



SINGER
INSTRUMENTS
A RESPONSIBILITY TO SCIENCE!

SPORE™
PLAY+



*The worlds fastest manual
yeast tetrad dissection scope!*

INTUITIVE
QUICK
PRECISE



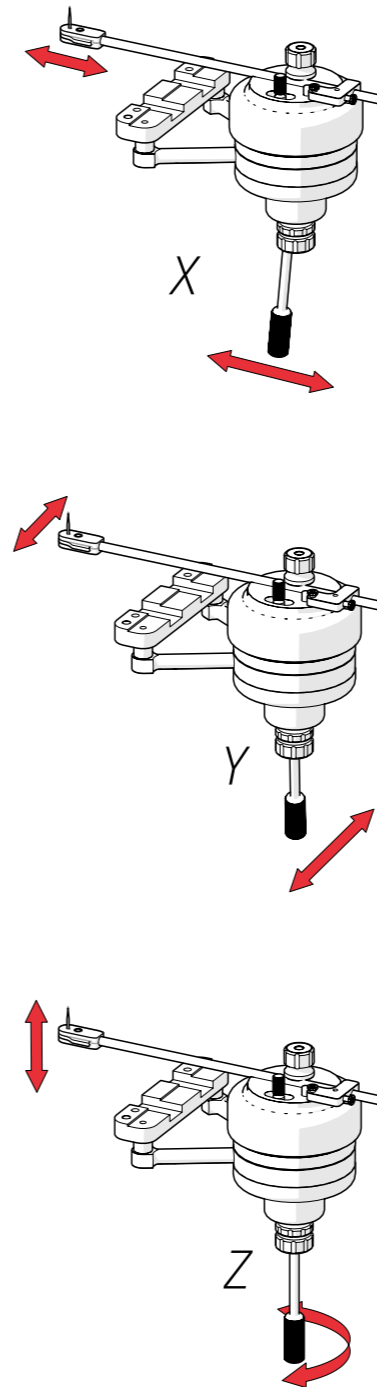
Singer Instruments have listened to you, worked with you and learnt from you for the last 30 years. We've built our entire reputation around the yeast community and, more specifically, yeast tetrad dissection. If there is one thing that you can feel assured of, it's that the SporePlay+ can dissect tetrads.





WHAT IS IT? The SporePlay+ is a manually-controlled, microscope platform for the dissection of yeast and fungal cells and spores. It is called the SporePlay+ because it makes tetrad dissection as fun and easy as playing a game!

WHAT DOES IT DO? The SporePlay+ combines an upright optical microscope, extra long working distance objectives, a stage with click-stops in a grid, and an integrated Singer Micromanipulator for the fastest and most efficient manual dissection in the world. Boom!



