

Using art and history to communicate immunology to a broad audience



By Francesca Di Rosa

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Francesca Di Rosa works on T cells and is committed to science outreach. Together with Adrian Hayday, she recently conceptualized and delivered the exhibit ‘Vaccination, a time machine’ at the Royal Society Summer Exhibition in London. Here, she shares her thoughts on how to communicate a core scientific content with artistic and historical input, according to her ‘5C’ formula.

Can vaccination be portrayed as a ballet? This and other unconventional ideas formed part of an outreach project called ‘Vaccination, a time machine’, which was exhibited in July 2024 at the Royal Society Summer Exhibition, a science festival that showcases cutting-edge research in the UK. The display was designed to communicate basic notions about vaccine-elicited immunity in the context of recent and ongoing results about T cell responses to vaccine boosters, and the immunomonitoring of individuals with COVID-19 in pre- and post-vaccination settings.

For this project, we paid particular attention to the use of multidisciplinary modalities, specifically art and history, in the setting of a bespoke architect-designed stand. Our aim was to communicate scientific information and elicit surprise, while introducing visitors to the past and future of vaccination. Importantly, given that the audience varied hugely in age, interests and subject knowledge, we offered various different ways to navigate the exhibit during the visit. A leaflet entitled ‘Senses of time’ and online contents were available as take-home materials.

With a focus on ‘time’ as a keyword, the exhibit delved into topics and challenges related to vaccination, such as how to achieve long-term immunity and when to administer additional vaccine boosters. The title of our exhibit provoked visitors to think of vaccination as an imaginary apparatus that propels people into a healthy future by accelerating immune responses. Our stand offered

non-digital educational activities with underlying scientific messages, that were created in-house at the Francis Crick Institute (by immunologists Adrian Hayday, Ambra Natalini and me, together with public engagement professional Kat Nilsson, and designers Albane Imbert and Christina Dix). Thus, customized hourglasses simulated the effect of time on immunity and a modified version of the children’s game ‘Kerplunk’ mimicked the expansion of antigen-specific lymphocytes after a booster dose of vaccine. Young scientists guided the hands-on educational activities and senior immunologists were ready to discuss state-of-the-art research and ideas behind the exhibit.

A welcoming stand (designed by the architect Fabrizio Lepore) facilitated an immersive visitor experience and honoured the unique history and tradition of the Royal Society – for example, by emphasizing a bookcase in the backdrop containing the permanent collection of the *Philosophical Transactions*, the world’s first recorded scientific journal (launched by the Royal Society in 1665). The stand had display cases for both artworks and historical documents, and a two-level plinth resembling a small-scale sculpture that held the objects for interactive activities and allowed access for children, adults and individuals using wheelchairs. We presented original documents about ‘variolation’ from the eighteenth century (selected from the Royal Society library and archives in collaboration with the historian Louisiane Ferlier) and displayed three arresting glass sculptures of variola Virus, HIV and an imaginary future virus mutant, by the artist Luke Jerram.

One of the biggest attractions was a beautiful short film (by directors Tim Whitehead and Michael O’Halloran) representing a dance created by the Royal Academy of Dance for our exhibit. Under the guidance of the choreographer Dennie Wilson, dancers acting as ‘viruses’, ‘lung cells’, ‘lymphocytes’ and a ‘vaccine’ evoked the dynamics of infection and immunity. At the opening of the exhibit, science communicator Francesco Segnanfreddo launched a podcast miniseries entitled ‘On time’. The first episode featured an imaginary

conversation between Mary Wortley Montagu and Emmanuel Timoni, two historical figures in immunology from the early 1700s. Future episodes will explore topics that include memory and speed, and their relationships with immunology, and will feature scientists, artists and historians.

The ‘5C’ formula

Looking back, I extrapolate five leading principles, referred herein as the ‘5Cs’, from this project and the responses we received from colleagues and the public. The 5Cs are likely to be valuable also for other types of science outreach project, as can act as a framework to facilitate scientists and non-scientists alike to connect with the relevance of cutting-edge research to our everyday lives.

Concept. The scientific content guided the choice of contributions from art and history. The core of the exhibit was the notion of immunological memory induced by vaccination. This included individual variation in response to vaccination, and the potential loss of memory over time. In a broader sense, envisioning the scientific content as a wheel hub and the different display modalities as spokes is a strategic communication concept to reinforce the outreach message. This approach can strengthen the learning process for visitors who have widespread interests and facilitate a full immersion, while still conveying the key points to those only attracted by one type of presentation.

