

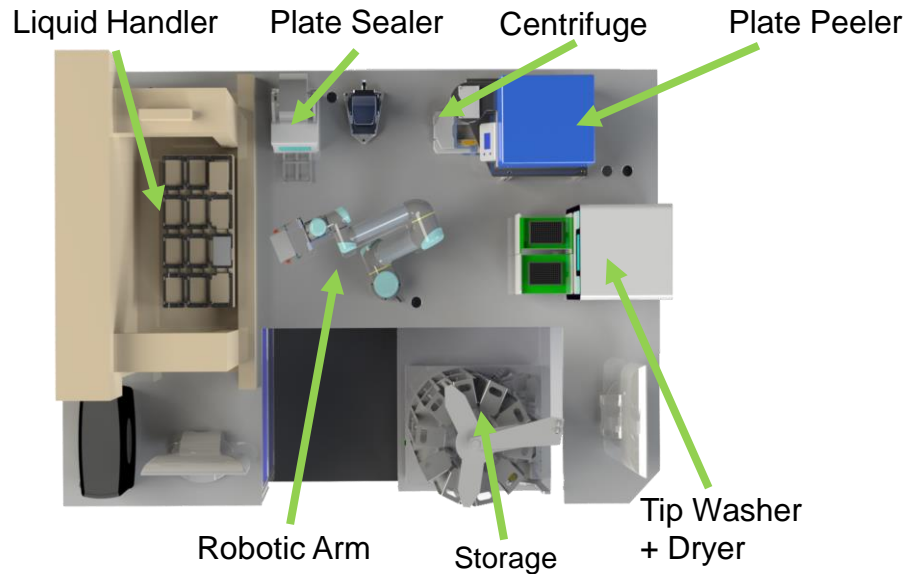
Strategic Integration of Pipette Tip Cleaning to Facilitate Lab Sustainability

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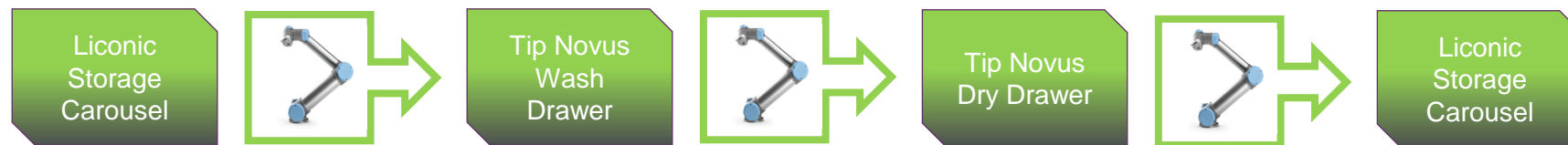
Director, Automation and Operations



Automated Pipette Tip Cleaning



- Integrated Grenova TipNovusMini 384 pipette tip washer onto existing Fujifilm Wako Automation robotic platform
 - **Increases capability of system**
 - **Utilizes inherent system modularity**
 - Tips cleaned for use on separate robotic system for siRNA library preparation

