

EVALUATION OF A NEW VIRAL TRANSPORT SYSTEM FOR CULTURE RECOVERY OF INFLUENZA VIRUSES

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Introduction: Viral collection and transport systems are designed to maximize the capture of viruses from the patient, stabilize and preserve the organisms during transport to the laboratory, and optimize the recovery of viruses in culture and other laboratory methods. We sought to evaluate the performance of a new flocced swab and viral transport system, Puritan Medical Products Universal Transport Medium (UTM-RT)(Puritan Medical Products, Guilford, ME), for the recovery of influenza virus in culture.

Methods: The TCID₅₀ of frozen stocks of influenza A and influenza B viruses were established. Nine nasopharyngeal swabs, provided as part of the Puritan Medical Products universal transport system, were inoculated with 330µl of the appropriate dilution of each virus. Swabs were held at room temperature for five minutes, then placed in Puritan Medical Products UTM-RT and vortexed for two minutes. Aliquots from three UTM-RT tubes containing inoculated swabs were set up in culture immediately after inoculation (time “0”). The remaining inoculated swabs were held at 2-8°C for 24 and 48 hours. Following each hold time, three R-Mix shell vials (Quidel®, Stillwater, MN) were inoculated with 100µl of UTM-RT. Shell vials were incubated, fixed, and stained with fluorescent labeled monoclonal antibodies according to the manufacturer’s instructions. Fluorescing foci in each shell vial were counted in three microscopic fields at 200x and 400x magnification by two different technicians, for a total of six fields per shell vial. Frequency distributions and patterns over time were examined via density histograms and plots. In order to evaluate recovery of virus from very dilute specimens, a second assay using a 10⁻³ TCID₅₀ dilution of influenza A virus was also performed.

Results: All shell vials inoculated with the TCID₅₀ concentration exhibited viral growth (Table 1) and no marked difference in recovery of virus from transport tubes held at 0, 24 or 48 hours before culture inoculation was found. Density plots for both viruses at all three hold times were similarly distributed. Shell vials inoculated with very low virus concentration (10⁻³TCID₅₀) also demonstrated growth and recovery of virus at 0, 24, and 48 hours hold time.

Table 1. Average number of fluorescing foci at 400x magnification by virus, concentration, and hold time using the Puritan Medical Products flocced swab and universal transport system.

Average number of fluorescing foci per field						Average number of fluorescing foci per shell vial coverslip		
TCID ₅₀ Influenza A			TCID ₅₀ Influenza B			10 ⁻³ TCID ₅₀ (Influenza A)		
0hr	24hr	48hr	0hr	24hr	48hr	0hr	24hr	48hr
32	26	25	21	30	29	3	1	2

Conclusions: The Puritan Medical Products flocced swab and universal transport system supports the stabilization and viability of influenza virus for recovery in culture.