

How to design an outstanding poster

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Introduction

Picture this: your poster session is about to begin. Your poster is up – along with a hundred other posters – in a big, noisy room. Your fellow scientists walk in after sitting through yet another session of talks. They are already tired and saturated; their attention levels will wane after they have looked at a few posters. But you need them to be alert and fully engaged while you are presenting your poster. You probably want feedback on the manuscript you are preparing or you want to showcase your skills to a potential future advisor or collaborator. If you want to get the best out of a poster session, you, as the presenter, and your poster need to stand out from the crowd. Viewing a poster session is like visiting an art museum; visitors are bound to feel saturated at some point, and no longer able to appreciate the paintings on display. So, your poster should be like a Caravaggio painting: eye-catching, engaging, and it draws the viewers closer – no matter how tired they are – because they want to see the details.

If you are a graduate student in the middle of your PhD training, or a seasoned postdoc, you will, most certainly, get the chance to present a poster at a meeting. Posters are one of the commonest means through which you will communicate your results to the scientific community, especially early in your career (Box 1); and like preparing a manuscript or giving a talk, making a stand-out poster is a skill that can be polished and honed to get the best return on your effort.

We have previously advised you on how best to prepare a scientific manuscript [1] and how to avoid some of the most common pitfalls in figure preparation [2]. And this advice is certainly also valid for posters, in the sense that you should prepare your poster with the same diligence and attention to detail that you would apply to your manuscript. Before you start, you should think about the narrative, the importance of the title and what key figures you will include. But do not forget that posters are meant to be a visual display of your work, so they require a unique set of guidelines and should be visually attractive and engaging. However, the work does not end with printing the poster. You also need to practice how to showcase your results, using your poster as a visual aid.

This instalment of the Words of Advice series features the art of designing an outstanding poster. Here, we summarise some of the key ingredients of a successful poster that will help you get the most out of your meeting. Before you read any further, take a look at Box 2, where we have summarised the basics of writing a strong abstract that will help draw an audience to your poster and hopefully get you closer to a poster prize too!

Why and for whom?

Before you start preparing your poster, ask yourself the following questions: ‘why am I preparing this poster?’ and ‘for whom?’ A generic answer such as ‘to let people know what I’m working on’ will not get you very far. A clear purpose, e.g. ‘to get feedback before I submit my manuscript’, or ‘to share the very useful reporter constructs that I’ve synthesised’, will help you design your poster for that specific purpose, and get the most out of your meeting. If your aim is to get feedback on the manuscript you are preparing, a detailed experimental section, or too many figures, will deter your audience. Less is more, so focus on your key observations and results, and make your main conclusions very clear. Clearly identify what you want your audience to take away from your poster, as this will really help you decide what to include and what not to. If you want to

Box 1.

Did you know that the first appearance of posters at an international conference was at the 6th FEBS meeting in Madrid in 1969 [3]? The organisers had a high number of registered participants at the meeting and to give everyone a chance to communicate their results, they set up so called ‘Demonstration sessions’. Horizontal boards were installed so that the participants can ‘pin their cards’ before the session is scheduled to begin. Some participants even ‘drew their presentations *in situ*’ [3]. We have come a long way since then. Posters are now part of every scientific meeting and they are of better quality (in terms of graphics and style), but the initial idea behind the poster session, to promote the communication of scientific data and allow broad participation at meetings, is still the same.

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Box 2.

The abstract. Writing an abstract for a scientific meeting is very similar to writing one for a manuscript [1]. Your goal may be different – you would like the organisers to select your work for a short talk or you want your fellow attendees to look at your poster – but your approach should be the same. You should, however, consider that conference organisers have to read thousands of posters in a relatively short time, so your abstract needs to make an immediate impact. You need to engage your readers with enough enticing details, but keep it brief. Aim for a short abstract (ideally, less than 150 words) and write it for a broad audience. Start with a brief background statement and the motivation behind your work. Highlight only your main experimental approach and your strongest result and conclusions. Readers will go to your talk or check your poster if they want details. Use keywords to get the attention of your audience but stay focused on your main findings – do not overreach.

