Description

Research in Life Sciences is based on experimental protocols. In order to answer the questions in a manuscript, researchers have to think of a biological object, which process they want to study in it in order to address their question, and how they will analyze this process or specific behavior. This last step corresponds to designing an experimental protocol, i.e. a succession of actions (e.g. adding a reactant, increasing or decreasing temperature, running a gel or an electrophoresis, etc.) one will undertake to finally obtain or "visualize" the answer to their question. Hence, even though readers of an article generally pay attention to its conclusions and results, it is also the protocols in the study that make the study more specific.

However, journals tend to hide protocols, often asking authors to present them as "supplementary material" that will not be present in the printed edition of the article. The full description of experimental protocols is necessary to students or researchers who take their first steps in a field. Sharing protocols is most helpful to those, who are unaware of the possible difficulties of a given step (e.g. an exact incubation temperature), and at the same time lack expertise for determining which step of a protocol would be more tolerant to fluctuations.

Journey of Protocols.io

Protocols.io was conceived in 2012 in Berkeley, California, by two researchers: geneticist Lenny Teytelman and computer scientist Alexei Stoliartchouk, along with a business woman, Irina Makkaveeva. Their goal was to facilitate the sharing of existing, unpublished knowledge among researchers. In the development phase, the company, Zappylab.com, created various simple tools to assist researchers at the workbench, such as a molecular mass calculator, a timer, and so on. One of the tools it developed next was PubChase, which makes literature recommendations based on existing literature.

Zappylab was developing all these tools for free, in a bid to attract a community of users. By 2014, it had raised $225,000 through a fundraising campaign and venture funding. Actual funding also originated in a partnership with New England Biolabs.

What is Protocols.io?

On protocols.io, protocols are public content and be accessed without having a user account. To become an active user, one has to create an account by only providing an e-mail address and a password, thus making it a painless procedure. A richer profile, which includes affiliations and research interests, however, increases the likelihood of interacting with further researchers.

With respect to costs, registration is free for academic users. However, for organizations, the minimum price is $35/month, which includes the first five users.

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Users are also asked to upload their personal library which can result in new literature suggestions by protocols.io based on the literature already existing.

Format of Online Protocols

An experimental protocol in protocols.io is entered as a succession of “steps”. A step can be a mere description of the actions to be taken (e.g. adding a given volume of a reagent), but some can also include more detailed notes, with respect to extra caution or a more extensive description on how to proceed when scaling the protocol up or down. Images showing what an experiment should look like at a given step can also be included, in order to help to new users of the protocol.

Once fully entered on the platform, a protocol can be run or launched, so that its different steps will successively appear, in order to reproduce the whole protocol. Running the protocol on a mobile device enables researchers to directly follow the protocol on their bench in a handy, portable manner.

Using Protocols.io

One can visit protocols.io when searching for a protocol describing an experiment they have never performed, or which has so far failed. Some protocols are public, i.e., viewable by all users, others are group-restricted. When a user enters a new protocol, he or she can decide whether it is viewable by all. If it is restricted to group members, they can decide whether all users can apply to the group, or if other users can join only by invitation.

It is possible to embed a given protocol in a “collection” of protocols. This provides a more direct concatenation of protocols to be sequentially followed in order to carry out a given experiment. This is even more relevant, due to the fact that protocols.io enables a user to enter both bench protocols and bioinformatical procedures.

A feature that will be relevant when the community becomes large enough is the commenting of existing protocols. Instead of adding a new protocol as a variation to an existing protocol, registered users can post comments on each given step of a protocol, suggesting their personal variations or possible improvements. Ideally, these would only be minor, with protocols only posted by researchers with sufficient expertise in a given field of knowledge.

Impact of Protocol Sharing

Researchers are sometimes facing problems they cannot understand when carrying out an experimental protocol. Generally, expertise can be found within their lab in order to assist them understand and solve such problems. However, when on-site expertise is limited, or when a lab wishes to implement new research protocols, this expertise has to be looked for elsewhere. The standard behavior is to look for publications of researchers with an established knowledge in that field. At a later stage, these expert researchers can also be contacted directly in case reproduction of a published protocol does not work properly. Protocols.io is proposing a solution to solve this gap of missing knowledge by making protocol expertise directly available to its users. On one hand, this will remove the possibility of a direct interaction between researchers. On the other hand, it could help accelerate the development of new protocols in research labs. Its development will depend on whether

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researchers will judge the repository to be useful enough for them to describe a protocol the second time as they have already detailed it in their publication, or as an online supplementary material.

Category

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2. Product & Service Reviews

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