

Digital genebankers plan to ignore UN request on the impact of genomics and synthetic biology on access and benefit sharing

by Edward Hammond

New documents show that key players in DiversitySeek (DivSeek),¹ a large international digital genebanking project, are trying to ignore a request from the United Nations to report on how technologies to deep-sequence, database and electronically distribute the genomes of hundreds of thousands of crop seeds will impact access and benefit sharing (ABS) for genetic resources.

While DivSeek scientists argue that making a report to the UN is too political, at the same time they are actively courting seed giant Syngenta and trying to put together a policy initiative by themselves. DivSeek is privy to Syngenta's private policy papers and is considering a funding scheme to sell access to genetic data that was suggested by the Swiss company. The quiet negotiation of Syngenta's terms for entry into the DivSeek project appears to include DivSeek's acquiescence to the seed company's demands on patenting of plant genes, sequences and traits.

Documents released under the US Freedom of Information Act reveal these and other DivSeek kicks in the teeth to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), whose government members asked DivSeek to report on sequencing and synthesis technologies in preparation for considering the issue at a 2017 Treaty meeting.

The documents point to the need for urgent action by the Convention on Biological Diversity (CBD), a nearly universal treaty governing biodiversity that DivSeek members barely consider relevant to their enterprise, evidenced by the absence of any significant consideration of how the CBD applies to DivSeek in the more than 1,000 pages of documents and e-mails obtained to date.

The CBD is especially important to questions of biological "big data" – industrial-scale

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genome sequencing and synthesis. The ITPGRFA's multilateral ABS system is a specialized instrument under the CBD which applies to a short list of crops and which is widely acknowledged not to be working well. As the overarching agreement on all biodiversity under which the ITPGRFA system operates, the CBD will take its approach to access and benefit sharing for gene sequences and associated data. The CBD urgently needs to consider and address the ABS implications of digital genebanking, a process that can start as part of its current consideration of synthetic biology.

DivSeek plans to link and facilitate analysis of databases that will ultimately host the genomes of hundreds of thousands of crop seeds as well as seeds of crop wild relatives, along with characterization information about them. Both the CBD and the ITPGRFA could be undermined if companies avoid ABS agreements when they access such genetic resources electronically, because using synthetic biology technologies such as gene synthesis and editing, digital genetic resources data can be used to select, recreate, manipulate and utilize key genes without physically transferring materials – and potentially without implementing benefit-sharing obligations.

Documents: Digital genebankers dodge fairness and equity discussion

Governments, civil society organizations and farmers are concerned about DivSeek's ABS implications, but documents show that DivSeek members want to avoid a discussion ... at least at the United Nations.

In October 2015, concerned governments approved ITPGRFA Resolution 3/2015, which asked DivSeek "to report on the implications for the objectives of the Treaty of the technologies underlying the DivSeek initiative and to compile a synthesis report on this for consideration by the Governing Body at its Seventh Session". (This is to take place in 2017.)

But shortly thereafter, an internal report showed that key DivSeek leaders were unhappy with the project's rising policy profile and the Treaty's request:² "The discussions at [the Governing Body] illustrated how much DivSeek has become a topic of the political discourse among ITPGRFA stakeholders ... Was DivSeek meant to embrace the *entire* spectrum of PGRFA stakeholders, including R&D organizations, governments, farmers, NGOs, and consumers? We believe not." (emphasis in original)

When DivSeek's steering committee met in December 2015 to discuss the resolution in person, committee member Andreas Graner, head of Germany's IPK Gatersleben seed bank, was recorded as being unequivocally opposed to answering the Treaty. Notes from the meeting say that Graner "strongly recommends that [DivSeek] not accept the invitation" to report to the ITPGRFA.³