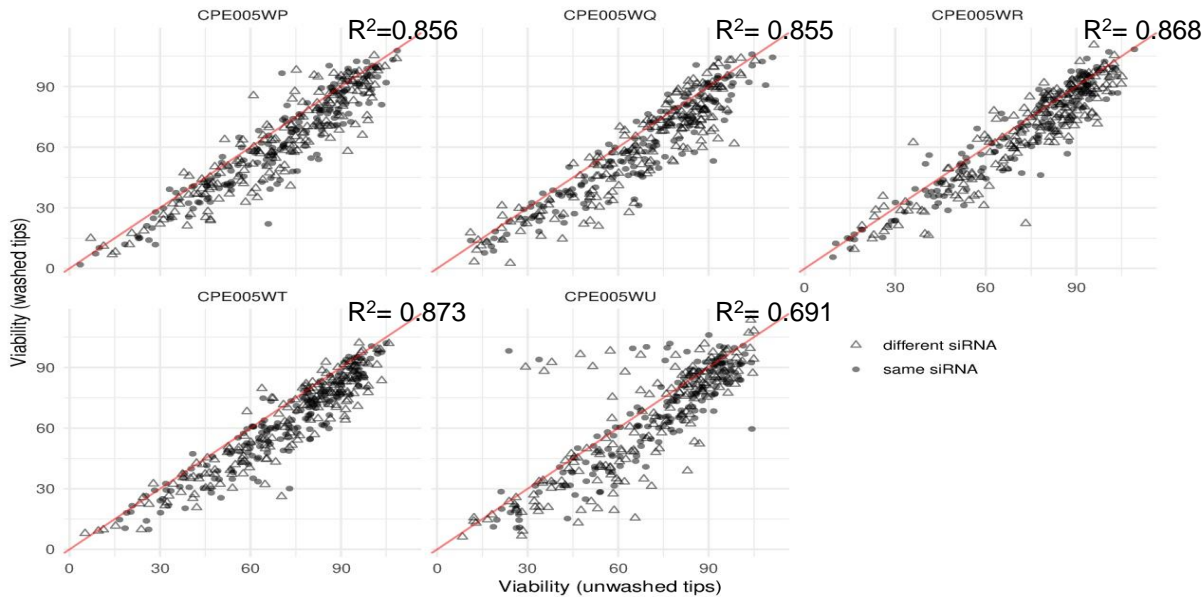


Standard Wash - NCATS							
Subprotocol	Reagent	Soak(Y/N)	UV(Y/N)	Sonication (Y/N)	# Purges	Agitation (Y/N)	Volume (L)
Soak Low	DI	Y	Y	Y	4	Y	0.52
Soak High	DI	Y	Y	Y	5	Y	0.65
Pre Wash	Grenoclean	N	Y	N	3	Y	0.39
Wash	DI	N	Y	Y	5	Y	0.65
Rinse	DI	N	Y	Y	3	Y	0.39
Total							2.60

Tips dry at 70°C for 12 minutes then sit o/n in enclosed system

Validation Method and Results

- 1) 2 uL siRNAs transferred from source 384 library plates to destination assay plates
- 2) Assay-ready plates stored at -80 °C until day of use then thawed and centrifuged
- 3) 2 uL negative and positive siRNA controls added into column 23 and 24 respectively
- 4) 20 uL of serum free media including 0.03 uL RNAiMAX transfection reagent dispensed into each well
- 5) Incubation for 30 minutes at room temperature
- 6) 20 uL cells in 20% serum media dispensed at a concentration of 650 cells/well
- 7) Incubation for 96 hours at 37 °C, 95% humidity and 5% CO₂
- 8) 20 uL of CellTiter-Glo dispensed into each well
- 9) Incubation for 30 minutes at room temperature
- 10) Luminescence data collected on multimode plate reader for viability



Two sets of assay plates were screened against the Ambion Silencer Select Human Kinase siRNA library to validate the effectiveness of the tip washer. The first set was processed with new sterile tips while the second set was processed using tips cleaned with the TipNovus Mini. Validation assay protocol was then followed.

Data generated using cleaned tips from the pipette tip washer is of the same quality as data generated using fresh sterile tips directly from the manufacturer.



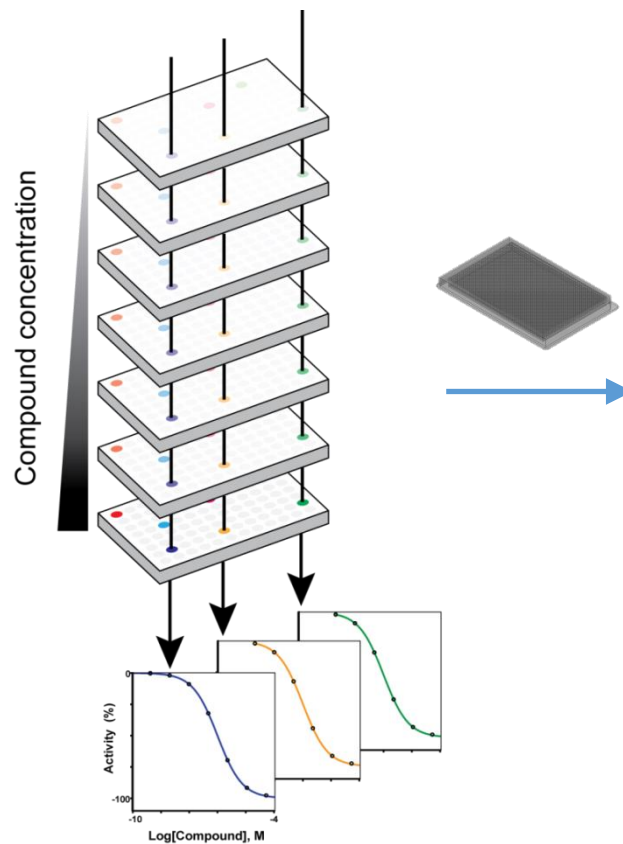
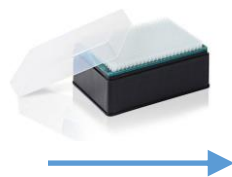
Overview