Combining brevity and scientific accuracy is a delicate balancing-act. It requires a lot of practice and feedback. Be ready to rewrite the abstract multiple times until it reads effortlessly; and always ask for feedback.

highlight a specific experimental method that you have optimised, including a detailed protocol will draw attention to your poster. Knowing the audience will also help inform the poster's content and design. For example, if you are attending a broad-scope meeting, your poster should not be the same as the one you have used before in a more specialised meeting. If your audience is not entirely familiar with the model organism you are working on, you need to highlight the advantages of this system and how your results could be extrapolated to other organisms. Once you have combined these two factors, purpose and audience, you should already have a clear idea of what goes in the poster and how you will organise the content (Fig. 1).

The elements of a successful poster

As mentioned above, a poster is meant to be a visual display of your work. It should be designed for a specific purpose, have a main message and should get all the key information across quickly and clearly. Consequently, it should be visually attractive, uncluttered, well illustrated and be easy to digest. You will use it as a visual aid that helps you illustrate your point faster when you are interacting with the viewer, but it should also be understandable even if you are not there to explain it. Many conference delegates

Purpose and audience

- Have a clear aim for preparing a poster
- Know your target audience
- Tailor your poster accordingly

Design

- Visually segment the content for an easy-to-follow narrative
- Dedicate most of the space to figures and graphics
- Use clear headings
- Use bullet points
- Leave enough white space for a clean, uncluttered layout
- Use 2 - 3 matching colours

Content and data

- Compose a strong (and short) title
- Convey one clear message
- Showcase quality of data & soundness of methodology

Pitch

- Practice giving short, clear answers
- Rehearse your questions if seeking feedback
- Promote your poster (social media, email...)
- Be enthusiastic

Fig. 1. The four essential elements of a successful poster.

browse through the posters outside of the normal poster session times, coming back later to speak to the presenter during the scheduled poster times. Therefore, your poster should stand out on its own, even when you are not standing next to it. So how do you design a poster that fits these criteria? (see also Fig. 1).

A clear message begins with a strong title

The first thing that anyone will read on your poster is the title. A strong title should communicate your main message and why it matters, and should also entice people to visit your poster to find out the full story. Do not make the title too generic, or too specialised. Short, punchy titles that are explicit and informative tend to work well. Asking a question (e.g. 'Is autophagy essential for development?') can also be effective. Keep in mind your audience and what they will find interesting. And most importantly, keep it short. One

