# *The National Institutes of Health Green Labs Program*

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Office of Research Facilities
National Institutes of Health (NIH)
Department of Health and Human Services
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# The National Institutes of Health Mission

*To seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.*

- 27 Institutes/Centers/Offices • 22,000 staff • Approximately 3000 labs

# Environmental Management Programs

- Water Conservation
- Energy Conservation
- Green Procurement
- Waste Management:
  - Chemical Waste
  - General Waste
  - Medical Pathological Waste
  - Radioactive Waste
- Recycling
- Outreach and Communication

Source: Getty Images

# *Why did we start a Green Labs Program?*

**Current Situation**

Each lab has the flexibility to choose the area of focus to support environmental stewardship

⇩

**Goal**

Reduce environmental footprint by increasing participation in the NIH environmental initiatives

⇩

**Approach**

Develop a self-assessment tool for laboratories to assess their participation

Source: Getty Images

## Green Labs Program

*Initiative: Sustainability Management Team*

Intramural Research

Institutes Centers Offices

Office of Research Services

Office of Research Facilities

# Sustainability Management Team


Sustainability Goal Leads

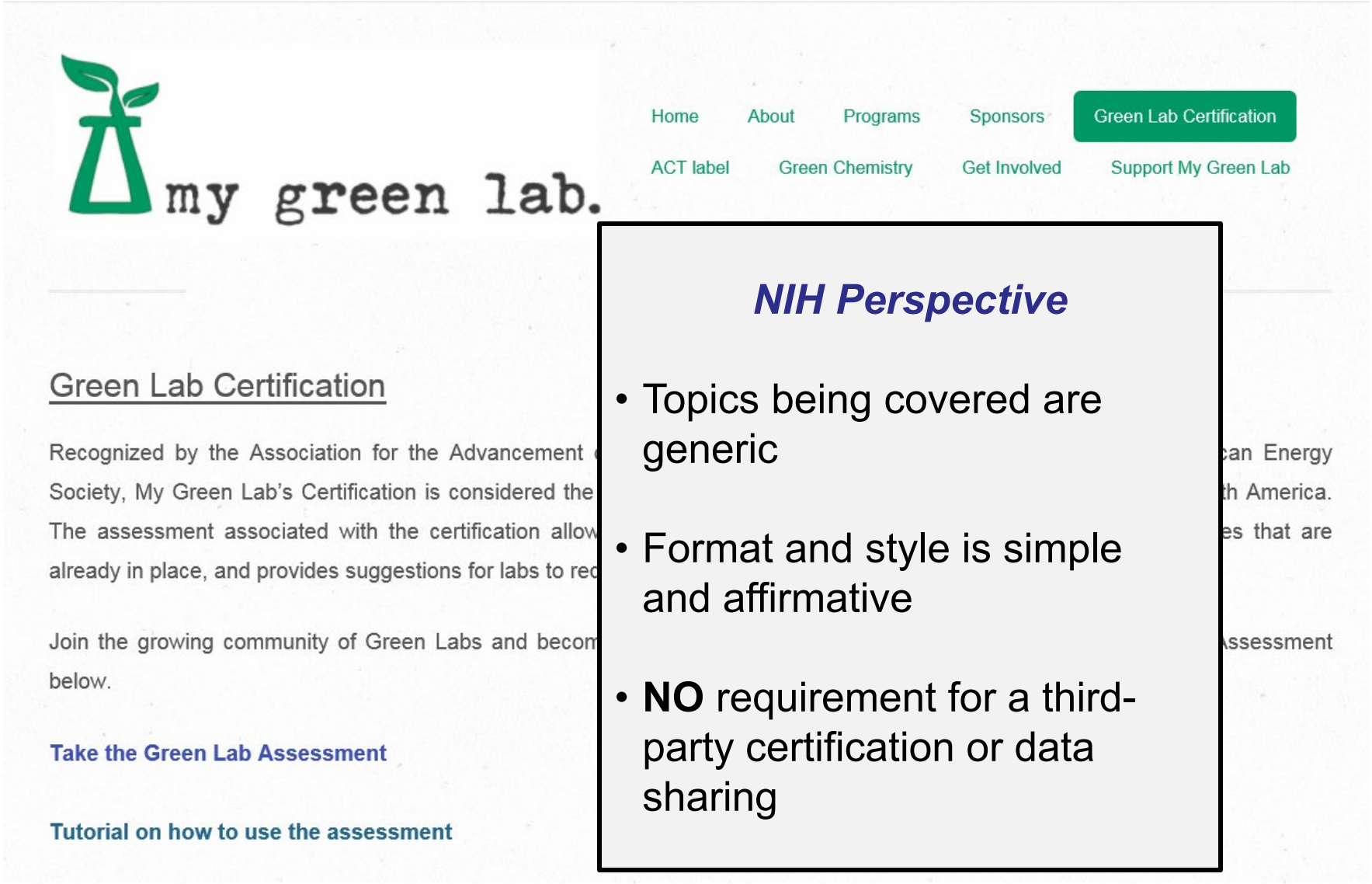
Environmental Management Program Leads

Sustainable Laboratory Practices Working Group (SLPWG)

Institutes and Centers Green Teams Leads Council (GTLC)

Grassroots Participation

# How did we develop the Green Labs Certification?




## *NIH Perspective*

- Topics being covered are generic
- Format and style is simple and affirmative
- **NO** requirement for a third-party certification or data sharing

# Identify the Key Components

- Educational
- User-friendly
- Central repository of information with links to policies/regulations and contact information
- Self-explanatory about the NIH environmental programs and best management practices
- One page document
- Complete the assessment quickly
- Submit the assessment electronically

Source: Getty Images

**Special acknowledgement:** Beta Testers (Lab representatives from various Institutes and Centers) who helped in developing the program.

# Online: NIH Green Labs Program (created on SharePoint)

## Fact Sheet

Site Actions