- Functional Genomics assay-ready plate stamping (Agilent)
 - Pipette tip driven process - *Millions* used
 - Cleaning/reusing pipette tips for *5 years*
 - Saved *hundreds of thousands of \$\$* to date
- Expanding pipette tip cleaning to other operations
 - Preparation of chemical compound screening libraries (Beckman Coulter)
 - DMPK sample analysis (Tecan)



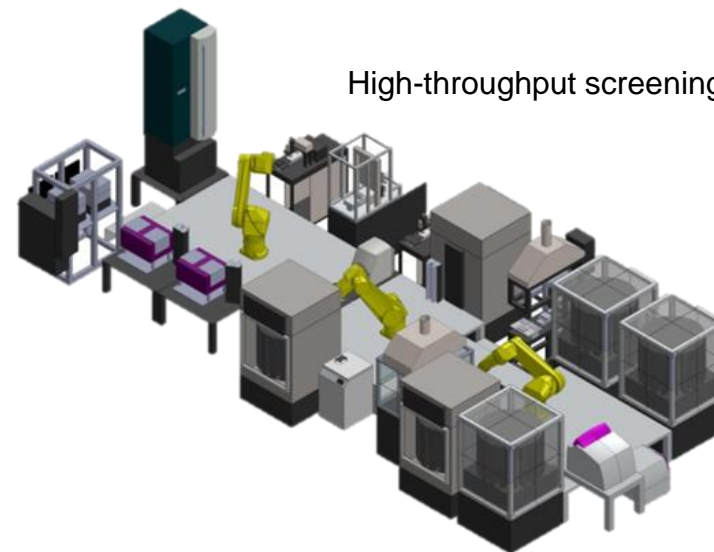
Chemical compound library creation

Plating

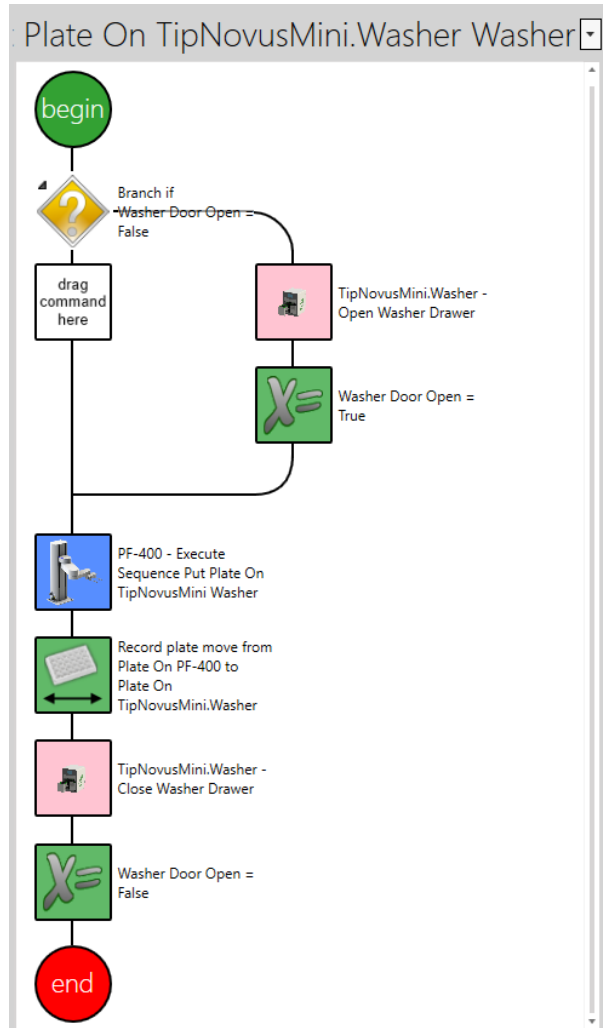


384-well compressed to
1536-well plates, inter-plate
dilution series

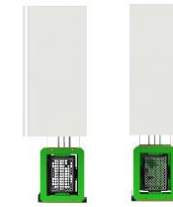
High-throughput screening



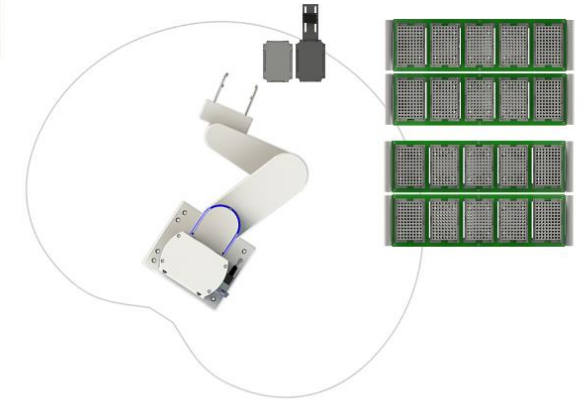
Pipette Tip Washing Island



GBG Method



System layout within GBG



Start Layout Process Schedule Run Advanced

Process: Wash Tips & Return to Original Location 2

- Deck 1
- Barcode Reader
- Deck 2
- TipNovusMini.Washer
- TipNovusMini.Dryer
