2013 Issue #3

Cell Culture Report

HappiLabs.org

This report belongs to _____

If scientists are FALSIFYING data, are suppliers and manufacturers too?

In recent years there has been a rise in the quantity of retracted papers due to false data. Is this trend limited to scientists? Most people are unaware there is minimal regulation of the price and quality of lab supplies. Anyone can make and sell products to scientists. A system without "watchdogs" or regulation is more likely to contain false information.

Therefore, HappiLabs is collecting, organizing, and analyzing product quality data from suppliers and manufacturers. We will identify and promote the companies that are transparent and fair with their product information. This will result in an increase in the overall quality of scientific research, which is part of our mission.

We want you to focus on your research, and we'll make sure you're using high-quality products. We're here to help your lab. Use us.

Peace,
Tom Ruginis
President and Chief Happiness Officer

Learn more at
www.happilabs.org
@HappiLabs_org

THANK YOU!

These wonderful humans contributed to the creation of this report:

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Tom Ruginis

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EDITOR Elizabeth Preston

SCIENTIST SPOTLIGHT

Raudel has a PhD in Pharmacology from UIC with expertise in PCR and cell culture–related experiments. He contributed to product research and editing in this report. He loves soccer, Thai food and *Breaking Bad*.

PAPERS OF SPECIAL INTEREST

1 **Bioactive Contaminants Leach from Disposable Laboratory Plasticware**, from *Science* 7 Nov. 2008, Vol. 322 pg. 917

2 **Plastics Hamper DNA Assays: Chemicals Leaching from Lab Plastics Throw Off Results**, from *Nature.com*, April 2010

How much time, money and happiness does this cost your lab?

Do HEALTHY cells = HAPPY scientists?

The quality of cell culture supplies can have a big impact on how "happy" your cells are (adherence, confluence, proper morphology, etc.). Has your lab evaluated the quality of the cell culture plastics currently in use?

Plastics are manufactured all over the world under varying conditions and quality standards. Low quality can lead to unhealthy cells, which will affect the consistency and validity of your experimental results!

To help keep your cells healthy, HappiLabs examined the quality information available for various manufacturers and distributors of cell culture supplies. Use our data and features tables to decide which brand is best for your experiments.

GLOSSARY OF TERMS

QUALITY FEATURE	DEFINITION
Price	Average cost per unit
Sterilized	Free from all microorganisms (e.g. bacteria, fungi, viruses). Sterilization is achieved by gamma irradiation
Certified non-pyrogenic	Products have been tested for a level of endotoxin that will not elicit a pyrogenic response, which can affect cell growth and function *in vitro*
Level EU/mL	Endotoxin units per milliliter. One EU equals approximately 0.1 to 0.2 ng endotoxin/mL of solution
RNase/DNase free	Free from RNases/DNases, which are enzymes that degrade RNA/DNA. The sterilization process alone (gamma irradiation) is unable to eliminate RNases/DNases
Non-cytotoxic	Samples have been tested and shown to be free of cytotoxic substances, which can alter the morphological characteristics of a cell and cause growth inhibition and/or cell death
Certificate of Analysis (COA)	The COA is a document issued by Quality Assurance that confirms that a regulated product meets its product specifications
HappiFeatures	Attributes that enhance the usability and efficieny of a product. **Pay attention** to these features to determine which brand to buy

NOTE: Product quality information was obtained from company websites, product catalogs, and quality control documents. Only the brands listed were evaluated.

FLASKS

Cell culture flasks provide a reliable contamination barrier and are therefore recommended for **long-term** maintenance of cells.

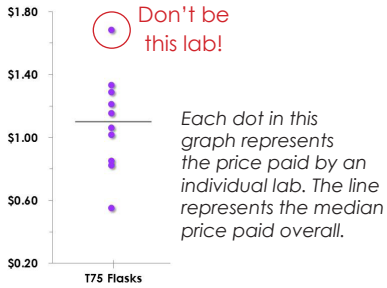
Flasks come with filtered or non-filtered caps. Filtered caps allow the exchange of CO_2 while still providing a barrier to contamination. They are only capable of maintaining an open system (air exchange between inside and outside environments). Non-filtered caps allow a closed system.