Bhattacharya, Bani (NIH/OD/ORF) [C]

### NIH Green Labs Program

The NIH Green Labs Program is an initiative of the Sustainability Management Team to recognize laboratories who choose to reduce their environmental footprint by participating in NIH environmental initiatives. The purpose of the program is to recognize laboratories for their achievements; to encourage greater participation in NIH environmental initiatives; and to make it easier for researchers learn about environmental stewardship by providing one source of information about relevant programs, policies, regulations, and mandates.

The Green Labs program is a self-assessment tool. Laboratory personnel can apply to the program by filling out one form, which has 32 statements.

**The topics covered in the NIH Green Lab Assessment tool include:**

- Energy Conservation
- Freezer Management
- Water Conservation
- Chemical Waste
- Medical Pathological Waste
- Radioactive Waste
- Waste reduction
- Recycling
- Green Chemistry
- Inventory Management
- Outreach

**Who can apply?** All laboratories are eligible to apply. Any person representing the lab ca

**What is the application process?** First, please take a few minutes to read the Green Lab
Once you have all of the information, please scroll down the link to fill out the Green Lab
Applicable: NA" to reflect the current practices in your lab.

After reading the Green Lab Self-Assessment statements, if you become aware and recog
moving forward. For instance, if you have not subscribed to the NIH Green Zone Newslett

Please note that the application MUST be completed all at one time. It is not possible to c
minutes. Once all of the responses to the statements are provided, please click "Finish" to

**What is the Timeframe?** Applications for the 2018 Green Labs Program can be submitt
application and send a reply within 2 weeks.

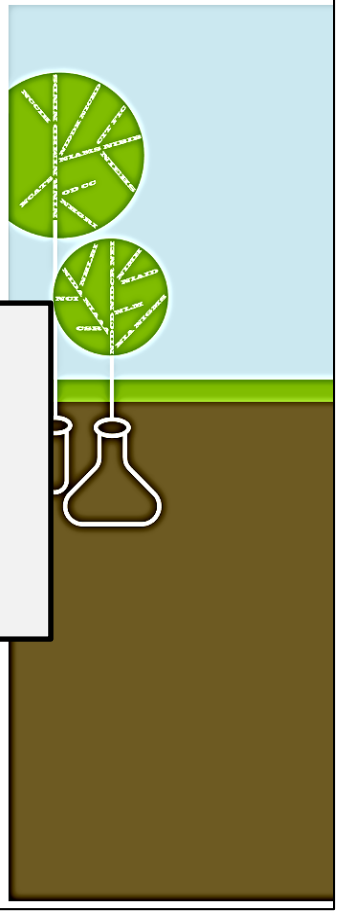
**What is the Criteria to achieve a Green Lab Certification? There are two criteria:**

1. The first five statements refer to practices that are required by NIH policy, and therefore affirmative "True" or not applicable responses to each of these 5 statements are mandatory to achieve a Green Lab Certification.
2. In addition, the next 27 statements refer to initiatives that are preferred, but not required. Labs that reply "True" to 10 of these statements will receive the NIH Green Lab Certification.