Graner was not alone. The Global Crop Diversity Trust, which supports the Consultative Group for International Agricultural Research (CGIAR) genebanks and collections of seeds and crop wild relatives, also wants DivSeek to avoid engagement with the Treaty. Meeting notes describe the Crop Trust as "concerned about where [DivSeek] is heading", because it is "being pulled into policy domain, particularly at the Treaty's request". Echoing Graner's comments, the Crop Trust wanted DivSeek to instead be a "science platform"⁴ with a "research-driven focus".⁵

No to Treaty, but Yes to industry

But the motives of DivSeek's defenders of scientific "purity" may not be so pure. While the "science platform" envisioned by the Crop Trust purportedly rules out engagement on ABS issues as being too political, documents show that DivSeek does not avoid those issues when it comes to cultivating cosy relations with the seed companies, and that DivSeek is considering a policy initiative of its own.

Steering committee member Emily Marden, a patent attorney affiliated with a United States intellectual property law firm and the University of British Columbia in Canada, leads DivSeek's governance group, which is officially charged with developing proposals for the project's internal governance. Compared with DivSeek's global ambition, Marden's group is rather local. It consists of herself, a University of Saskatchewan professor, two graduate students from Canada and one US government official.⁶

Adding to the strangeness of its membership, the governance group does not only work on governance. It is actively recruiting private sector participation in DivSeek, even though this activity appears to be outside the group's charge. In late 2015, Marden reported to DivSeek steering committee colleagues that her group received a letter from Syngenta (many months earlier) expressing interest in affiliating with DivSeek and including the company's terms for it to do so.⁷

In fact, in September 2015, DivSeek's governance group received a Syngenta policy paper.⁸ The paper is titled "Challenges and opportunities in creating consistent governance around plant genetic resources for food and agriculture and related information, knowledge and rights". Among other things, "Challenges and opportunities" puts forward Syngenta's perspective on policies for access to data, and stresses the importance Syngenta places on obtaining patents on plant genes and traits.⁹

The seed giant's paper on "creating consistent governance around plant genetic resources for food and agriculture and related information, knowledge and rights" of course goes to the same policy concerns that ITPGRFA governments had in mind when asking for DivSeek's report.

But whereas key DivSeek members endorse ignoring the ITPGRFA on the grounds that DivSeek should be a purely scientific platform, there is no indication of Graner, the Crop Trust or anyone else objecting to DivSeek's governance committee's engagement with Syngenta.

Perhaps that is because the Canadian-dominated governance group was arguably following the lead of the DivSeek steering committee itself. In May 2015, at its first meeting, the steering committee expressed interest in funding DivSeek by selling subscriptions to its databases.¹⁰ This idea, according to the committee's minutes, is a "model proposed by a white paper submitted by Syngenta to the attention of DivSeek Partner organizations ... and shared with Committee members".¹¹

Marden continued her talks with industry at the 6th meeting of the Governing Body of the ITPGRFA in October 2015. While governments debated and ultimately passed Resolution 3/2015 asking for DivSeek's report, Marden was privately offering Syngenta and other, unnamed companies a DivSeek "listening session" in early 2016, during which industry could present terms to affiliate with the project.¹² (It is unclear if this meeting has occurred.)

Reporting back to the "governance" group, Marden wrote that companies she consulted about joining DivSeek said that their "main concern would be that information in DivSeek could be subject to the Treaty's SMTA [Standard Material Transfer Agreement], which to their minds, would be untenable".¹³

¹⁴

Marden added her personal agreement with industry's concern. Peter Bretting, of the US Department of Agriculture, concurred, replying to Marden and colleagues by saying, "DivSeek is a voluntary association of research institutions, completely independent of the ITPGRFA."^{15 16}

Does DivSeek want to make digital genebanking policy on its own?

