

Comics as a tool to communicate neuroscience

The experience of creating comics with neuroscientists of the Work Package 1 of the Human Brain Project.

Résumé

Cette communication est un retour d'expérience sur la création des bandes dessinées mensuelles pour vulgariser la recherche en neuroscience faite au sein du Work Package 1 (WP1) du projet européen Human Brain Project (HBP) dans sa troisième période de financement. Le WP1 compte 37 institutions partenaires et plus de 200 membres qui font de la recherche sur la modélisation des réseaux neuronales avec le but de construire une infrastructure qui servira aux chercheurs européens à développer des recherches en neuroscience et médecine. Pendant septembre 2020 et novembre 2021, l'auteure a créé une BD courte (2 pages) par mois en collaboration avec des chercheurs du WP1, traitant des différents sujets de recherche. Dans ce rapport, nous présentons les détails de cette démarche, le format utilisé, comment la collaboration avec des chercheurs du WP1 s'est développée et les défis rencontrés.

Mots-clés : neuroscience, Human Brain Project, bandes dessinées, vulgarisation scientifique, BD scientifique.

Abstract

We report on our experience creating monthly comics on the research done in the Work Package 1 (WP1) of the Human Brain Project, during its third funding period. The WP1 consists of 37 associated institutions and more than 200 members, all who do research on the modeling of brain networks, with the goal of building a European infrastructure to assist research in neuroscience and medicine. Between September 2020 and November 2021, the author collaborated with researchers of the WP1 to create a 2-page comic every month, covering different research topics developed at WP1. In this report, we describe this collaboration, the format used, the communication with the researcher at WP1 and the challenges encountered.

Key-words: Neuroscience; Human Brain Project; Comics; Science Communication; Science Comics.

Introduction

The Human Brain Project (HBP)¹, started in 2013 as a Flagship project of the European Commission, is a large-scale collaborative research project focused on neuroscience, computer science and applications to brain medicine. The HBP during its third and last funding period (2020-2023) consists of 9 interdisciplinary Work Packages that work together to create a large research infrastructure to allow scientists in the public and private sector to carry out research in neuroscience.

Of these subprojects, Work Package 1 (WP1) is titled “The human multiscale brain connectome and its variability – from synapses to large-scale networks and function” and is led by Prof. Viktor Jirsa, Director of Institut de Neurosciences des Systèmes at U. of Aix-Marseille/INSERM. The goal of WP1 is to develop biologically realistic brain models that can assist physicians in therapy related to brain disorder, among others. The WP1 counts with 37 Partner Institutions and more than 200 members, organized in 16 Tasks. Given the large scale of the WP1 and the diversity in its different tasks, it was important for the project to be able to communicate their research effectively among the different research groups and to the general audience. For this, WP1 started a newsletter for their consortium in Summer 2020, when the author was contacted in their quality of science illustrator and communicator to contribute to the communication efforts within WP1. The author’s task was to work in close collaboration with the scientists to create comics about the research carried out at WP1. These collaborations took the format of a 2-page comic that were published monthly in the newsletter of WP1. While this newsletter is restricted to WP1 members, in February 2021 the WP1 management created a Twitter account @hbppw1 where they promote the comics to a large audience. So far, 11 comics have been produced and this collaboration has been renewed for the year 2022.

In what follows we describe the details of this collaboration between the author and the researchers of WP1, the format of the comic, the approach to the graphic narrative and the challenges faced.

Description of the work

The collaboration between illustrator and WP1

The author has a scientific training in mathematics and works currently as researcher and lecturer in academia, besides working as a freelancer scientific illustrator. This gives them² a unique perspective as an insider of the research activity while being an outsider of the discipline of neuroscience that is the core of the work done at WP1.

