

Filter Tip Sample Retrieval

Abstract

ART® Filter Pipet Tips from Molecular Bio-Products, inc., were compared with filter tips from Continental Lab Products, Inc. (CLP), Oxford, LabCon and USA Scientific in a test designed to measure the retrievability of over pipetted samples. Randomly chosen, 20 µl filter pipet tips were intentionally overdrawn and the samples expelled. The tips were weighed at each stage to determine the amount of sample retained in each tip.

Introduction

The advantages of ART filter tips are known throughout the bio-research industry but there is concern that their self-sealing feature prevents the retrieval of overdrawn liquids. ART filters are designed to prevent carryover contamination by sealing completely when in contact with liquids. ART's patented design has been proven to block the passage of DNA but over pipetting will seal the filter, making it difficult to expel samples with air pressure.

Precious samples can be retrieved by cutting the tip and using a syringe or small pipet tip to withdraw the liquid. Other manufacturer's filters do not seal out liquids and consequently allow normal dispensing with the pipettor. However, they retain liquids leaving some sample unretrievable.

Objective

If over pipetting occurs, maximum sample retrieval can be achieved by choosing the right filter tip. This consideration becomes more meaningful when working with precious low-volume samples, so this test was designed to quantify the amount of sample retained by filter tips from each of the five manufacturers.

Materials and Methods

Seven, 20 µl filter tips from each manufacturer were chosen at random and weighed to the nearest µg using a 4-place, Sartorius electronic balance. Then each tip was used with a 200 µl pipettor set at 200 µl to intentionally overdraw 1X PCR buffer.

The fluid was expelled and the tips weighed individually comparing the dry weight with the weight after the sample was expelled to determine the percent retained. ART tips block fluids, therefore a slightly different method of removing the sample was necessary.

The liquid was removed with a 10 µl pipet tip through the enlarged orifice created by cutting the tip with a sharp razor blade just below the trapped fluid. A small amount of liquid is absorbed by the filter before it seals, leaving a small air space at the base of the tip. It is this portion that can be cut and the resulting orifice is large enough to remove liquids with a small pipet tip or syringe. The clipped portion of the tip was weighed with the rest after the liquid was removed.

Results

Only the ART filter sealed, preventing the sample from reaching the pipettor. In each case, the tip was cut and the sample successfully removed with a 10 µl pipet tip. Filters from Oxford, LabCon, USA, and CLP did not seal and allowed the fluids to penetrate completely. Since air and liquid could pass easily through the wet filters, the sample was expelled normally with the pipettor.

The average percent retained and the range is summarized in the table below.

Brand	Average %	Range %
ART	11.1	8.9-14.1
CLP	18.3	3.8-37.3
Oxford	20.2	18.7-23.2
LabCon	31.5	26.1-35.5
USA	16.7	10.8-20.6

Discussion

ART's unique ability to seal out liquids actually improves the retrievability of precious samples. This test shows that other manufacturer's sponge-like filters absorb and retain liquids, whereas ART filters block the movement of liquids leaving more retrievable sample. By simply cutting the tip slightly above its point, up to 26% more sample can be recovered from ART tips, than with other filter tips.

ART is a registered trademark of MBP and is protected by U.S. Patent Number 5,156,811; MBP is a registered trademark of Molecular Bio-Products, inc., San Diego, CA. ©MBP 1996.