Marden's dalliance with Syngenta and ABS is not the only recent foray by DivSeek's leaders into the policy arena. In late 2015, the Crop Trust appears to have put DivSeek forward as a mediator of access and sovereignty issues related to soya (soybean), an Asian native not in the ITPGRFA's Multilateral System (MLS). At a Seattle meeting called by

US soya scientists seeking to recruit Asian researchers and genebanks into a DivSeek-affiliated sequencing project, Peter Wenzl, the Crop Trust's representative to DivSeek, noted that DivSeek could act as a "broker for issues surrounding data and germplasm exchange".¹⁷

More evidence of disingenuity in DivSeek's pretence that it is too purely scientific to engage with the United Nations comes in the form of a proposed DivSeek seminar at the Rockefeller Foundation's Bellagio Center in Italy. A Bellagio conference draft proposal, discussed by the steering committee, would consider "game-changing and potentially disruptive DNA-sequencing technologies, big-data platforms, high performance computing, image-based phenotyping methods, gene-editing techniques, and synthetic biology concepts".¹⁸

But the planned consideration of these technologies is not a technical one. Rather, the conference is envisioned to "consider interactions between emerging scientific opportunities and policy challenges related to securing, managing and using plant genetic resources" and to "propose and advocate innovative solutions to global commons policy issues". (A "policy initiative" is indicated as the outcome of the meeting in the draft proposal.)¹⁹

This proposal for a DivSeek policy initiative on governance of plant genetic resources in light of synthetic biology technologies does not even mention the Convention on Biological Diversity.

Notably, DivSeek has also become an institutional member of Global Open Data for Agriculture and Nutrition (GODAN), an initiative of the G-8 funded by the US and European governments.²⁰ Few would argue against making genomic data available for scientific research, but the terms of availability are certainly relevant. GODAN is focused on open access, i.e., free access to data, but what if making that sequence data freely available – without an appropriate user agreement – allows and encourages companies to avoid benefit sharing?

Clearly, open data on biodiversity of developing countries and international agricultural collections can't mean data that comes without benefit-sharing obligations. Indeed, DivSeek has discussed funding itself by selling access to its databases. Do some DivSeek members envision genomic data as a free resource for anyone to use, with no compensation for providers, while the project's analytic tools will be rented out for payment?

The deeper one scratches, the more dubious DivSeek's assertions of scientific purity become. In fact, key players in DivSeek appear to wish to stall UN policymakers while the project makes de facto policy by itself, offering access to genetic resources for industry and establishing precedents for ABS at digital genebanks, while leaving the CBD, the ITPGRFA and developing countries behind.

Call for policy action

Leaders of the DivSeek project seek to avoid engagement with policymakers but are actively negotiating with industry. This attempt to supplant government policymaking with DivSeek's own deals with Syngenta and self-styled ABS policies for hundreds of thousands of crop genomes should be of huge concern to those interested in the health of the international ABS regimes. Governments should immediately move to regulate access and benefit sharing for sequence data and related information, even if digital genebankers are reluctant to cooperate.

DivSeek's double-dealing should be condemned. It avoids engaging with governments, farmers and civil society for reasons of "scientific purity". But that claim is revealed as disingenuous by DivSeek's frequent and deepening engagement with seed companies on the same issues that governments, farmers and civil society raise. Indeed, DivSeek's steering committee is privy to private industry policy papers, is pondering a Syngenta-inspired scheme to sell access to the sequence data of farmers' seeds from international genebanks, appears

to be weighing endorsement of industry patent demands, and is considering its own policy initiative.

Whether or not DivSeek ultimately becomes the premier genomic “big data” project in agriculture, the ABS issues that digital genebanking brings to the table will remain. If DivSeek collapsed tomorrow, massive projects such as BEAN-ADAPT (10,000 bean accessions), G2P-SOL (50,000 *Solanaceae* accessions) and others (e.g., on rice and chickpeas) will go ahead. So will smaller, more focused efforts – with ABS implications too – like the Netherlands’ Wageningen University project on Andean wild tomato relatives.

The emerging gap in the application of ABS rules between physical and digital access to genetic resources must be closed. Whereas physical access to genetic resources increasingly occurs under signed ABS agreements, electronic access to genetic resources is comparatively unregulated. This problem is felt not only in plant-related projects like DivSeek, but has also arisen in public health policy in relation to pathogens.

