

## Science Grandma - Manual

Science Grandma is an Alexa skill that allows users to retrieve protocols on the fly

After buying an Alexa-enabled device, go to:

<https://alexa.amazon.com/spa/index.html#skills/dp/B07HWPLMCH> and press the “Enable Skill” button.

Like any other skill, you will need to **invoke** Science Mom whenever you need to use it.

This skill uses protocols hosted on the free database of protocols [protocols.io](https://protocols.io). Anyone can upload protocols to this database, which immediately get a DOI and become citable. Protocols that are already there can be copied (forked) and updated.

The web interface of protocols.io is intuitive, and creating a protocol should be straight forward. Remember to add steps to your protocol that can be read out loud. After you have found a suitable protocol or created one, you will need to link the skill to your specific protocol.

You will need to publish your protocol so Alexa can see it.

### How to make it work:

**Select or create your own protocol on protocols.io**. For example, here it is a protocol for bacterial transformation that I wrote in a way that can be read by Alexa.

The screenshot shows a web interface for a protocol on protocols.io. At the top, there's a breadcrumb trail: Researchers > Tiago Lubiana > Protocols > iGEM Registry Bacterial Transformation. Below this is a navigation bar with tabs: Steps (active), Abstract, Materials, and More. To the right of the tabs are buttons: MANUSCRIPT CITATION, START EXPERIMENT, NEW VERSION, and COPY / PASTE. The main content area has a title 'iGEM Registry Bacterial Transformation' with a fork icon. Below the title, it says 'Forked from iGEM Registry Bacterial Transformation' and 'Tiago Lubiana<sup>1</sup>'. The affiliation is '1 University of São Paulo'. The date is 'Jul 18, 2018' and the DOI is 'dx.doi.org/10.17504/protocols.io.rr3d58n'. There's a 'Working' button. Below the title, there's a list of steps. The first step is numbered '1' and reads: 'Get 2 petri dishes with the appropriate antibiotics for each of the constructs, plus one for the control'.

**Get the Protocol Integer ID.** The protocol ID is an unique identifier, as there might be many different protocols for the same technique which are unsuitable to your laboratory. You can find the ID under the Metadata button.



**Create a spreadsheet on your Google Drive named exactly “Science Grandma ”** . In the first column, you need to put the name of the protocol. In the second, the ID. All in **lowercase**. The table is automatically found and queried by the application and any changes are immediately effective.

	A	B	C
1	protocol name	protocol number	
2	bacterial transformation	13851	
3	RNA extraction	11342	
4	rna extraction	11342	
5	electrocompetent cells	531	
6			
7			

### **Link the Alexa skill to Google Drive.**

Say “Alexa, ask Science Grandma to set me up” and link your account to Google Drive on your Alexa App ([alexa.amazon.com](https://alexa.amazon.com))

What can you do now:

Ask for a protocol by name:

- “Alexa, open Science Grandma”
- (...)
- “Read the protocol for bacterial transformation”

Then you are able to either:

Go step-by-step ( by just saying ‘next’)

Go to specific steps by number (“go to step 5”)

You will have to **invoke** Science Grandma whenever you use the skill. When invoked, Science Grandma will return to the last step of the last protocol assessed, so it is possible to continue protocols with long incubation times.