The author had previous experience doing scientific illustrations for the research center Forschungszentrum Jülich in Germany, a partner institution of WP1, and it was through mutual connections to this institution that WP1 contacted the author to carry out the comic collaboration. The WP1 management trusted that the author’s scientific background would facilitate the interaction with the researchers and to synthesize the information provided by the research groups. Currently, the author works directly with Prof. Viktor Jirsa, WP1’s Director, and Lisa Otten, WP1’s Project Manager. Prof. Jirsa and Ms Otten are in charge of selecting the topics, selecting the researchers that will be interviewed for the elaboration of the comic, and making the first contact with them. In February 2022, Roberto Ichingolo, Scientific Writer at WP1, integrated the team as reviewer.

¹ <https://www.humanbrainproject.eu/en/>

² “them” is used in this document as singular neutral pronoun.

The production cycle

The preparation of the comic usually takes a month, and follows a cycle consisting of the following steps:

1. The management of WP1 (Director Viktor Jirsa and Project Manager Lisa Otten) communicate to the author the names of the researchers and the topic to be treated in the next comic. This usually takes place in the month before the execution of the comic.
2. The Project Manager puts the author and the researchers in contact via email, briefly explaining the activity. The author takes on the communication by coordinating a date for a short Zoom interview with the researchers. This takes place early in the month of the execution of the comic.
3. 30-minute Zoom interview between the author and the researchers involved in the topic that will be the subject of the comic. Most of the time, researchers do not have time to prepare in advance for this moment, so the meeting starts with an introduction by the author, where the steps of the production of the comic are explained. It is emphasized that researchers are allowed and encouraged to participate in the final product by making remarks and comments on the first draft they will receive. It is also emphasized that all corrections must be done in the first round. This is important to keep the schedule of the activity. The interview takes place in week 1 of the month of the execution of the comic.
4. Conceptualization of the comic: script and pencil sketch by the author. In this phase the researchers provide support material so that the author has a better understanding of the topics discussed in the interview. The support material includes preprints, published articles, videos of seminars or slides of scientific talks. This is the most challenging part of the comic production, as the author has to process the information and synthesize it in an appealing way to fit 2 pages. This step usually takes place between weeks 2-3 of the month.
5. Submission of the sketch to the management of WP1 and the researchers involved. In this step the different parties can make remarks and ask for corrections or modifications. This takes place at the end of week 3. Usually, feedback is done quickly.
6. Submission of second sketch taking into account remarks from the previous step. Usually in this step the draft is accepted.
7. The author proceeds to inking and coloring with flat colors. This is done in week 4 of the month.
8. The comic appears in the newsletter at the beginning of the following month.

The format

The comic consists of 2 pages in A4 format, that is suitable for reading on screen. The style is ligne claire and strongly influenced by visual notetaking (sketchnotes) and infographics. The emphasis is on explaining the scientific research, with portraits of the researchers involved in the topic. The narrative is built in 4 stages:

- Introduction (Top two frames in Page 1),
- Presentation of the researchers and their research topic within WP1 (lower half of Page 1).
- Details on the research and challenges (top half of Page 2)
- Concluding remarks and outlook, discussing the future steps and/or impact of the work (bottom half of Page 2).

The coloring is done with 2 flat colors plus white. This choice answers a need for visual simplicity, to compensate for the complexity of the content. It also responds to time efficiency and to give a coherent look to the series of monthly comics.