If governments fail to quickly close the digital ABS gap, developing countries will lose out. Addressing this policy dimension of synthetic biology requires careful consideration of how to adapt the ABS approaches typically used under the CBD and its Nagoya Protocol on access and benefit sharing to the new reality of “big data” in biology.

The need for action by Parties to the CBD is clear. Genome sequencing and synthetic biology will have increasing impact on access and benefit sharing for genetic resources, and will continue to undermine traditional ABS approaches reliant on physical transfer of genetic resources and material transfer agreements. Without the CBD acting to thoughtfully apply ABS rules to digital genebanks, this undermining process will eventually threaten the core principles of the Convention and the ITPGRFA.

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This paper was written in April 2016. Records obtained under the open records laws that are referenced here may be viewed at: <http://www.pricklyresearch.com/AutoIndex/index.php?dir=digitalgenebanking/>. In due course, the full set of DivSeek documents obtained under US and Canadian open records requests will be posted at the above URL.

Endnotes

1. DivSeek’s website is: <http://www.divseek.org>
2. DivSeek (2015). Updates since the last meeting of the Steering Committee. Information note by the Joint Facilitation Unit. Document DS/SC-2/15/2. December. This portion of the Joint Facilitation Unit document was authored by the Global Crop Diversity Trust. USDA FOIA 2016-REE-01121-F.
3. Marden E (2015). E-mail to Susan McCouch (DivSeek Coordinator). Notes prepared for McCouch by Marden and Peter Phillips (University of Saskatchewan). 9 December. USDA FOIA 2016-REE-01121-F.
4. Ibid.
5. DivSeek (2015). Document DS/SC-2/15/2.

6. This primarily Canadian contingent confusingly refers to itself by several different names, even within the same document. These include “governance committee”, “expert group” and “expert governance committee”, and “subcommittee” (of the steering committee), though only two of the five members are on the DivSeek steering committee.
7. DivSeek (2015). Report of Governance Expert Group [sic]. 8 December. USDA FOIA 2016-REE-01121-F.
8. DivSeek (2015). Governance Committee [sic] Agenda. 23 September. USDA FOIA 2016-REE-01121-F.
9. Syngenta (2015). Challenges and opportunities in creating consistent governance around plant genetic resources for food and agriculture and related information, knowledge and rights. White paper. USDA FOIA 2016-REE-01121-F.
10. Or, perhaps, subscriptions to use its analytical tools to evaluate “open” genomic data. See discussion of GODAN below in this report.
11. DivSeek (2015). Report of the DivSeek Steering Committee. 28 May. Rome. USDA FOIA 2016-REE-01121-F.
12. Marden E (2015). E-mail to DivSeek Governance Committee [sic]. 8 October. USDA FOIA 2016-REE-01121-F.
13. The ITPGRFA’s Standard Material Transfer Agreement implements the ABS obligations of the Treaty’s Multilateral System (MLS). Without application of the SMTA or its equivalent, companies might access and use sequences of MLS seed accessions without incurring benefit-sharing obligations.
14. Marden E (2015). E-mail. 8 October.
15. Ibid.
16. Bretting remarkably ignored that the ITPGRFA Secretariat is part of the DivSeek Joint Facilitation Unit and that other DivSeek facilitators and committee members, like the CGIAR and Crop Trust, have formal Treaty affiliations.
17. DivSeek (2015). DivSeek Steering Committee conference call (Meeting minutes). 27 April. USDA FOIA 2016-REE-01121-F.
18. DivSeek (2015). Proposal for a Bellagio conference on the science/policy interface in relation to crop germplasm. Information note by the Joint Facilitation Unit. DS/SC-2/15/7. USDA FOIA 2016-REE-01121-F.
19. Ibid.
20. GODAN(2015). PublicGODANmembership listing (web page). URL: <http://www.godan.info/civicrm/profile?pv=1&cid=194&gid=14&force=1&crmPID=2>