Sunday Evening News No. 106

Week 49 (2018-12-03 / 12-09)

Selected and edited by ***BGF*** Jany

Dear all,

and again my subjective selection of press releases and publications.

ZKBS: ***Genome Editing*** **- Auswirkungen des EuGH-Urteils auf die Pflanzenzüchtung**
https://www.zkbs-online.de/ZKBS/DE/03_Fokusthemen/Genome%20Editing/Genome%20Editing_node.html;jsessionid=AEAC4D5445899B9BEB340E12E1DB3EE4.2_cid340

„Aktuelle Forschung zu CRISPR-Cas begreifbar machen“
https://crispr-whisper.de/aktuelle-forschung-zu-crispr-cas-begreifbar-machen/

Kyodo News: **Japan may boost gene-edited foods development**
https://english.kyodonews.net/news/2018/12/66a6cf039c8d-panel-report-may-help-promote-gene-edited-foods-in-japan.html

BVL: **Gentechnik und Saatgut - Ergebnisse der Überwachung durch die Bundesländer im Analysejahr 2018**
https://www.bvl.bund.de/DE/06_Gentechnik/04_Fachmeldungen/2018/2018_12_04_Fa_Gentechnik_Saatgut_Ergebnisse.html

transcript: **Gegendruck von Genscheren-Gegnern**
https://transkript.de/news/gegendruck-von-genscheren-gegnern.html

https://www.topagrar.com/markt/news/eu-futtermittelfirmen-fordern-sicherstellung-einer-gentechnikfreien-produktion-10121690.html

Innovationsreport: **Getreidepflanzen nutzen ihre Abwehrstoffe multifunktional gegen verschiedene Schädlinge**
https://www.innovations-report.de/html/berichte/agrar-forstwissenschaften/getreidepflanzen-nutzen-ihre-abwehrstoffe-multifunktional-gegen-verschiedene-schaedlinge.html
see also: Klymiuk V. et al. (2008) below:

Aarhus University: **"New insights in rust resistance in wheat**. ScienceDaily,
https://www.sciencedaily.com/releases/2018/12/181206085120.htm

Royal Society statement on gene drive research
What are gene drives? What are their potential applications? How can risks and benefits be managed?
https://royalsociety.org/topics-policy/publications/2018/gene-drive-statement/?utm_campaign=6251&utm_source=adestra&utm_medium=email

J.R. SIMPLOT COMPANY STATEMENT ON CAIUS ROMMENS' BOOK
http://www.innatepotatoes.com/newsroom/view-news/j.r.-simplot-company-statement-on-caius-rommens-book

GM Watch: **Dr Caius Rommens replies to Simplot on GMO potato controversy**
https://gmwatch.org/en/news/latest-news/18530
https://mailchi.mp/gmwatch.org/dr-caius-rommens-antwortet-simplot-in-der-kontroverse-um-gv-kartoffel?e=ca15334802

USDA Foreign Agriculture Service: **Poland Poised to Postpone GE Feed Ban for More Two Years**
https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Poland%20Poised%20to%20Postpone%20GE%20Feed%20Ban%20for%20More%20Two%20Years%20_Warsaw_Poland_11-26-2018.pdf

GM Watch: **EU: Protect food safety, not industry secrets!**
https://act.wemove.eu/campaigns/1055?utm_source=civimail-19664&utm_medium=email&utm_campaign=20181206_EN_PS

Kluwer Patent blogger: EPO Board of Appeal decides plants can be patentable after all
http://patentblog.kluweriplaw.com/2018/12/05/epo-board-of-appeal-decides-plants-can-be-patentable-after-all/

EuropaBio: **Statement on the decision of the Board of Appeal of the European Patent Office (EPO) on case T1063/18**
https://www.europabio.org/agricultural-biotech/publications/statement-decision-board-appeal-european-patent-office-epo-case

As always you will find the daily up-date of the press releases at: https://www.biotech-gm-food.com/presse

Publications

Sax, J.K. & Doran, N. J (2018): **Ambiguity and Consumer Perceptions of Risk in Various Areas of Biotechnology.** Consum Policy https://doi.org/10.1007/s10603-018-9398-8
Certain advances in biotechnology generate controversy, with consumer resistance derived from publicly expressed concerns about safety, despite scientific evidence of safety. The reasons for this discrepancy are not fully understood. This study aimed to understand how participants respond to biotechnology when some ambiguity about risk or uncertainty is presented. A sample of 318 adults completed a survey assessing aversion to ambiguous information in controversial areas such as food, vaccines, fluoridated water, and stem cell research. Participants responded to ambiguity assessments and 14 scenarios in these categories that contained a description of a benefit and either missing or conflicting information about an unknown risk or uncertainty. Participants who reported greater aversion to ambiguity tended to respond in a way that signals the assignment of high risk, and low benefit, when presented with some unknown or uncertain risk. The results of the present study can be used to develop methods to close the divide.
https://link.springer.com/article/10.1007/s10603-018-9398-8