Cell culture flasks range from 25–150 cm^2, which represents the total growth surface area. We analyzed pricing for the most commonly used size, T75. A fair price to pay in academia is…

T75 Flasks w/ Filter Cap

$1.18/Flask
Median Price
$23.60/20 Flasks

Do you want help shopping for flasks?
Call us: 312-569-0161



Each dot in this graph represents the price paid by an individual lab. The line represents the median price paid overall.

Important Flask Features

Certain HappiFeatures for T75 flasks can make cell culture more efficient. These include:

- **Integrity/Leak Tested** to ensure no leaking
- **Graduations** for easy volume reading
- **Marking Area** for labeling samples
- **Stacking Ridges** allow for more secure stacking

	BD Falcon	BioLite (Thermo)	Corning Costar	Genesee Olympus	Greiner CELLSTAR	Nest (Denville)	Nunc (Thermo)	Sarstedt	TPP (MIDSCI)
Quality Features									
Sterilized	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-pyrogenic	✓	✓	✓	✓	✓	✓	✓	✓	✓
Level EU/mL	<0.1		<0.1		<0.06	<0.125		<0.06	<0.06
RNase/DNase free				✓	✓	✓			✓
Non-cytotoxic	✓	✓			✓			✓	✓
Certificate of Analysis	✓		✓		✓	✓		✓	✓
HappiFeatures									
Integrity/Leak Tested			✓		✓	✓	✓		✓
Graduations	✓		✓	✓	✓	✓	✓	✓	✓
Marking Area	✓			✓	✓	✓		✓	✓
Stacking Ridges	✓			✓	✓	✓			✓

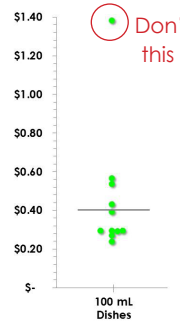
DISHES

Cell culture dishes come with an increased risk of contamination due to accidental lid removal and therefore are recommended for **short-term** experimental setups, not long-term.

Dishes are commonly available in the following sizes: 35, 60, 100 and 150 mm. We surveyed labs for pricing of the most commonly used size, 100 mm. A fair price to pay in academia is…

100 mm Dishes

$0.40/Dish
Median Price
$39.53/100 Dishes



Each dot in this graph represents the price paid by an individual lab. The line represents the median price paid overall.

Important Dish Features

Certain HappiFeatures for 100mm dishes can make cell culture more efficient. These include:

- **Stacking Rings/Beads** allow for more secure stacking
- **Vented Lids** provide consistent gas exchange and reduced condensation
- **Numerical Markings** allow better plate orientation
- A **Secure Grip** decreases the risk of experimental contamination
- **Marking Area** for clear labeling

	BD Falcon	BioLite (Thermo)	Corning	Genesee Olympus	Greiner CELLSTAR	Nest (Denville)	Nunc (Thermo)	Sarstedt	TPP (MIDSCI)
Quality Features									
Sterilized	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-pyrogenic	✓	✓	✓	✓	✓	✓		✓	✓
Level EU/mL	<0.1		<0.1		<0.03	<0.125		<0.06	<0.06
RNase/DNase free				✓	✓	✓			✓
Non-cytotoxic	✓	✓			✓			✓	✓
Certificate of Analysis	✓		✓		✓	✓	✓	✓	✓
HappiFeatures									
Stacking Rings/Beads	✓		✓				✓	✓	✓
Vented Lids	✓		✓	✓	✓	✓	✓	✓	✓
Numerical Markings				✓		✓			✓
Secure Grip				✓				✓	✓
Marking Area									✓

Which brand do you use? Write a review @ HappiLabs.org

SEROLOGICAL PIPETS

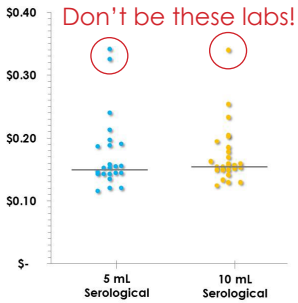
Serological pipets are used in cell culture and in the general laboratory for liquid handling. Disposable serological pipets are manufactured from polystyrene and are available in three main types of packaging: bulk, individually wrapped in paper/plastic and individually wrapped in all plastic.

