Lab Manager

EVOLUTION OF MICROPLATE TECHNOLOGY

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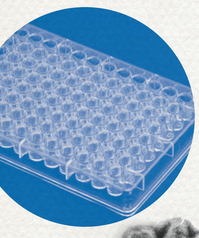
Enter any clinical diagnostic or research lab today and you will see the intricate dance of microplates being filled with samples, transported into various diagnostic and analytical instruments, washed, and then begin the process all over again. The microplate has evolved over the past 65 years into an indispensable piece of equipment used in many labs today.

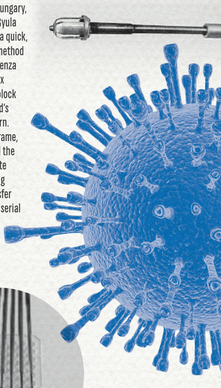
1950

1951

In response to a serious influenza epidemic in Hungary, scientist and inventor Gyula Takátsy worked to find a quick, reliable, and low-cost method for identifying the influenza virus. He constructed six rows of 12 wells into a block of acrylic, and the world's first microplate was born. During the same time frame, Dr. Takátsy also created the first form of a microplate automation tool, helping scientists mix and transfer pre-defined volumes in serial dilution testing.

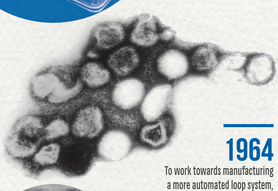


Dr. Gyula Takátsy



1953

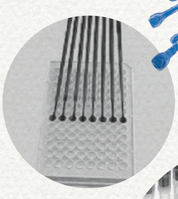
The industry gains momentum as a manufacturer begins mass producing molded 96-well microplates for the first time.



1964

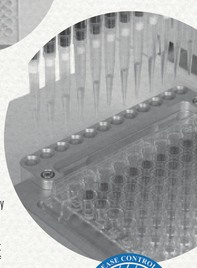
To work towards manufacturing a more automated loop system, Dr. John Sever, who was leading a Rubella vaccine program at the National Institutes of Health (NIH), teamed up with engineer Frank Cooke. Together, the team created microtiter plates. For the first time, lab technicians were able to maneuver eight to 12 machine loops and droppers, twirling them around and moving them from row to row in a plate.

Dr. John Sever



1967

Although the system developed by Sever and Cooke was efficient, it was still a manual one. A few years later, the creation of the Autotiter, the brainchild of Tom Astle, provided researchers with fully automated serial dilution. The Autotiter proved itself as a worthy clinical lab instrument after performing thousands of hemagglutination inhibition tests for a trial for a Rubella vaccine.

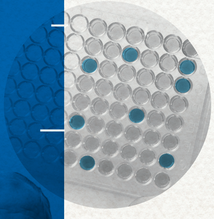


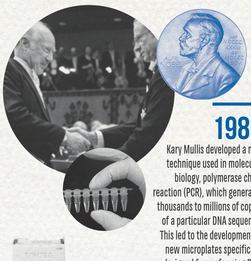
1969

Researchers at the NIH were using serial dilution for minimum inhibitory concentrations (MIC) for antibiotic susceptibility testing, and they saw the Autotiter as a potential tool for gathering more definitive numbers from MIC. Dr. Hugh Gerlach, at St. Francis Hospital in Wichita, conducted an initial trial with the Autotiter, but it lost to one of Gerlach's technicians, according to Astle. However, it would go on to make a comeback.

1976

In London, the Centers for Disease Control (CDC) began using microplates for ELISA (Enzyme-Linked Immunosorbent Assay) diagnostics and quality control techniques, which became one of the most common applications for microplates. This created a high demand for instruments to perform ELISAs, which inspired manufacturers to evolve early microplate readers into the Multiskan photometer—the earliest version of the common day microplate reader.





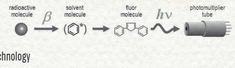
1983

Kary Mullis developed a new technique used in molecular biology, polymerase chain reaction (PCR), which generates thousands to millions of copies of a particular DNA sequence. This led to the development of new microplates specifically designed for performing PCR. Mullis went on to win a Nobel Prize in Chemistry for this contribution.

Dr. Kary Mullis

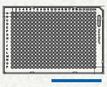
1986

Wallac, a biotechnology company now known as PerkinElmer, developed the Wallac Betaplate. The Betaplate is used for scintillation counting, or detecting and measuring ionizing radiation. It was the first-ever automated microplate-based instrument for scintillation counting.



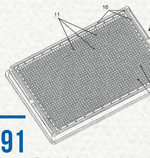
1990

Tom Astle, the creator of the Autotiter, continued to position himself as a lead innovator in the development of new technologies for drug discovery labs. Building on the Wallac Betaplate instrument, Astle created the Harvestor2 and Quadra 3 automated pipettors.



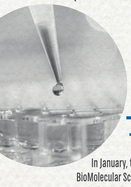
1991

The first 864-well microplate was produced, enabling single machines to increase their throughput to over 10,000 samples per day.



1992

Bigger microplates don't always mean better. Companies continued to experiment with various sized microplates in search of the right combination of thermal mass and capacity, leading to the production of the first 384-well plate.

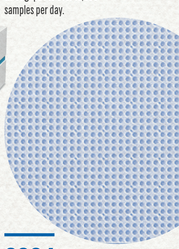


1996

The demand for high throughput screening leads to the development of multiple formats including 1536-well and 3456-well plates by Whatman and Aurora Biosciences.

1997

The first-ever multi-detection microplate reader with fluorescence polarization, dubbed the BMG POLARstar, was developed.



2000

1998

In January, the Society of BioMolecular Screening (SBS) established a committee to standardize the dimensional elements of the microplate. Going forward, microplate manufacturers modified production equipment to adhere to the new standards, and the industry saw an increased ability to develop automation equipment.

2004

BioTek introduced a multi-detection system, the Synergy™ 4 with Hybrid Technology™, giving scientists the ability to perform an unlimited number of microplate-based assays.

2009

As microplate automation continued to evolve, a new product hit the market that combined a microplate washer and reagent dispenser in one instrument. With the new combination washer dispenser, called the EL406, researchers no longer needed to maintain and purchase separate instruments.

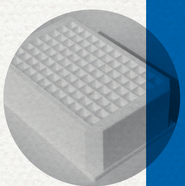
slas
Come Transform Research

2010

In 2010, the Society for Biomolecular Sciences merged with the Association for Laboratory Automation to form a new organization, the Society for Laboratory Automation and Screening (SLAS). Henceforth, microplate standards have been governed by this organization and are known as ANSI/SLAS standards.

2015

Researchers created a cost-effective cellphone-based microplate reader, featuring a 3D-printed opto-mechanical attachment. The hand-held instrument helps researchers perform high-throughput disease screening and tracking of vaccination campaigns.



2016

A new microplate for genomics sample preparation was launched at the Analytica 2016 exhibition in Germany. It was designed with thickened walls and supporting ribs to prevent cracking or leaking when used in Geno/Grinder machines.

2016

Researchers launched the Spark® 20M multimode microplate reader to help with drug discoveries and advanced life science research applications.

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