

ROTOR
H D A



SINGER
INSTRUMENTS

A RESPONSIBILITY TO SCIENCE!



ROTORTM
H D A

High-throughput Microbial Array Pinning Robot

COMPACT
ULTRA-FAST
INTUITIVE



Genome-wide screening is easy when you have the right tools. You need a collection library and you need a precision method of pinning colonies – this is why we created the ROTOR.



INTRODUCTION



WHAT IS IT? The Singer ROTOR HDA is a compact benchtop robot for easy, ultra-fast manipulation of high-density arrays of yeast, fungi, bacteria and algae. Reagent sets such as deletion mutant collections and the complete set of cloned yeast genes can be utilised for large-scale 2-hybrid, synthetic genetic array, phenotypic and chemical-genetic analysis. The ROTOR HDA uses plastic replica plating pads and supports liquid pinning to and from 96 and 384 well microtitre plates and agar pinning at densities 96, 384, 1536, and 6144.

WHAT DOES IT DO? This ROTOR HDA is designed for the picking and re-plating of yeast, fungi, bacterial and algae cells in various size arrays and can operate with cells grown on solid agar or in liquid media.

HOW DOES IT WORK? The ROTOR HDA uses a robotic arm and plastic replica plating pads to pick up samples of cells from culture plates. The robotic arm then moves to a new 'target' plate and deposits the cells. The operator selects and uses an appropriate program from a simple, drop-down menu.

*“THE ROTOR IS A
REMARKABLE
INSTRUMENT: USER-
FRIENDLY, RELIABLE &
EFFECTIVE.”*

· Hiten Madhani
University of California, San Francisco
United States

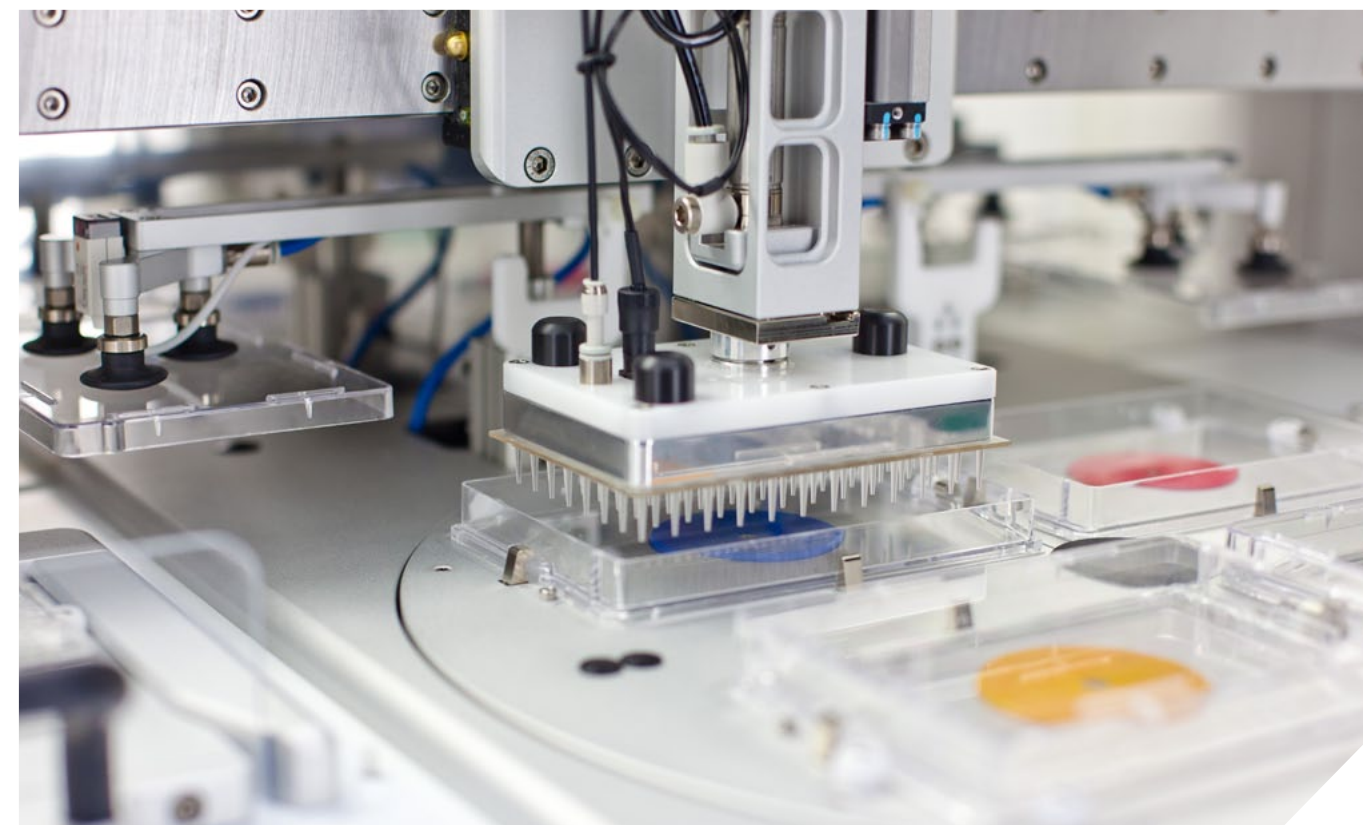
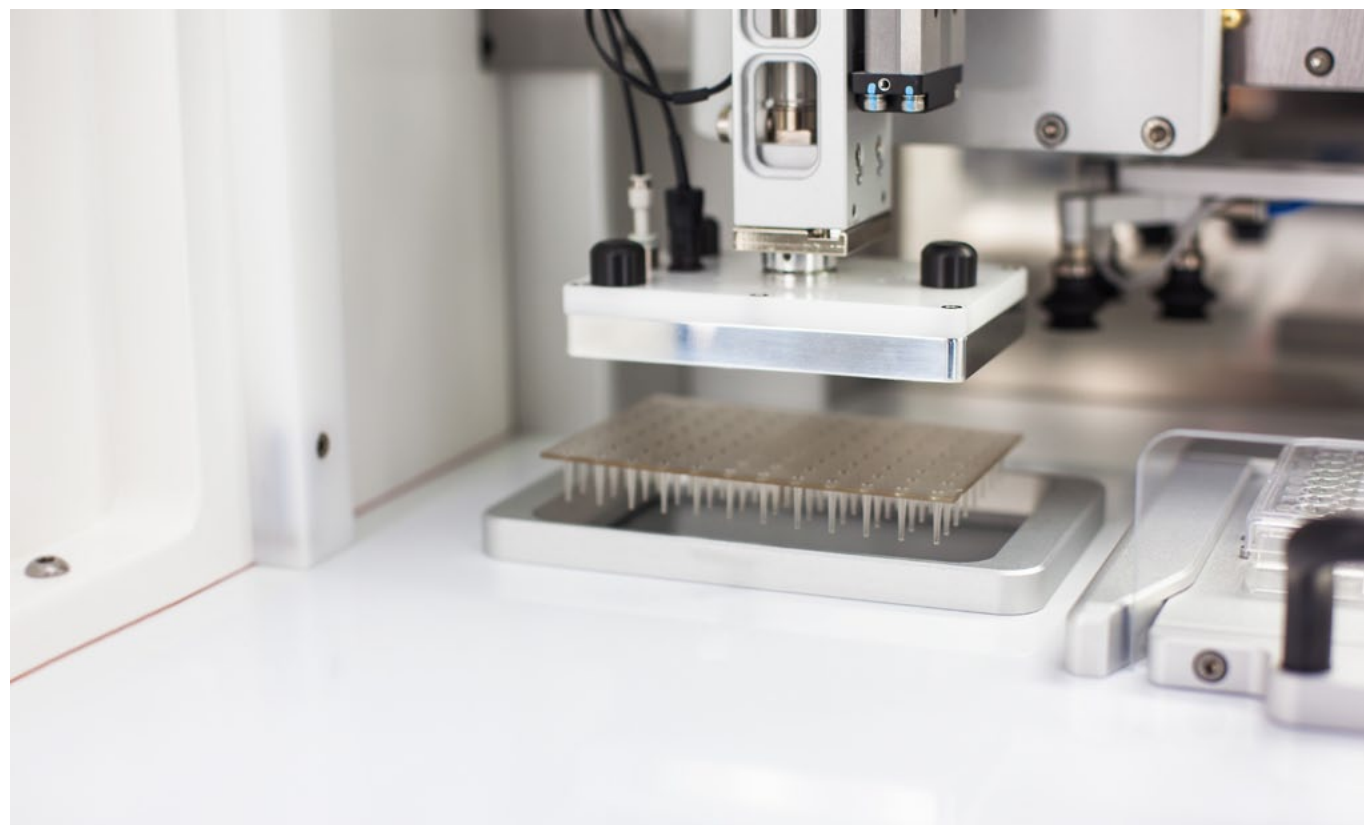
- WHAT CAN I USE IT FOR?**
- Duplicate and back up large libraries of yeast, fungi, bacteria and algae.
 - Re-plate cells from liquid to agar and vice versa.
 - Replicate, mate, re-array, screen and breakdown from single or multiple source plates at densities of 96, 384, 1536 and 6144.
 - Yeast 2-hybrid or cell mating assays.
 - Prepare arrays of colonies for chemical screening.
 - High-density serial dilutions.