Iyengar S. and Massey D. S. (2018): **Scientific communication in a post-truth society.** PNAS**;** https://doi.org/10.1073/pnas.1805868115
Within the scientific community, much attention has focused on improving communications between scientists, policy makers, and the public. To date, efforts have centered on improving the content, accessibility, and delivery of scientific communications. Here we argue that in the current political and media environment faulty communication is no longer the core of the problem. Distrust in the scientific enterprise and misperceptions of scientific knowledge increasingly stem less from problems of communication and more from the widespread dissemination of misleading and biased information. We describe the profound structural shifts in the media environment that have occurred in recent decades and their connection to public policy decisions and technological changes. We explain how these shifts have enabled unscrupulous actors with ulterior motives increasingly to circulate fake news, misinformation, and disinformation with the help of trolls, bots, and respondent-driven algorithms. We document the high degree of partisan animosity, implicit ideological bias, political polarization, and politically motivated reasoning that now prevail in the public sphere and offer an actual example of how clearly stated scientific conclusions can be systematically perverted in the media through an internet-based campaign of disinformation and misinformation. We suggest that, in addition to attending to the clarity of their communications, scientists must also develop online strategies to counteract campaigns of misinformation and disinformation that will inevitably follow the release of findings threatening to partisans on either end of the political spectrum.
http://www.pnas.org/content/early/2018/11/21/1805868115
http://www.pnas.org/content/pnas/early/2018/11/21/1805868115.full.pdf

IAP: **Opportunities for future research and innovation on food and nutrition security and agriculture The InterAcademy Partnership's global perspective**
https://easac.eu/publications/details/opportunities-for-future-research-and-innovation-on-food-and-nutrition-security-and-agriculture/

Hanson A., Joseph Jez J. (eds.) (2018): **Synthetic Biology Meets Plant Metabolism** Volume 273, Pages 1-120 (the whole issue)
https://www.sciencedirect.com/journal/plant-science/vol/273/suppl/C

Klymiuk V. et al. (2008): **Cloning of the wheat Yr15 resistance gene sheds light on the plant tandem kinase-pseudokinase family**. *Nature Communications*, 2018; 9 (1) DOI: 10.1038/s41467-018-06138-9
Yellow rust, caused by *Puccinia striiformis* f. sp. *tritici* (*Pst*), is a devastating fungal disease threatening much of global wheat production. Race-specific resistance (*R*)-genes are used to control rust diseases, but the rapid emergence of virulent *Pst* races has prompted the search for a more durable resistance. Here, we report the cloning of *Yr15*, a broad-spectrum *R*-gene derived from wild emmer wheat, which encodes a putative kinase-pseudokinase protein, designated as wheat tandem kinase 1, comprising a unique *R*-gene structure in wheat. The existence of a similar gene architecture in 92 putative proteins across the plant kingdom, including the barley RPG1 and a candidate for *Ug8*, suggests that they are members of a distinct family of plant proteins,

termed here tandem kinase-pseudokinases (TKPs). The presence of kinase-pseudokinase structure in both plant TKPs and the animal Janus kinases sheds light on the molecular evolution of immune responses across these two kingdoms.
https://www.nature.com/articles/s41467-018-06138-9

Förster S., Schmidt L.K., Kopic E., Anschütz U., Huang S., Schlücking K., Köster P., Waadt R., Larrieu A., Batistič O., Rodriguez P., Grill E., Kudla J., Becker D. (2018): **Wounding Induced Stomatal Closure Requires Jasmonate-Mediated Activation of GORK K+ Channels by a Ca2+ Sensor-Kinase CBL1-CIPK5 Complex.** Developmental Cell, DOI: 10.1016/j.devcel.2018.11.014
Guard cells integrate various hormone signals and environmental cues to balance plant gas exchange and transpiration. The wounding-associated hormone jasmonic acid (JA) and the drought hormone abscisic acid (ABA) both trigger stomatal closure. In contrast to ABA however, the molecular mechanisms of JA-induced stomatal closure have remained largely elusive. Here, we identify a fast signaling pathway for JA targeting the K^+ efflux channel GORK. Wounding triggers both local and systemic stomatal closure by activation of the JA signaling cascade followed by GORK phosphorylation and activation through CBL1-CIPK5 Ca^{2+} sensor-kinase complexes. GORK activation strictly depends on plasma membrane targeting and Ca^{2+} binding of CBL1-CIPK5 complexes. Accordingly, in *gork*, *cbl1*, and *cipk5* mutants, JA-induced stomatal closure is specifically abolished. The ABA-coreceptor ABI2 counteracts CBL1-CIPK5-dependent GORK activation. Hence, JA-induced Ca^{2+} signaling in response to biotic stress converges with the ABA-mediated drought stress pathway to facilitate GORK-mediated stomatal closure upon wounding.
https://www.sciencedirect.com/science/article/abs/pii/S1534580718309328?via%3Dihub