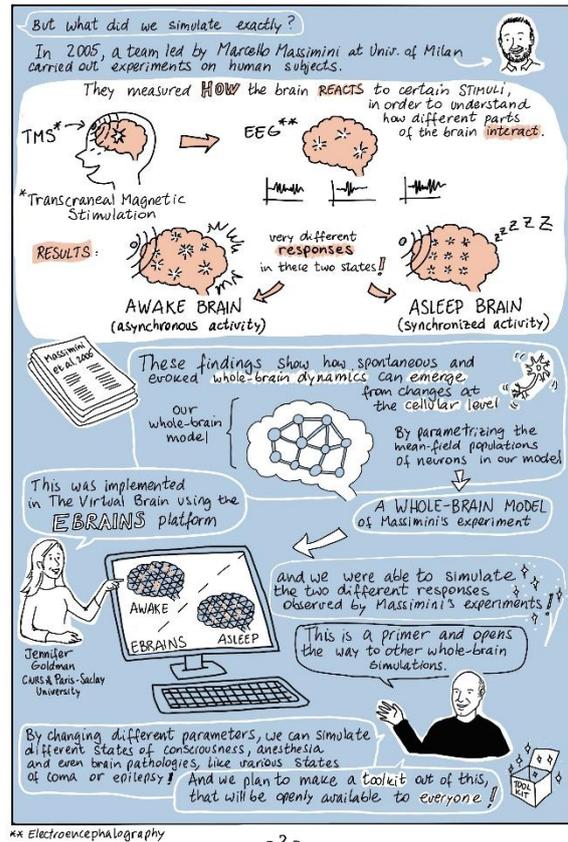
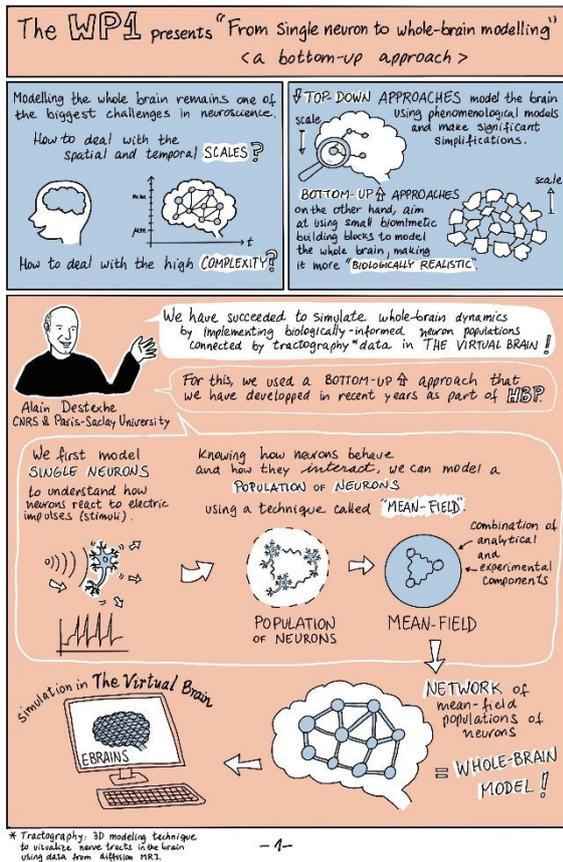


Image 1: The comic published in November 2021 is about the research carried out by the group led by Alain Destexhe (CNRS & U. Paris Saclay)

Challenges

Neuroscience is a very applied science where many disciplines like biology, mathematics, physics, computer science and statistics are combined. This implies that there is a rich imagery associated to it. The biggest challenge doing a comic to communicate neuroscience research is getting hold of this imagery. This implies processing the information provided by researchers on their research topic during the interview and effectively using the support material provided to understand the topic. Neuroscientists have their own scientific language, and during the interview one of the author's goals is to break through the language and terminology barrier to obtain a description of the phenomenological aspects of the research, which will inspire the illustrations. The technical terms that are important and cannot be avoided are explained in footnotes (see Image 1).

Another challenge is to strike a balance in the complexity of the content between scientific content and simplicity in explanation. The reason is that the primary audience is the members of WP1, all experts in neuroscience, however, very specialized, and perhaps not fully aware of the research that is done in other groups within WP1, given the large scale of the project. On the other hand, the secondary audience is a non-expert audience. Therefore, the comic needs to be scientifically interesting, not too simple but not too complicated either. In the first comic the approach was to show a typical situation in a research environment (see Image 2) but evolved quickly to a more scientific-oriented content starting with the second issue, that would show better the specificities of the research done at WP1, differentiating it from other Work Packages at HBP.