HOW MANY COLONIES CAN I ARRAY? Starting from liquid or solid media at 96 or 384-density, arrays can be generated at 96, 384, 768, 1536 and 6144-densities. Multiple, low-density plates may be combined into fewer, high-density plates.

WHAT PLATES CAN I USE? For precise replication at all densities, Singer high-quality PlusPlates with increased plating area are essential. The ROTOR HDA will also accept multi-well, microtitre plates (96 and 384) and SBS standard trays (using long-pin RePads).

IS IT EASY TO USE? The ROTOR HDA is designed so anyone can operate the robot in a matter of minutes! No need for a dedicated technician or hours of training; our simple, touchscreen software guides you through your chosen protocol with ease.

FEATURES & FUNCTIONS



SMART FUNCTIONS The ROTOR HDA is simple, but very smart. ROTOR Smart Functions run in the background to augment basic procedures. Examples include Smart Offset and Smart Resuspension. Smart Offset: When replicating a single source plate multiple times, minute, alternating offsets will be applied to the source plate picking position by default, to maximise the homogeneity and consistency of target plate cell density. Smart Suspension: When spotting liquid to agar, the helical stirring of 96 or 384 well plates is applied by default to maximise cell resuspension and target plate homogeneity. While Smart parameters have been carefully optimised to save the user time, they are also fully customisable. Smart!



- FEATURES INCLUDE:**
- Intuitive touch-screen menu operation.
 - Anti-contamination front screen.
 - Small footprint: free-up valuable lab space.
 - Built-in disinfection lamp.
 - Interlocked roller cover to protect the ROTOR HDA when not in use.

*NO LENGTHY
WASH CYCLE OR
RISK OF BACK-
CONTAMINATION...*

[CLICK TO SEE THE ROTOR HDA IN ACTION](#)

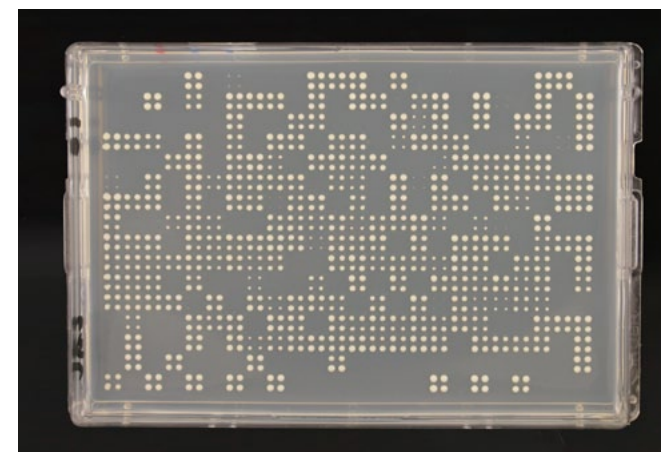


Image courtesy of Dr Hille Tokotile,
University of Edinburgh.

