From ‘Open Science’ to ‘Science’, lessons learned from this year’s Open Access week.

https://www.uantwerpen.be/nl/bibliotheek/onderzoek/open-access/open-access-week/open-access-week-2020/blog-articles/#340416

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“*The critical importance of open and free exchange of scientific information cannot be underestimated and is an essential aspect of a modern and future-oriented society.*” With these strong words opened Vice-rector Research Professor Ronny Blust this year’s Open Access week at the University of Antwerp. Over the recent years, a strong advocacy for so-called ‘Open Science’ has been growing strongly in the research community, pleading that science should be publicly available, be reusable, induce collaboration and be transparent. This Open Science is not as straightforward as one might think, where in present science, the open and closed system are living in an elbowing harmony. Indeed, the importance of having the scoop as a researcher often contrasts the open sharing of information for global efficiency, and on top of that, scientific publishers are wielding high publication and/or reading fees for monetary gain. This persistence of a closed system is only minutely the researchers’ fault, since we are still depending on a funding and publishing system that started in medieval times[1]. However, developments in the last decade have made it clear that the tide is turning. As Mick Watson asked for in his famous 2015 paper, “When will ‘Open Science’ become simply ‘Science’?”[2], there is a tangible drive within the scientific community to rid itself of the burden of a faulted system. We are rethinking how to publish, how to evaluate scientific impact, how to collaborate and how to enhance reproducibility and integrity.

This year’s Open Access week made it clear that there is a strong will in our University to take the extra step, not only from the researchers, but also from the research staff and administration. The different talks, blog posts and

video testimonials touched many aspects of Open Science. Together with the Belgian Open Access week webinars, which were more focused on research administration, we were handed a nice and handy set of tips and tools. Nevertheless, why should we care about Open Science? Moreover, what are the pitfalls we yet need to overcome?

Understanding the why

Professor Colebunders, a big advocate of Open Access publishing, stated in his testimony that rapid and open availability of research results in the scientific community is crucial. However, why is Open Science so important? Truth being, one can argue that keeping research data closed also has its advantages. As our colleague Dr. Bronwen Martin from the faculty of pharma, biomedicine and veterinary sciences explained in her talk during the Belgian program, Open Science can accelerate science when thought trough carefully. This question, the why of Open Science, was also the main theme of the video testimonials of our researchers, and support the general consensus on the benefits on open research in the research community (Fig. 1). Dr. Bert van den Bogerd, postdoctoral researcher at the UA, explained how open research publications and data can lead to more visibility for a researchers work, enhancing (inter)national collaboration and increasing visibility for the non-academic world. The latter view was strongly endorsed by Anthony Liekens, alumnus and citizen scientist, who gave an example about using research results to correctly develop mouth masks in the current Covid pandemic. Citizens and non-academic experts like practitioners usually can't afford articles behind a steep paywall, and greatly benefit from freely available research. Open Science thus does not only enhance a researcher's visibility, but strongly enhances societal impact. Hanne Leysen, PhD student at the UA, thus pleaded for more outreach events to communicate with the general public. Lastly, as stated by professor Maudsley and PhD students Matthias Govaerts and Marlies Boeren, Open Data and publications allow for development of a broader understanding than that which can be achieved by one research project alone. Endorsed by the blog post of Joris van Meenen, if we even can expand our search for

answers by supplying machine-readable open formats, we are well on our way to answer big questions about the world. To finish, during an interesting talk about open research data and research integrity, professor Sabine Van Doorslaer (UA) explained how open data can lead to a lower degree of research fraud. This by providing means for quality assurance and by improving reproducibility of the research[3].

