

## **Pathogenesis of systemic *Candida glabrata* infection in an intravenous challenge murine model**

### **ABSTRACT**

The incidence of systemic infection caused by *C. glabrata* is increasing in immunocompromised patients and resulted in high mortality rate due to antifungal resistance. The pathogenesis underlying *C. glabrata* infection still remains elusive and requires extensive study on it. Hence, this study was aimed to elucidate the pathogenesis of a clinical *C. glabrata* isolate from a Malaysian patient in an intravenous challenged murine model. Mice were challenged intravenously with *C. glabrata* ( $1 \times 10^8$  organisms/mouse) via lateral tail vein and parameters such as quantitative yeast culture, red blood cells and haemoglobin counts, blood plate assay and histopathology were adopted to evaluate the pathogenesis of systemic *C. glabrata* infection. Transcript level of erythropoietin from blood at day 7 post infection was quantified via RT-qPCR. Kidneys of infected mice have highest fungal recovery rate as compared to other organs and there were yeast infiltration with mild inflammation seen in kidney and brain tissues. Red blood cells and haemoglobin counts were reduced throughout the infection period and this reduction which might be associated with the action of haemolysin enzyme of *C. glabrata* in conjunction with iron scavenging for the fungal growth. Erythropoietin mRNA level was found to be up-regulated in blood which indicated a possible role for erythropoietin in compensating the red blood cells loss throughout the infection period. This study reflected the core events during systemic *C. glabrata* infection and involvement of erythropoietin which could be of clinical relevance during systemic *C. glabrata* infection. However, further comprehensive in vitro and in vivo studies are warranted.

**Keyword:** *C. glabrata*; Erythropoietin; Haemolysin; Red blood cells; Haemoglobin counts; Histopathology; Quantitative yeast counts