A collection of yeast colonies growing at 1536-density on a Singer PlusPlate. Small or missing colonies represent mutants that have exhibited a growth defect under the tested conditions.

*“MY STUDENTS REALLY
APPRECIATE ITS
SIMPLICITY—EVERYONE
CAN OPERATE THE
SYSTEM!”*

- Kevin Verstrepen
VIB lab for Systems Biology
Belgium

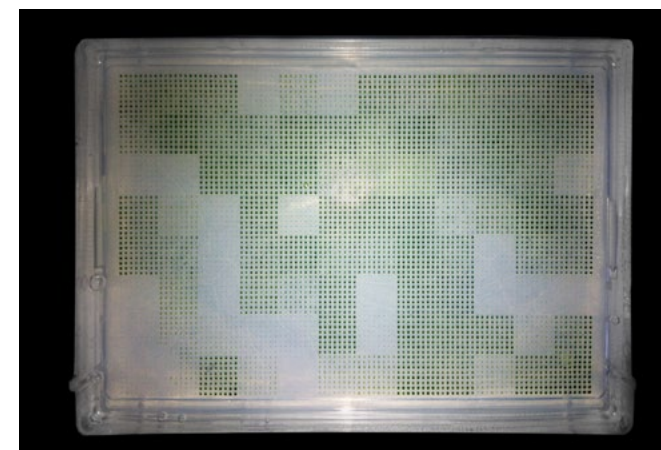
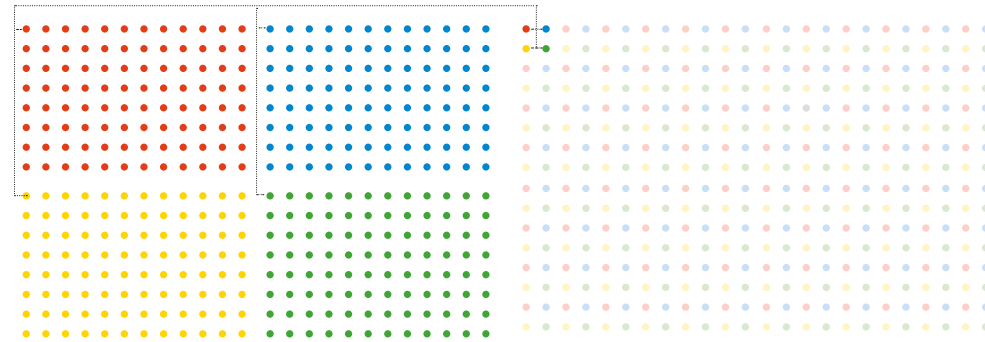


Image courtesy of Professor Fred Cross,
The Rockefeller University, New York.

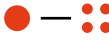
A collection of algae colonies growing at 6144-density on a Singer PlusPlate. [Click here to see this plate being pinned.](#)