- Misc ?

Startup Process
These processes will execute before any plate processes start.

- Deck 1: Edit Content
- Deck 2: Edit Content 2
- Run User setup

Shutdown Process
These processes will execute after all plate processes complete.

- Run Move to System Safe
- Run Close Washer Drawer

GBG Process

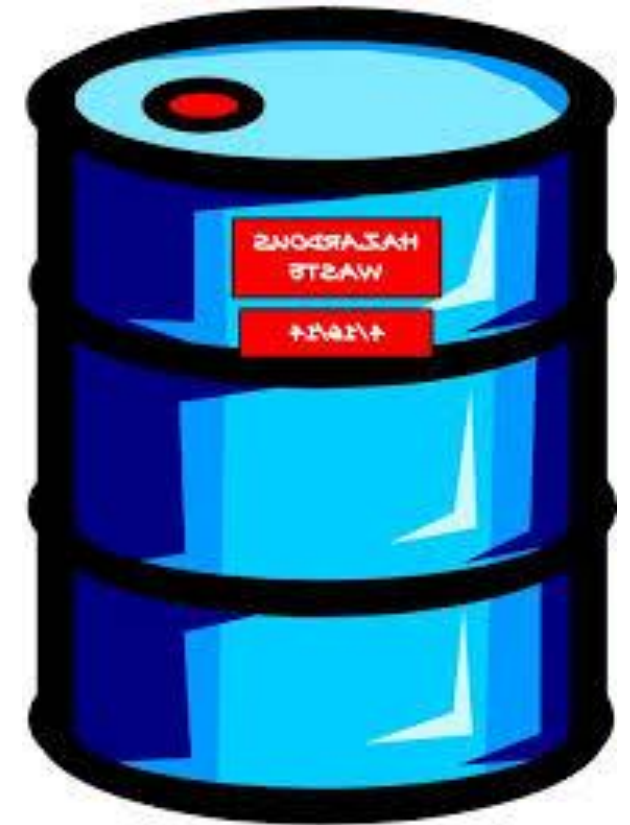
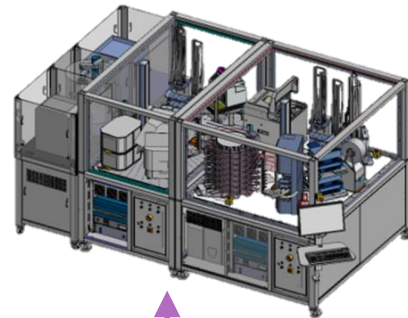
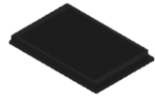
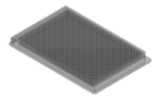
Process	Plate	Labware	Step	Equipment
Startup Process	Deck 1	Default	Get From Deck	Deck 1
	Deck 2	Default	Get From Deck 2	Deck 2
Shutdown Process	Deck 1	Default	Put In Deck	Deck 1
	Deck 2	Default	Put In Deck 2	Deck 2
Barcode Reader	Plate	Default	Scan Barcode	Barcode Reader
	Plate 2	Default	Scan Barcode	Barcode Reader
	TipNovusMini.Washer	Default	Wash Tips	TipNovusMini.Washer
	TipNovusMini.Dryer	Default	Dry Tips	TipNovusMini.Dryer