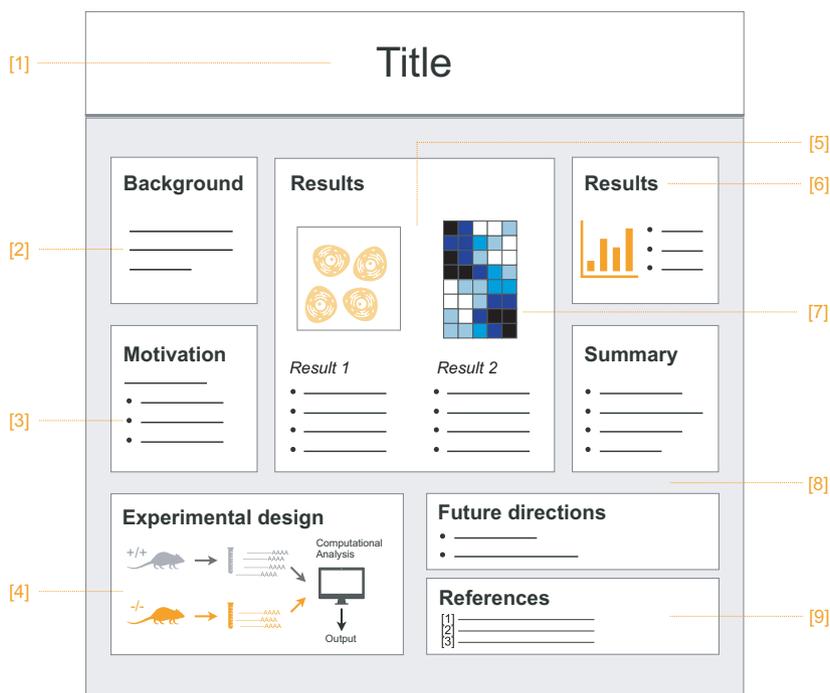


Fig. 2. Arranging the content in boxes is one way to achieve a clean, uncluttered layout. [1] Title: sans serif, dark font on a light background. [2] Text: left-aligned – less gap between the words equals faster reading. [3] Short bullet points. [4] Illustrations replace a lot of text. [5] A colourful, engaging figure in the centre. [6] Headings: same level of importance, same font size. [7] Matching colour combinations. [8] Light coloured background, dark fonts for high contrast. [9] References: up to 5.

way to compose a strong title is to list a set of keywords and verbs from your content and link them together in as few words as possible. You will need multiple iterations before you get to the best title. Make the title font big enough so that it can be seen from a reasonable distance. Use a sans serif font and high-contrast colour combination. Avoid using all capital letters (Figs 2 and 3).

Make it easy to follow

One of our Editorial Board Members, Professor Lawrence Banks, says that one of the first things he always looks for when judging a poster is the ‘overall clarity and ease with which the message is conveyed’. His advice is to ‘keep the message straightforward and easy to follow’. Your poster will stand out to the viewers and the judges if it quickly conveys a clear message. And since the layout controls the narrative (i.e. motivation, approach and conclusions), it determines if your main message gets across clearly and quickly. So, this should be your main task: laying out the content in a way that makes it easy for the viewer to follow the narrative. The worst thing you could do is to simply convert a ‘manuscript format’ into a ‘poster format’ by copying pieces of text and the figures into PowerPoint or Illustrator. Instead, aim to visually segment the material in a clean, uncluttered and aesthetically appealing layout. For example, you could arrange the content in boxes (Fig. 2) or 2–3 columns (Fig. 3). Use clear headings to make every box/section

stand out to the viewer. Here are some examples of useful boxes that you could include:

- 1 Purpose or Motivation
- 2 Background
- 3 Methods/Experimental Design
- 4 Results
- 5 Summary/Conclusions
- 6 Future Directions
- 7 References [five maximum – be sure to note whether your work has been published]

You do not necessarily have to use the above titles as labels for the boxes. Get creative. You could formulate a strong message as a title, instead. For maximum impact, use dark, legible font over a light background.

Overall, use text sparingly. Replace sentences with bullet points; but keep them short, otherwise your bullet points will lose their effect. The judicious use of bold or italic font will help draw attention to key points (but don’t overdo the fancy formatting!). Try combining figures and text within the boxes, and matching colours between the figures and the text to make complex figures more accessible. But be consistent with the use of colours and try your best to use colours that match (Figs 2 and 3).

A figure is worth a thousand words

Most of the space (70–80%) on your poster should be dedicated to figures and graphics. Find creative ways to



Fig. 3. Arranging the content in 2–3 columns is another way to achieve an easy-to-follow layout. [1] Title font size: 72–85 pt. [2] Headings font size: at least 36 pt. High contrast between background and text colours. [3] Enough breathing space between sections. [4] Content arranged in 2–3 columns for a clear, easy-to-follow message. [5] The main message in an eye-catching central figure. [6] References: include a citation to your manuscript (if published).

replace text (for e.g. the experimental procedures) with an illustration. Viewers will be deterred by too much text and will move along to the next poster. This is also why you need to capture their attention very quickly by making the main message stand out (see above). One way to achieve this is to put a colourful, engaging figure in the middle of the poster or to include a nice graphic summarising your results and conclusions.

