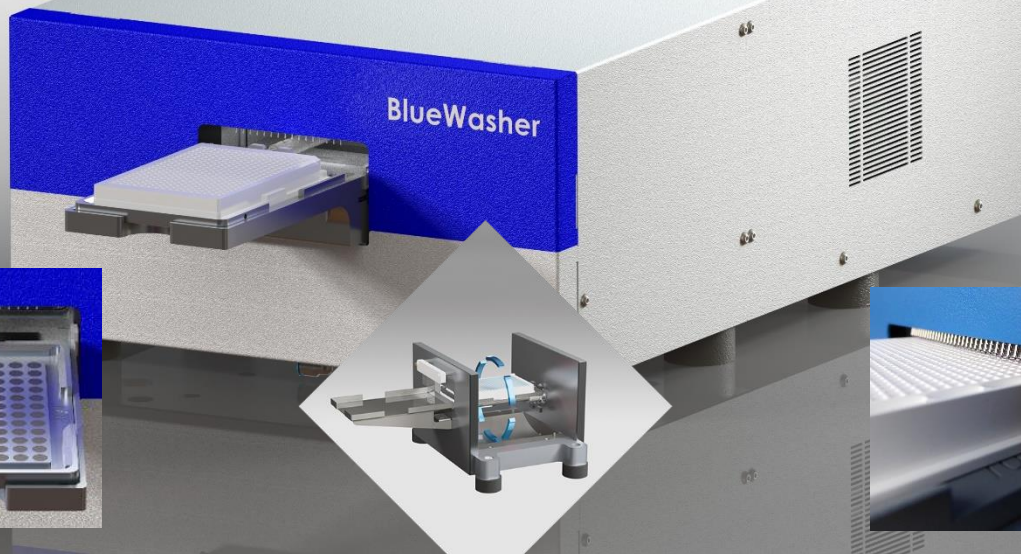




# BlueWasher

BLUE CAT BIO

The most cost-effective tool to improve data quality ( $z'$ ) for cellular assays



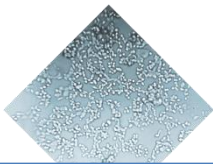
**Magnetic carrier for non-contact bead wash**

**Centrifugation instead of aspiration**

**Cell-friendly dispensing for 96, 384 & 1536w plates**

The award-winning BlueWasher uses centrifugation instead of aspiration to remove liquids from all plate formats, including 1536w, eliminating background and variability at their (assay) sources. Highly reproducible residual volumes 10x lower than tip-based plate washers enable imagers to produce cleaner images, **raising  $z'$  0.1-0.3 for typical adherent cellular assays**. Higher  $z'$  = miss fewer active compounds AND reduce false positives to re-screen. **BlueWasher** immediately improves screening economics without complex assay or automation changes, delivering unparalleled ROI and direct boost to overall drug discovery productivity. Now with gravity drain, eliminating waste pump & filters.

## Cellular Assays



**Non-contact media change for HTS, HCS, FLIPR®, genomic assays**

### Better Data

- No contact, no "donuts"
- Better %CV &  $Z'$  lift typical 0.1-0.3
- Low residual, lower background

### Simpler Assay Design

- ~0.2 $\mu$ l residual allows direct addition of compound, stain, Ab
- Fewer wash steps
- Simpler assay automation
- Simpler transition to 1536

### More Reliable Screens

- No clogged needles
- No re-calibration
- Constant residual volume

### Fast, Compact, Quiet

- < 30 sec to evacuate 1536 well plate
- 40 cm x 70cm footprint
- No compressed air or vacuum

## Magnetic Bead Wash



**Contamination-free bead wash without disposable tips for DNA extraction, mRNA purification, expression**

### High Throughput

- Removes buffer from 384 well plate < 20sec
- Frees up automated liquid handler
- Easy to automate and integrate

### Saves Cost

- Tipless evacuation eliminates consumable waste

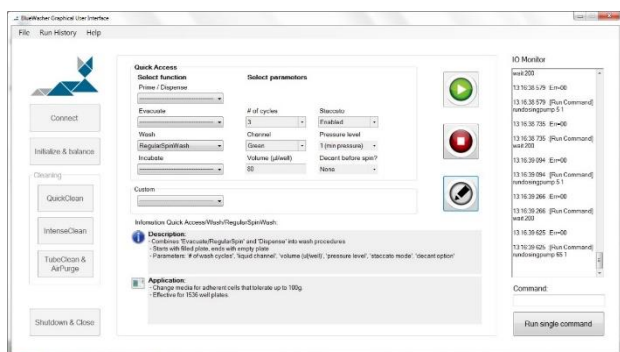
### Better Data

- Lower background and variability due to consistent and complete buffer removal

# BlueWasher: standalone - benchtop automated – HTS integrated

## Intuitive Graphical User Interface

- Quick access to all BlueWasher functions
- Single-click cleaning for effective contamination control
- Workflow editor for simple programming of complex workflows



## NEW at SLAS2017:

**BlueBench - compact, user friendly and modular benchtop automation for BlueWasher and other stand-alone instruments**



## Easy to integrate & automate with third party high-throughput systems

- Open, well documented API
- Easy plate pick-up by simple gripper
- BlueWasher autonomous mode minimizes remote control complexity
- Gravity waste drain – no pump, no filters
- Integrations: Agilent, Beckman Coulter, BioNex, BioSero, Hamilton, HighResBio, ThermoFisher

## Options and accessories



Magnetic carriers for 96, 384, 1536w plates for magnetic bead applications



Dispense from up to 7 liquid inputs



BlueDaily cleaning solution



BlueIntense cleaning solution

Download literature and CAD files at: [www.bluecatbio.com/downloads](http://www.bluecatbio.com/downloads)



**12/2016 Journal of Biomolecular Screening paper by S. Knight (AstraZeneca) et. al.: Enabling 1536-Well High-Throughput Cell-Based Screening through the Application of Novel Centrifugal Plate Washing.**

“... In this study, we describe the **novel application of a centrifugal plate washer** to facilitate miniaturization of a range of 1536-well cell assays and techniques to reduce edge effects, all of which improved throughput and data quality. Cell assays currently limited in throughput because of cost and complex protocols may be enabled by the techniques presented in this study.”