The subject of the comic usually corresponds to one of the 16 Tasks of WP1, therefore it is designed to be part of a global research strategy within WP1. There is big diversity in the topics and therefore the need to invest time understanding them enough to illustrate it does not decrease considerably

with experience, as every month so far, the author has faced a different topic. In this sense, the comic is time demanding. The fact that it is restricted to 2 pages is a challenge. For example, the fact that many of the research groups interact with each other needs to be emphasized through the comic style and icons, since there is no space to go deeper into the details of the research. Dealing with the 2-page restriction is a challenge. For example, the EBRAINS or TVB (The Virtual Brain) icons (a computer with a brain-mesh on its screen) will be repeated in several comics, without explaining each time what EBRAINS or TVB is (EBRAINS and TVB: infrastructure and digital platform for neuroscience mathematical simulations).



Image 2: The first comic was about the kick-off meeting of WPI in September 2020 and emphasized the usual troubles that organizers had with virtual conferences met in the middle of the COVID-19 pandemic. The comic was focused on the activity of preparing and attending a conference, a very common academic practice, and did not have a specific neuroscience content.

Impact

The comic is distributed primarily in the WPI monthly newsletter. In April 2022 the comic team distributed a questionnaire to measure the impact among the WPI Newsletter readers, using a Google Form consisting of 10 questions. The turnout was low and was probably impacted by many members of WPI being busy with conferences organized in this period and Easter holidays. Yet, the answers to the questionnaire are quite diverse and we expect this gives a good indicator of the overall reception of the comic.

The following questions set the background of the reader

1. Do you read comics/BD/manga/graphic novels in your spare time?
2. Do you use comics/BD/manga/graphic novels to communicate your research to a wide audience?
3. Do you read the WPI comic included in the WPI newsletter?

The following questions concern the readability of the comic

4. On which device do you read the WPI Newsletter and/or comic?
5. If you have read the comic, do you find it accessible/understandable?

The next question measures directly the purpose of the WP1 which is originally to inform members of the WP1 about the work done by other members of WP1

6. Have you learnt about the research activities of other groups at WP1 that you didn't know of before?

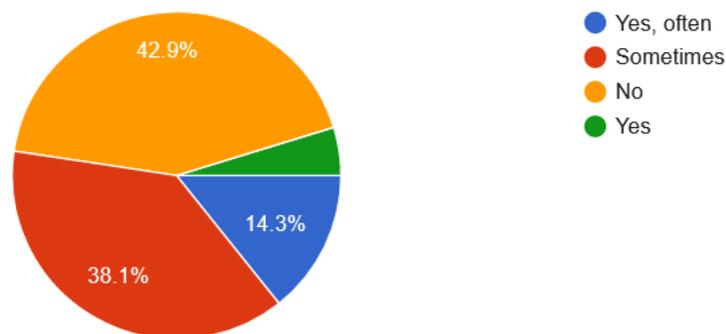
The next questions measure the impact of reading the WP1 comic and should be compared with the first set of questions on background

7. Do you think that comics is a suitable format to communicate about neuroscience research to an EXPERT audience?
8. Do you think that comics is a suitable format to communicate about neuroscience to a NON-expert audience?
9. Have you shared the WP1 comic with colleagues or friends?
10. Would you consider comics as a format to communicate your research in the future?

Answers:

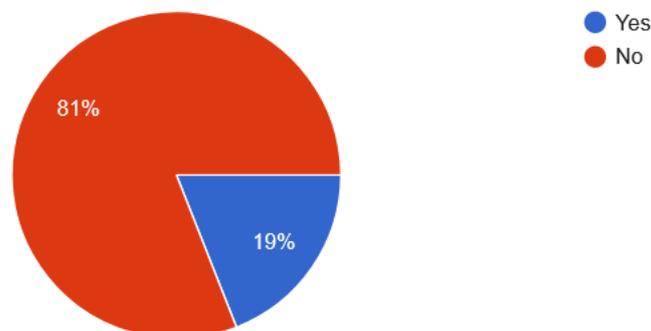
1. Do you read comics/BD/manga/graphic novels in your spare time?