**How will labs be recognized for achieving the Green Lab?** The NIH Sustainability Management Team (SMT) will award Green Lab Certificates to each lab that applies to the program and meets the criteria. The SMT will also share the results with the NIH Office of Intramural Research and the IC Scientific Directors.

For additional information, please contact the Green Labs Program Manager, bani.bhattacharya@nih.gov

A note of appreciation: The NIH Green Labs Program is adapted from My Green Lab, a non-profit organization which collaborated with Universities in California including UC Davis, UC Santa Barbara, UC Santa Cruz, UC San Francisco, and UC Los Angeles, to develop a Green Lab assessment tool. The NIH Green Labs Program was developed to fit the circumstances and priorities of NIH laboratories.



- *Application instructions*
- *Certification criteria*
- *Link to self-assessment document*

# Online: NIH Green Lab Program

## Self-Assessment Form

Freezer Management:

8. All of our freezers are listed in the NIH Business System Sunflower Property Database. Please contact your Property Accountability Officer (PAO) for more information. *

9. When purchasing a new freezer we select an Energy Star Certified model per the Manual Chapter 26101-16. *

10. We have installed remote monitoring temperature sensors and we calibrate them annually. *

Water Conservation:

11. We shut the door of the autoclave after removing the items to prevent loss of heat and steam.

12. We request the building maintenance staff to repair leaks and malfunctioning faucets and mac

Chemical Waste Management:

13. We collect all types of batteries for proper disposal and recycling. *

### *Certification Criteria:*

Q1-Q5: Mandatory NIH policies – Answer either "**True**" or "**NA**" to be eligible for Green Labs Certificate

Q6-Q32: Answer "**True**" to 10/27 questions and receive a Green Labs Certificate

# Advertise and Communicate

- Newsletters
- NEMS website www.nems.nih.gov
- Announcements and reminders to partner groups
- Events

NIH GREEN ZONE NEWSLETTER
The Newsletter of the NIH Environmental Management System

SUBSCRIBE PREVIOUS ISSUES

SEPTEMBER 2018

**Introducing the NIH Green Labs Program**

Does your lab recycle? Do you turn off equipment not in use? Take a look at the new NIH Green Labs Program Self-Assessment tool to evaluate how well you are implementing green practices in your lab. You can also learn about new ways to improve your lab's environmental stewardship!

The NIH Green Labs Program is designed to help NIH labs reduce their environmental footprint by encouraging participation in NIH environmental initiatives. The Self-Assessment tool provides a singular source of information for researchers to learn about relevant programs, policies, regulations, and mandates. The Self-Assessment tool also provides contact information for anyone looking to participate in the listed environmental initiatives. Some of the topics covered in the NIH Green Labs Program are conserving energy and water, managing waste, using less toxic chemical alternatives, and many more. Review the NIH Green Labs Program Self-Assessment statements to evaluate how well your lab is doing at environmental stewardship!

Any NIH staff can fill out the NIH Green Labs Self-Assessment form for their lab until December 31, 2018. The self-assessment consists of 32 statements with quick and easy true or false answers. To become certified, labs must reply "True or NA" to 5 statements about NIH regulations and "True" to 10 of the remaining 27 statements about green practices. For a more detailed summary of the NIH Green Labs Program certification process and to fill out the Self-Assessment form, please visit the NIH Green Labs Program webpage (you must be on the NIH network to access this form).

Once your self-assessment is submitted and evaluated, qualifying labs will receive the title of NIH Green Lab! These labs will receive an official NIH Green Labs Program Certificate and will be entered into a lottery pool in early January 2019, from which 5 lab representatives will receive a travel award to a conference on environmental stewardship in biomedical research. The NIH Green Labs will also be recognized in a variety of media forms, such as newsletters, e-mails, bulletins and more! Be sure to submit your self-assessment to have your lab announced as an NIH Green Lab!

You can learn more about the NIH Green Labs Program in person at the 2018 NIH Green Labs Fair on September 12, from 12-2 pm, in the Building 10 South Lobby. The Green Labs Fair also features a variety of information on green products, green practices and environmental initiatives that you can use to reduce your lab's environmental footprint. Learn about green products directly from their vendors, discover green practices from the lab staff that actually use them, and inquire about NIH initiatives with the staff that run them! To learn more about the 2018 NIH Green Labs Fair, click here.