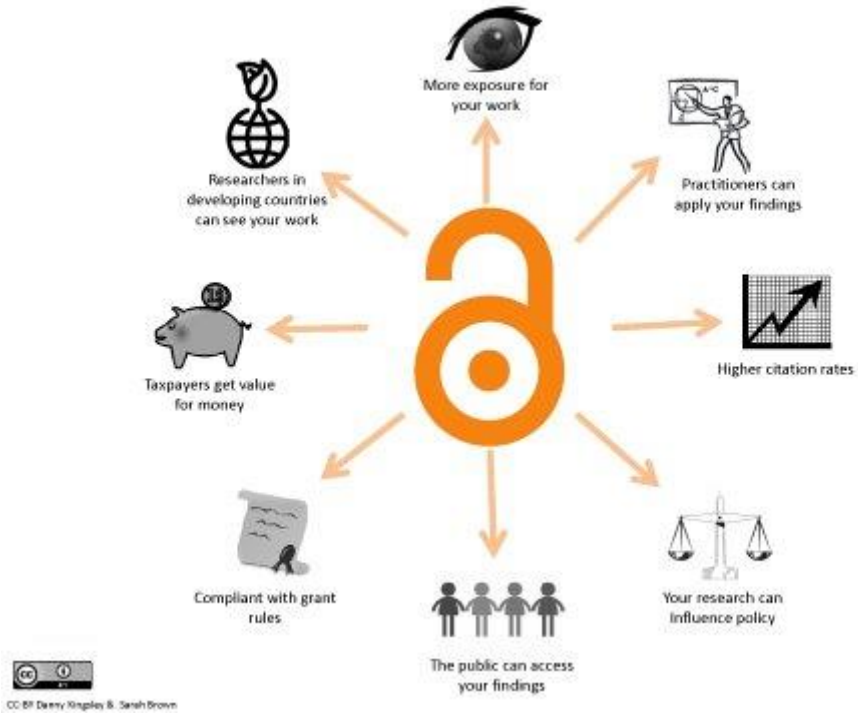

Figure 1: Different ways of how Open Access can improve the overall research process. Both reasons for personal benefit (e.g. more exposure and higher citation rates) as well as societal benefit (e.g. better access for researchers in developing countries and practitioners) are generally agreed upon in the research community. Picture by Danny Kingsler and Sarah Brown, CC-BY.

Strengthening the foundations of Open Science

Although the importance of Open Science is nowadays broadly understood and supported by the research community, researchers are still bound to evaluation systems and publishers agreements that slow down transitions to Open Science systems. Luckily, legislators are slowly recognizing the importance of Open Science as well. Recent advances led to the formation of the European Open Science Cloud, the Flemish Open Science Board and

many others, endorsing the need for Open Science. A big milestone was the adoption of the Belgian Open Access provision in 2018, which allows researchers to overrule most restrictions of publishers and to make the author accepted manuscript (AAM) of their research papers open access through an institutional repository (so-called 'Green' open access). This law, together with our own institutional open access policy, allows for a broad dissemination of research results. As stated by Rudi Baccarne in his blog article, behind this process stands a diligent research administration that manages the institutional repository, advises researchers in all aspects of Open Science and looks for new ways of enhancing this, e.g. by exploring the possibilities for 'transformative agreements' and cooperative electronic publishing models (see the blog article of Felipe César de Andrade for examples from Brazil)

Nonetheless, since science is a quickly evolving field and legislation tends to be rather static, it is often challenging to keep laws up to date and future-proof. A pertinent example of this was given in the lecture of Professor Esther van Zimmeren (UA) about the Nagoya protocol on the sharing of benefits from genetic resources (Fig. 2). Prof. van Zimmeren's talk did not only clearly show the need for fair and equitable sharing of benefits of research data and resources, but also showed some pitfalls in which legislation still needs to grow in order to make this happen. As an example, she showed that the ever-growing dissemination of digital sequence information (DSI) leads to pressing concerns about how to provide legal certainty. Luckily, this field is also evolving, with the WILDSI report[4] as a great example of the work that has been going on to provide a sound legal framework for Open Science.