21 responses



2. Do you use comics/BD/manga/graphic novels to communicate your research to a wide audience?

21 responses



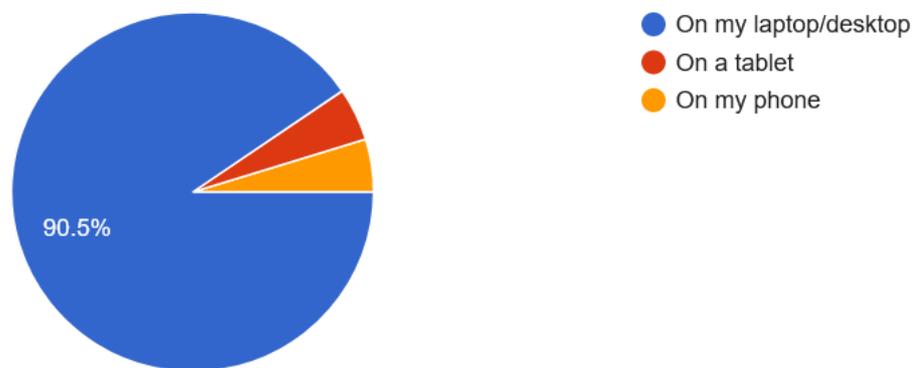
3. Do you read the WP1 comic included in the WP1 newsletter?

21 responses



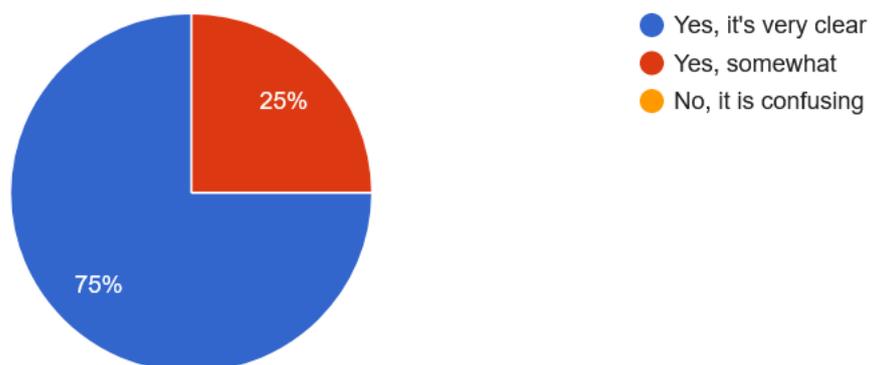
4. On which device do you read the WP1 Newsletter and/or comic?

21 responses



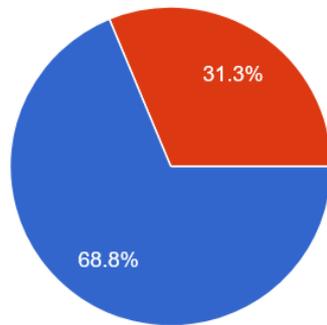
5. If you have read the comic, do you find it accessible/understandable?

16 responses



6. Have you learnt about the research activities of other groups at WP1 that you didn't know of before?

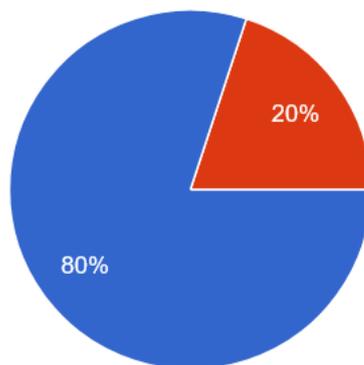
16 responses



- Yes, I wasn't aware of all the topics covered by the groups mentioned in the comic
- No, I knew all about them before reading the comic