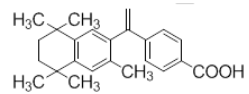
Sample Plate Preparation Process

Source Plate

Assay Ready Plate



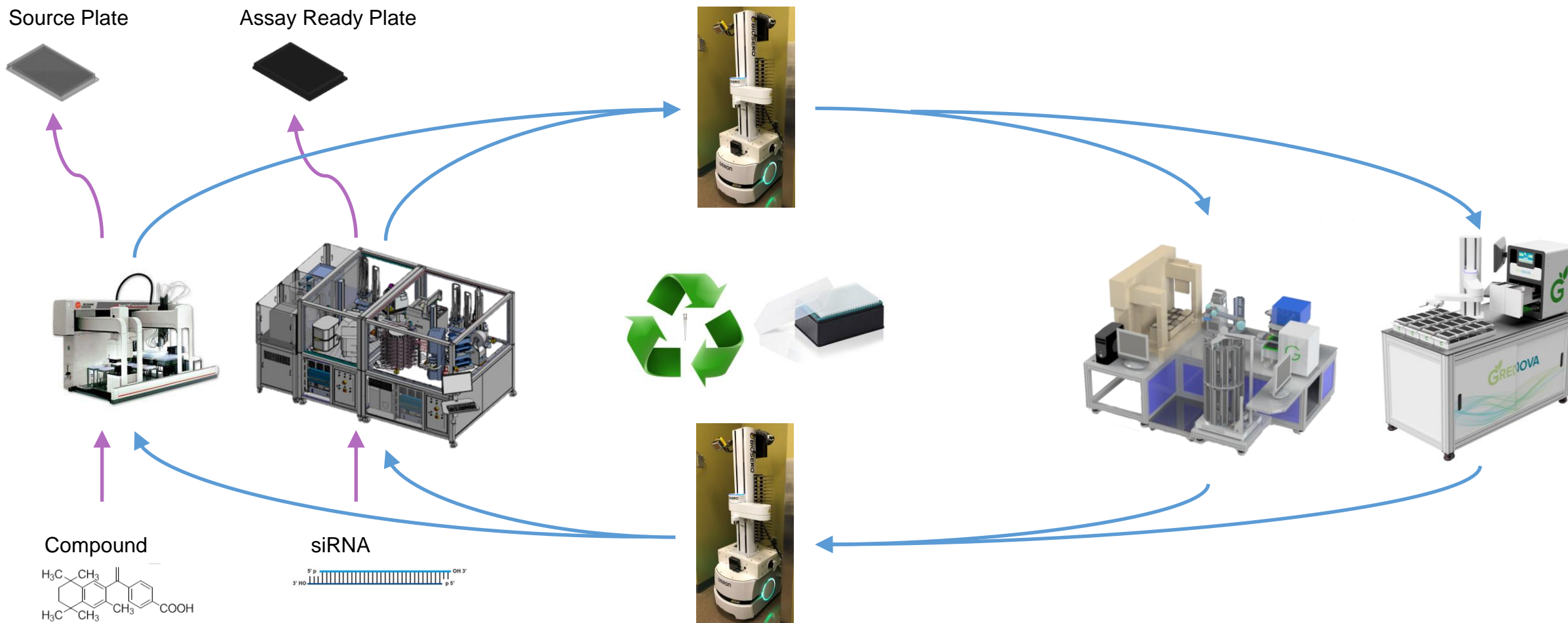
Compound



siRNA



Sustainable Laboratory Practice



THANK YOU!

This was all a TEAM effort.

Automation

Jameson Travers
Savannah Wood
Anthony Garrison
Shayne Frebert
Eric Wallgren
Charles “Pepper” Bonney
Sam Michael

Compound Management

Glenn Gomba
Misha Itkin
Paul Shinn

Biology
Informatics
DMPK Core
Purchasing
Building Support
...and many others!

Want more info?

Please email me!

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