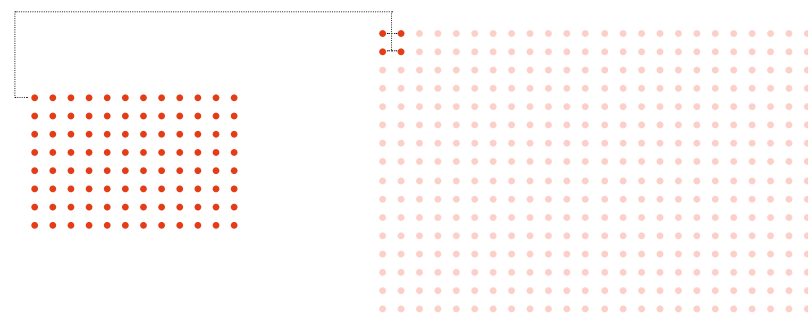
PINNING EXAMPLES

1:4 Array 



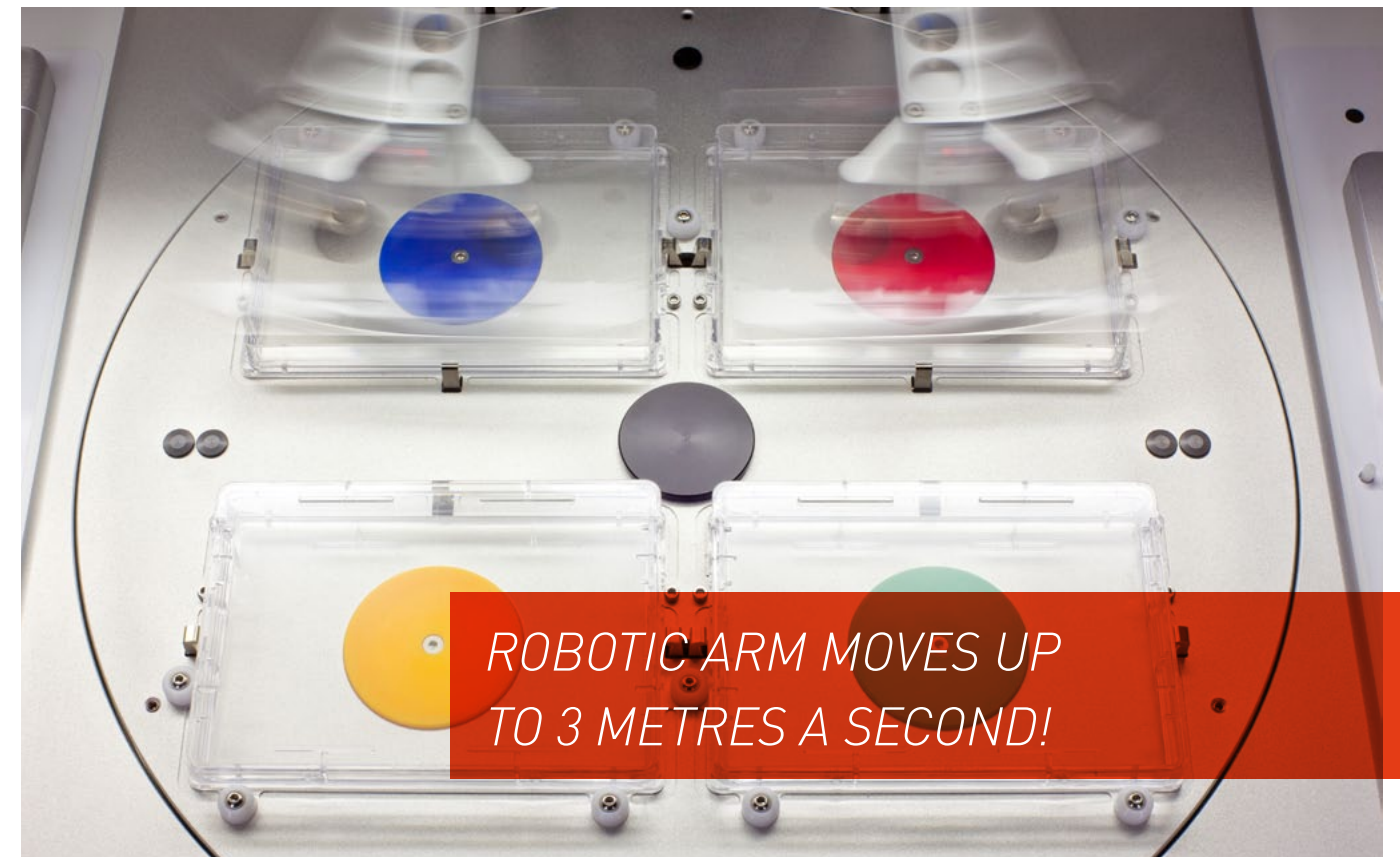
- 4x 96-density plates are combined onto 1x 384-density plate.

1:4 Single source 



- Each colony from a 1x 96-density plate replicated in quadruplicate to a 1x 384-density plate. These protocols can be applied at all pinning densities.

THE ROTOR'S SPEED IS UNPARALLELED. IT TAKES UNDER 10 MINUTES TO REPLICATE THE ENTIRE YEAST GENOME IN QUADRUPLICATE!



- WHY IS IT SO FAST?**
- The ROTOR HDA uses disposable plastic pin pads, which removes the need for lengthy washing and sterilisation cycles between pinnings.
 - The robotic arm moves very rapidly (up to 3 metres per second) and always selects the shortest path between source and target.
 - It takes hardly any time to learn how to operate the ROTOR HDA and run a program— you can begin running your pinning protocol immediately!



Agar to agar pinning speed is 25 seconds per plate.

Liquid to agar pinning speed is 28 seconds per plate.

CLICK TO SEE HOW FAST THAT REALLY IS!

TECHNICAL SPECIFICATIONS



TECHNICAL SPECS

FOOTPRINT: L: 130cm x W: 65cm x H:72.5cm	POWER: 110Vac >240Vac 500W	MODEL: ROTOR HDA™
WEIGHT: 120kg	AIR SUPPLY: Minimum 4 bar @ 3 litres/minute	PRODUCT CODE: ROT-001

Three line drawings of the ROTOR HDA™ system. The first drawing is a side view showing the machine's profile and the robotic arm. The second drawing is a front view showing the machine's width and the front screen. The third drawing is a rear view showing the machine's depth and the back of the front screen.

SINGLE COLONY PICKING

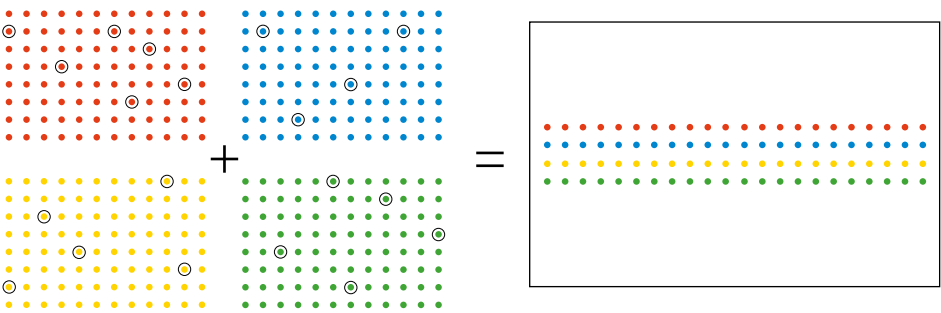


THE STINGER™

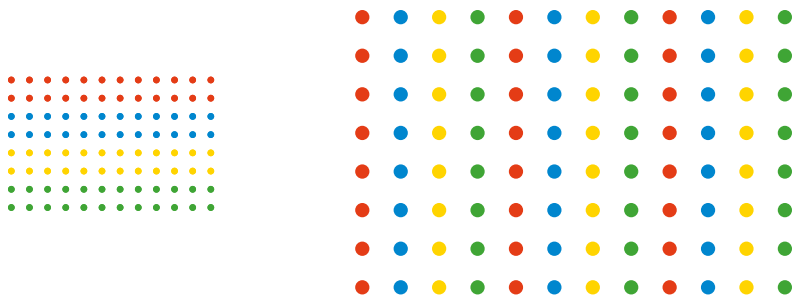
PRODUCT NAME:
THE STINGER™

PRODUCT CODE:
STR-001

THE STINGER PINNING EXAMPLES



- Individually picked colonies from four separate 96-density source plates are combined onto one target plate. This example can be applied at all pinning densities of source and target plates, from 96 to 1536.