For increased sterility, individually wrapped pipets are recommended for cell culture work. A fair price to pay in academia is…

Individually wrapped in paper/plastic

5 mL	10 mL
$0.15/Pipet Median Price $30.61/200 Pipets	**$0.16/Pipet** Median Price $31.40/200 Pipets

Do you want help shopping for pipets?
Call us: 312-569-0161



Each dot in this graph represents the price paid by an individual lab. The line represents the median price paid overall.

Important Pipet Features

Recommended Feature: **One-Piece Construction** will decrease risk of contamination, increase volume accuracy and reduce dripping. Other features:

- Stated volume is within **+/- 2% Accuracy**
- **Color Coded** sizes provide quick volume identification
- A good **Plug** can protect your pipet-aid from overpipetting

	BD Falcon	Corning Costar	Fisherbrand	GeneMate (Bioexpress)	Genesee Olympus	Greiner	Nest (Denville)	Sarstedt	TPP (MIDSCI)	VWR
Quality Features										
Sterilized	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-pyrogenic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Level EU/mL	<0.1	<0.1	<0.5				<0.06		<0.06	<0.1
RNase/DNase free		✓			✓	✓	✓		✓	
Non-cytotoxic	✓	✓		✓		✓	✓		✓	✓
Certificate of Analysis	✓	✓				✓			✓	✓
HappiFeatures										
One-Piece Construction							✓		✓	
+/- 2% Accuracy	✓	✓	✓		✓	✓	✓		✓	✓
Color Coded	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Plug	polyester-fiber	polyester		polyester-fiber	patented filter	bonded polyester	bonded polyolefin	cotton wool	cotton	polyester

Researchers Who Make an ENVIRONMENTAL Difference

Alicia Murchie was a researcher for five years. At UMass Amherst she powered tiny cars with electricity generated by bacteria (*Geobacter*) and then became Tissue Culture Manager in the Eggan lab at Harvard. Noticing the excessive waste created by researchers, she took action. Alicia galvanized lab managers to consolidate purchases—reducing shipping waste and lowering costs by $50,000 in the first year—then contributed to the innovative design of three new labs to make them more sustainable.

Eventually, she transitioned into Sustainability Manager for the Harvard Longwood Campus, where she has contributed to the creation of multiple programs aimed at reducing waste and saving grant money (including styrofoam recycling, left). A popular program is the **Lab Reuse List**, which helps labs share unused supplies with other labs that need them. The process is simple: take a photo, write a short description, send it to the Harvard Sustainability Team, and wait for a lab to "claim" it. To view the list, visit green.harvard.edu/labs-reuse-list.

Launched in January, the program saw 500 page views in the first month and a 70% turnover of supplies. Labs have shared items as small as glass pipets and as large as stacked incubators. Alicia estimates that labs have easily **saved over $10,000** to date from swapping supplies and simultaneously reduced the amount of waste destined for landfill by salvaging usable supplies from lab moves.

For questions about the program, contact Alicia:
alicia_murchie@harvard.edu

And to learn more about creating green labs, visit:
www.green.harvard.edu

ADVICE FOR BEING A QUALITY LAB MANAGER

We asked two lab managers with 10+ years of experience, "What advice would you share with other lab managers?"

"Lead by example. *If it is annoying when people leave dishes in the sink, then make sure you don't do it. It is cliché, but treat others as you expect to be treated."*

KEVIN FELDHEIM, PhD
Lab Manager at The Field Museum

"Communication *in the lab is key—especially communicating when lab supplies are running low, what lab chores need to be done, phone messages, etc. A dry-erase white board is a great way to achieve this."*

DEBBIE KNIGHT, MS
Lab Manager at Ohio State University

"HappiLabs has been extremely **HELPFUL**. I am **HAPPY** that a service like this exists; it makes my job easier."

—Jenny Beck
Director of Research Resources Center at the University of Illinois at Chicago

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