For questions regarding the NIH Green Labs Program, please contact Ms. Bani Bhattacharya.

TAKE ACTION

NIH Green Labs Fair
Vendor & Poster Show
Wednesday, Sept 12
12:00–2:00pm
Bldg 10 – South Lobby

**Visit the 2018 NIH Green Labs Fair**

The 2018 NIH Green Labs Fair is September 12 from 12-2 pm in the Building 10 South Lobby. This event features a green products show with over 20 vendors and a green poster show with presentations from throughout NIH. Visit the Green Labs Fair to learn more about green products, green practices and NIH environmental programs and initiatives!

LEARN MORE

STAFF SPOTLIGHT

**Meet Dr. Da-Ting Lin, a Green Champion Award Winner**

This month, we are highlighting an individual that uses green practices in his daily routine, Dr. Da-Ting Lin. Dr. Lin has been previously recognized with a 2016 HHS Green Champion award for the development of the miniScope, which combines multiple green practices. Read the full article to learn about the ways Dr. Lin is incorporating sustainability at the NIH!

LEARN MORE

NEWS YOU CAN USE

**How to Make Your Lab Go Green**

BY MANJU BHASKAR, NINDS

There's a lot of talk these days about labs "going green" in an effort to reduce their environmental footprint and promote sustainable laboratory practices. But what does "going green" mean exactly, and how do you go about it?

Some of the basic fundamentals of a green lab include conserving energy and water, reducing waste, and recycling. Proper disposal of chemical, medical, and radioactive waste in safe, environmentally friendly ways plays an additional critical role in supporting sustainability. Even using "green" chemicals should be considered as part of the effort to "go green."

The good news is that several NIH labs already meet the green-labs criteria. But, until now, there has been no official process for recognizing them. Now labs can be assessed and certified as green under a new initiative sponsored by the Green Labs Program.

The Green Labs Program aims to encourage "going green" in NIH laboratories, to conserve natural resources, and to protect

minimal usage of radioisotopes, methanol, and X-ray film; and using green products as safer alternatives to certain toxic chemicals. For example, try semidry transfer techniques for Western blot analysis to avoid using methanol, limit waste, and save time and energy. Throughout the campus, there's been increased use of safer substitutes for ethidium bromide. Labs are also trying environmentally friendly DNA-purification and DNA-isolation kits that use significantly less plastic and are in recyclable packaging.

In the electrophoresis realm, the National Institute on Deafness and Other Communication Disorders (NIDCD) is playing a role: The Section on Human Genetics (in the Laboratory of Molecular Genetics) has an E-Gel Agarose Gel Station with a digital imager that uses less power than a large agarose gel-electrophoresis box. The gels come prestained with either ethidium bromide or SYBR Green, and, to increase safety, they are encased in plastic so the stain does not leak out.


Green Labs Fair

# *Example of an Institute Event*
# *14th Annual NIDDK Scientific Conference*
# *NIH Green Labs Program*

## Abstract

We are calling all friends of the environment to come-and-learn how to green your labs! The Sustainable Laboratory Practices Working Group (SLPWG) works toward the goal in identifying and encouraging sustainability in the NIH laboratories. The NIH Green Labs Program is a collaboration between the SLPWG and the NIH Environmental Program Leads to encourage greening activities in the laboratories. The Program provides a comprehensive list of the various NIH environmental programs including but not limited to energy and water conservation; waste management of chemical waste, radiological waste, and medical pathological waste; recycling, green chemistry, toxic reduction, and many more within the Green Labs self-assessment form. Any NIH staff representing a lab could fill out the self-assessment form. Labs meeting the Green Labs Program criteria would be recognized and rewarded for practicing sustainability. We, the SLPWG, are continuously looking for innovative ideas, suggestions, and collaborative efforts for improving and inculcating sustainable laboratory practices. As a team, we strive to encourage participation, address challenges, and listen to your ideas and recommendations for "greening" our labs.