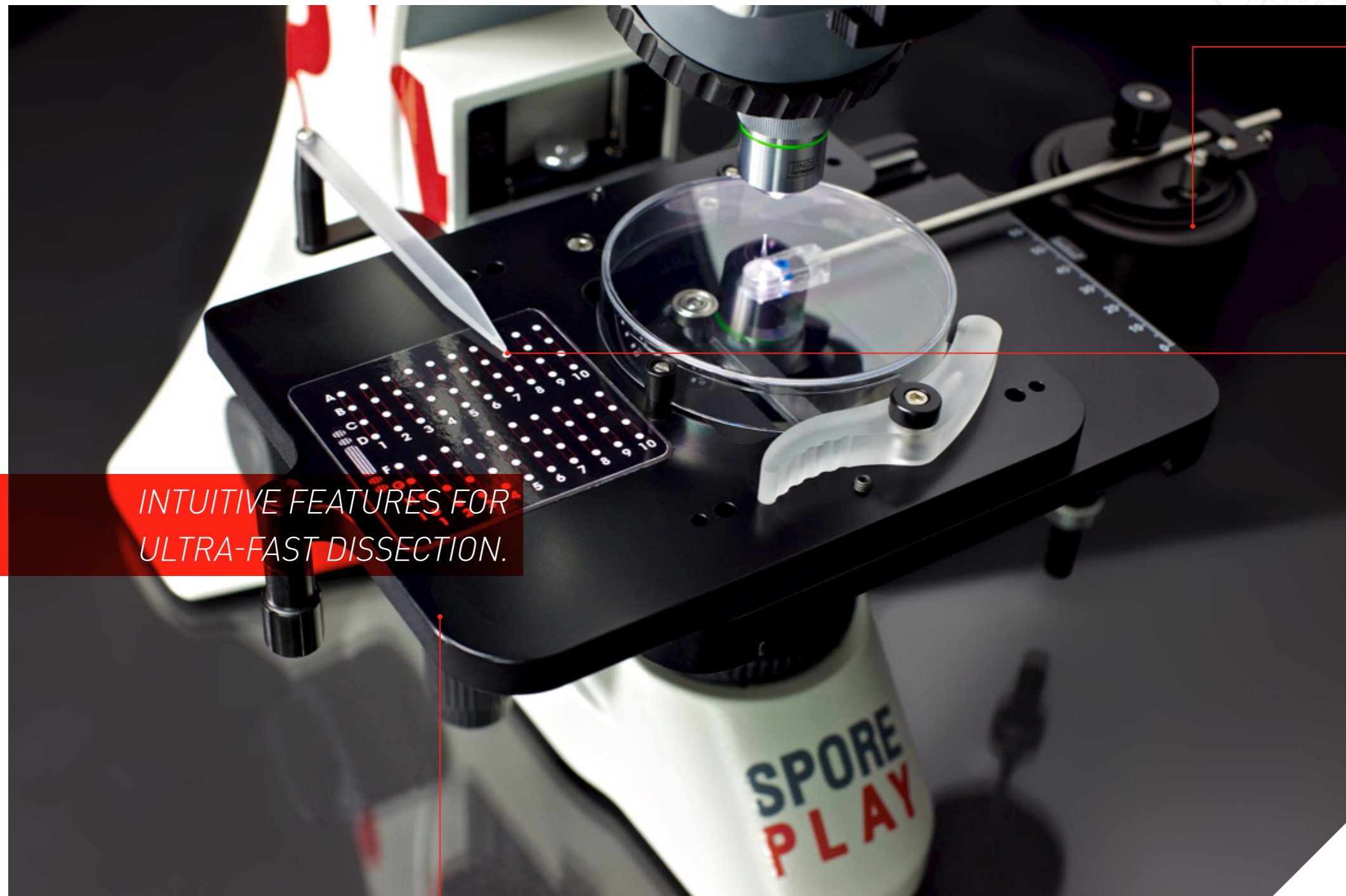
WHAT CAN I USE IT FOR? Ascospore dissection of *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe* and other fungal and ascospore-producing species.

HOW DOES IT WORK? The familiar stage twist grip and the carefully integrated micromanipulator pencil grip are controlled with hands in a relaxed, benchtop position. Either hand is always in close proximity to coarse and fine focus. Users work "head-down" at a comfortable height, adjustable by the butterfly swivel on the binocular eye-pieces. These ergonomic features have been specially developed for comfort and are of great benefit to those performing long or repeated dissection sessions.

WHAT PLATES CAN I USE? The SporePlay+ accepts standard 90mm Petri dishes on which most tetrad dissections are performed. The SporePlay+ also accepts glass slides when attached to the slide-holder.*



HOW GOOD IS THE IMAGE? To minimise airborne contamination of dissection plates, the Petri dish is inverted. As such, the subject is always being viewed through an image-distorting layer of agar and needleholder. It falls short of the optical clarity that the same microscope can achieve by looking at samples on a slide. That being said, the SporePlay+ is plenty sufficient for microbial dissection and there are thousands of satisfied users of Singer Instruments dissection scopes that testify this!



