

# Anticipating the Logistics of Infectious & Neglected Diseases: The Sample Management & Automation Perspective

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## Abstract

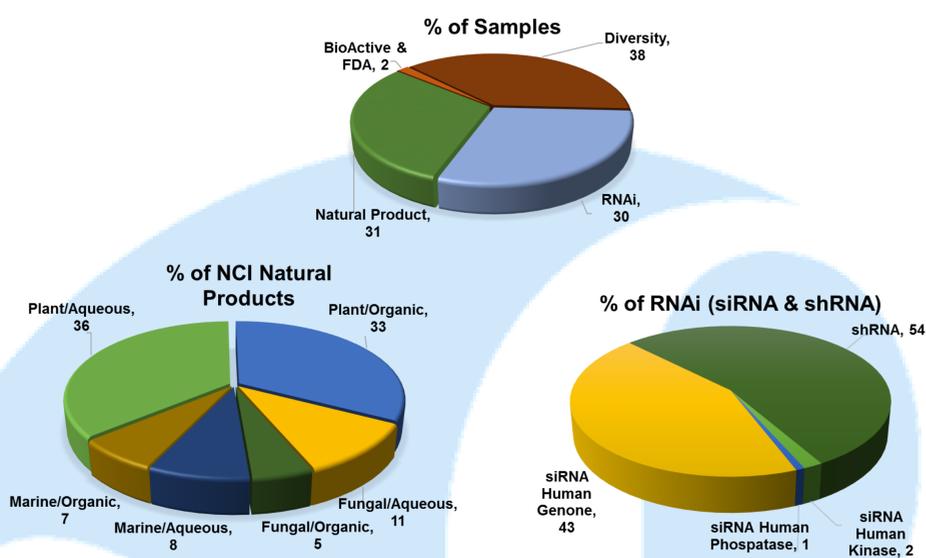
In the global health landscape, the emergence of neglected and infectious diseases has been increasing with spontaneous, indiscriminate of geographical location. Researching the neglected and infectious diseases realm has been the primary mission of Institut Pasteur Korea (IPK). One of the tools needed for screening is offering a complex chemical and RNAi sample libraries. Managing the diverse set of sample libraries is challenging by itself while taking into consideration the delicate compounds and siRNAs handling requirement and focusing on the integrity; adding to the challenge is the logistics of handling the sample and screening in Biosafety Level 3 (BSL-3) and Biosafety Level 2 (BSL-2) Laboratories.

The logistics of handling the chemical library consisting of ~ 400K molecules (synthetic, natural products and extracts) as well as RNAi libraries (siRNAs & shRNAs) is complex in assuring accurate liquid transfer. The complexity of sample treatments to infectious diseases introduces another challenging layer, requiring special precautions to be taken before sample transfer and after. In a joint collaboration with Apricot Designs Inc, we have utilized one of their liquid handling tools allowing for flexibility to use in various BSL environments. We will present our method and findings while highlight the flexibility and versatility of the Personal Pipettor as a robust instrument of choice for our screening lab. We will show the robustness of the instrument capabilities of easily being moved to various locations as well as its precision of dispensing into 384 and 1536 well plates with CVs of 0.35% to 3% in liquid and dry dispensing respectively.