# NIDDK Laboratory Green Lab Initiatives Poster

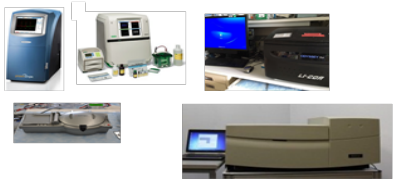
## Green Lab Initiative: Bringing NIH Closer to Sustainability Goals

**Minoo Shakoury-Elizeh**[1], **Daman Kumari**[2], **Peter Yuen**[3]
[1]Genetics and Metabolism Section, LDB, [2]Gene Structure and Disease Section, LCMB, [3]Kidney Disease Branch
National Institute of Diabetes, Digestive and Kidney Diseases

### Reduction of Chemical Waste and Cost

**-Minimal usage of radioisotopes, X-ray film and methanol**

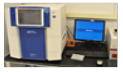
- Using digital imaging for protein, RNA and DNA detection
- Reduces usage of film and the need for having a darkroom
- More sensitive for protein detection
- Can be used for both DNA/RNA gels and WB (chemiluminescent as well as fluorescent detection)



**-Real time PCR:**

**384 well plates**

- Screen more genes
- Saves time, reagents and energy



**96 well plates**

- Shared by 3 sections of LDB

**-Safer Substitute for Ethidium Bromide**

DNA: GreenGlo Safer DNA Dye

DNA: Ethidium Bromide (mutagen)

RNA: SYBRsafe DNA Dye

**-Safer Substitute for Xylene**

- Rapid clearing without toxic hazard of xylene
- Biodegradable

**-Plasmid Prep kit**


- Significantly less plastic use
- Responsibly-sourced and recyclable packaging
- Faster protocol saves time

### Recycling in the Laboratory

- Empty chemical bottles: glass, plastic, and metal
- Pipet tips containers and packaging tray
- X-ray films for silver recovery
- Batteries are picked up by DEP
- **Recycling paper (uncontaminated)**

### Styrofoam Take Back Program

- Leave the cooling pack in the Styrofoam box
- In Bldg. 10 housekeeping will take them to the dock for collection
- Collection of these Styrofoam boxes are done in bldg. 35, 10,50

**Sending Styrofoam boxes back to the vendors:**

- Sigma and NEB
- Have the return address on the boxes
- Can be taken to the building area where mail is picked up (for building 10, take to B1 Mail office)


### NIH Solvent Recovery Program

This program recovers: used spent solvents and delivers them to you

- 70% Ethanol for surface sterilization

### Energy Conservation

- Keeping freezers frost free
- Turning off lights
- Purchase of energy efficient equipment

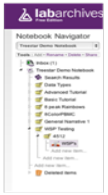
### Controlling What Goes Down the Drains at NIH

**Request approval for Discharges to the Drain**

- Collecting liquid waste at LDB
- Call DEP for pick up

### Electronic Laboratory Notebook

**-Labarchives** www.labarchives.com




- LabArchives is an innovative web-based electronic notebook software that enables researchers to store, organize, and publish their research data
- Maintains multiple backups of your data
- Saves paper, and lab space that can be used for storing other items

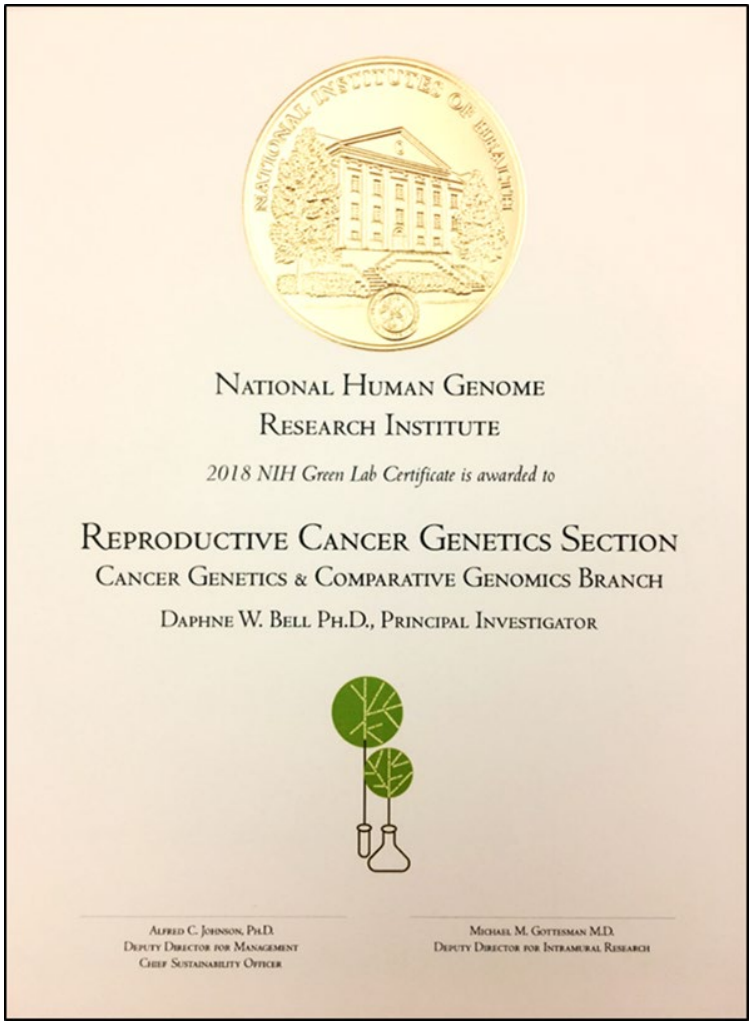
**To help GREEN NIH visit NEMS website** www.nems.nih.gov

