<u>COST EFFECTIVE DRUG DISCOVERY AT NCATS</u>

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ABSTRACT

The National Center for Advancing Translational Science (NCATS) is the newest of 27 Institutes and Centers (ICs) the National Institutes of Health (NIH). A major focus NCATS is to lead innovation – the validation of novel d targets and novel screening strategies to enable effect and efficient discovery campaigns for the next generat of pharmaceutical scientists. We will describe development of NCATS, providing examples of novel as systems, ongoing discovery campaigns and innovat technologies. We are on a path to decrease assay costs NCATS to refurbish and reuse standard laboratory plas We will discuss our preliminary efforts us ware. standard wash protocols and recent work by IonFi Systems showed that room temperature plasmas can employed to decontaminate micropipette tips using TipCharger, cleaning surfaces of detectible DNA, prot and small organic molecules. And new results suppor by an SBIR grant awarded to IonField Systems for instrument using plasma to clean microplates. We describe our experience with this technology, and outline the Phase 2 plans of IonField for inclusion in commercial system. We believe this technology dramatically decrease costs and improve assay mether robustness throughout the biotechnology and pharmaceutical community.

Ferric chloride reacts with phenolic compounds in solution to form complexes with the general formula Fe-(OR)₆ ⁻³ where -OR⁻ represents the ionized phenol $-\lambda$ max 510 in alkaline solution.



METHODS



INTRODUCTION

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A source of high cost and inefficiency in high throug screening protocols is the utilization of single-use pl labware. At the NCATS Division of Pre-Cli Innovations, screening activities require 1500-2 microplates per screen and 50 screens per year. Ac to this cost of labware, the waste stream resulting fror use of biohazard materials in plastic labware significant outlay.

For some experimental systems, the NCATS team developed plate cleaning protocols that enable pl assay plates to be reused. Since 2011, NCATS screening ~50,000 plates of experiments using only ~ plates, with a significant saving in both cost and waste. The protocol is limited to certain assay syst however.

Employing the Small Business Innovation Rese program, NCATS is working to develop a micro cleaning system with IonField Systems, LLC. company utilizes cold plasma to clean plastic pipette with TipCharger – the company is now working to a this technology microassay plates for all as technologies.



plasma cleaning used plates

Used plates were stored as then described, processed using PlasmaKnife and analyzed for esidua luminescence



Data presented as difference between untouched p and cleaned microassay plate. Data shows uniforn cleaning to detection background.



	METHODS
ghput lastic inical 2000 dding	 TANNIC ACID AS TEST SUBSTRATE Tannic acid is a basic ingredient in the chemical wood and a common fixative for fabric dyes In foods, tannic acid is used as a clarifying agent, cold stabilizer and taste enhancer in beer and wine.
m the is a has lastic	• Polyphenolic compounds like tannic acid often contaminate natural product libraries used in drug screening
5 has 1400 solid tems.	TANNIC ACID ASSAY 10 nmol tannic acid (in methanol) deposited onto wells of Corning 3072 white 384-well plate
earch oplate The e tips	Samples DRIED to insure surface binding Plates washed in 20% ethanol (30 seconds) Where specified, plates treated with plasma using PlasmaKnifo
ssay	Add 40 ul 1% SDS Buffer C + 6 ul 10 mM FeCl3 Incubate 15' at RT, Quantitate A510 nm
	Figure 2: Spray wash uniformly rem tannic acid from plate
	PLATE B 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 A 0.142 0.152 0.142 0.143 0.137 0.157 0.115 0.112 0.130 0.128 0.126 0.126 0.126 0.149 0.133 0.145 0.133 0.145 0.132 0.133 0.144 0.127 0.133 0.145 0.133 0.145 0.144 0.133 0.145 0.133 0.145 0.144 0.141
er	CONCLUSION
 Series2 Series3 Series4 Series5 Series6 Series7 Series8 Series9 Series10 Series11 Series12 Series13 Series14 Series15 Series16 Series17 Series18 	 IonField Systems constructed prototy PlasmaKnive cleaning station as defined by proposal PHS 2013-1 NCATS No 003: "Auto Instrument to Clean Microtiter Plates" PlasmaKnife prototype successfully removed acid dried onto 384-well polystyrene assay plat PlasmaKnife successfully cleaned undefined re biologic material from 384-well assay plates Phase 2 funding for development of Plasma awarded to IonField Systems.