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# Unprecedented control of plate evacuation

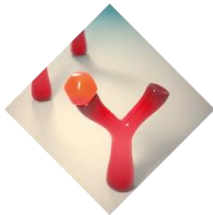
From emulating gentle manual decanting to evacuating plates down to 1,000x less residual volume than aspiration-based washers, BlueWasher offers evacuation algorithms for a wide range of applications with single-click access from the “Evacuate” Menu on the graphical user interface.



## Application-specific evacuation algorithms

### GentleDecant

- Emulates manual decanting – reproducibly & automated
- For low affinity ELISA



### HardDecant

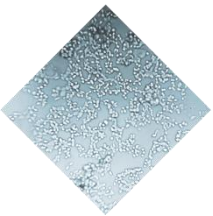
### MagBeadSpin

- Emulates manual tapping – reproducibly & automated
- For magnetic bead applications



### GentleSpin

- 2-4x dryer than manual tapping
- For contact-free media change in adherent cellular assays

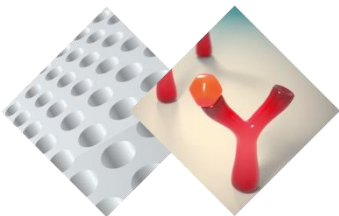


### LightSpin

### RegularSpin

### StrongSpin

- 10-1,000x dryer than manual tapping
- For automated & complete slide drying for array imaging, “no wait”
- For complete ELISA background removal



### ExtraSpin

### SuperSpin

# BlueWasher specifications

Applications	<b>Contactless</b> media change & liquid evacuation with <b>near zero, reproducible residual</b> volume <b>Magnetic bead washes</b> with magnetic carrier for 96, 384, 1536 well MTPs
Compatibility	Any SBS format plate up to 17.4mm height (including 1536 well) strip or slides, custom formats programmable; dispensing into 96 and 384 well plates; 1536 well MTP option
Centrifuge system	Liquid evacuation by centrifugation; plates positioned in symmetric rotor with well openings facing outwards to expel liquids. Rotor driven by computer controlled, high power servo motor
Residual volume	0.01µl to 5µl per well, depending on application-specific evacuation method selected
Shaking & incubation	Programmable speeds, rocking angles and time, ideal to break up liquid layers
Centrifuge specs	<b>RPM:</b> 5 to 3,500 RPM (= 630 g), <b>Acceleration:</b> <1,500 RPM/s, <b>Deceleration:</b> < 1,000 RPM/s <b>Maximum weight difference</b> between active plate and balance plate in dry condition: 15 g @ 3,500 rpm, 20 g @ 2,000 rpm, 35 g @ 1,500 rpm, 70 g @ 1,000 rpm
Dispense system	Precision membrane pump and electromechanical valves controlled by on-board Linux CPU
Liquid inputs	Choice of 4 or 7 liquid inputs with Luer lock fittings
Specifications	<b>Manifold:</b> 8, 16, or 32 needles (for 96/384/1536 well MTP) <b>Dispense jet position:</b> Slanted dispenser mount to aim at well walls, plate off-set adjustable <b>Dispense pressure:</b> adjustable in 5 steps, from approx. 35% to full pressure <b>Dispense speed:</b> 9 sec / 96 well, 13.5 sec / 384 well, 24 sec /1536 well MTP (13 sec in autonomous mode) <b>Range &amp; accuracy:</b> 96 and 384 MTP: >5µl, < 3%CV @ 100µl; 1536 MTP: >3µl, < 5%CV @ 10µl
Internal dead volume	8 ml (input connector to dispenser pin tips)
Tubes	<b>Reagent tubes:</b> length: 1m, Ø outside: 5mm, Ø inside: 3mm; Luer locks on both ends connect BlueWasher input to Luer lock on GL-45 cap for reagent bottle, color-coded
Software and operation	<b>PC-based GUI</b> with quick access to pre-set, application specific evacuation methods and <b>editor</b> to customize methods and program workflows. <b>Autonomous mode</b> to run methods from BlueWasher's internal memory
Automation	Easy plate load/ pick-up by simple robotic gripper; standard API, USB and Ethernet Available automated plate loading via <b>BlueBench</b> ; choice of plate storage in up to 5 stacks or random access hotels with auto de-lidding/ re-lidding
Safety	Centrifugation shut off in case of excessive vibration; sensor controlled interlocking door
Cleaning & decontamination	Single touch <b>QuickClean</b> and <b>IntenseClean</b> protocols with custom <b>BlueDaily</b> and <b>BlueIntense</b> cleaning solutions highly effective to clean and decontaminate BlueWasher interior
Dimensions (HxWxD)	20.5 cm x 36.5 cm x 69.0 cm   8.1" x 14.4" x 27.2" (without plate nest: 54.5 cm   21.5"); electrical and liquid connections on left side wall of BlueWasher housing
Weight	27 kg   60 lbs
Power requirements	100 – 240 V, 50/60 Hz, 350 W, auto sensing, I max = 10A
Ambient temperature	15°C – 55°C   60 F – 130F

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