*INTUITIVE FEATURES FOR
ULTRA-FAST DISSECTION.*

THE STAGE A manual, smooth-action stage with torque control and click-stops of adjustable pressure at 5mm increments with grid positions set in two 12x4 orthogonal arrays. The stage is controlled with the left hand so the dissection can be performed with the right hand.

The large working area includes the options to inoculate tetrads to the left or between the dissection arrays. Working limits for needle protection and a stage lock mechanism are fitted as standard to prevent damage.

MICRO-MANIPULATOR

The micromanipulator is used for ultra-fine control of a glass needle for biological dissection in the microscope field of view. The X, Y and Z needle movement is intuitively controlled from the micromanipulator's pendant joystick. As easy and comfortable as holding a pen, it makes picking and placing quick and simple.

INDEX POINTER

This is a mechanical indicator of stage position click-stops and a graphical representation of the dissection layout on the Petri dish. This intuitive feature aids ease-of-use and reduces user-error. Forget about having to note coordinates or count clicks; the index pointer does it all for you at a glance!

*“THE INDEXING IN
BOTH DIMENSIONS IS
VERY HELPFUL.”*

· Mike Stark
University of Dundee
Scotland



OPTICS Two x15 wide-angle eyepieces with integrated dioptre adjustment, designed to minimise strain and eye fatigue. One extra-long working distance x20 objective provides superior colour reproduction and fidelity at long distances.

NEEDLE HOLDER 5mm diameter, 150mm long shank with integrated clear acrylic holder for minimum light disruption and maximum ease of needle setup and replacement. An alignment fixture has also been fitted for fine needle position adjustment and no-hassle needle replacement.

NEEDLE REPLACEMENTS Each one of our needles is carefully engineered with precision and rigorously quality controlled for strength, light transmission and other special properties necessary for optimal biological manipulation.

MICROZAPPER The MicroZapper is an electronically controlled needle agitator that provides an elegant way to separate spores. It clamps onto the needle holder and at the touch of a button will vibrate the tip of the needle. No more damaged agar or lost spores; the MicroZapper is a valuable accessory for the SporePlay+.

LIGHT CONTROL The SporePlay+ remembers the light intensity setting of each objective, so that it automatically reloads the correct settings when you switch between objectives. An intelligent energy saving mode is also used which includes a sensor to detect the user — Turning itself off after 15 minutes of not detecting any movement and switching itself on when a person returns.



“THE DISSECTION IS SO MUCH MORE TACTILE AND IT ALL JUST FEELS RIDICULOUSLY WELL ENGINEERED!”