## Results

### 1. Sample Preparation

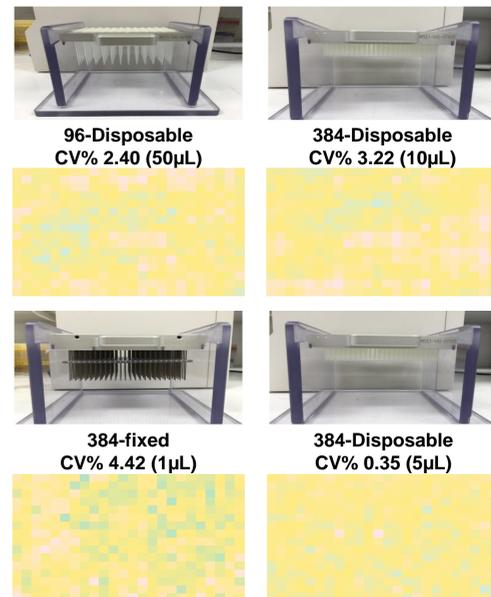
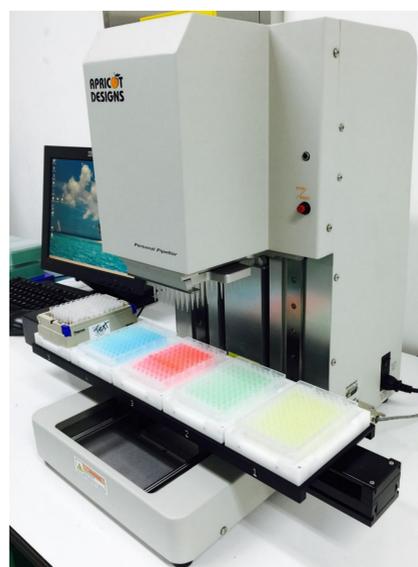
~ 501,000 samples (small molecules, natural products & RNAis)  
Plates reformatting (master plates, daughter plates, and intermediate plates) to make assay plates into 384 well format



### 2. Instrument Validation

Equipment	Model	Tips	Condition
Apricot Personal Pipettor	PP-384-M(E) & PP-384-M(E)-UL	125µL Sterile Tip (125-096-EZ-S)	<ul style="list-style-type: none"> <li>Dispensing volume (µL): 1, 5, 10 &amp; 50</li> <li>Photometric analysis using 1µM Fluorescein + 0.5% DMSO + 1X PBS*</li> <li>Fixed head to be washed between plates with 70% DMSO</li> </ul>
		15µL Sterile EZ Tip (015-384-EZ-S)	
		Fixed Tips Head (125-A-02-023-25U)	

\* coefficient of variation (CV%) was calculated on fluorescence measurement

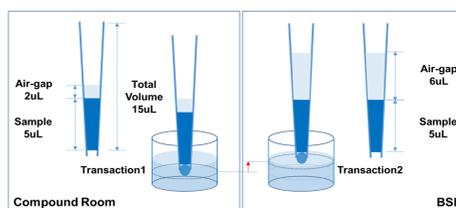


### 3. Transferring samples for screening projects

1) Diluted samples to intermediate plates (IPLs) and transferred samples to assay plates (APLs) into BLS2/BSL2+

Screening Project	Samples	Condition of IPLs	Condition of APLs	Biosafety Level
HBV	Chemicals	0.25 µL in PBS	10µL to APLs	BSL II+
Leishmania	Chemicals	0.4µL in PBS	1µL to APLs	BSL II
T.Cruzi	Chemicals	-	0.3µL to APLs	BSL II
Brest Cancer	siRNA	-	5µL to APLs	BSL I

2) Environmental Control Usage: BSL 1 & BSL 2+ Labs



### 4. PP-384 Decontamination

- Post liquid transfer: Clean w/ 4%Hexanios detergent, which is safe and effective to decontaminate liquids and instrument surfaces.
- Before removal from BSL 2+: 1. Seal the BSC and conduct the sterilization with aeration cycle for sterility testing using H<sub>2</sub>O<sub>2</sub> vapor generator, 2. Disinfectant (H<sub>2</sub>O<sub>2</sub>), 3. Use biological Indicator (HMV-091 for Gaseous Hydrogen Peroxide), 4. Wipe with detergent

## Summary

- Established a validated protocol for using the PP-384 in BSL 1 & BSL 2+ environments across multiple projects and various infectious diseases.
- The Apricot PP-384 is one of the go to liquid handlers for reformatting and accurately transferring our samples while supporting screening activities at Institut Pasteur Korea for chemical or RNAi - platforms.

## Contact Information

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