- Colonies from a 96-density plate are re-arrayed to produce customised arrangement at the same or different density.

- WHAT CAN I USE IT FOR?
- Selectively re-array groups, or individual colonies from large microbial arrays.
 - Produce custom arrays comprising of functionally related strains/mutants.
 - Generate subset of library arrays to follow-up with initial screening results.
 - Accurately and reliably pick colonies from high-density arrays.
 - Pin large arrays of a single strain from a source library.
 - Quickly and easily mate specific colonies of interest from high-density arrays.



WHAT IS IT? The Stinger is an attachment for the ROTOR HDA that allows for fast, single-colony picking. It expands the functionality of the ROTOR to enable the re-arraying of specific individual colonies of interest from high-density agar plates and multi-well dishes. As an automated modular accessory for the ROTOR, The Stinger allows for easy, ultra-fast duplication and rearrangement of high-density library arrays of yeast, other fungi, bacteria and algae.

WHAT DOES IT DO? The Stinger is designed for the picking and spotting of user-specified colonies from high-density arrays onto solid agar at densities of 96, 384, 768 and 1536. It also spots colonies into liquid culture at 96 and 384-density. Automated and ultra-fast pinning by The Stinger allows for the easy and accurate rearrangement and generation of microbial libraries. Pin up to 200 colonies an hour.

HOW DOES IT WORK? The Stinger uses cartridges of 384 re-usable, stainless steel pins to sample yeast, other fungi, bacteria or algae from colonies grown on solid agar or in liquid culture. Colony selection methods are flexible; choose from importing .csv files or manually on the touch-screen software. This allows you to pick a few strains of interest or rearrange entire arrays.

"IT'S A HUGE IMPROVEMENT FROM PICKING COLONIES MANUALLY, PLUS THE ACCURACY GAINED IS VITAL."

· Gudjon Olafsson
MRC National Institute for Medical Research
England

THE SHUTTLE The Shuttle is an accessory to The Stinger that has been designed to rapidly speed up the time between pinning cycles. The Shuttle holds two individual pin cartridges and fits easily into the ROTOR pad rim. When the Shuttle is enabled, The Stinger will take sterile pins from one cartridge and once used, reload them into the second cartridge ready to be autoclaved. Without the Shuttle, pins would need to be manually loaded into the cartridge to be reused after sterilisation.



ACCESSORIES & CONSUMABLES



SPARES, ACCESSORIES & REMOTE SUPPORT

AIR COMPRESSOR:
CMP-003

THE STINGER:
STR-001

YEARLY SUPPORT:
SRO-101

PAD HOPPER:
HOP-001

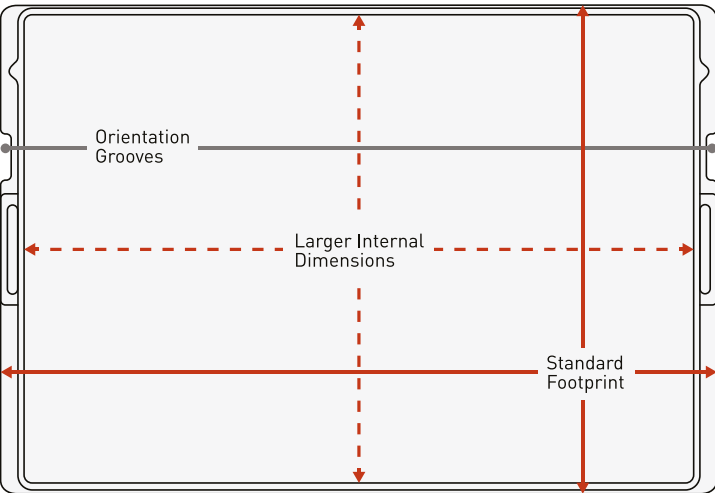
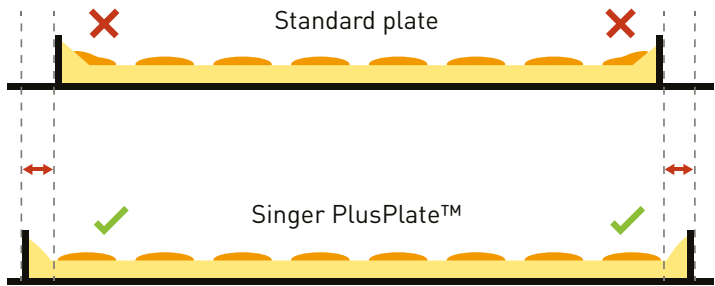
THE SHUTTLE:
SSH-001

YEARLY SUPPORT PLUS:
SRO-110

DUMP DRAWER:
DDR-001

PLUSPLATES™

PLUSPLATES:
PLU-003



REPADS™

96 LONG:
REP-001

1536 SHORT:
REP-005

96 SHORT:
REP-002

6144 SHORT:
REP-006

384 LONG:
REP-003

VARI START PACK:
VSP-001

384 SHORT:
REP-004

[96 long x40, 384 long x40, 96 short x200, 384 short x200, 1536 short x200]



