

## Purification and comparison of heat shock protein 90 (Hsp90) in *Candida albicans* isolates from Malaysian and Iranian patients and infected mice

### ABSTRACT

**Objective:** The purposes of this study were to purify and compare the concentration ratios of heat shock protein 90 (Hsp90) in clinical isolates of *Candida albicans* (*C. albicans*) obtained from Malaysian and Iranian patients and infected mice. **Materials and methods:** Hsp90 was extracted using glass beads and ultracentrifugation from yeast cells and purified by ion exchange chromatography (DEAE-cellulose) and followed by affinity chromatography (hydroxyapatite). Purity of Hsp90 was controlled by SDS-PAGE and its identification was realized by immunoblotting test. **Results:** The graphs of ion exchange and affinity chromatography showed one peak in all *C. albicans* isolates obtained from both Malaysian and Iranian samples, infected mice and under high-thermal (42 °C) and low-thermal (25 °C) shock. In immunoblotting, the location of Hsp90 fragments was obtained around 47, 75 and 82 kDa. The least average concentration ratios of Hsp90 were 0.350 and 0.240 mg/g for Malaysian and Iranian isolates at 25 °C, respectively, while the highest average concentration ratios of Hsp90 were 3.05 and 2.600 mg/g for Malaysian and Iranian isolates at 42 °C, respectively. There were differences in the ratio amount of Hsp90 between Malaysian isolates ( $1.01 \pm 0.07$  mg/g) and mice kidneys ( $1.23 \pm 0.28$  mg/g) as well as between Iranian isolates ( $0.70 \pm 0.19$  mg/g) and mice kidneys ( $1.00 \pm 0.28$  mg/g) ( $P < 0.05$ ). **Conclusion:** The results showed differences in all situations tested including Iranian and Malaysian isolates, samples treated with temperatures (25 °C or 42 °C) and before and after infecting the mice (37 °C), indicating higher virulent nature of this yeast species in high temperature in human and animal models.

**Keyword:** Candidiasis; *Candida albicans*; Heat shock protein; Malaysian and Iranian populations; Chromatography