

# Detection of Ethylglucuronide in Urine following the Application of Germ-X

## To the Editor:

Ethylglucuronide (EtG) is a non-volatile, water-soluble direct metabolite of ethanol, a biological state marker of recent alcohol consumption, that is becoming a routine assay in many laboratories (1). It can be detected for an extended time period (up to 5 days) after alcohol is completely eliminated from the body and has found wide acceptance in the detection of relapse in recovering alcoholics, monitoring of medical professionals, and detection in postmortem specimens (2,3). There is a great deal of literature on the methodology of detection of EtG in urine, serum, plasma, and hair (4,5), but an accepted "cut-off" concentration for urine analysis has not been widely adopted. Although several publications list the limit of quantitation between 0.05 and 0.5 mg/L of urine, cut-offs in commercial laboratories in the U.S. range from 0.10 to 1.0 mg/L.

In the medical profession, hand sanitizers are used routinely throughout the day. Many of these sanitizers contain ethanol, potentially exposing individuals who enter hospital wards on multiple occasions to the absorption of ethanol through the skin. The objective of our study was to determine whether measurable EtG could be detected following frequent application of the hand sanitizer Germ-X, which contains 62% ethanol.

Four individuals volunteered to take part in the study. Each subject applied Germ-X hand sanitizer at different time intervals. Prior to urine sample collection, hands were washed with soap and water. Urine samples were collected before the experiment began and then at time intervals of approximately 4 h throughout the workday. Each experiment was conducted on a different day, with a four- or five-day interval. The study participants did not consume ethyl alcohol between study days.

EtG was measured in urine using a modification of the liquid chromatography–tandem mass spectrometry method described by Morini et al. (6), with a limit of quantitation of 0.05 mg/L. Specimens were also analyzed for ethanol using headspace gas chromatography with a detection limit of 0.01 g%.

Experimental group #1 ( $n = 3$ ) applied Germ-X every 60 min throughout the workday. Experimental group #2 ( $n = 4$ ) applied Germ-X every 30 min throughout the workday. Experimental group #3 ( $n = 2$ ) applied Germ-X every 15 min throughout the workday. None of the subjects were positive for EtG or ethanol before the experiments were started, and no ethanol was detected in any subject throughout the studies. Experimental groups #1 and #2 did not show the presence of EtG in the urine throughout the study period. However, in Experimental group #3, EtG was detected following application of Germ-X every 15 min throughout the workday at a concentration of 0.062 mg/L (Table I) in one subject.

The generation of measurable concentrations of EtG following the application of an ethanol containing hand sanitizer

**Table I. Experimental Group #3: Subject A**

Germ-X Application Interval	Every 60 min	Every 30 min	Every 15 min
Before experiment			
8:15 am	not detected	not detected	not detected
11:00 am	not detected	not detected	not detected
4:45 pm	not detected	not detected	0.062 mg/L

Germ-X raises questions for the interpretation of low levels of EtG detected in urine, specifically when medical professionals potentially exposed to daily routine use of hand-sanitizer products are involved. Low concentrations of EtG in urine must be interpreted with caution and regard for the profession of the individual.

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