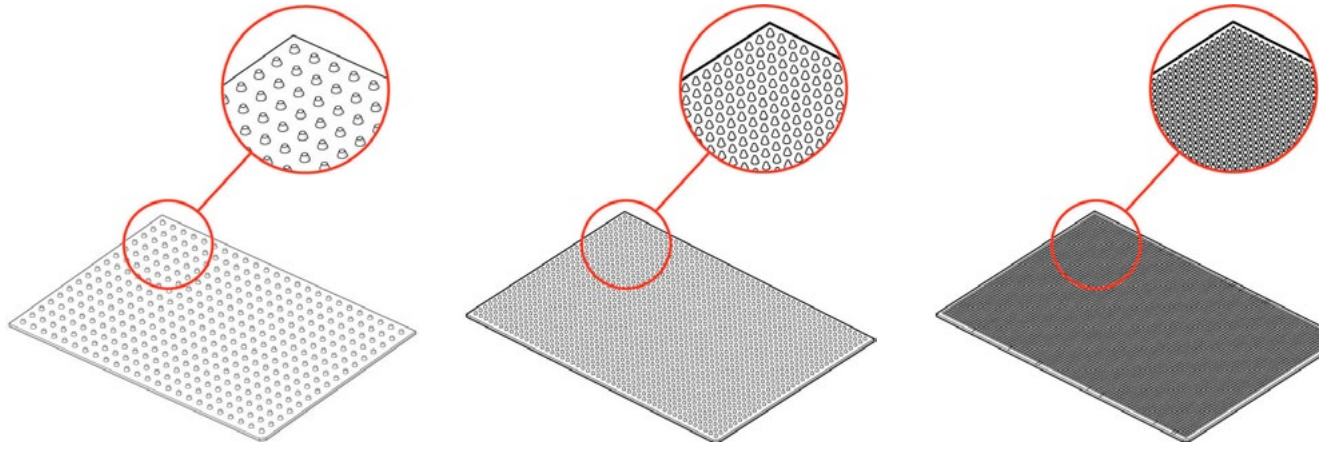
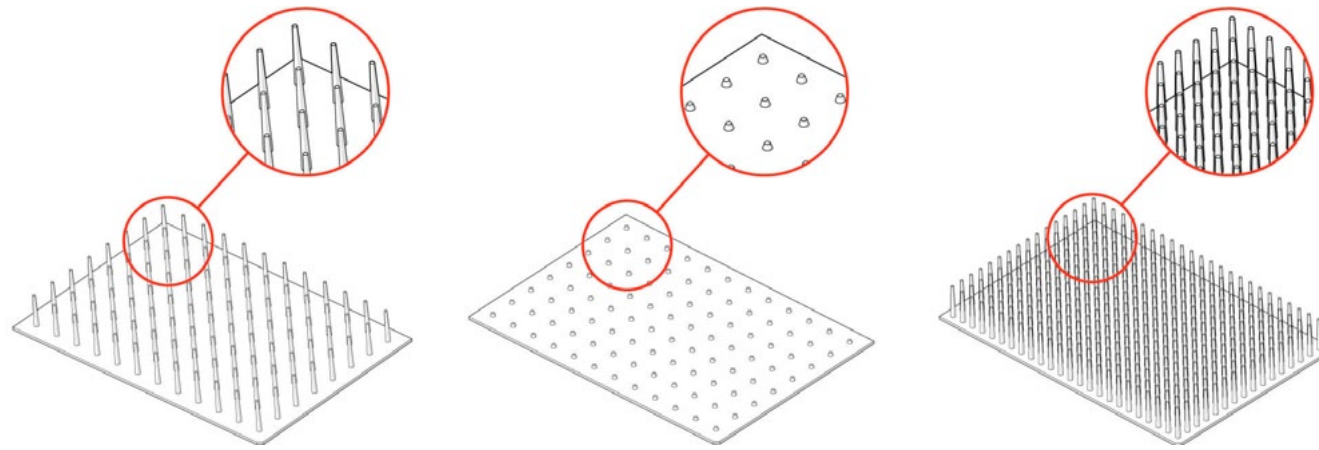
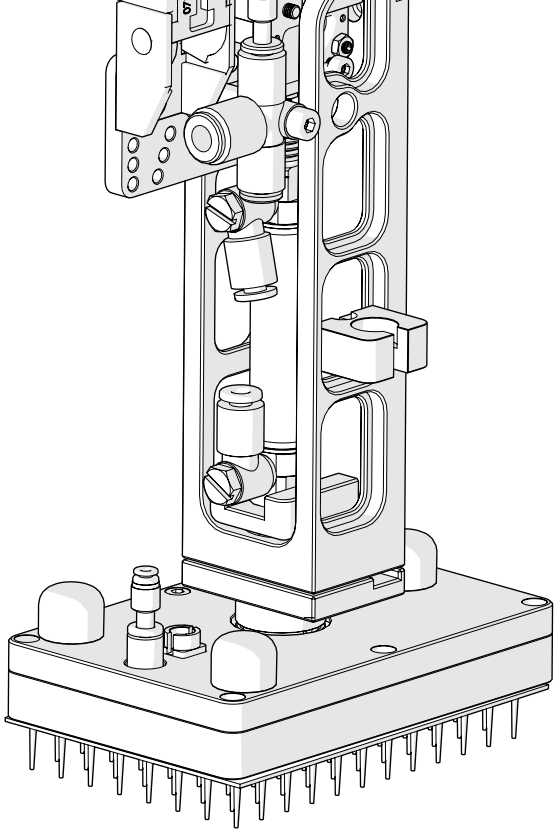
PLATES & PADS

The ROTOR HDA uses Singer RePads™: high-quality plastic replica-plating pads to transfer colonies between plates. Singer RePads are available in two pin lengths: short for agar-to-agar colony transfer and long for transferring cells in liquid culture.

Our short-pin RePads come in a range of densities: 96, 384, 1536 and 6144. Our long-pin RePads are available in 96 and 384 format, allowing transfer from multi-well microtitre dishes.

Singer high-quality PlusPlates™, with increased plating area, are essential for precise replication at all densities. Singer RePads and PlusPlates come in gamma-irradiated packs and in application-matched sleeves.

The ROTOR HDA will also accept multi-well, microtitre plates (96 and 384) and SBS standard trays, compatible with long-pin RePads.





