1000 words in 1 picture: How I combine art and science in medical illustrations

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Abstract
Communication is as much verbal as it is visual. We tend to rely on technical texts for transmitting medical information, but sometimes an image may convey complex medical concepts in a simpler and shorter form. Medical illustration requires artistic skills and scientific knowledge, but the academic choices leading to this professional activity are limited. Here I describe how I gradually rediscovered my artistic side and welcomed it into my scientific background, exploring this exciting career path.

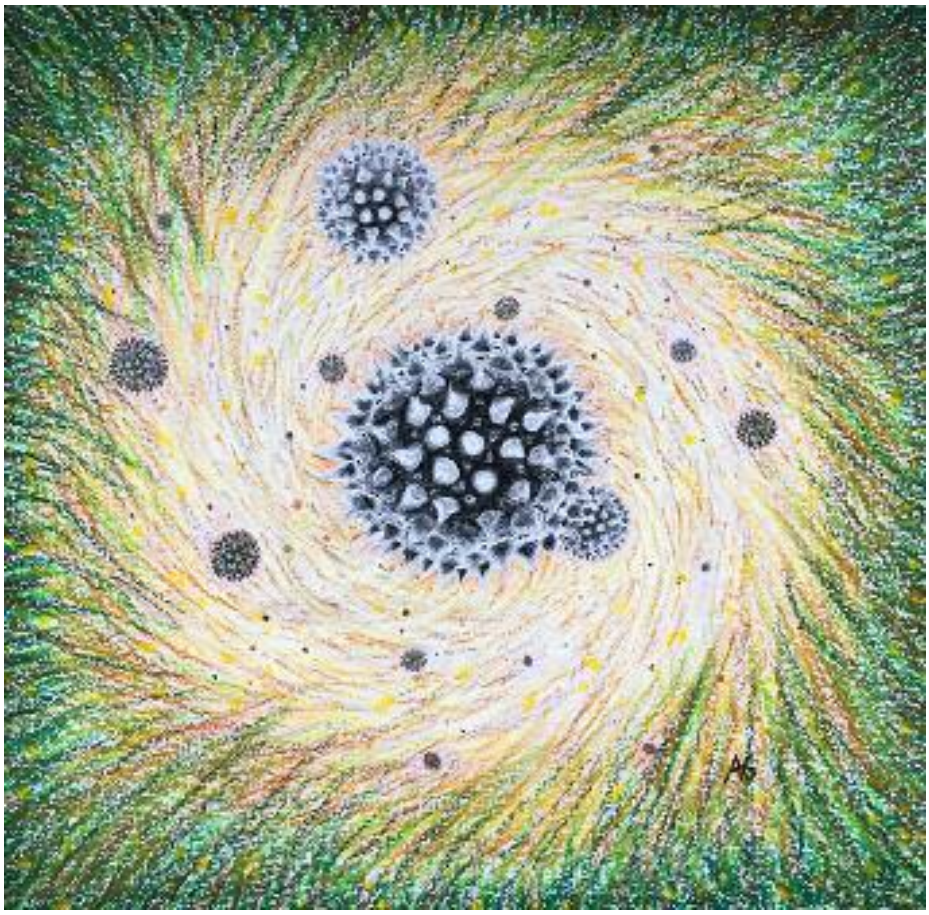

Figure 1. Hay Fever. Science-inspired painting. Mixed media.

When I was 15 years old, I had to decide which major field to study. I was generally a good student and had no major difficulties in any specific subject, although my favourite disciplines were arts and natural sciences. And, even though my arts teacher insisted that I should follow art, I easily opted for science. At that time, it was clear to me that I could make art a hobby.

I never had a scientific career path in mind. I took the biology course because I liked biology. I then took a research position in population genetics because I liked genetics. This position led me to apply for a PhD fellowship in the same topic even though a doctorate degree was not part of my plans. So, what does one do with a PhD in genetics? A postdoc, of course! And yet another one. During this time, I grew to like the topics I was researching. I particularly enjoyed working on forensic genetics and being involved in international societies. And although I never really enjoyed bench work, I liked analysing data and telling their stories. I liked writing and preparing posters and slides for presentations.

During all these years I never envisaged a possibility to professionally integrate art into my work. I was following a very typical scientific career path, which would lead me to a non-existing academic position at a university. In fact, the only two moments when I thought about this possibility were two intensive scientific illustration courses I took while still pursuing my biology degree. I also did not get to make art as a hobby as planned. During my PhD and postdoc years, my artistic side only rarely popped up when preparing slides or posters.

Academic career positions are scarce in Portugal, as generally in Europe, and after eight years of postdoc and having two children, I had to consider alternative career paths. I briefly tried working on genetic diagnostics until I decided that it was not making me happy or successful. I stopped for a year to try to find a job closer to home. During this year, I got more active online and maintained a blog about genetics for lay audiences. With more time on my hands, I began to draw and paint again and attended free workshops and other events on illustration. I did some science-inspired illustrations (Figure 1) and graphics explaining scientific concepts

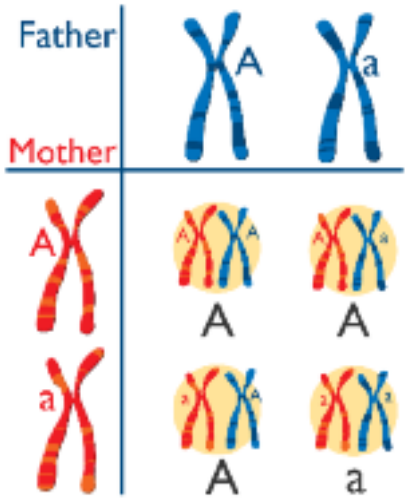

Figure 2. Graphic representation of dominant vs. recessive allele transmission. Digital illustration.