According to Prof Banks, the other elements that make a poster stand out from the rest – and these will be closely evaluated by the judges – are the ‘quality of the data and a logical thought process behind the (experimental) approach’. Therefore, along with an easy-to-follow layout, you need to showcase the quality of your data, and that your methodology is logical and unbiased. Good quality data are generated by well-designed, well-executed and correctly analysed experiments [2]. But *how* you represent your data is equally important. And this is also useful for your manuscript, so it is worth putting the time to learn the different options for data visualisation. Think about using box plots to show all the data points, instead of histograms, or use violin plots if you have enough data points and want to show the full distribution of the data. You could use chord plots to display relatedness (or similarities) between data sets or different groups of data. Chord plots are not only visually appealing but very informative. Which data you choose to include in your poster is

also important. Keep in mind that a strong poster conveys a straightforward, easy-to-follow message. Include only the key experiments that support your main message. Tangential or secondary data will distract the viewers.

These are the design elements that will help you prepare a successful poster. But your work is not done yet. During the meeting, you need to interact with your fellow scientists, some of whom will be judging whether your poster should receive a prize, while others could be potential collaborators or future employers. In fact, how a candidate interacts with the person judging their poster is extremely important, according to Prof Banks. So, how can you excel during a poster session?

Practice makes perfect

The most common question at any poster session – and this is certainly the first thing that Prof Banks asks the candidate – is some variation on ‘Tell us about your work’. If you give a strong answer that sparks interest, you could start a meaningful discussion or a future collaboration, or receive a poster prize. And a strong answer is a short answer. Judges typically have no more than 5 min per poster as Prof Banks says, and ‘what sets the good candidates apart are those that can be succinct and to the point’. So, cut to the chase, if the judges wish to know more about the background to the work or the fine details,

they will ask. So, when asked what ‘the take home message is’, you should aim to answer this question in 1 min or so. Keep the details to a minimum. If you give a laundry list of all the experiments that you have done, you will lose your audience. If you do not clearly (and quickly) state your main objective, no one will be able to follow your explanation no matter how amazing your results are. So, how do you answer such question in less than 60 seconds? The trick is to break down your answer as follows:

- 1 What is the problem/scientific question I am working on?
- 2 What has been done?
- 3 What is missing?
- 4 What did I do?
- 5 What do my results mean/why are they important?

You should expect to be asked other questions too, relating specifically to your project and data, or the broader implications of your work. It is a good idea to anticipate these questions and practice how to answer them too, in a quick and engaging manner. You could use the same approach as above (i.e. break down your answer, and follow the 60 seconds rule). You may need multiple iterations to reach the best way to answer. But it will be worth it. The more effort you put into this preparation, the more effortless your performance will be. You will also appear less stressed and more enthusiastic about your work; a bonus point, according to Prof Banks. If you are seeking feedback on your project, be sure to rehearse your questions beforehand. Make your questions short and specific, and have pen and paper at the ready to jot down notes as they occur to you during conversations. It is also a nice idea to leave a stack of sticky notes at your poster in case visitors have questions or want to leave their contact details while you are off enjoying the other posters (Fig. 1).

Getting the most out of your meeting

Now that you have polished your poster and perfected your pitch, how do you ensure that you’ll have

an audience? Once you know your poster number and session, share it on social media (using the appropriate conference hashtag, of course). Invite people to your poster when you bump into them at coffee breaks and dinner. If you know that potential collaborators or future employers will be at the meeting, email them beforehand to let them know you’ll be presenting and ask if they’d like to stop by. A little groundwork in the days before your presentation will ensure a steady stream of interested visitors. Then, take full advantage of the chance to get direct feedback on your unpublished work and to see how your results will potentially be perceived when you finally submit your paper. Use this as an opportunity to test different approaches to frame your narrative. When you explain your discovery to scientists within your field, but who are not intricately familiar with every detail of your work, you will not only get ideas on which experiment to do next or what is the most suitable figure type to visualise your data but also on how best to organise your results to get a clear and engaging manuscript. Use your interviewers as (hopefully) unbiased test subjects. Take cues from their questions, their level of engagement to improve on your performance and the preparation of your next poster and manuscript. If you had not thought about a poster session in this way, I advise you to do so. It will be very rewarding.

References

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