7. Do you think that comics is a suitable format to communicate about neuroscience research to an EXPERT audience?

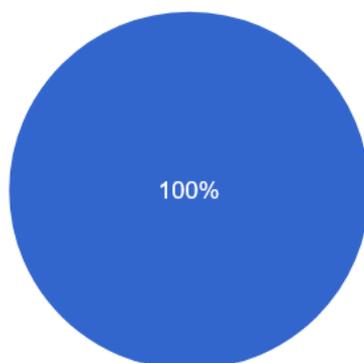
20 responses



- Yes
- No

8. Do you think that comics is a suitable format to communicate about neuroscience to a NON-expert audience?

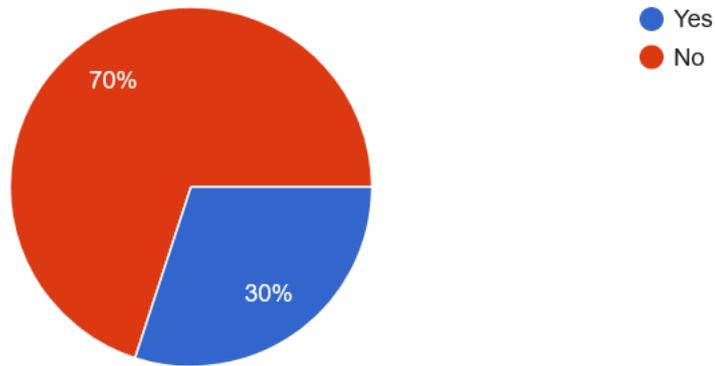
20 responses



- Yes
- No

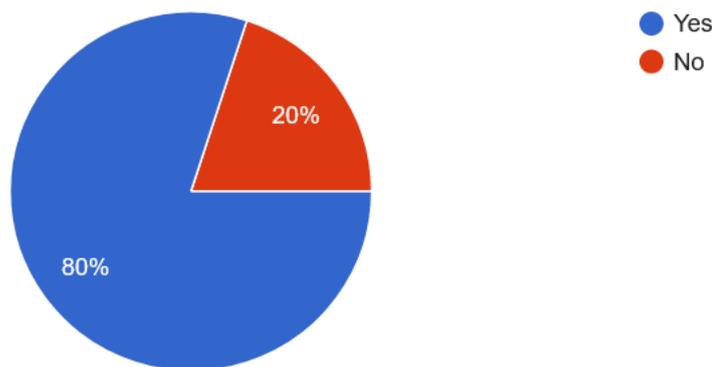
9. Have you shared the WP1 comic with colleagues or friends?

20 responses



10. Would you consider comics as a format to communicate your research in the future?

20 responses



We see from the results that the majority of the people who answered the questionnaire do not read comics regularly. The comic is overall understandable, but could be improved. The main purpose of the comic is achieved as the majority has learnt about other research done within WP1, but we need a bigger sample to have a good answer to this. Comics are seen as a suitable format to communicate research and the majority of people who answered the questionnaire would consider this format for their own research. This is an overall positive output, as the majority of respondents do not read themselves comics regularly, the WP1 seems to be an instance where they do read comics.

Social media: In February 2021, shortly after the beginning of the comic collaboration, WP1 created a Twitter account where they share the monthly comic³. While this Twitter account has a modest number of followers (225 to date), the comics are reposted by two main accounts: @EBRAINS_eu (1565 followers) and @HumanBrain Proj (35.3K followers). Analytics on the impact in terms of retweets and impressions has not been done so far. In the meantime, we have only a qualitative impression of the positive impact of the comic by feedback and comments from the members of the WP1 and the community in Twitter. Together, the WP1 management and the author expect to continue the promotion online of the comic and in time publish the outcome of the collaboration in book format. This can be distributed at the different scales of action of WP1 and HBP (in France

³ <https://twitter.com/hbpwp1>

and the countries of partner institutions and Europe), to support the communication of the research done at WP1.

Conclusion

In this report the author has shared their experience creating a monthly comic in collaboration with researchers working at the Work Package 1 of the Human Brain Project. The comic is produced over a month and is meant to be part of a series of comics to be produced throughout the 3-year funding period of WP1. In this process, the author has had the chance to interact directly with researchers doing cutting-edge work in neuroscience, and to popularize their findings in comics that are then distributed internally in a monthly newsletter, and external via Twitter. This format seems to have a good reception from the audience, as shown by the results of a questionnaire run in April 2022, the positive informal feedback from WP1 members and followers in Twitter. It would be good in the future to complement this with more in-depth questionnaires among WP1 readers, gather a bigger sample, and consider data analytics of the Twitter posts.