Instructions on lab-making by Sachiko Hirosue & Urs Gaudenz

Making a Laboratory is both a spontaneous activity and a slow labor of love.

A Lab is a place to labor (not only of love), experiment, research and share - there is no labor, experiment, research orsharing without the people. A Lab is not a museum for journalists, but a place made by a person for other people Start a small Lab , put it in a box, suitcase, backpack, picnic basket and take it with you. A Mobile Lab it actually allows you to go to people, and not wait for the others to come.

We have always been biohackers.

- cheese, kimchi, tempeh
The kitchen is not a far cry from the ideal bio Lab. In traditional houses, the kitchen faces the North, so it will not spoil the food. There is a water and heat source, solid non-porous work surfaces, fridge and freezer or equivalent for long-term storage, utensils, garbage bins.

- wine, bouillon, agar
In entry-level biology, taste and eat in the lab. If you can not eat what you are cooking, it's probably too dangerous for a public lab . Many chemicals and reagents can be found in the pharmacy, garden center, hardware, pet and grocery stores . It is easier and safer. Get to know your local stores. Build a relationship with the pharmacist, not the chain-store kind. If you have to order chemicals and biological supplies, the pharmacist is your friend. If you start to order reagents yourself, start by ordering something innocuous. This will allow you to be a registered customer without raising red flags. Then graduate to ordering the harder stuff. Get two fridges: eat and not eat. Label well, with understandable words, because eating is best when shared with others, and you don't want to kill your friends who stop by.

Build it Open, Hack it and Own it!
Biology is about living things. Make a home for your living friends in the BioLab. Be prepared to take care of your new pets day and night.

Build your Lab around your pets and projects, one thing at a time.The projects will attract a community. Then let the community build the Lab, don't build a lab for the community - or you get a lot of stuff that is never used. The Lab is the people and the projects.Make the Lab environmentally friendly,using and sharing it. This will shape your Lab to evolve and evolve with your projects.

Spend some time in the local flea market. Go to your local recycling center (déchetterie). Go dumpster-diving. Get to know people who work in institutional laboratories. Visit them frequently and don't be shy to ask for some materials. Dentists, opticians/optometrists and doctors have amazing materials. Go get your teeth cleaned and a go for a check-up. Make your own lab equipment . Use a pressure cooker as an autoclave, a hard disk as a desktop centrifuge, a styrofoam box and a light bulb and make an incubator. Print your own micropipettor , or buy some from the internet . Microbiology

started with the discovery of the microscope. Make your own webcam microscope . Make your own PCR machine with an OpenPCR kit. You will become an expert in what it is that you are doing. Evolve what is out there. Second-hand equipment bought from the internet can be old, heavy, big, time consuming and not cool. Know what can be built by yourself, and when to get the equipment ,even if it's aged . Sometimes old-school is the best - easier to fix.

Make it yours - mix up the "lab aesthetic" and your every-day objects.Pick a color, paint a wall. Play with lights. But still a Lab is a place to labor, to try things out and make mistakes. Make sure it is inviting to make a big mess. Mixing wet stuff with electronics is not a crime. It's cool. As long as you use small batteries you are on the safe side. High voltage can kill elephants.And box, label, box, label, label so you can find your stuff.

Know how to throw things out. Batteries are batteries. Electronic waste is electronic waste. Blades, syringes are sharps. Glass is glass. PET is PET. If it is something that can grow forgotten in a corner of your fridge, it is regular waste. If in doubt, autoclave it.Separate materials in separate waste bins. Separate concentrated acids and bases. If you have solvents, better to ventilate. Halogenatedsolvents should be separate from other solvents. Look up material safety data sheets, and learn what not to freak out about them. Know what your local recycling center is ready to receive. Think about what you are using. Don't throw everything down the drain or in the trash. For simple experiments, washing and reusing plastic tips and petridishes makes sense. Find glass petridishes so they can be cleaned and sterilized. We are not saving the world, we just try to fix it, tweak it, hack it - we have time to do some kitchen cleaning.

Biology is about living things. Biology takes time. Biology takes iteration. Like anything else, biology takes practice. Observe your Lab pets, love them, take a look at them under the microscope. Spend a long time observing the amazing small things that inhabit our planet. The rest are just dinosaurs and their relatives.

Did we mention Biology stinks?

You are never alone.
If you don't know how to do something, just try - or ask. If you don't know whom to ask, just talk to everyone about what you plan to do - in person, online. Learn from the community. Give to the community. The network and open sharing of knowledge is our unique strength.

You will find community in local citizen science groups. You will find communities self-identified as biohackers and DIYbio-ers. The craziest and most experienced DIY biohackers are probably still under-cover. Sitting in an inconspicuous Lab, growing mushrooms, spiders, snakes, ants, exotic fish, artificial tissue...

Enjoy lab-making!
Hope to hear from you, soon!