Collaboration. Both scientists and contributors from other fields developed creative ideas for the project, and planning was refined in a highly interactive manner. In our project, we were able to fuse immunology, design, architecture, history, communication, contemporary art and dance, owing to the interactions within our team and with external collaborators. Multidisciplinary collaboration of this type nurtures the thought-provoking integration of creative inputs. A further advantage is that ideas with regards to science communication can be immediately tested on non-scientific members of the team.

Coherence. This was achieved at many levels. Regarding the scientific content, heterogeneous inputs were harmonized to communicate a consistent message. The various means used to engage the public were all optimized to complement each other. The display was coherent with the historical collections and the site where the exhibit was displayed. In our project, the use of ‘time’ as a keyword was a crucial instrument to maintain cohesion across the different parts of the exhibit. Overall, coherence can be a big challenge for a multidisciplinary communication project. The goal is achieved when visitors feel that they can connect the dots of the ‘exhibit puzzle’, rather than being disoriented by arbitrary stimuli.

Conversation. Visitors were encouraged to talk to team members by a welcoming and attractive environment that provoked questions and elicited curiosity. We invited visitors to navigate the exhibit freely according to their inclinations, while still offering them some light-touch orientation. In my opinion, a spontaneous approach to the contents of the exhibits can more easily nurture critical thinking than structured educational activities, such as formal talks.

Continuity. The exhibit experience was not finished on the closing day, but it continued with a legacy. In our project, the exhibit generated a lively exchange of personal comments, emails and messages on social platforms that is still ongoing, thanks also to the attention given to the exhibit in the press and the general media. Additional episodes of our podcast miniseries ‘On time’ are in production. While offering the opportunity to further delving into the exhibit subject, and even to listen to the podcast as a stand-alone material, we hope to receive advice and criticism that will be useful for future outreach plans.

Concluding thoughts

A multifaceted display including art and history is likely to make the scientific notions linked to the exhibit experience easier to remember, in agreement with the emerging concept of moving from STEM (science, technology, engineering and mathematics) to STEAM (science, technology, engineering, art and mathematics) to engage the public. Personally, I also found that leaving my immunology comfort zone to find connections with other disciplines resulted in a new mindset, with a cascade of positive consequences. During the development phase of the exhibit, collaboration with experts from other fields influenced the design of the outreach project. For example, both the sculptures and the choreography were essential to propose a fascinating view of the interaction between viruses and the immune system, in contrast to the more commonplace analogy of a war. In the delivery phase, the stand offered an aesthetic experience that people could enjoy regardless of their scientific proficiency. This appeared to put visitors and members of the scientific team at ease. It also facilitated two-way communication, drastically decreasing the risk of an overly didactic approach.

An outreach project of this type extends beyond the boundaries of a classical educational activity. Considering that non-conventional displays that include humanities can help to embed science, art and history in society, it is desirable that economic support for this kind of activities is increased – for example, by interdisciplinary funding bodies from government, academic institutions, no-profit organizations and charities. Such investments are of high priority to build scientific literacy in the public. More specifically, vaccine-related issues are currently hot topics in the public debate after rapid

development of anti-SARS-CoV-2 vaccines in the face of the COVID-19 pandemic and recent progress in cancer vaccines. Fostering multidisciplinary outreach projects that centre on vaccination and closely related subjects will be important to overcome and/or prevent obstacles in the public understanding of immunology.

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Competing interests

The author declares no competing interests.

Related links

All the collaborators: <https://www.crick.ac.uk/research/labs/adrian-hayday/vaccination-a-time-machine/vaccination-a-time-machine-credits-and-thanks>

‘On time’: <https://www.crick.ac.uk/research/labs/adrian-hayday/vaccination-a-time-machine/vaccination-a-time-machine-podcast>

Royal Society Summer Exhibition: <https://royalsociety.org/science-events-and-lectures/summer-science-exhibition/>

‘Senses of time’: <https://www.crick.ac.uk/research/labs/adrian-hayday/vaccination-a-time-machine/vaccination-a-time-machine-leaflet>

‘Vaccination, a time machine’: <https://www.crick.ac.uk/research/labs/adrian-hayday/vaccination-a-time-machine>