**We do not endorse any specific vendor.**

**Photos by Arnaud Carpentier, Fengmin Li, Inbal Gazy, Daman Kumari and Minoo Shakoury-Elizeh**
**Acknowledgement: Olga Protchenko, Kari Duck, Shyamalagauri Jadhav, Sarju Patel**

# Recognize and Reward

- Nine (9) Institutes and Centers participated in the Green Labs Program.
- Seventeen (17) Principal Investigators representing 46 labs received the Green Lab Certificate.
- One (1) lab received a perfect score.
- A select number of Green Labs winners were sponsored to attend International Institutes for Sustainable Laboratories conference.



# Accomplishments

Staff Scientist: Mary Ellen Urick
Reinstated the NIH Styrofoam Takeback Program
Building 50

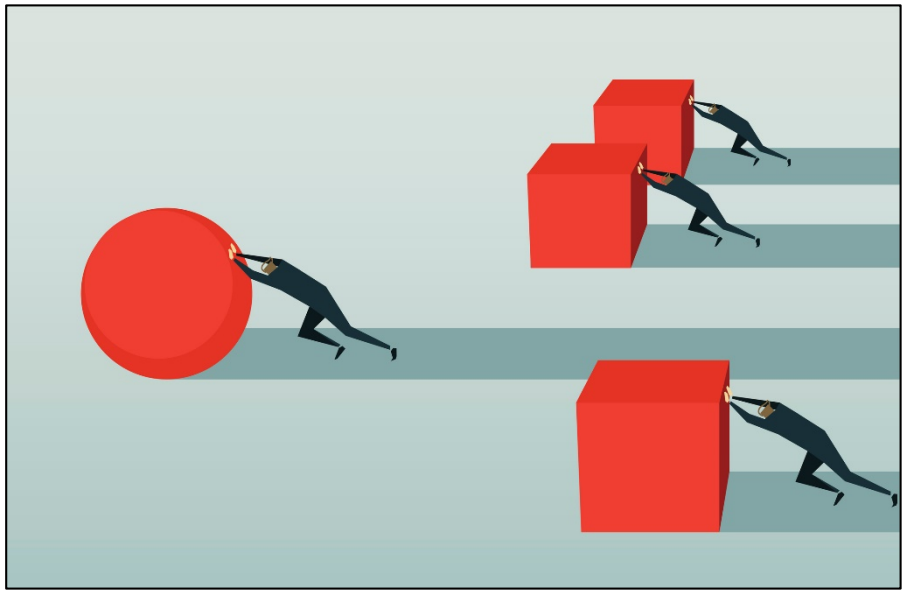
# *Benefits*

- Reduce environmental footprint.
- Assess program areas that need additional awareness.
- Learn about new ideas to improve the Green Labs Program.
- Create friendly competition among Institutes and Centers.
- Acknowledge and encourage labs to participate in sustainable practices.

# Future Plans

- Develop the Green Labs Program to increase sharing of Best Management Practices, generate new ideas and progressively challenge labs to commit to more sustainable practices.

- Collaborate with outside entities like International Institutes for Sustainable Laboratories, My Green Lab, and various workgroups to share and showcase state-of-the-art sustainable practices.



Source: Getty Images

# Summary

- New NIH Green Labs Program.
- Online self-assessment form with links on policies, regulations, POC to learn and participate in environmental programs.
- Assess participation in environmental programs, and address limitations to improve the programs throughout the year.
- Recognize and acknowledge labs and Institutes and Centers Offices for promoting environmental stewardship.

# *Thank you!*

Questions?

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