*SUPPORT IS FAST,
EFFICIENT &
SECOND-TO-NONE.*

SINGER SUPPORT SERVICES

Singer Instruments has a long-standing reputation for fantastic service and support, for which we are very proud. Our motto, 'a responsibility to science', extends to our service and support whereby our primary motivation is to eliminate, or at least minimise, your experimental downtime. Singer products are designed for reliability, longevity, speed, and ease-of-use. Singer service packages augment these design criteria by increasing life-expectancy and increasing device reliability with preventative and predictive maintenance. Should any reactive maintenance be called upon, our time, cost and carbon efficient support should get you up and running in the shortest time possible.

Singer Support is an excellent and cost effective service that gives you unlimited access to Singer technical experts by phone, email, VOIP or remote access. All requests are entered into the Singer ticketing system that allow both you and Singer Instruments to log, track and monitor any reported issues from initial contact through to resolution. While we aim to respond to all queries within 24 hours, our average response times are far less.

Singer Support packages are extendable and can be bought in 1, 3 or 5 year packages with discounts applied for the 3 and 5 year packages and if bought at the time of purchase. There are 2 levels of cover offered – Support and Support Plus.

*“CUSTOMER SUPPORT
IS ALWAYS FRIENDLY,
RESPONSIVE AND FAST.”*

· Babis Rallis
University College
England



BEER BOTTLE OPENER FITTED AS STANDARD!



ABOUT US

Singer Instruments was established in 1934 and has a long-standing track record developing and manufacturing mechatronic workstations and laboratory automation robotics. Our world-leading, specialist products are used to facilitate and accelerate genetic and genomic research around the world, for customers who include university research labs, cancer research institutions, pharmaceuticals companies, biotechnology companies and biofuels companies.

Singer Instruments is a Private Limited Company owned by its directors; three out of four of whom are family members. Our premises, on the edge of Exmoor National Park in Somerset in the UK, is a state-of-the-art factory with full, virtual prototyping facilities, precision CNC manufacture, robotic coordinate measurement for quality control, and a lab-coat-clinically-clean and Lean assembly environment. We design, manufacture,

program, assemble and QC all of our core products on site. Having worked alongside and added value to laboratory research for over 40 years, we are a truly integrated and respected member of the genetics research community. We maintain and enhance our brand recognition, scientific knowledge and market research by regularly supporting and attending scientific conferences and meetings and by teaching at workshops. Our tag line 'a responsibility to science', acts as a continual reminder for us to do our utmost to support, develop new technology, and add as much value as possible to the science and the scientific community we serve.

Should you have any feedback, suggestions or collaborative opportunities that may help accelerate scientific research, we would be delighted to hear from you. Please email: contact@singerinstruments.com or come round to our beautiful offices for a cup of tea!



ERIC BROWN

MCMaster UNIVERSITY

TACKLING SUPERBUGS AND
THE ANTIBIOTICS CRISIS

SCIENCE IS SO INCREMENTAL AND SO
FRUSTRATINGLY SLOW, BUT IT REALLY
DOES FEEL AS THOUGH WE ARE
PUSHING THINGS FORWARD IN THE
RIGHT DIRECTION.

“

It's really in the last 100 years or less, that we've have had the upper hand on infectious pathogens like bacteria. We've been able to just eradicate infection at will, it's a real blip in our timeline as human beings. However, bugs have a very clever survival strategy which involves relatively high rates of mutation and the acquisition of foreign DNA that allows them to adapt and survive in the presence of a variety of drugs. When this process carries on through multiple exposures to many different drugs, you wind up with a superbug, which is resistant to all kinds of drugs. In fact, there are situations, such as Pseudomonas infections, where clinicians are really challenged in their ability to use any antibiotics with any effect. So, you end up with patients who are just helpless to infection. It's going to take some real diligence, and I dare say vigilance, to make sure that we stay a step ahead of the microbes.

The antibiotics crisis is a tremendously important problem. If you look back to the history of antibiotics, not many new efficacious antibiotics have been discovered. In fact, the last mechanistic class to be discovered was really daptomycin, which was in the late 80s. Despite the incredible advances in biomedical research in the last 10-15 years, there's been a slump in the area of antibacterial drug discovery. I think there's certainly lots of room for innovation there.

In my group we are really concerned with how antibiotics are discovered. Our focus is to unravel the complex biology of microbes with the ultimate aim of trying to elucidate systems we can manipulate to the detriment of drug resistant superbugs. The overriding idea is that can we come up with new agents or probes that not only allow us to understand the biology, but may also be leads for new antibacterial drugs.