News About a Plant Hormone
https://www.uni-wuerzburg.de/en/news-and-events/news/detail/news/news-about-a-plant-hormone/

Busoms S., Paajanen P., Marburger S., Bray S., Huang X.-Y., Poschenrieder C., Yant L., Salt D. E. (2018): **Fluctuating selection on migrant adaptive sodium transporter alleles in coastal Arabidopsis thaliana.** *PNAS* (2018). www.pnas.org/cgi/doi/10.1073/pnas.1816964115
Stressors such as soil salinity and dehydration are major constraints on plant growth, causing worldwide crop losses. Compounding these insults, increasing climate volatility requires adaptation to fluctuating conditions. Salinity stress responses are relatively well understood in *Arabidopsis thaliana*, making this system suited for the rapid molecular dissection of evolutionary mechanisms. In a large-scale genomic analysis of Catalonian *A. thaliana*, we resequenced 77 individuals from multiple salinity gradients along the coast and integrated these data with 1,135 worldwide *A. thaliana* genomes for a detailed understanding of the demographic and evolutionary dynamics of naturally evolved salinity tolerance. This revealed that Catalonian varieties adapted to highly fluctuating soil salinity are not Iberian relicts but instead have immigrated to this region more recently. De novo genome assembly of three allelic variants of the high-affinity K^+ transporter (*HKT1;1*) locus resolved structural variation between functionally distinct alleles undergoing fluctuating selection in response to seasonal changes in soil salinity. Plants harboring alleles responsible for low root expression of *HKT1;1* and consequently high leaf sodium ($HKT1;1^{HLS}$) were migrants that have moved specifically into areas where soil sodium levels fluctuate widely due to geography and rainfall variation. We demonstrate that the proportion of plants harboring $HKT1;1^{HLS}$ alleles correlates with soil sodium level over time, $HKT1;1^{HLS}$-harboring plants are better adapted to intermediate levels of salinity, and the $HKT1;1^{HLS}$ allele clusters with high-sodium accumulator accessions worldwide. Together, our evidence suggests that *HKT1;1* is under fluctuating selection in response to climate volatility and is a worldwide determinant in adaptation to saline conditions.
https://www.pnas.org/content/early/2018/12/05/1816964115
https://www.pnas.org/content/pnas/early/2018/12/05/1816964115.full.pdf

Emma Thorne, University of Nottingham
Nature's 'laboratory' offers clues on how plants thrive through genetic diversity
https://phys.org/news/2018-12-nature-laboratory-clues-genetic-diversity.html#jCp

Li B. et al. (2018): **Convergent evolution of a metabolic switch between aphid and caterpillar resistance in cereals.** *Science Advances*: 4 (12), eaat6797; DOI: 10.1126/sciadv.aat6797
Tailoring defense responses to different attackers is important for plant performance. Plants can use secondary metabolites with dual functions in resistance and defense signaling to mount herbivore-specific responses. To date, the specificity and evolution of this mechanism are unclear. Here, we studied the functional architecture, specificity, and genetic basis of defense regulation by benzoxazinoids in cereals. We document that DIMBOA-Glc induces callose as an aphid resistance factor in wheat. *O*-methylation of DIMBOA-Glc to HDMBOA-Glc increases plant resistance to caterpillars but reduces callose inducibility and resistance to aphids. DIMBOA-Glc induces callose in wheat and maize, but not in *Arabidopsis*, while the glucosinolate 4MO-I3M does the opposite. We identify a wheat *O*-methyltransferase (TaBX10) that is induced by caterpillar feeding and converts DIMBOA-Glc to HDMBOA-Glc in vitro. While the core pathway of benzoxazinoid biosynthesis is conserved between wheat and maize, the wheat genome does not contain close homologs of the maize DIMBOA-Glc *O*-methyltransferase genes, and *TaBx10* is only distantly related. Thus, the functional architecture of herbivore-specific defense regulation is similar in maize and wheat, but the regulating biosynthetic genes likely evolved separately. This study shows how two different cereal species independently achieved herbivore-specific defense activation by regulating secondary metabolite production.