· Rebecca C. Burgess
Stevenson University
USA



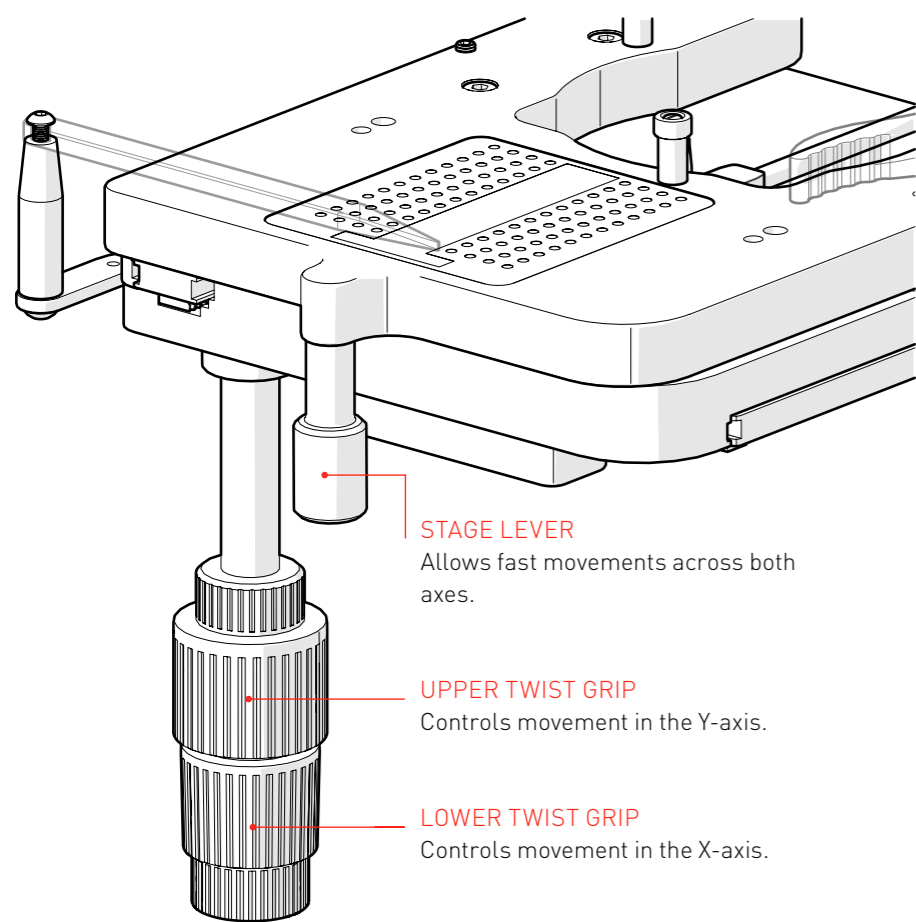
*WORKING LIMITS FOR
NEEDLE PROTECTION.*

SEE THE SPOREPLAY+ IN ACTION!

TECHNICAL SPECS

Footprint:
L:37.5cm x W:24cm
Height: 43cm
Weight:15.2kg

Power:110 > 240V AC



STAGE LEVER
Allows fast movements across both axes.

UPPER TWIST GRIP
Controls movement in the Y-axis.

LOWER TWIST GRIP
Controls movement in the X-axis.

ORTHOGONAL GRID & INDEX POINTER
This unique feature of the SporePlay+ gives a graphical representation of the dissection layout as a positional reminder during stage translation. It also gives the user a choice of inoculum position.

SPRUNG LEVER
Holds dishes securely against dish locators.

DISH LOCATORS
The stage is capable of housing a standard 90mm dia. Petri dish.

NEEDLE HOLDER
Enables the user to change the needle quickly and safely with the convenient pinch-release function.

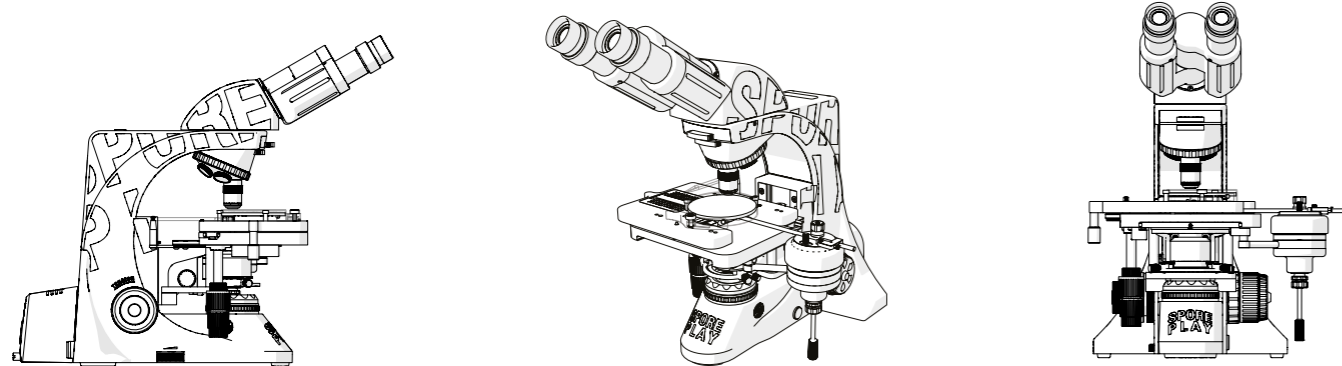
TOOL HOLDER CLAMP

TOOL HOLDER STOP
Allows fine control of tool holder.

