

## Recycling plastics from research labs

With sustainability in mind, MIT's EHS Lab Plastics Recycling Program gathers clean plastics from 212 MIT labs, recycling some 280 pounds per week.

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Normand Desrochers, MIT EHS technician, picks up pipette tip boxes and conical tube racks to be recycled.

Photo: Hao Nguyen

In 2019, MIT's Environment, Health, and Safety (EHS) Office collaborated with several research labs in the Department of Biology to determine the feasibility of recycling clean lab plastics. Based on early successes with waste isolation and plastics collection, EHS collaborated with [GreenLabs Recycling](#), a local startup, to remove and recycle lab plastics from campus. It has been a huge triumph.

Today, EHS spearheads the campus Lab Plastics Recycling Program, and its EHS technicians regularly gather clean lab plastics from 212 MIT labs, transferring them to GreenLabs for recycling. Since its pilot stage, the number of labs participating in the program has grown, increasing the total amount of plastic gathered and recycled. In 2020, EHS collected 170 pounds of plastic waste per week from participating labs. That increased to 250 pounds per week in 2021. In 2022, EHS collected a total of 19,000 pounds, or 280 pounds of plastic per week.

Joanna Buchthal, a research assistant with the MIT Media Lab, indicates that, prior to joining the EHS Lab Plastics Recycling Program, "our laboratory was continuously troubled by the substantial volume of plastic

waste we produced and disheartened by our inability to recycle it. We frequently addressed this issue during our group meetings and explored various ways to repurpose our waste, yet we never arrived at a viable solution.”

The EHS program now provides a solution to labs facing similar challenges with plastics use. After pickup and removal, the plastics are shredded and sold as free stock for injection mold product manufacturing. Buchthal says, “My entire lab is delighted to recycle our used tip boxes and transform them into useful items for other labs!”

Recently, GreenLabs presented EHS with a three-gallon bucket that local manufacturers produced from 100 percent recycled plastic gathered from MIT labs. No fillers or additives were used in its production.

### **Keeping it clean**

The now-growing EHS service and operation started as a pilot. In June 2019, MIT restricted which lab-generated items could be placed in single-stream recycling. MIT’s waste vendors were no longer accepting possibly contaminated waste, such as gloves, pipette tip boxes, bottles, and other plastic waste typically generated in biological research labs. The waste vendors would audit MIT’s single-stream recycling and reject items if they observed any contamination.

Facing these challenges, the EHS coordinator for biology, John Fucillo, and several EHS representatives from the department met with EHS staff to brainstorm potential recycling solutions. Ensuring the decontamination of the plastic and coordinating its removal in an efficient way were the primary challenges for the labs, says Fucillo, who shared his and lab members’ concerns about the amount of plastic being thrown away with Mitch Galanek, EHS associate director for the Radiation Protection Program. Galanek says, “I immediately recognized the frustration expressed by John and other lab contacts as an opportunity to collaborate.”

In July 2019, Galanek and a team of EHS technicians began segregating and collecting clean plastic waste from several labs within the biology department. EHS provided the labs with collection containers, and its technicians managed the waste removal over a four-month period, which produced a snapshot of the volume and type of waste generated. An audit of the waste determined that approximately 80 percent of the clean plastic waste generated was empty pipette tip boxes and conical tube racks.

Based on these data, EHS launched a lab plastics recycling pilot program in November 2019. Labs from the Department of Biology and the Koch Institute for Integrative Cancer Research were invited to participate by recycling their clean, uncontaminated pipette tip boxes and conical tube racks. In addition to providing these labs with collection boxes and plastic liners, EHS also developed an [online waste collection request tool](#) to submit plastic pickup requests. EHS also collected the waste containers once they were full.

Assistant professor of biology Seychelle Vos joined the pilot program as soon as she started her lab in fall 2019. Vos shares that “we already use pipette tips boxes that produce minimal waste, and this program allows us to basically recycle any part of the box except for tips. Pipette boxes are a significant source of plastic waste. This program helps us to be more environmentally and climate friendly.”

Given the increased participation in the program, EHS technician Dave Pavone says that plastic pickup is now a “regular component of our work schedules.”

Together, the EHS technicians, commonly known as “techs,” manage the pickup of nearly 300 plastic collection containers across campus. Normand Desrochers, one of the EHS techs, shares that each morning he plans his pickup route “to get the job done efficiently.” While weekly pickups are a growing part of their schedules, Desrochers notes that everyone has been “super appreciative in what we do for their labs. And what we do makes their job that much easier, being able to focus on their research.”

Barbara Karampalas, a lab operations manager within the Department of Biological Engineering, is one of many to express appreciation for the program: “We have a fairly large lab with 35 researchers, so we generate a lot of plastic waste ... [and] knowing how many tip boxes we were using concerned me. I really appreciate the effort EHS has made to implement this program to help us reduce our impact on the environment.” The program also “makes people in the lab more aware of the issue of plastic waste and MIT’s commitment to reduce its impact on the environment,” says Karampalas.

### **Looking ahead**

MIT labs continue to enthusiastically embrace the EHS Lab Plastics Recycling Program: 112 faculty across 212 labs are currently participating in the program. While only empty pipette tip boxes and conical tube racks are currently collected, EHS is exploring which lab plastics could be manufactured into products for use in the labs and repeatedly recycled. Specifically, the EHS Office is considering whether recycled plastic could be used to produce secondary containers for collecting hazardous waste and benchtop transfer containers used for collecting medical waste. As Seychelle notes, “Most plastics cannot be recycled in the current schemes due to their use in laboratory science.”

Says Fucillo, “Our hope is that this program can be expanded to include other products which could be recycled from the wet labs.” John MacFarlane, research engineer and EHS coordinator for civil and environmental engineering, echoes this sentiment: “With plastic recycling facing economic constraints, this effort by the Institute deserves to be promoted and, hopefully, expanded.”

“Having more opportunities to recycle ‘biologically clean’ plastics would help us have a smaller carbon footprint,” agrees Vos. “We love this program and hope it expands further!”

MIT labs interested in participating in the EHS Lab Plastics Recycling Program can contact [pipetip@mit.edu](mailto:pipetip@mit.edu) to learn more.