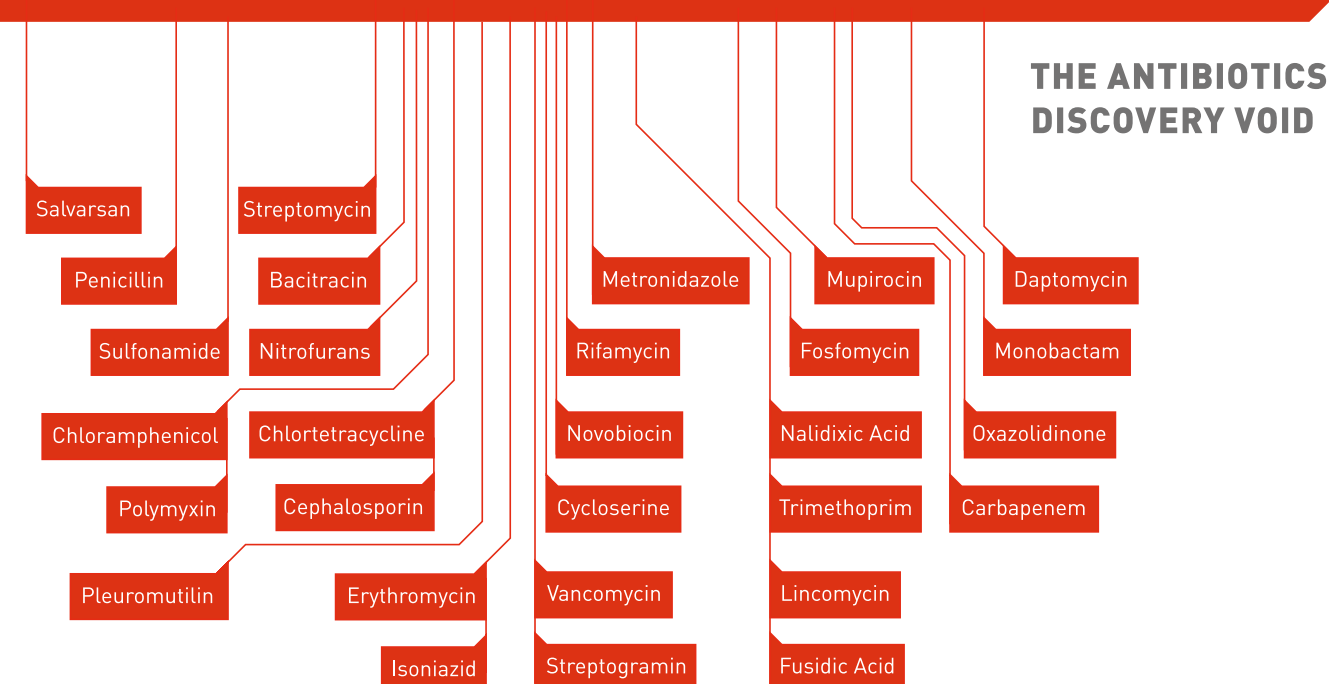
Certainly we're not interested in treading into territory where lots of other people have been. We are known for having crazy and unthinkable ideas. We try to do things and look into places that pharmaceuticals haven't.

The idea of using drug synergy to fight superbugs probably came about over a beer. The idea for drug synergy is that a non-antibacterial drug can potentiate the effect of an existing antibiotic when applied simultaneously. Take Pseudomonas infection for example, which are resistant to many antibiotics. We looked into a collection of more than 1,000 off-patented drugs for molecules that would potentiate Minocycline, which is the tetracycline molecule, a relatively poor antibiotic against Pseudomonas infection. We discovered that Imodium would act synergistically with Minocycline against Pseudomonas infection.

There is an infectious disease clinician in California who has been prescribing tetracycline along with Imodium for years to patients who have gastroenteritis. Suddenly our work has helped him make sense of it. Our work certainly attracts interests in the pharmaceutical sector. They seem to follow our work extremely closely, the way people follow baseball in North America. I think that's really where the rubber hits the road. We'd like to know that ultimately our stuff is pushing things ahead, and it certainly feels as though we are.

It is a pleasure to work at the Michael DeGroote Institute for Infectious Disease Research (IIDR). It's a multi-disciplinary team of more than 400 researchers from different backgrounds. In particular, the IIDR has incorporated lots of infectious disease clinicians. Having clinicians on board is a key touch-down for me because I get to meet regularly with

1920 1930 1940 1950 1960 1970 1980 1990 2000 2010



clinicians and make sense of what the medical need is. Some of our best work has been done in collaboration with other groups here at IIDR. We've built some infrastructure at IIDR for high-throughput screens, which is unlike what you would see in the small biotech companies. We've got a really robust platform of pinning deletion or expression clones. We're monitoring the growth of those pinned strains at as high as 6144 density using the ROTOR HDA. I just love the fact that my students are hands-on with the robot, which makes them more in touch with the experiments they are doing.

I am fortunate to work with an extraordinary group of young researchers who do some of the most amazing work. They have a great deal of pride in what we produce as a group. I'm tremendously interested in their careers and their success when they move on, which just makes for a really amazing work environment. It really is a privilege that I constantly have fresh and bright young people coming in with new ideas.

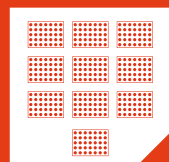
Being a scientist is the greatest job in the world.

”

ROTORTM H D A

THE STINGERTM

LIBRARY
MAINTENANCE



LIBRARY
RE-ARRAYING



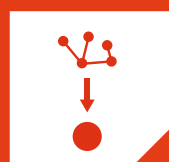
SYNTHETIC
GENETIC ARRAY
Read more



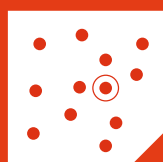
GENERATING
SUB-COLLECTION



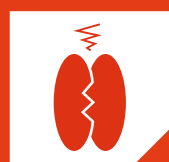
CHEMICAL GENETICS
/ DRUG TARGET
DISCOVERY
Read more



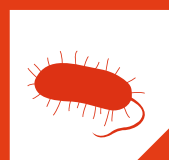
RANDOM COLONY
PICKING
Read more



YEAST
2-HYBRID
Read more



BACTERIA
GENETIC
SCREENING
Read more



ALGAE
GENETIC
SCREENING
Read more



SERIAL
DILUTION &
SPOT ASSAYS



ZONE
INHIBITION



ROTORTM H D A

THE FASTEST & MOST POWERFUL
COLONY MANIPULATION ROBOT
IN THE WORLD

*BOOK AN ONLINE
DEMO TODAY*

singerinstruments.com/rotor-demo/



BOOK NOW



SINGER INSTRUMENTS

A RESPONSIBILITY TO SCIENCE!

Roadwater,
Watchet,
Somerset.
TA23 0RE

+44 (0)1984 640226 (tel)

+44 (0)1984 641166 (fax)

contact@singerinstruments.com

singerinstruments.com

GET A QUOTE

OUR DISTRIBUTORS

For a list of our distributors visit:

singerinstruments.com/our-friends