COARSE CONTROL LOCK
Allows the coarse control of the needle across Y-axis.

MICROMANIPULATOR JOYSTICK
Give user needle control across X,Y & Z axes.

TOOL HOLDER



STANDARD SET-UP

MODEL:

SporePlay+™

PRODUCT CODE:

SPO-002

OPTICAL SYSTEM:

- x20 LWD objective, x15 widefield eyepieces.

MICROMANIPULATOR:

- X,Y & Z Axis control from single joystick.
- Twist-lock mechanism.
- Tool holder clamp for quick needle change.

STAGE:

- Mechanical stage, X & Y range of 80x55mm.
- Z axis movement 27mm with fixed upper limit stop for lens protection.
- 5mm click stop grid positions.
- 2x 12x4 grids for total of 96 spores.
- Choice of inoculum position.

TOOL HOLDER:

- Pinch-release needle replacement function.
- Tool holder stop with fine control.

NEEDLES:

- One complimentary box of ten Singer dissection needles.

FOCUS:

- Coarse focus with torque adjustment & lock.
- Fine focus with 1µm minimum increment.

ILLUMINATION:

- Externally mounted lamphouse, 6V/30W.
- In preparation: 3W LED illumination, 6000k & 4500K.
- Quartz Halogen illumination (included as spare)
- Auto-off/on and Light Memory function.

OPTIONAL EXTRAS

MICRO-ZAPPER

ZAP-003

NEEDLES (3PK OF 10)

NDL-030

X4 OBJECTIVE

OBJ-001

SLIDE HOLDER

SLH-002

SUPPORT (1-YEAR)

LAB SUPPORT LITE

SLS-001

LAB SUPPORT

SLS-002

LAB SUPPORT PLUS

SLS-003

GET A QUOTE



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!





LUKASZ KOZUBOWSKI

CLEMSON UNIVERSITY

FINDING A TREATMENT FOR
CRYPTOCOCCAL MENINGITIS



THE KEY COMPONENT OF GETTING
A FACULTY POSITION TODAY IS TO
BE THE RIGHT FIT FOR THE JOB, IN
TERMS OF YOUR RESEARCH PLAN
AND YOUR FUTURE GOALS.

“

As a child, I would always like to take apart all of my toys. I would destroy it completely to see what was inside. I could not stand the fact that I saw something working and I did not really know what was behind it, what's the mechanism. So, it is just in me, this curiosity, this need to get to the truth, to the core of the problem. I just want to know how things work. Studying biology is no different. My major motivation is to know the answers to some basic scientific questions. Biological systems are extremely complex. Understanding how cells work fascinates me. It is challenging to get to the nuts and bolts of nature's intricate design, which is what I love about this process.

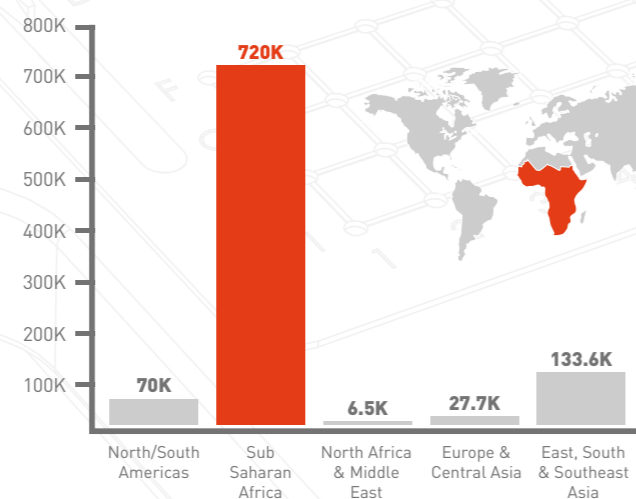
Cryptococcus neoformans is a great model organism to satisfy my scientific curiosity. Since it is a human pathogen, I want to know how it is infectious, why it is infectious, and how to treat the disease better. It is genetically tractable, which means it presents us with a great tool to study the molecular nature of the disease, and identify genes and pathways, which can be targets of drug therapy.