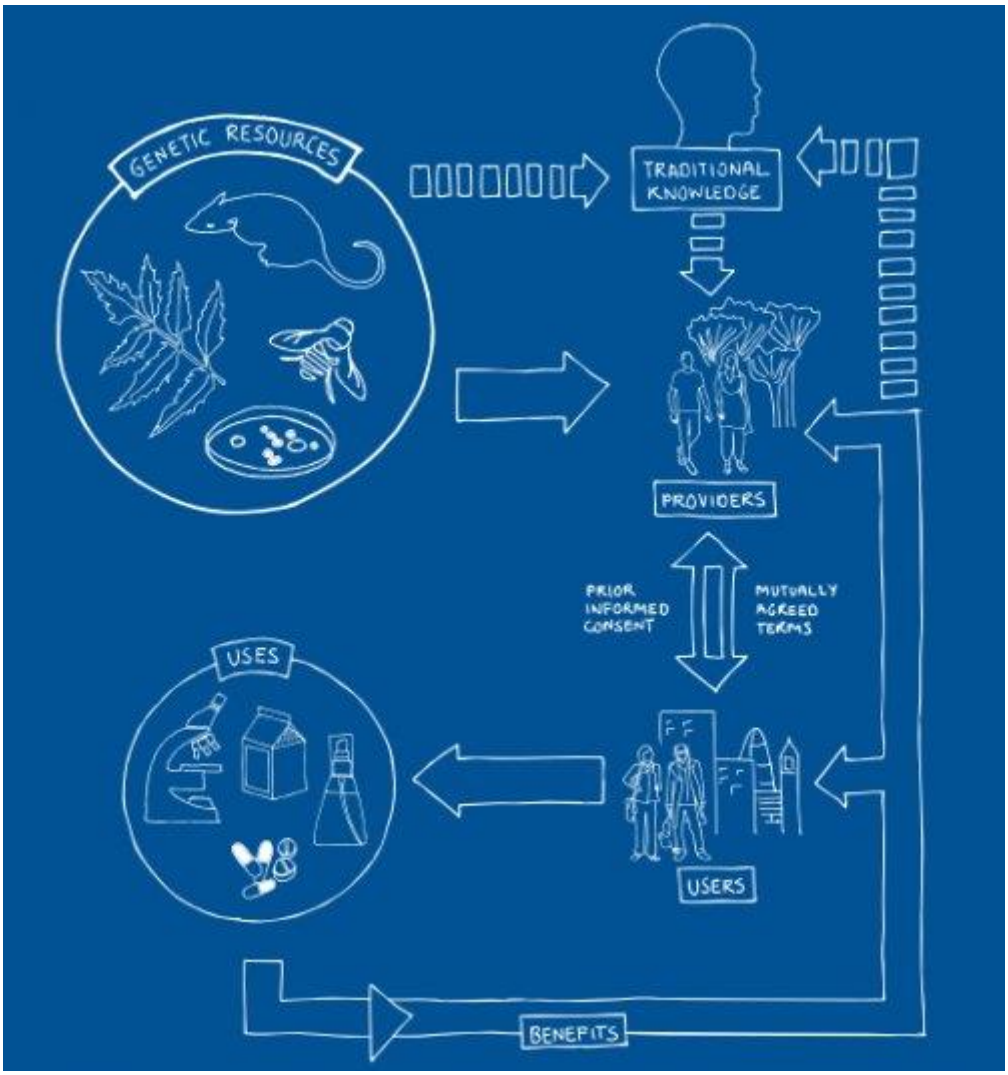

Figure 2: The rationale of the Nagoya protocol on access and benefit sharing. Provider countries hold legal ownership on their natural genetic resources and their traditional knowledge. When users like researchers and companies want to make use of these resources, it is expected and regulated by the Nagoya protocol that the benefits of this use is shared fair and equitable with the provider country. Of course, when pleading for open data, legislation has to find a way to deal with digital sequence information to defend this sharing of benefits. Picture from Copyright (2011), Secretariat of the Convention on Biological Diversity.

