%
<b>DAY 286</b>		WT	25	0	25	100%	22	0	22	100%	14	0	14	100%

VB GKO Plate 4			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.2061		G1	18	0	18	100%	14	0	14	100%	11	0	11	100%
orf19.1793		G2	15	1	16	94%	13	0	13	100%	8	0	8	100%
orf19.1793		G3	22	2	24	92%	17	2	19	89%	6	0	6	100%
orf19.3122		G4	21	7	28	75%	17	5	22	77%	3	1	4	75%
orf19.3122		G5	22	0	22	100%	19	1	20	95%	12	0	12	100%
orf19.5887		G6	23	0	23	100%	19	0	19	100%	10	1	11	91%
orf19.5887		G7	28	0	28	100%	21	1	22	95%	7	2	9	78%
orf19.4188		G8	24	0	24	100%	22	1	23	96%	13	1	14	93%
orf19.4139		G9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4139		G10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1795		G11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1795		G12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	25	0	25	100%	22	0	22	100%	14	0	14	100%



VB GKO Plate 5			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3012		A1	23	4	27	85%	14	4	18	78%	4	1	5	80%
orf19.6036		A2	31	2	33	94%	10	2	12	83%	N/A	N/A	N/A	N/A
orf19.6036		A3	22	4	26	85%	16	4	20	80%	N/A	N/A	N/A	N/A
orf19.4743		A4	17	3	20	85%	15	3	18	83%	5	1	6	83%
orf19.4743		A5	23	5	28	82%	12	3	15	80%	N/A	N/A	N/A	N/A
orf19.6763		A6	21	1	22	95%	18	1	19	95%	3	1	4	75%
orf19.6763		A7	21	0	21	100%	17	0	17	100%	7	0	7	100%
orf19.4010		A8	26	4	30	87%	20	0	20	100%	N/A	N/A	N/A	N/A
orf19.4010		A9	24	3	27	89%	15	1	16	94%	2	2	4	50%
orf19.7207		A10	19	2	21	90%	17	0	17	100%	N/A	N/A	N/A	N/A
orf19.2508		A11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2508		A12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	26	3	29	90%	21	0	21	100%	21	0	21	100%

VB GKO Plate 5			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5016		B1	22	4	26	85%	16	4	20	80%	N/A	N/A	N/A	N/A
orf19.5016		B2	16	4	20	80%	10	2	12	83%	N/A	N/A	N/A	N/A
orf19.5023		B3	16	0	16	100%	14	0	14	100%	N/A	N/A	N/A	N/A
orf19.5023		B4	10	0	10	100%	10	0	10	100%	N/A	N/A	N/A	N/A
orf19.998		B5	21	5	26	81%	14	2	16	88%	3	0	3	100%
orf19.998		B6	25	8	33	76%	14	4	18	78%	1	0	1	100%
orf19.7355		B7	17	2	19	89%	15	2	17	88%	N/A	N/A	N/A	N/A
orf19.814		B8	22	0	22	100%	15	0	15	100%	N/A	N/A	N/A	N/A
orf19.814		B9	24	4	28	86%	18	4	22	82%	N/A	N/A	N/A	N/A
orf19.411		B10	25	0	25	100%	20	0	20	100%	N/A	N/A	N/A	N/A
orf19.411		B11	23	0	23	100%	18	0	18	100%	N/A	N/A	N/A	N/A
orf19.5235		B12	24	4	28	86%	19	3	22	86%	6	2	8	75%
<b>DAY 286</b>		WT	26	3	29	90%	21	0	21	100%	21	0	21	100%

VB GKO Plate 5			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5235		C1	17	5	22	77%	17	1	18	94%	N/A	N/A	N/A	N/A
orf19.12351		C2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12351		C3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6344		C4	14	4	18	78%	11	3	14	79%	N/A	N/A	N/A	N/A
<b>Blank</b>		C5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		C12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	26	3	29	90%	21	0	21	100%	21	0	21	100%



DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3193	BRY468	A1	18	4	22	82%	21	0	21	100%	18	0	18	100%
orf19.7374	DSY1691	A2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.166	DSY1762	A3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2647	DSY2892	A4	25	4	29	86%	27	2	29	93%	27	1	28	96%
orf19.3188	DSY2906	A5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1358	DSY3233	A6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1499	DSY3297	A7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6817	DSY3298	A8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	27	3	30	90%	25	0	25	100%	22	0	22	100%

DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.681	DSY2989	B1	23	1	24	96%	23	0	23	100%	22	0	22	100%
orf19.4662	BRY429	B2	15	4	19	79%	16	0	16	100%	15	0	15	100%
orf19.5848	HZY14	B3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6407	HZY15	B4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5975	HZY20	B5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1032	HZY2-1	B6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1032	HZY2-2	B7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2356	HZY22	B8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	27	3	30	90%	25	0	25	100%	22	0	22	100%







DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4961	DSY3422-9	F1	22	3	25	88%	23	0	23	100%	23	0	23	100%
orf19.5953	DSY3452 -15	F2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5953	DSY3452 -17	F3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6124	DSY3423 -6	F4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6124	DSY3423 -9	F5	23	3	26	88%	25	0	25	100%	22	0	22	100%
orf19.173	DSY3440 -17	F6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.173	DSY3440 -18	F7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6121	DSY3410 -1	F8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	24	2	26	92%	25	0	25	100%	22	0	22	100%

DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.6121	DSY3410 -2	G1	17	4	21	81%	21	0	21	100%	17	0	17	100%
orf19.217	DSY3430 -3	G2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.217	DSY3430-4	G3	21	5	26	81%	24	0	24	100%	22	0	22	100%
orf19.1035	DSY3429-1	G4	22	5	27	81%	23	1	24	96%	21	0	21	100%
orf19.1035	DSY3429-2	G5	22	2	24	92%	24	0	24	100%	23	0	23	100%
orf19.1718	DSY3447-11	G6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1718	DSY3447-13	G7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2423	DSY3411-2	G8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	24	2	26	92%	25	0	25	100%	22	0	22	100%

DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.255	DSY3412-2	H1	6	3	9	67%	7	0	7	100%	6	0	6	100%
orf19.2748	DSY3426-2	H2	16	6	22	73%	18	2	20	90%	19	0	19	100%
orf19.2753	DSY3413-2	H3	14	26	30	47%	17	12	29	59%	18	11	29	62%
orf19.2808	DSY3424-6	H4	20	4	24	83%	23	0	23	100%	23	0	23	100%
orf19.2808	DSY3424-9	H5	21	7	28	75%	24	3	27	89%	24	0	24	100%
orf19.3252	DSY3414-1	H6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3405	DSY3436-5	H7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3405	DSY3436-7	H8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	24	2	26	92%	25	0	25	100%	22	0	22	100%



DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3876	DSY3427-3	I1	24	0	24	100%	24	0	24	100%	22	0	22	100%
orf19.4145	DSY3415-1	I2	20	3	23	87%	23	0	23	100%	19	0	19	100%
orf19.4166	DSY3416-1	I3	19	5	24	79%	24	0	24	100%	23	0	23	100%
orf19.4166	DSY3416-2	I4	24	2	26	92%	26	0	26	100%	25	0	25	100%
orf19.4225	DSY3417-1	I5	25	4	29	86%	26	1	27	96%	25	0	25	100%
orf19.4288	DSY3418-1	I6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4450	DSY3419-1	I7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4524	DSY3425-9	I8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	24	2	26	92%	25	0	25	100%	22	0	22	100%

DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4524	DSY3425-10	J1	21	5	26	81%	24	2	26	92%	24	0	24	100%
orf19.5924	DSY3420-1	J2	18	6	24	75%	24	0	24	100%	23	0	23	100%
orf19.5940	DSY3421-1	J3	21	4	25	84%	25	0	25	100%	22	0	22	100%
orf19.5940	DSY3421-2	J4	27	0	27	100%	27	0	27	100%	24	0	24	100%
orf19.7372	DSY3437-5	J5	21	0	21	100%	21	0	21	100%	21	0	21	100%
orf19.6227	DSY3367	J6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6227	DSY3368	J7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6713	DSY3369	J8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	20	3	23	87%	22	0	22	100%	20	0	20	100%

DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.6713	DSY3370	K1	7	16	23	30%	6	15	21	29%	5	15	20	25%
orf19.7319	DSY3365	K2	20	2	22	91%	22	0	22	100%	21	0	21	100%
orf19.7319	DSY3366	K3	24	6	30	80%	27	3	30	90%	28	0	28	100%
orf19.5995	DSY3328	K4	16	7	23	70%	19	2	21	90%	20	0	20	100%
orf19.5759	DSY3329-3	K5	20	2	22	91%	22	0	22	100%	20	0	20	100%
orf19.4979	DSY3330	K6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.2395	DSY3336-4	K7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6626	DSY3331	K8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	20	3	23	87%	22	0	22	100%	20	0	20	100%

DS TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7523	DSY3332	L1	22	3	25	88%	22	0	22	100%	20	0	20	100%
orf19.1813	DSY3333	L2	24	2	26	92%	25	0	25	100%	24	0	24	100%
orf19.2217	DSY3326	L3	26	2	28	93%	28	0	28	100%	25	0	25	100%
orf19.702	DSY3438-2	L4	25	3	28	89%	27	0	27	100%	25	0	25	100%
orf19.702	DSY3438-3	L5	17	3	20	85%	20	0	20	100%	19	0	19	100%
BLANK		L6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		L7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		L8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DAY 286		WT	20	3	23	87%	22	0	22	100%	20	0	20	100%

SFY TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7547	SFY1	A1	24	2	26	92%	25	0	25	100%	10	0	10	100%
orf19.7547	SFY1-2	A2	19	3	22	86%	18	1	19	95%	9	0	9	100%
orf19.7547	SFY1-3	A3	25	4	29	86%	24	2	26	92%	2	0	2	100%
orf19.5660	SFY2	A4	27	4	31	87%	25	2	27	93%	8	0	8	100%
orf19.5660	SFY2-2	A5	22	0	22	100%	18	0	18	100%	9	0	9	100%
orf19.5175	SFY3	A6	25	0	25	100%	24	0	24	100%	5	0	5	100%
orf19.5175	SFY3-2	A7	17	2	19	89%	18	1	19	95%	3	0	3	100%
orf19.5175	SFY3-3	A8	20	3	23	87%	21	2	23	91%	2	0	2	100%
orf19.1577	SFY4	A9	11	6	17	65%	12	4	16	75%	6	1	7	86%
orf19.1577	SFY4-2	A10	25	0	25	100%	22	0	22	100%	12	0	12	100%
orf19.1253	SFY5	A11	21	7	28	75%	19	7	26	73%	8	2	10	80%
orf19.5651	SFY6	A12	26	4	30	87%	25	3	28	89%	14	1	15	93%
<b>DAY 286</b>		WT	27	1	28	96%	26	1	27	96%	3	0	3	100%

SFY TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5651	SFY6-2	B1	27	0	27	100%	25	0	25	100%	10	0	10	100%
orf19.5651	SFY6-3	B2	26	3	29	90%	26	1	27	96%	14	0	14	100%
orf19.4062	SFY7	B3	24	0	24	100%	24	0	24	100%	8	0	8	100%
orf19.4062	SFY7-2	B4	22	3	25	88%	21	1	22	95%	0	0	0	0%
orf19.8085	SFY8	B5	22	3	25	88%	23	2	25	92%	4	0	4	100%
orf19.8085	SFY8-2	B6	25	2	27	93%	24	1	25	96%	7	0	7	100%
orf19.8085	SFY8-3	B7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3969	SFY9	B8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6824	SFY10	B9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6824	SFY10-2	B10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6824	SFY10-3	B11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1275	SFY11	B12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	27	1	28	96%	26	1	27	96%	3	0	3	100%

SFY TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5389	SFY14	C1	23	5	28	82%	26	2	28	93%	11	1	12	92%
orf19.5389	SFY14-2	C2	24	7	31	77%	29	2	31	94%	4	0	4	100%
orf19.7385	SFY15	C3	24	1	25	96%	25	0	25	100%	8	0	8	100%
orf19.7385	SFY15-2	C4	26	2	28	93%	27	1	28	96%	11	0	11	100%
orf19.7385	SFY15-3	C5	21	1	22	95%	22	0	22	100%	10	0	10	100%
orf19.59	SFY16	C6	24	5	29	83%	26	3	29	90%	15	2	17	88%
orf19.5498	SFY18	C7	18	3	21	86%	19	2	21	90%	10	1	11	91%
orf19.5498	SFY18-2	C8	20	4	24	83%	23	1	24	96%	14	0	14	100%
orf19.1314	SFY19	C9	20	7	27	74%	22	5	27	81%	7	1	8	88%
orf19.1314	SFY19-2	C10	17	2	19	89%	17	2	19	89%	4	0	4	100%
orf19.1314	SFY19-3	C11	18	1	19	95%	18	1	19	95%	1	0	1	100%
orf19.3018	SFY21	C12	15	7	22	68%	18	4	22	82%	9	3	11	82%
<b>DAY 286</b>		WT	27	1	28	96%	26	1	27	96%	3	0	3	100%

SFY TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3018	SFY21-2	D1	22	2	24	92%	23	1	24	96%	3	0	3	100%
orf19.3018	SFY21-3	D2	26	1	27	96%	27	0	27	100%	12	0	12	100%
orf19.878	SFY23	D3	27	1	28	96%	27	1	28	96%	5	0	5	100%
orf19.6506	SFY24	D4	20	3	23	87%	20	3	23	87%	14	0	14	100%
orf19.6506	SFY24-2	D5	22	3	25	88%	23	2	25	92%	8	0	8	100%
orf19.6506	SFY24-3	D6	26	3	29	90%	28	1	29	97%	6	0	6	100%
orf19.2087	SFY25	D7	25	2	27	93%	20	2	22	91%	5	0	5	100%
orf19.2087	SFY25-2	D8	18	4	22	82%	18	2	20	90%	7	0	7	100%
orf19.2087	SFY25-3	D9	23	2	25	92%	24	1	25	96%	12	0	12	100%
orf19.610	SFY26	D10	24	2	26	92%	22	2	24	92%	11	0	11	100%
orf19.259	SFY27	D11	21	1	22	95%	20	0	20	100%	8	0	8	100%
orf19.971	SFY29	D12	25	3	28	89%	27	1	28	96%	14	0	14	100%
<b>DAY 286</b>		WT	25	2	27	93%	26	1	27	96%	10	0	10	100%



SFY TF Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.971	SFY29-2	E1	20	1	21	95%	20	1	21	95%	6	0	6	100%
orf19.971	SFY29-3	E2	18	1	19	95%	18	1	19	95%	2	0	2	100%
orf19.2823	SFY30	E3	24	1	25	96%	23	1	24	96%	12	0	12	100%
orf19.2823	SFY30-2	E4	20	4	24	83%	22	2	24	92%	3	0	3	100%
orf19.4941	SFY32	E5	27	0	27	100%	25	0	25	100%	8	1	9	89%
orf19.4941	SFY32-2	E6	25	3	28	89%	24	3	27	89%	6	1	7	86%
orf19.4941	SFY32-3	E7	21	2	23	91%	23	0	23	100%	1	0	1	100%
orf19.3281	SFY33	E8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3281	SFY33-2	E9	25	1	26	96%	24	0	24	100%	8	0	8	100%
orf19.3281	SFY33-3	E10	21	0	21	100%	18	0	18	100%	11	0	11	100%
orf19.3407	SFY36	E11	16	6	22	73%	17	4	21	81%	10	2	12	83%
orf19.3407	SFY36-2	E12	16	8	24	67%	16	6	22	73%	4	1	5	80%
<b>DAY 286</b>		WT	22	3	25	88%	21	2	23	91%	8	0	8	100%





CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.10012	OX71-6	A1	20	5	25	80%	18	0	18	100%	0	0	0	0%
orf19.10012	OX71-7	A2	20	0	20	100%	15	0	15	100%	0	0	0	0%
orf19.10489	I892-8	A3	18	6	24	75%	23	0	23	100%	5	0	5	100%
orf19.10489	I892-10	A4	18	9	27	67%	17	7	24	71%	7	3	10	70%
orf19.10949	OQ05-6	A5	27	0	27	100%	21	0	21	100%	5	0	5	100%
orf19.10949	OQ05-11	A6	24	0	24	100%	16	0	16	100%	5	0	5	100%
orf19.10953	IQ49-1	A7	31	0	31	100%	26	0	26	100%	16	0	16	100%
orf19.10953	IQ49-4	A8	24	4	28	86%	21	0	21	100%	1	0	1	100%
orf19.11156	HV52-1	A9	24	0	24	100%	21	0	21	100%	6	0	6	100%
orf19.11156	HV52-10	A10	27	3	30	90%	20	0	20	100%	1	0	1	100%
orf19.11580	IU53-2	A11	25	0	25	100%	22	0	22	100%	0	0	0	0%
orf19.11580	IU53-9	A12	30	0	30	100%	24	0	24	100%	3	0	3	100%
<b>DAY 286</b>		WT	28	0	28	100%	23	0	23	100%	14	0	14	100%

CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.12035	NP77-2	B1	28	0	28	100%	24	0	24	100%	18	0	18	100%
orf19.12035	NP77-10	B2	29	1	30	97%	28	0	28	100%	12	0	12	100%
orf19.12458	L522-6	B3	27	0	27	100%	25	0	25	100%	9	0	9	100%
orf19.12458	L522-12	B4	19	3	22	86%	18	0	18	100%	5	0	5	100%
orf19.12732	P075-2	B5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12732	P075-4	B6	16	4	20	80%	17	0	17	100%	7	0	7	100%
orf19.1277	D531-1	B7	24	4	28	86%	21	2	23	91%	5	1	6	83%
orf19.1277	F851-2	B8	15	5	20	75%	16	0	16	100%	8	0	8	100%
orf19.12854	IB15-1	B9	11	13	24	46%	10	10	20	50%	7	4	11	64%
orf19.12854	IB15-4	B10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.12983	OJ94-1	B11	26	0	26	100%	22	0	22	100%	16	0	16	100%
orf19.12983	OJ94-4	B12	17	5	22	77%	18	0	18	100%	7	0	7	100%
<b>DAY 286</b>		WT	26	1	27	96%	26	0	26	100%	20	0	20	100%

CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.13003	KS46-3	C1	24	4	28	86%	25	2	27	93%	22	0	22	100%
orf19.13080	B265-1	C2	29	4	33	88%	30	1	31	97%	23	0	23	100%
orf19.13080	B265-2	C3	19	3	22	86%	21	1	22	95%	19	0	19	100%
orf19.13103	IA18-2	C4	25	1	26	96%	23	1	24	96%	18	0	18	100%
orf19.13103	IA18-5	C5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1321	FJS24	C6	22	0	22	100%	21	0	21	100%	17	0	17	100%
orf19.1321	FJS25	C7	20	4	24	83%	21	1	22	95%	20	0	20	100%
orf19.1327	EA41-1	C8	29	0	29	100%	28	0	28	100%	25	0	25	100%
orf19.1327	EA41-4	C9	18	5	23	78%	22	1	23	96%	20	0	20	100%
orf19.13461	LH85-1	C10	22	3	25	88%	24	0	24	100%	23	0	23	100%
orf19.13461	LH85-7	C11	16	3	19	84%	16	3	19	84%	17	0	17	100%
orf19.13474	KQ92-2	C12	25	3	28	89%	25	2	27	93%	25	0	25	100%
<b>DAY 286</b>		WT	25	2	27	93%	25	0	25	100%	22	0	22	100%

CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.13474	KQ92-5	D1	20	4	24	83%	24	0	24	100%	22	0	22	100%
orf19.138	JJH23	D2	22	0	22	100%	22	0	22	100%	20	0	20	100%
orf19.138	JJH24	D3	17	2	19	89%	19	0	19	100%	16	0	16	100%
orf19.13923	HU63-1	D4	17	4	21	81%	20	0	20	100%	15	0	15	100%
orf19.13923	HU63-3	D5	17	3	20	85%	20	0	20	100%	14	0	14	100%
orf19.1401	OM60-6	D6	23	0	23	100%	21	0	21	100%	17	0	17	100%
orf19.14065	IS42-1	D7	20	0	20	100%	20	0	20	100%	18	0	18	100%
orf19.14065	IS42-3	D8	20	3	23	87%	22	0	22	100%	21	0	21	100%
orf19.14215	LG68-1	D9	19	3	22	86%	21	1	22	95%	22	0	22	100%
orf19.14215	LG68-5	D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1490	CO56-4	D11	28	0	28	100%	28	0	28	100%	22	0	22	100%
orf19.1490	FU32-1	D12	22	3	25	88%	25	0	25	100%	21	0	21	100%
<b>DAY 286</b>		WT	25	2	27	93%	25	0	25	100%	22	0	22	100%

CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.1524	OD77-1	E1	22	0	22	100%	22	0	22	100%	20	0	20	100%
orf19.1524	OD77-5	E2	24	0	24	100%	23	0	23	100%	17	0	17	100%
orf19.1563	DL37-2	E3	17	4	21	81%	21	0	21	100%	19	0	19	100%
orf19.1563	G758-4	E4	18	5	23	78%	21	2	23	91%	20	0	20	100%
orf19.1714	AU60-1	E5	25	2	27	93%	27	0	27	100%	26	0	26	100%
orf19.1714	AU60-4	E6	25	3	28	89%	28	0	28	100%	24	0	24	100%
orf19.1779	JJH17	E7	24	0	24	100%	22	0	22	100%	21	0	21	100%
orf19.1779	JJH18	E8	26	3	29	90%	28	1	29	97%	28	0	28	100%
orf19.1957	JJH27	E9	25	1	26	96%	24	0	24	100%	21	0	21	100%
orf19.1957	JJH28	E10	20	7	27	74%	25	2	27	93%	27	0	27	100%
orf19.1969	JJH1	E11	23	3	26	88%	25	0	25	100%	22	0	22	100%
orf19.1969	JJH2	E12	27	2	29	93%	29	0	29	100%	26	0	26	100%
<b>DAY 286</b>		WT	27	0	27	100%	27	0	27	100%	32	0	23	100%



CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.2075	JJH19	F1	31	0	31	100%	29	0	29	100%	28	0	28	100%
orf19.2075	JJH20	F2	30	0	30	100%	30	0	30	100%	27	0	27	100%
orf19.212	J162-7	F3	35	0	35	100%	35	0	35	100%	34	0	34	100%
orf19.2237	GKO237	F4	27	1	28	96%	26	0	26	100%	26	0	26	100%
orf19.2237	GKO238	F5	34	0	34	100%	32	0	32	100%	29	0	29	100%
orf19.2296	HO05-8	F6	30	0	30	100%	30	0	30	100%	29	0	29	100%
orf19.2296	HO05-9	F7	8	24	32	25%	26	6	32	81%	30	2	32	94%
orf19.2332	IM55-5	F8	21	7	28	75%	25	3	28	89%	28	0	28	100%
orf19.2332	IM55-7	F9	29	0	29	100%	25	0	25	100%	25	0	25	100%
orf19.2336	LR58-2	F10	24	3	27	89%	26	0	26	100%	24	0	24	100%
orf19.2336	LR58-6	F11	25	4	29	86%	28	0	28	100%	28	0	28	100%
orf19.242	IF17-3	F12	23	8	31	74%	25	6	31	81%	28	3	31	90%
<b>DAY 286</b>		WT	30	3	33	91%	32	0	32	100%	30	0	30	100%

CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.242	IF17-7	G1	19	9	28	68%	23	5	28	82%	25	2	27	93%
orf19.2476	CK11-2	G2	29	0	29	100%	27	0	27	100%	23	0	23	100%
orf19.2476	CV89-3	G3	26	0	26	100%	23	0	23	100%	22	0	22	100%
orf19.251	IK51-1	G4	27	0	27	100%	25	0	25	100%	25	0	25	100%
orf19.251	IK51-4	G5	29	0	29	100%	29	0	29	100%	27	0	27	100%
orf19.2613	DQ11-3	G6	27	0	27	100%	27	0	27	100%	27	0	27	100%
orf19.2613	ES55-1	G7	22	8	30	73%	26	2	28	93%	20	0	20	100%
orf19.2762	PI79-6	G8	24	1	25	96%	25	0	25	100%	21	0	21	100%
orf19.2765	K087-2	G9	22	4	26	85%	23	3	26	88%	24	2	26	92%
orf19.2765	K087-11	G10	23	4	27	85%	24	3	27	89%	26	1	27	96%
orf19.299	BY54-5	G11	25	3	28	89%	28	0	28	100%	26	0	26	100%
orf19.299	GG42-1	G12	24	6	30	80%	28	2	30	93%	29	0	29	100%
<b>DAY 286</b>		WT	25	2	27	93%	27	0	27	100%	22	0	22	100%

CWP Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.2996	HU29-1	H1	22	4	26	85%	24	2	26	92%	19	1	20	95%
orf19.2996	HU29-3	H2	25	5	30	83%	26	4	30	87%	24	4	28	86%
orf19.3010.1	BU26-1	H3	21	6	27	78%	23	3	26	88%	24	0	24	100%
orf19.3010.1	CB64-2	H4	28	0	28	100%	25	3	28	89%	26	0	26	100%
orf19.3014	GKO180	H5	26	0	26	100%	26	0	26	100%	22	0	22	100%
orf19.3014	GKO181	H6	23	5	28	82%	27	0	27	100%	26	0	26	100%
orf19.3111	FJS26	H7	23	7	30	77%	25	5	30	83%	24	3	27	89%
orf19.3111	FJS27	H8	21	5	26	81%	23	3	26	88%	24	1	25	96%
orf19.3370	JJH5	H9	15	16	31	48%	14	15	29	48%	12	13	25	48%
BLANK		H10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		H11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		H12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DAY 286		WT	25	2	27	93%	27	0	27	100%	22	0	22	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3380	JJH29	A1	25	0	25	100%	25	0	25	100%	23	0	23	100%
orf19.3380	JJH30	A2	24	0	24	100%	20	0	20	100%	18	0	18	100%
orf19.3434	EN68-4	A3	23	0	23	100%	23	0	23	100%	19	0	19	100%
orf19.3434	GG92-1	A4	24	0	24	100%	22	0	22	100%	20	0	20	100%
orf19.3642	CV53-7	A5	20	5	25	80%	25	0	25	100%	24	0	24	100%
orf19.3642	CV53-10	A6	23	0	23	100%	20	0	20	100%	17	0	17	100%
orf19.3765	BQ87-1	A7	26	0	26	100%	23	0	23	100%	21	0	21	100%
orf19.3765	BQ87-2	A8	19	5	24	79%	21	3	24	88%	22	1	23	96%
orf19.3839	IM68-5	A9	27	0	27	100%	25	0	25	100%	22	0	22	100%
orf19.3839	IM68-8	A10	25	0	25	100%	25	0	25	100%	20	0	20	100%
orf19.3869	BT32-2	A11	23	3	26	88%	24	0	24	100%	22	0	22	100%
orf19.3869	CJ26-2	A12	27	0	27	100%	27	0	27	100%	24	0	24	100%
<b>DAY 286</b>		WT	25	2	27	93%	24	0	24	100%	21	0	21	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3895	FJS5	B1	21	4	25	84%	25	0	25	100%	23	0	23	100%
<b>BLANK</b>		B2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3966	B642-3	B3	24	2	26	92%	25	0	25	100%	23	0	23	100%
orf19.3966	CT09-1	B4	24	0	24	100%	21	0	21	100%	20	0	20	100%
orf19.3997	JJH21	B5	22	0	22	100%	19	0	19	100%	16	0	16	100%
orf19.3997	JJH22	B6	26	0	26	100%	22	0	22	100%	20	0	20	100%
orf19.4255	C180-5	B7	30	0	30	100%	27	0	27	100%	25	0	25	100%
orf19.4255	F577-1	B8	24	3	27	89%	26	0	26	100%	25	0	25	100%
orf19.4457	GKO379	B9	25	5	30	83%	28	0	28	100%	26	0	26	100%
orf19.4457	GKO380	B10	20	8	28	71%	26	1	27	96%	24	0	24	100%
orf19.4475	LC10-2	B11	26	2	28	93%	27	0	27	100%	26	0	26	100%
orf19.4475	LC10-8	B12	27	0	27	100%	27	0	27	100%	25	0	25	100%
<b>DAY 286</b>		WT	29	0	29	100%	27	0	27	100%	23	0	23	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4477	JH3	C1	31	0	31	100%	29	0	29	100%	25	0	25	100%
orf19.4477	JH4	C2	24	6	30	80%	28	0	28	100%	24	0	24	100%
orf19.45	FJS34	C3	25	2	27	93%	26	0	26	100%	24	0	24	100%
orf19.45	FJS56	C4	29	0	29	100%	28	0	28	100%	23	0	23	100%
orf19.4565	FB63-1	C5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4565	FB63-3	C6	26	0	26	100%	26	0	26	100%	24	0	24	100%
orf19.4765	FJS45	C7	28	0	28	100%	28	0	28	100%	27	0	27	100%
orf19.4765	FJS46	C8	21	7	28	75%	24	3	27	89%	24	1	25	96%
orf19.4887	C007-1	C9	26	5	31	84%	29	1	30	97%	28	0	28	100%
orf19.4887	FA52-1	C10	27	0	27	100%	25	0	25	100%	20	0	20	100%
orf19.4958	M163-2	C11	26	0	26	100%	26	0	26	100%	22	0	22	100%
orf19.4975	FJS1	C12	25	0	25	100%	24	0	24	100%	21	0	21	100%
<b>DAY 286</b>		WT	29	0	29	100%	27	0	27	100%	23	0	23	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4975	FJS2	D1	20	5	25	80%	24	0	24	100%	22	0	22	100%
orf19.4981	EI30-2	D2	22	2	24	92%	23	0	23	100%	19	0	19	100%
orf19.4981	FQ65-1	D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.532	BL17-1	D4	24	3	27	89%	26	0	26	100%	24	0	24	100%
orf19.532	D166-1	D5	22	8	30	73%	25	5	30	83%	26	2	28	93%
orf19.5401	K871-1	D6	24	5	29	83%	28	0	28	100%	26	0	26	100%
orf19.5412	EI52-1	D7	20	7	27	74%	23	4	27	85%	26	0	26	100%
orf19.5412	EI52-2	D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.548	L672-2	D9	17	4	21	81%	20	0	20	100%	16	0	16	100%
orf19.548	L672-11	D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5632	FJS48	D11	25	3	28	89%	26	0	26	100%	24	0	24	100%
orf19.5632	FJS49	D12	30	0	30	100%	30	0	30	100%	28	0	28	100%
<b>DAY 286</b>		WT	22	2	24	92%	23	0	23	100%	19	0	19	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.5636	FJS7	E1	34	0	34	100%	32	0	32	100%	29	0	29	100%
orf19.5636	FJS8	E2	32	0	32	100%	32	0	32	100%	30	0	30	100%
orf19.5674	GO69-1	E3	23	5	28	82%	26	0	26	100%	23	0	23	100%
orf19.5674	GO69-5	E4	24	2	26	92%	24	1	25	96%	21	0	21	100%
orf19.5867	D120-1	E5	25	0	25	100%	23	0	23	100%	22	0	22	100%
orf19.5867	EO32-2	E6	29	0	29	100%	27	0	27	100%	23	0	23	100%
orf19.6033	C561-12	E7	12	15	27	44%	14	12	26	54%	12	13	25	48%
orf19.6214	JJH8	E8	25	7	32	78%	26	4	30	87%	27	0	27	100%
orf19.6214	JJH9	E9	24	2	26	92%	25	0	25	100%	22	0	22	100%
orf19.637	R586-4	E10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.690	JJH13	E11	20	4	24	83%	23	0	23	100%	20	0	20	100%
orf19.690	JJH14	E12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	24	2	26	92%	26	0	26	100%	22	0	22	100%



CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7030	FJS35	F1	22	3	25	88%	25	0	25	100%	24	0	24	100%
orf19.7030	FJS36	F2	26	0	26	100%	24	0	24	100%	19	0	19	100%
orf19.7114	JJH10	F3	20	3	23	87%	22	0	22	100%	18	0	18	100%
orf19.7218	J004-2	F4	26	2	28	93%	25	0	25	100%	23	0	23	100%
orf19.7218	J004-3	F5	27	0	27	100%	26	0	26	100%	24	0	24	100%
orf19.7251	BC40-3	F6	20	4	24	83%	23	0	23	100%	21	0	21	100%
orf19.7251	BC40-6	F7	26	0	26	100%	26	0	26	100%	25	0	25	100%
orf19.7339	I463-2	F8	25	0	25	100%	25	0	25	100%	22	0	22	100%
orf19.7339	I463-4	F9	28	2	30	93%	29	0	29	100%	26	0	26	100%
orf19.7363	I889-2	F10	26	0	26	100%	26	0	26	100%	24	0	24	100%
orf19.7363	I889-7	F11	27	3	30	90%	28	0	28	100%	25	0	25	100%
orf19.7383	JF02-2	F12	20	6	26	77%	24	0	24	100%	22	0	22	100%
<b>DAY 286</b>		WT	24	2	26	92%	26	0	26	100%	22	0	22	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7383	JF02-3	G1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7472	GKO460	G2	19	4	23	83%	21	2	23	91%	22	0	22	100%
orf19.7472	GKO461	G3	22	2	24	92%	24	0	24	100%	21	0	21	100%
orf19.7489	IS86-1	G4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7489	IS86-2	G5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7503	LQ71-1	G6	26	0	26	100%	25	0	25	100%	22	0	22	100%
orf19.7503	LQ71-3	G7	25	3	28	89%	28	0	28	100%	27	0	27	100%
orf19.7517	JJH6	G8	21	1	22	95%	22	0	22	100%	19	0	19	100%
orf19.7517	JJH7	G9	23	0	23	100%	21	0	21	100%	20	0	20	100%
orf19.7586	JJH25	G10	21	5	26	81%	22	4	26	85%	20	3	23	87%
orf19.7586	JJH26	G11	23	6	29	79%	25	4	29	86%	24	3	27	89%
orf19.807	I617-1	G12	28	0	28	100%	28	0	28	100%	23	0	23	100%
<b>DAY 286</b>		WT	25	2	27	93%	27	0	27	100%	24	0	24	100%

CWP Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.807	I617-5	H1	24	0	24	100%	22	0	22	100%	20	0	20	100%
orf19.852	L586-1	H2	23	4	27	85%	24	3	27	89%	23	2	25	92%
orf19.852	L586-2	H3	24	2	26	92%	25	1	26	96%	22	0	22	100%
orf19.8557	IA24-2	H4	27	0	27	100%	27	0	27	100%	23	0	23	100%
orf19.8557	IA24-10	H5	18	3	21	86%	21	0	21	100%	20	0	20	100%
orf19.8907	GKO68	H6	23	5	28	82%	24	4	28	86%	24	1	25	96%
orf19.8907	GKO69	H7	23	4	27	85%	25	2	27	93%	25	0	25	100%
orf19.893	E592-1	H8	26	0	26	100%	24	0	24	100%	19	0	19	100%
orf19.893	E592-2	H9	25	3	28	89%	28	0	28	100%	26	0	26	100%
BLANK		H10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		H11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLANK		H12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DAY 286		WT	25	2	27	93%	27	0	27	100%	24	0	24	100%

Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7329	K312-2	A1	19	1	20	95%	24	0	24	100%	N/A	N/A	N/A	N/A
orf19.7347	KD24-21	A2	24	0	24	100%	23	0	23	100%	N/A	N/A	N/A	N/A
orf19.1191	DR70-21	A3	33	1	34	97%	33	0	33	100%	N/A	N/A	N/A	N/A
orf19.1516	IO92-10	A4	27	0	27	100%	28	0	28	100%	N/A	N/A	N/A	N/A
orf19.4996	O855-21	A5	23	0	23	100%	34	1	35	97%	N/A	N/A	N/A	N/A
orf19.4041	DX69-2-1	A6	26	0	26	100%	22	0	22	100%	N/A	N/A	N/A	N/A
orf19.2225	G829-41-3	A7	14	0	14	100%	25	0	25	100%	N/A	N/A	N/A	N/A
orf19.4540	PI95-35	A8	22	0	22	100%	22	0	22	100%	N/A	N/A	N/A	N/A
orf19.5337	HZ77-21	A9	31	0	31	100%	40	0	40	100%	N/A	N/A	N/A	N/A
orf19.848	IV13-23	A10	30	0	30	100%	38	0	38	100%	N/A	N/A	N/A	N/A
orf19.6358	CJ18-31-2	A11	23	0	23	100%	34	0	34	100%	N/A	N/A	N/A	N/A
orf19.1085	HC56-43-2	A12	47	1	48	98%	55	0	55	100%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	27	0	27	100%	19	0	19	100%	N/A	N/A	N/A	N/A

Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.719	BZ52-4-7	B1	27	0	27	100%	48	0	48	100%	N/A	N/A	N/A	N/A
orf19.719	BZ52-5-5	B2	26	0	26	100%	47	0	47	100%	N/A	N/A	N/A	N/A
orf19.422	Spt20-5	B3	20	0	20	100%	35	0	35	100%	N/A	N/A	N/A	N/A
orf19.422	Spt20-1	B4	36	0	36	100%	49	0	49	100%	N/A	N/A	N/A	N/A
orf19.6573	Bem2-18	B5	44	0	44	100%	44	0	44	100%	N/A	N/A	N/A	N/A
orf19.6573	Bem2-16	B6	22	0	22	100%	47	0	47	100%	N/A	N/A	N/A	N/A
orf19.5544	Sac6-5	B7	11	0	11	100%	38	0	38	100%	N/A	N/A	N/A	N/A
orf19.794	ceme-13	B8	28	0	28	100%	40	0	40	100%	N/A	N/A	N/A	N/A
orf19.794	ceme-14	B9	39	0	39	100%	64	0	64	100%	N/A	N/A	N/A	N/A
orf19.3038	ceme-7	B10	31	0	31	100%	41	0	41	100%	N/A	N/A	N/A	N/A
orf19.3038	ceme-8	B11	27	0	27	100%	44	0	44	100%	N/A	N/A	N/A	N/A
orf19.3023	ceme-9	B12	34	0	34	100%	37	0	37	100%	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	27	0	27	100%	19	0	19	100%	N/A	N/A	N/A	N/A

Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3023	ceme-10	C1	25	0	25	100%	23	0	23	100%	33	0	33	100%
orf19.736	ceme-11	C2	34	0	34	100%	25	0	25	100%	22	0	22	100%
orf19.736	ceme-12	C3	11	0	11	100%	4	0	4	100%	2	0	2	100%
orf19.1298	ceme-15	C4	23	0	23	100%	11	0	11	100%	6	0	6	100%
orf19.1298	ceme-16	C5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6000	ceme-17	C6	Spot Growth Was Slow				6	0	6	100%	4	0	4	100%
orf19.6000	ceme-18	C7	Spot Growth Was Slow				13	0	13	100%	7	0	7	100%
orf19.6848	ceme-1	C8	20	0	20	100%	12	0	12	100%	9	0	9	100%
orf19.6848	ceme-2	C9	23	1	24	96%	16	0	16	100%	13	0	13	100%
orf19.6640	ceme-5	C10	25	1	26	96%	28	0	28	100%	20	0	20	100%
orf19.6640	ceme,6	C11	13	0	14	93%	18	0	18	100%	24	0	24	100%
orf19.923	ceme-3	C12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	85	0	85	100%	48	0	48	100%	51	0	51	100%

Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.923	ceme-4	D1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.10882	FJS6	D2	36	1	37	97%	18	0	18	100%	19	1	20	95%
orf19.10995	CM69-4	D3	25	0	25	100%	16	0	16	100%	14	0	14	100%
orf19.11484	I318-1	D4	17	0	17	100%	9	0	9	100%	13	0	13	100%
orf19.11700	GQ41-1	D5	22	0	22	100%	21	0	21	100%	12	0	12	100%
orf19.13026	B518-2	D6	14	0	14	100%	7	0	7	100%	6	0	6	100%
orf19.13156	I439-11	D7	15	0	15	100%	13	1	14	93%	30	0	30	100%
orf19.13655	CU87-1	D8	51	1	52	98%	37	12	49	76%	59	0	59	100%
orf19.14177	I093-5	D9	23	0	23	100%	19	1	20	95%	16	0	16	100%
orf19.1543	N538-1	D10	26	1	27	96%	21	1	22	95%	11	0	11	100%
orf19.2208	CJ90-1	D11	28	0	28	100%	18	0	18	100%	6	0	6	100%
orf19.2752	A563-3	D12	23	0	23	100%	20	0	20	100%	6	0	6	100%
<b>DAY 286</b>		WT	85	0	85	100%	48	0	48	100%	51	0	51	100%

Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4716	FJS20	E1	54	0	54	100%	18	0	18	100%	14	0	14	100%
orf19.4716	FJS221	E2	32	0	32	100%	21	0	21	100%	11	0	11	100%
orf19.5758	MV66-6	E3	62	0	62	100%	32	0	32	100%	29	0	29	100%
orf19.716	A428-6	E4	58	0	58	100%	31	0	31	100%	15	0	15	100%
orf19.7397	I525-2	E5	67	0	67	100%	43	0	43	100%	39	0	39	100%
orf19.7572	IA06-1	E6	35	0	35	100%	40	0	40	100%	26	3	29	90%
orf19.7585	J847-3	E7	77	0	77	100%	61	1	62	98%	41	0	41	100%
orf19.7693	GZ35-3	E8	46	0	46	100%	22	0	22	100%	24	0	24	100%
orf19.8550	BF70-3	E9	34	0	34	100%	16	0	16	100%	10	0	10	100%
orf19.8554	IB70-5	E10	43	0	43	100%	22	0	22	100%	20	0	20	100%
<b>BLANK</b>		E11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.3112	FJS17	E12	25	0	25	100%	20	0	20	100%	22	0	22	100%
<b>DAY 286</b>		WT	59	0	59	100%	30	0	30	100%	28	0	28	100%



Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3112	FJS18	F1	34	0	34	100%	23	0	23	100%	21	0	21	100%
orf19.1930	CV09-8	F2	36	0	36	100%	32	0	32	100%	11	0	11	100%
orf19.9697	HM41-1	F3	29	0	29	100%	27	0	27	100%	19	0	19	100%
orf19.11834	HP36-2	F4	42	0	42	100%	21	0	21	100%	9	0	9	100%
orf19.11834	HP36-3	F5	46	0	46	100%	43	0	43	100%	29	0	29	100%
orf19.12198	HV68-2	F6	60	0	60	100%	28	0	28	100%	21	0	21	100%
orf19.12198	HV68-5	F7	36	0	36	100%	22	0	22	100%	10	0	10	100%
orf19.10254	I205-4	F8	38	0	38	100%	12	0	12	100%	17	0	17	100%
orf19.10254	I205-8	F9	38	0	38	100%	12	0	12	100%	8	0	8	100%
orf19.10487	I252-1	F10	42	0	42	100%	21	0	21	100%	9	0	9	100%
orf19.1567	I271-4	F11	63	1	64	98%	42	1	43	98%	34	1	35	97%
orf19.10742	I345-4	F12	45	0	45	100%	36	0	36	100%	36	0	36	100%
<b>DAY 286</b>		WT	59	0	59	100%	30	0	30	100%	28	0	28	100%

Miscellaneous Plate			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.10742	I345-7	G1	15	0	15	100%	7	0	7	100%	5	0	5	100%
orf19.24	I610-6	G2	15	0	15	100%	7	0	7	100%	6	0	6	100%
orf19.24	I610-8	G3	14	4	18	78%	9	0	9	100%	7	0	7	100%
orf19.11546	I968-5	G4	22	0	22	100%	18	0	18	100%	15	0	15	100%
orf19.11546	I968-6	G5	30	1	31	97%	21	0	21	100%	20	0	20	100%
orf19.13494	I985-3	G6	36	0	36	100%	23	0	23	100%	12	0	12	100%
orf19.13494	I985-4	G7	17	0	17	100%	8	0	8	100%	4	0	4	100%
orf19.4304	IA94-2	G8	14	0	14	100%	5	0	5	100%	5	0	5	100%
orf19.4304	IA94-8	G9	11	0	11	100%	4	0	4	100%	4	0	4	100%
orf19.1089	IB74-4	G10	8	0	8	100%	6	0	6	100%	5	0	5	100%
orf19.1089	IB74-6	G11	22	0	22	100%	23	0	23	100%	10	0	10	100%
orf19.1669	IC89-7	G12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	59	0	59	100%	30	0	30	100%	28	0	28	100%



Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7388	jjh31	A1	18	7	25	72%	21	4	25	84%	23	2	25	92%
orf19.7388	jjh32	A2	20	6	26	77%	22	4	26	85%	24	2	26	92%
orf19.896	jjh33	A3	22	4	26	85%	24	1	25	96%	25	0	25	100%
orf19.896	jjh103	A4	23	4	27	85%	26	1	27	96%	24	0	24	100%
orf19.7001	jjh34	A5	21	4	25	84%	25	0	25	100%	22	0	22	100%
orf19.7001	jjh35	A6	26	2	28	93%	27	1	28	96%	28	0	28	100%
orf19.4866	jjh36	A7	25	3	28	89%	23	1	24	96%	24	0	24	100%
orf19.4866	jjh120	A8	25	4	29	86%	28	1	29	97%	25	0	25	100%
orf19.5181	jjh37	A9	22	4	26	85%	24	2	26	92%	24	0	24	100%
orf19.5181	jjh38	A10	21	6	27	78%	26	1	27	96%	25	2	27	93%
orf19.4252	jjh39	A11	22	3	25	88%	25	0	25	100%	22	0	22	100%
orf19.4252	jjh40	A12	25	3	28	89%	24	1	25	96%	25	0	25	100%
<b>DAY 286</b>		WT	23	1	24	96%	23	0	23	100%	20	0	20	100%

Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4084	jjh42	B1	24	5	29	83%	29	0	29	100%	29	0	29	100%
orf19.4084	jjh43	B2	25	3	28	89%	26	2	28	93%	25	0	25	100%
orf19.469	jjh44	B3	23	5	28	82%	25	3	28	89%	26	0	26	100%
orf19.469	jjh45	B4	26	1	27	96%	23	0	23	100%	22	0	22	100%
orf19.5350	jjh46	B5	20	4	24	83%	23	1	24	96%	24	0	24	100%
orf19.5350	jjh47	B6	21	6	27	78%	24	0	24	100%	23	0	23	100%
orf19.2605	jjh48	B7	21	4	25	84%	24	1	25	96%	21	0	21	100%
orf19.2605	jjh49	B8	19	5	24	79%	23	1	24	96%	19	1	20	95%
orf19.5224	jjh127	B9	20	5	25	80%	25	0	25	100%	22	0	22	100%
orf19.5224	jjh128	B10	21	2	23	91%	21	0	21	100%	18	0	18	100%
orf19.663	jh53	B11	23	2	25	92%	25	0	25	100%	20	0	20	100%
orf19.663	jjh87	B12	18	5	23	78%	22	1	23	96%	22	0	22	100%
<b>DAY 286</b>		WT	23	1	24	96%	23	0	23	100%	20	0	20	100%

Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.451	jjh54	C1	21	5	26	81%	24	2	26	92%	24	0	24	100%
orf19.451	jjh105	C2	23	1	24	96%	24	0	24	100%	19	0	19	100%
orf19.1874	jjh55	C3	18	4	22	82%	20	2	22	91%	18	0	18	100%
orf19.1874	jjh56	C4	19	5	24	79%	21	3	24	88%	22	1	23	96%
orf19.4242	jjh58	C5	16	5	21	76%	19	2	21	90%	20	0	20	100%22
orf19.4242	jjh59	C6	21	4	25	84%	24	1	25	96%	23	0	23	100%
orf19.2395	jjh61	C7	24	3	27	89%	26	1	27	96%	25	0	25	100%
orf19.2395	jjh62	C8	23	2	25	92%	25	0	25	100%	24	0	24	100%
orf19.3047	jjh64	C9	20	2	22	91%	22	0	22	100%	20	0	20	100%
orf19.3047	jjh108	C10	21	1	22	95%	22	0	22	100%	22	0	22	100%
orf19.794	jjh65	C11	17	6	23	74%	21	2	23	91%	21	0	21	100%
orf19.794	jjh66	C12	20	4	24	83%	22	2	24	92%	23	0	23	100%
<b>DAY 286</b>		WT	24	2	26	92%	25	0	25	100%	22	0	22	100%

Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4892	jjh67	D1	21	5	26	81%	23	3	26	88%	22	0	22	100%
orf19.4892	jjh68	D2	23	2	25	92%	24	1	25	96%	21	0	21	100%
orf19.5408	jjh70	D3	20	3	23	87%	22	1	23	96%	20	0	20	100%
orf19.5408	jjh71	D4	23	1	24	96%	24	0	24	100%	21	0	21	100%
orf19.223	jjh74	D5	19	4	23	83%	20	3	23	87%	22	0	22	100%
orf19.223	jjh75	D6	20	6	26	77%	22	3	25	88%	23	0	23	100%
orf19.3256	jjh77	D7	21	3	24	88%	24	0	24	100%	20	0	20	100%
orf19.3256	jjh111	D8	21	4	25	84%	23	2	25	92%	23	0	23	100%
orf19.1196	jjh78	D9	22	2	24	92%	24	0	24	100%	22	0	22	100%
orf19.1196	jjh79	D10	18	4	22	82%	21	1	22	95%	19	1	20	95%
orf19.835	jjh130	D11	20	7	27	74%	24	1	25	96%	23	0	23	100%
orf19.835	jjh131	D12	21	6	28	75%	26	2	28	93%	24	1	25	96%
<b>DAY 286</b>		WT	24	2	26	92%	25	0	25	100%	22	0	22	100%

Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.469	jjh82	E1	25	4	29	86%	28	1	29	97%	27	0	27	100%
orf19.469	jjh83	E2	23	4	27	85%	26	1	27	96%	24	0	24	100%
orf19.4084	jjh85	E3	26	2	28	93%	28	0	28	100%	25	0	25	100%
orf19.4084	jjh86	E4	22	2	24	92%	24	0	24	100%	22	0	22	100%
orf19.2341	jjh89	E5	23	3	26	88%	25	1	26	96%	24	0	24	100%
orf19.2341	jjh90	E6	24	0	24	100%	22	0	22	100%	20	0	20	100%
orf19.35	jjh91	E7	22	3	25	88%	24	1	25	96%	23	0	23	100%
orf19.35	jjh92	E8	23	3	26	88%	25	1	26	96%	21	0	21	100%
orf19.4001	jjh93	E9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4001	jjh94	E10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.4867	jjh96	E11	26	1	27	96%	24	0	24	100%	19	0	19	100%
orf19.4867	jjh124	E12	28	1	29	97%	28	0	28	100%	23	0	23	100%
<b>DAY 286</b>		WT	24	3	27	89%	26	0	26	100%	21	0	21	100%



Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7281	jjh175	F1	25	2	27	93%	26	1	27	96%	26	0	26	100%
orf19.7281	jjh176	F2	25	5	30	83%	27	1	28	96%	23	0	23	100%
orf19.3744	jjh179	F3	24	1	25	96%	25	0	25	100%	24	0	24	100%
orf19.6369	jjh243	F4	25	1	26	96%	26	0	26	100%	22	0	22	100%
orf19.4144	jjh244	F5	23	4	27	85%	25	2	27	93%	24	0	24	100%
orf19.4269	jjh245	F6	23	1	24	96%	24	0	24	100%	21	0	21	100%
orf19.4909	jjh113	F7	24	2	26	92%	25	1	26	96%	22	0	22	100%
orf19.4909	jjh114	F8	22	3	25	88%	24	1	25	96%	24	0	24	100%
orf19.4890	jjh115	F9	21	3	24	88%	23	1	24	96%	21	1	22	95%
orf19.4890	jjh116	F10	25	1	26	96%	24	0	24	100%	20	0	20	100%
orf19.4308	SF033	F11	23	4	27	85%	26	0	26	100%	23	0	23	100%
orf19.4308	jjh119	F12	26	2	28	93%	26	0	26	100%	21	0	21	100%
<b>DAY 286</b>		WT	24	3	27	89%	26	0	26	100%	21	0	21	100%

Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4432	SF001	G1	24	2	26	92%	25	0	25	100%	22	0	22	100%
orf19.4432	SF001A	G2	25	2	27	93%	24	0	24	100%	21	0	21	100%
orf19.3545	SF002	G3	25	0	25	100%	23	0	23	100%	20	0	20	100%
orf19.3545	SF002A	G4	25	1	26	96%	25	0	25	100%	21	0	21	100%
orf19.7510	SF014	G5	23	3	26	88%	25	1	26	96%	24	0	24	100%
orf19.7510	SF014A	G6	22	5	27	81%	25	0	25	100%	22	0	22	100%
orf19.2678	SF005	G7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.6913	SF006	G8	21	2	23	91%	23	0	23	100%	21	0	21	100%
orf19.6913	SF006A	G9	26	2	28	93%	26	0	26	100%	24	0	24	100%
orf19.5068	SF008	G10	25	0	25	100%	25	0	25	100%	20	0	20	100%
orf19.5068	SF008A	G11	24	2	26	92%	22	0	22	100%	19	0	19	100%
orf19.3854	SF009	G12	24	1	25	96%	23	0	23	100%	20	0	20	100%
<b>DAY 286</b>		WT	22	3	25	88%	24	0	24	100%	20	0	20	100%

Kinase Plate 1			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3854	SF009A	H1	12	0	12	100%	7	1	8	88%	7	0	7	100%
orf19.5357	SF011	H2	5	0	5	100%	4	0	4	100%	4	0	4	100%
orf19.4347	SF013	H3	5	0	5	100%	1	0	1	100%	3	0	3	100%
orf19.4347	SF013A	H4	6	0	6	100%	4	0	4	100%	7	0	7	100%
orf19.7510	SF014	H5	12	0	12	100%	11	0	11	100%	6	0	6	100%
orf19.7510	SF014A	H6	20	0	20	100%	13	0	13	100%	14	0	14	100%
orf19.5224	SF015	H7	11	2	13	85%	9	0	9	100%	16	0	16	100%
orf19.5224	SF016	H8	16	1	17	94%	16	0	16	100%	11	0	11	100%
orf19.3751	SF021	H9	17	0	17	100%	14	0	14	100%	6	0	6	100%
orf19.3049	SF023	H10	11	0	11	100%	10	0	10	100%	8	0	8	100%
<b>DAY 286</b>		H11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Blank</b>		H12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	10	0	10	100%	7	1	8	88%	7	0	7	100%