(Figure 2) for my blog and shared them on social networks. It was not until I accepted another research position in my hometown university that I got a request for illustration work.

My first true medical illustration project arrived through LinkedIn from a group of hospital clinicians leading an association for training in emergency medicine (POCUS Braga – AFEMED, Braga, Portugal). They had a set of slide deck presentations for workshops on point-of-care ultrasounds and needed a redesign including original illustrations. The first presentation was on deep vein thrombosis. My knowledge of thrombosis or ultrasounds was almost nil, so I did my homework. I learnt about these topics, did online searches, read books, examined pictures. I asked questions, and they gladly taught me how ultrasound can help diagnose deep vein thrombosis. I was even allowed to see one performed live, so I could understand how to distinguish arteries from veins in an ultrasound. I then created my illustrations using reference images, photos, ultrasound pictures, and my acquired knowledge. The result was a set of slides with a homogeneous design, handmade illustrations, and an overall clean look (Figure 3). This project was fun and allowed me to learn. It represented, for the first time, a possible alternative career doing what I love and using my scientific background.

As with medical writing, there is no academic degree specific to medical illustration. It requires skills from different fields. In fact, though divergent at first glance, these two activities have a lot in common, in particular, the main objective: to convey medical information in a clear (and appealing) way. Both require the ability to understand scientific concepts, an eye for detail, and communication skills. The main difference is the language: for writing, we need good English writing skills; for illustration, we need good drawing skills. They complement each other in transmitting information, and, sometimes, a picture may even be worth 1,000 words!

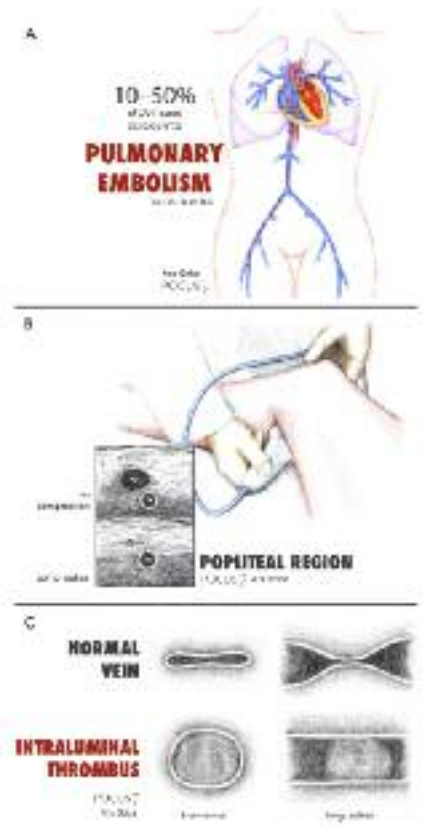

Figure 3. Deep vein thrombosis (DVT):
A. Consequence of DVT: pulmonary embolism.
B. Correct position to perform ultrasound for DVT diagnosis in the popliteal region and representation of ultrasound images.
C. Difference in ultrasound visualisation of normal vein and vein with intraluminal thrombosis. Medium: coloured pencils.

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My medical illustration work demands and reflects my scientific background. I also find myself using the same research strategies I used to write scientific papers. I look for reference images with the same critical view that I use to read scientific publications. I gather information from different sources and build the figures combining different references. When drawing, I try to achieve simple, yet scientifically correct images. Medical illustrations result from a scientific process. But for them to be visually appealing, I also search for literature and videos on design, illustration, drawing the human body and anatomy. And although some illustrations have limited artistic freedom, there is always room to input art into the process. Since I welcomed art back into my life, I began paying more attention to detail. I am more aware of light and shadows, alignments, and whitespace.

For the last year, I've been a researcher in a research institute connected to a medical school. I am helping develop a research line on population health. At the same time that I collaborate in projects on different health topics, I develop materials related to our new research line, which are used to summarise information or promote ongoing projects. These materials include graphical representations, slides, flyers, and texts. I also create medical illustrations for scientific papers, presentations, and posters. They may illustrate anatomic concepts, surgical procedures, or ultrasound interpretations. I have been able to network with different healthcare professionals and discover their communication needs. Through these experiences, I am finding that medical writing and illustration work synergistically in communicating healthcare messages. Luckily for me, they also work together to fulfil my needs for a career combining science and art.

Acknowledgements

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Author information

Ana Goios, PhD, has been a researcher at the Life and Health Sciences Research Institute for the past year. She also works as freelance medical writer and illustrator and embraces these activities in her research work, collaborating with other researchers, clinicians and institutions.