I am fortunate to be able to follow my passion as my job and also contribute by addressing cure for fungal infections. I feel that improving the therapeutics available is in some way my responsibility to this society.

Fluconazole is currently used for treating pulmonary cryptococcal infection, which is inexpensive, but *Cryptococcus* can develop resistance to the drug. For meningitis that is really life threatening, amphotericin B and flucytosine are used in combination. Apart from being relatively more expensive and with huge side-effects, they may actually be lethal when not applied carefully. So I think there is definitely a pressing need for better drugs and better treatment

of fungal infections. I'm trying to understand how *Cryptococcus* develops resistance to Fluconazole, by dissecting the molecular pathways, which contribute to drug resistance.

ESTIMATED YEARLY CASES OF CRYPTOCOCCAL MENINGITIS



The *Cryptococcus* genome is very plastic. It can actually change the chromosomal copy number and copy number of certain genes. If such a phenomenon were observed in the host cells, it would usually be considered the sign of malignancy or cancer. However, such genomic changes are very common in *Cryptococcus*, especially under drug-induced stress conditions. So within the population, it creates individuals that can have additional copies of specific genes, and that gives an advantage in the face of stress. This is because those lucky individuals who may have the right copy number of the right genes may gain an edge in that particular environment. Their progeny would simply take over the population and proliferate in the presence of the drug.

We know that changes in genome ploidy lead to drug resistance. We also know that fluconazole causes changes in *Cryptococcus* genome ploidy. But our understanding of the link between fluconazole treatment and establishing a change in ploidy is lacking. If we know the mechanism, we can make a contribution to eliminate *Cryptococcal* drug resistance. This is what I want to find out: What is the actual mechanism? How does *Cryptococcus* sense stress? How does fluconazole treatment translate into changes in the *Cryptococcal* genome?

Even though *Cryptococcus* is a budding yeast like *Saccharomyces cerevisiae*, I would describe its mitosis as being more similar to human cells. When you think of it, cancer cells are almost like pathogens. They are survivors, which escape normal cell death in the face of stressful conditions. One way to achieve this would be for the cells to become aneuploids or change their chromosomal numbers, making them more difficult to eradicate. I think there are many similarities between *Cryptococcus* and cancer cells. Knowing the mechanism of *Cryptococcal* genome changes may have a profound implication on our understanding on how cancer cells survive during stress. For *Cryptococcus*, the meiotic progeny are cells that basically grow as a chain of spores on the basidia. It's actually quite nifty to dissect *Cryptococcus* spores, especially with the SporePlay 40x objective, because you can glue these spore chains to the needle and take up the entire spore chains. Such manipulators allow detailed gene mapping because you can see the frequency of recombination.



SEE SIR PAUL NURSE'S STORY



If cells are on the drug plate, they change morphology and then develop into those resistant colonies. I like to use the indexing feature to go back and see the same cells over time, so we can track this very slow process of morphological change.

I was lucky because here at Clemson University there is this very new initiative, called Eukaryotic Pathogens Innovation Center (EPIC). While several laboratories within EPIC study parasites, my interest in fungal pathogens meant that I was somebody that could diversify the group and bring novel ideas to tackle infections. This is how I got on board at EPIC and how I found the right fit for my research interests. In addition to fulfilling my personal passion to be a researcher, becoming a faculty adds another exciting motivation for me: training and motivating young scientists. I find it very refreshing to discuss ideas and trouble-shoot problems with students. I am responsible for being a mentor, to guide students in the right direction and inspire them by being an example—it is extremely rewarding and reaffirms my faith in my profession.

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SPORE™ PLAY+

THE WORLD'S FASTEST TETRAD
DISSECTION MICROSCOPE

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DEMO TODAY*

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