Kinase Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7044	SF024	A1	32	3	35	91%	32	1	33	97%	12	0	12	100%
orf19.7044	SF024A	A2	29	5	34	85%	25	1	26	96%	11	0	11	100%
orf19.5253	SF025	A3	18	1	19	95%	6	0	6	100%	3	0	3	100%
orf19.5253	SF025A	A4	33	1	34	97%	12	0	12	100%	9	0	9	100%
orf19.2277	SF026	A5	15	1	16	94%	12	0	12	100%	2	0	2	100%
orf19.2277	SF026A	A6	22	0	22	100%	15	0	15	100%	7	0	7	100%
orf19.7451	SF028	A7	35	0	35	100%	23	0	23	100%	15	0	15	100%
orf19.7451	SF028A	A8	30	0	30	100%	23	0	23	100%	10	0	10	100%
orf19.3530	SF029	A9	29	0	29	100%	19	0	19	100%	8	0	8	100%
orf19.3530	SF029A	A10	29	1	30	97%	17	1	18	94%	12	0	12	100%
orf19.4297	SF030	A11	16	0	16	100%	10	0	10	100%	6	0	6	100%
orf19.4297	SF030A	A12	11	0	11	100%	11	1	12	92%	6	0	6	100%
<b>DAY 286</b>		WT	19	3	22	86%	16	0	16	100%	11	0	11	100%

Kinase Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.4518	SF035A	B1	13	0	13	100%	8	0	8	100%	7	0	7	100%
orf19.4518	SF048	B2	40	2	42	95%	27	0	27	100%	16	0	16	100%
orf19.2268	SF037	B3	40	0	40	100%	15	0	15	100%	19	0	19	100%
orf19.2102	SF039	B4	13	2	15	87%	3	0	3	100%	11	1	12	92%
orf19.3256	SF040	B5	27	0	27	100%	13	0	13	100%	15	0	15	100%
orf19.3256	SF040A	B6	21	0	21	100%	9	1	10	90%	10	0	10	100%
orf19.844	SF041	B7	33	0	33	100%	27	0	27	100%	19	0	19	100%
orf19.844	SF041A	B8	40	0	40	100%	40	0	40	100%	23	0	23	100%
orf19.3841	SF042	B9	41	0	41	100%	26	0	26	100%	18	0	18	100%
orf19.3841	SF042A	B10	25	0	25	100%	24	0	24	100%	17	0	17	100%
orf19.3049	SF043	B11	35	0	35	100%	25	1	26	96%	15	0	15	100%
orf19.3049	SF043A	B12	13	0	13	100%	10	0	10	100%	8	0	8	100%
<b>DAY 286</b>		WT	19	3	22	86%	16	0	16	100%	11	0	11	100%

Kinase Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.2436	SF044	C1	26	0	26	100%	23	0	23	100%	21	0	21	100%
orf19.846	SF045	C2	19	0	19	100%	17	0	17	100%	13	0	13	100%
orf19.846	SF045A	C3	31	0	31	100%	15	0	15	100%	16	0	16	100%
orf19.7355	SF046	C4	21	1	22	95%	17	0	17	100%	15	0	15	100%
orf19.3720	SF049	C5	31	0	31	100%	23	0	23	100%	17	0	17	100%
orf19.3720	SF049A	C6	17	0	17	100%	10	0	10	100%	5	0	5	100%
orf19.2910	SF050	C7	29	0	29	100%	26	0	26	100%	6	0	6	100%
orf19.2910	SF050A	C8	27	0	27	100%	23	0	23	100%	18	0	18	100%
orf19.4002	SF051	C9	22	0	22	100%	13	0	13	100%	12	0	12	100%
orf19.428	SF054	C10	24	0	24	100%	20	0	20	100%	20	0	20	100%
orf19.428	SF054A	C11	19	1	20	95%	21	0	21	100%	15	0	15	100%
orf19.1341	SF017	C12	25	0	25	100%	17	0	17	100%	11	0	11	100%
<b>DAY 286</b>		WT	9	3	12	75%	14	0	14	100%	9	0	9	100%

Kinase Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.3415	NJ77-4	D1	31	0	31	100%	25	0	25	100%	23	0	23	100%
orf19.3415	NJ77-9	D2	21	0	21	100%	17	0	17	100%	9	0	9	100%
orf19.3415	NJ77-12	D3	16	1	17	94%	13	0	13	100%	8	1	9	89%
orf19.6243	O879-4	D4	25	0	25	100%	19	0	19	100%	13	0	13	100%
orf19.7523	vic1175	D5	24	0	24	100%	16	0	16	100%	16	0	16	100%
orf19.7523	vic1176	D6	29	0	29	100%	23	0	23	100%	28	0	28	100%
orf19.6889	vic1156	D7	2	0	2	100%	5	0	5	100%	7	0	7	100%
orf19.6889	vic1157	D8	30	3	33	91%	33	1	34	97%	31	0	31	100%
orf19.5901	vic1167	D9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5901	vic1154	D10	5	2	7	71%	4	0	4	100%	3	0	3	100%
orf19.1341	OA02-6	D11	25	0	25	100%	30	0	30	100%	41	1	42	98%
orf19.1341	OA02-7	D12	36	0	36	100%	29	0	29	100%	22	0	22	100%
<b>DAY 286</b>		WT	17	0	17	100%	11	0	11	100%	8	0	8	100%

Kinase Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.130	SF034	E1	16	0	16	100%	4	1	5	80%	6	0	6	100%
orf19.130	BM39-3	E2	11	1	12	92%	16	0	16	100%	15	1	16	94%
orf19.2222	H957-8	E3	17	0	17	100%	12	0	12	100%	3	0	3	100%
Blank		E4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.1283	BG44-1	E5	7	0	7	100%	7	0	7	100%	3	0	3	100%
orf19.1283	BG44-2	E6	10	0	10	100%	1	0	1	100%	3	0	3	100%
orf19.1283	GX68-3	E7	15	1	16	94%	15	1	16	94%	14	2	16	88%
orf19.1283	GX68-4	E8	8	1	9	89%	8	1	9	89%	2	0	2	100%
orf19.7510	SF019	E9	11	0	11	100%	5	4	9	56%	6	1	7	86%
orf19.7510	SF019A	E10	3	2	5	60%	3	1	4	75%	0	0	0	0%
orf19.5911	jrb102	E11	15	0	15	100%	9	0	9	100%	9	0	9	100%
orf19.5911	jrb103	E12	29	0	29	100%	25	1	26	96%	16	1	17	94%
DAY 286		WT	17	0	17	100%	11	0	11	100%	8	0	8	100%



Kinase Plate 2			Day 3				Day 4				Day 5			
ORF #	Strain	Well	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar	Dar	No Dar	Total Worms	% Dar
orf19.7164	jrb86-1	F1	8	0	8	100%	4	0	4	100%	2	0	2	100%
orf19.7164	jrb86-2	F2	16	0	16	100%	12	0	12	100%	10	0	10	100%
orf19.5325	jrb100	F3	11	1	12	92%	7	0	7	100%	5	0	5	100%
orf19.5325	jrb101	F4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.895	jmr114	F5	2	0	2	100%	4	0	4	100%	2	0	2	100%
orf19.895	jmr115	F6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.5162	SF004	F7	19	0	19	100%	8	0	8	100%	6	0	6	100%
orf19.5162	SF004A	F8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.7652	vic108 (KO)	F9	8	0	8	100%	7	0	7	100%	4	0	4	100%
orf19.7652	vic109 (KO)	F10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
orf19.460	SA0148 (KO)	F11	1	0	1	100%	1	0	1	100%	1	0	1	100%
orf19.460	SA0149 (KO)	F12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>DAY 286</b>		WT	10	0	10	100%	7	1	8	88%	7	0	7	100%