Next to the possibility to make research publications and data openly accessible, of late, funding bodies have been making it increasingly more obligated to do so. A big part in this story is the need for transparency in how research data is being handled, made openly available and stored for later reuse. This need for FAIR data (Findable, Accessible, Interoperable and

Reusable) and the obligation for a transparent Data Management Plan (DMP) was clearly explained during the talk of Dr. Jord Hanus, Head of the Research Affairs Office of our University, and many other talks during the Belgian Open Access week program. Filling in a DMP transcends just being an administrative burden. It is a way to ensure a correct handling of the data and can be indispensable in collaborative (inter)national projects. Fortunately, help is always available through the research administration. Lastly, funding bodies are taking matters in their own hands to provide means of Open Access publishing. A talk by Michael Markie in the Belgian program showed the new plans for a European publishing platform, ORE (Open Research Europe). This platform, designed for Horizon2020 grantees, will provide an open and transparent review process and publication, ensuring compliance with Europe's Open Science goals, and importantly, being absolutely free of charge. Together with ORE, recent initiatives like F1000 and Peer Community In's (PCI's) are rethinking the way we validate, share and publish our research results.

Drowning in tools

What has been particularly apparent during this week's talks, especially from the Belgian Open Access week, is that there is a sheer amount of tools to help researchers and especially administrators to advance their institute's Open Science agenda. Countless tools like Unsub, Unpaywall, Sherpa Romeo, Zotero, Zenodo, ORCID, draw.io, GitLab, Atom, etc. exist (Fig. 3). Furthermore, there is an increasing prevalence of educational material about Open Science (and even 'training the trainer' material) scattered around the web. In this strength also lays its weakness, since the amount and diversity of tools leads to it that one may not see the wood for the trees. It is in the current era of digital information quite easy to drown in the never-ending supply of supporting material. In that respect, it is extremely important to keep in mind that these tools are not a goal in itself, but should be selected and used only if clearly helpful for advancing Open Science.

Fortunately, universities and other institutes can increasingly depend on administrators like librarians and repository managers to guide them through the landscape of Open Science. Some recent developments in providing guidance and support look very promising. For example, Paula Oset Garcia from the UGent presented during the Belgian webinars the new EOSC Pillar platform, providing a database on all of the abovementioned tools and resources. Other initiatives like the OpenAIRE Provide platform aim to link different repositories and their metadata together. This way, at least we will be able to maintain an overview and find the common thread in the Open Science landscape.

Figure 3: Non exhaustive representations of the sheer amount of tools that exist for every part in the research process. The green line is just one of the many possible combinations of these tools, and it is getting more and more important to provide sufficient guidance for researchers in this landscape of tools. Picture: Joint Roadmap for Open Science Tools (JROST).

Little by little, one walks far

To summarize, this year's Open Access week provided valuable insights, tips and tools to further enhance the Open Science agenda of our University and our researchers. Open Science offers valuable advantages, a viewpoint increasingly shared by scientists worldwide. Not only does open access publication of research data and papers provide more visibility and options for collaboration for the researcher; it can greatly enhance societal impact, provide citizens and non-academic experts with up to date information and

allow overarching research to answer big questions about the world and our universe.

Legislation is slowly but steadily acknowledging the need for a more open and transparent research process, and is step by step providing us with the tools to back this up. Although some legislative challenges still remain, the shift in view is noticeable and funding bodies are backing this up with new regulations and platforms for researchers to take the step. Furthermore, the research community can count on a strong research administration to guide them through these regulations and the sheer amount of tools and information increasingly available on the web.

The saying goes ‘little by little, one walks far’. Let’s not stop here. Some very fundamental problems in the way we evaluate and fund research, together with a faulty and wildly expensive publishing system still remain. But as a research community, where solving problems is our job and falling and getting up is just an occupational hazard, I’m sure we will find a solution. That’s what scientists do.

Special thanks

Organizing weeks like these take a lot more than you would think, so I would like to warmly thank the organizing committee of the Open Access week at the University of Antwerp: Bronwen Martin (UA), Rudi Baccarne (UA), Esther van Zimmeren (UA), Marianne De Voecht (UA). I would also like to thank the numerous people who organised the Belgian Open Access week, of which I don't know everyone by name. Thank you all! Lastly, a special additional thanks to Bronwen Martin, without whom the testimonials would not have been possible.

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