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## Virulence of *Candida* species in a new *Caenorhabditis elegans* infection model

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**Background:** Invasive candida infections are becoming increasingly important in specialized healthcare as one of the most prevalent healthcare associated infections among vulnerable patients in newborn intensive care units, intensive care and haematology departments. The distribution of candida species is also changing and less virulent strains are becoming more prevalent, yet little is known on candida virulence. We describe the development of a candida – *Caenorhabditis elegans* infection model which allow exposure of a large population of *C. elegans* with high frequent image capturing of survival and present results of the first successful infections studying virulence of candida species and *S. cerviciae*.

**Material/methods:** *Caenorhabditis elegans glp-4* temperature sterile mutant were used throughout the experiments. Infecting candida strains: *C. albicans* ATCC 90028, *C. glabrata* ATCC 15545 and *S. cerevisiae* WO303. Further *P. aeruginosa* PA14 and *E. coli* OP50 were used as positive control and feed respectively. Age-synchronized *C. elegans* were infected, plated on 6-well plates and automated high frequent image capturing using a modified EPSON™ V700 photo scanner documented survival of single worms. Each well contained appximately 100 worms. Images were analysed using FIJI (Fiji Is Just ImageJ) and Kaplan-Meier survival curves were constructed.

**Results:** The automated image capturing were used to study survival of *C. albicans*, *C. glabrata*, *S. cerevisiae* infected *C. elegans* with a positive control (PA14 infected) and negative control (non-

infected) *C. elegans*. Kaplan-Meier plots demonstrated significantly different survival (log rank test) of the differently infected *C. elegans* worms as illustrated in figure 1.

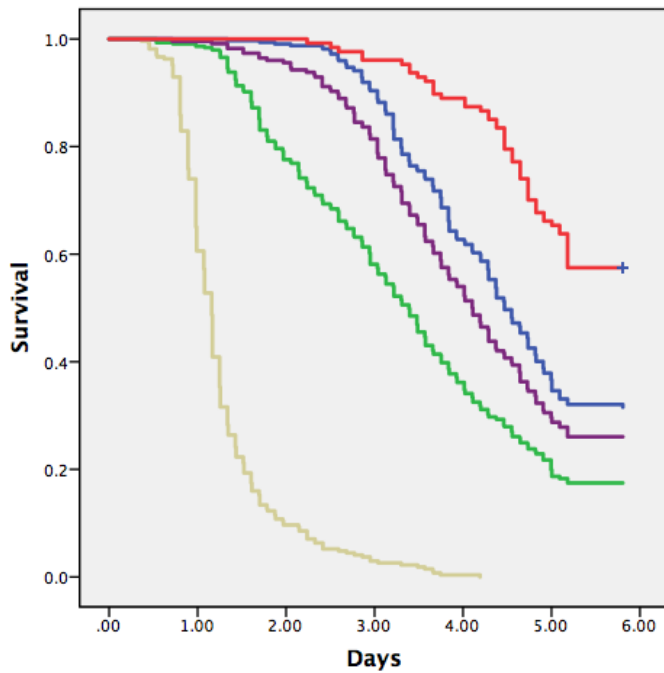


Figure 1: Survival curves of *Caenorhabditis elegans* infected with *C. albicans* (green), *C. glabrata* (purple), *S. cerevisiae* (red). Negative control (non-infected) (blue) and positive control (PA14) (brown). Log rank test for comparison with negative control ( $p < 0,05$ ).

**Conclusions:** The automated high frequent image capturing candida - *C. elegans* infection model has shown promising results for studying the virulence of candida and yeast species. The model is reproducible and automated scanning and picture acquisition reduces hands on time compared with other *C. elegans* infection models. The model will likely be suitable to study specific host immune deficiencies (*C. elegans* mutants) and treatment of candida infections with antifungal drugs.