

## Challenge 1004-KOH A and B

April 2010

Slide for direct microscopic examination: **A) POSITIVE, B) NEGATIVE**

### CMPT QA

These samples were verified by a reference laboratory. The laboratory used Calcofluor White method and reported sample A as positive and sample B as negative.

### SURVEY RESULTS

All participants reported the slide positive for challenge A and negative for challenge B. Seven participants used Calcofluor White method, three laboratories reported using both Calcofluor White and KOH methods while one participant used only KOH method for the examination of the slides.

### METHODS

#### KOH preparation

KOH solution (a strong base, NaOH may also be used) dissolves skin tissue cells and keratinized material allowing the fungal elements to be seen.

#### Methodology

Skin scrapings are placed in 1 or 2 drops of 10% KOH on a clean glass microscope slide, then a cover slip is placed on top.

To facilitate clearing of thick or viscous specimens it may be necessary to let the slides stand for up to 30 minutes or gently heat (but not boil) the mixture.

KOH preparations are not permanent, but the addition of 10% glycerol to the KOH helps to preserve the preparation for several days.<sup>1</sup>

All samples should be examined under low power, and the findings confirmed under high power.<sup>2</sup>

Cotton swabs should not be used to prepare the slides because cotton strands may resemble hyphae.<sup>1</sup>

**Table-1:** Results – 1004 KOH challenge

Reported results	Sample	
	A	B
Positive	11	0
Negative	0	11

#### Calcofluor White

It is a fluorescent brightener component of Calcofluor White that binds to  $\beta$ -1-3 and 1-4 polysaccharides, such as cellulose and chitin. When exposed to long-wave UV light, these polysaccharides will fluoresce.

While the fluorescent stain allows for rapid detection, intermittent difficulties of background fluorescence and cost must be considered.

A drop of Calcofluor White (0.1% solution) may be added directly to the KOH drop on the slide.<sup>2</sup>

### REFERENCES

- Larone DH. 2002. p. 296-298. *Medically important fungi A Guide to Identification*. 4th ed. ASM Press, Washington, D.C.
- Summerbell RC. 2003. pp. 1798-1819. *Trichophyton, Microsporum, Epidermophyton, and agents of superficial mycoses*. In PR Murray PR et al. (eds.) *Manual of Clinical Microbiology*. 8th ed. Vol. 2. Ch. 119. ASM Press, Washington, DC.
- Abdelrahman T, Letscher V Bru, J. Waller, G. Noacco and E. Candolfi. Dermatormycosis: comparison of the performance of calcofluor and potassium hydroxide 30% for the direct examination of skin scrapings and nails. 2006 J. Med. Mycol. Vol 16(2):87-91.

### KOH vs Calcofluor White

Abdelrahman et al (2006) compared the performance of 30% potassium hydroxide (KOH) with slight heating and staining with 0.01% calcofluor for the diagnosis of dermatomycosis. The study showed the sensitivity of direct microscopy was significantly higher with calcofluor than with KOH (respectively, 88% and 72%,  $P = 0.0116$ ). Specificity was 93% with calcofluor and 88% with KOH ( $P =$  not significant). Calcofluor showed higher specificity on skin scraping than on nails samples (respectively, 100% and 89%,  $P = 0.0138$ ) while KOH specificity did not differ as a function of the type of specimen (respectively, 92% and 86%).<sup>3</sup>