http://advances.sciencemag.org/content/4/12/eaat6797

Cooper A.MW, Silver K., Zhang J., Parka Y., Zhua K. Y. (2019): **Molecular mechanisms influencing efficiency of RNA interference in insects.** *Pest Manag Sci* **75**: 18–28
DOI 10.1002/ps.5126
RNA interference (RNAi) is an endogenous, sequence-specific gene-silencing mechanism elicited by small RNA molecules. RNAi is a powerful reverse genetic tool, and is currently being utilized for managing insects and viruses. Widespread implementation of RNAi-based pest management strategies is currently hindered by inefficient and highly variable results when different insect species, strains, developmental stages, tissues, and genes are targeted. Mechanistic studies have shown that double-stranded ribonucleases (dsRNases), endosomal entrapment, deficient function of the core machinery, and inadequate immune stimulation contribute to limited RNAi efficiency. However, a comprehensive understanding of the molecular mechanisms limiting RNAi efficiency remains elusive. Recent advances in dsRNA stability in physiological tissues, dsRNA internalization into cells, the composition and function of the core RNAi machinery, as well as small-interfering RNA/double-stranded RNA amplification and spreading mechanisms are reviewed to establish a global understanding of the obstacles impeding wider understanding of RNAi mechanisms in insects.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ps.5126

Simon S., Otto M., Engelhard M. (2018): **Scan the horizon for unprecedented risks.** Science 362(6418), 1007-1008
http://science.sciencemag.org/content/362/6418/1007.2.full

National Academies of Sciences, Engineering, and Medicine. 2018. ***Biodefense in the Age of Synthetic Biology***. Washington, DC: The National Academies Press.
https://doi.org/10.17226/24890.
Scientific advances over the past several decades have accelerated the ability to engineer existing organisms and to potentially create novel ones not found in nature. Synthetic biology, which collectively refers to concepts, approaches, and tools that enable the modification or creation of biological organisms, is being pursued overwhelmingly for beneficial purposes ranging from reducing the burden of disease to improving agricultural yields to remediating pollution. Although the contributions synthetic biology can make in these and other areas hold great promise, it is also possible to imagine malicious uses that could threaten U.S. citizens and military personnel. Making informed decisions about how to address such concerns requires a realistic assessment of the capabilities that could be misused.
Biodefense in the Age of Synthetic Biology explores and envisions potential misuses of synthetic biology. This report develops a framework to guide an assessment of the security concerns related to advances in synthetic biology, assesses the levels of concern warranted for such advances, and identifies options that could help mitigate those concerns.
https://www.nap.edu/catalog/24890/biodefense-in-the-age-of-synthetic-biology

SCoPAFF: Genetically Modified Food and Feed and Environmental Risk (03.12.2018)
No qualified majority for the approval of the plants could be achieved

The renewal of the authorisation to place on the market feed containing or consisting of genetically modified oilseed rapes Ms8, Rf3 and Ms8 × Rf3

Authorisation the placing on the market of products containing, consisting of or produced from genetically modified maize 5307

(SYN-Ø53Ø7-1)

Authorisation the placing on the market of products containing, consisting of or produced from genetically modified maize MON 87403 (MON-874Ø3-1)

Authorisation the placing on the market of products containing, consisting of or produced from genetically modified cotton GHB614×LLCotton25×MON15985

https://ec.europa.eu/food/sites/food/files/plant/docs/sc_modif-genet_20181203_agenda.pdf

EFSA:
EFSA GMO Panel (2018): **Scientific Opinion on the assessment of genetically modified soybean MON 89788 for renewal of authorisation under Regulation (EC) No 1829/2003 (application EFSA-GMO-RX-011).**EFSA Journal 2018;16(11):5468, 11 pp.
https://doi.org/10.2903/j.efsa.2018.5468
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5468

EFSA GMO Panel (2018): **Scientific Opinion on the assessment of genetically modified maize MZHG0JG for food and feed uses, import and processing under Regulation (EC) No**

1829/2003 (application EFSA-GMO-DE-2016-133). EFSA Journal 2018;16(11):5469, 26 pp.
https://doi.org/10. 2903/j.efsa.2018.5469
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5469

EFSA GMO Panel (2018): **Scientific Opinion on the assessment of genetically modified LLCotton25 for renewal of authorisation under Regulation (EC) No 1829/2003 (application EFSA-GMO-RX-010).** EFSA Journal 2018; 16(11):5473, 11 pp.
https://doi.org/10.2903/j.efsa.2018.5473
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5473

Food Safety in the EU:
Maintaining High Standards and Ensuring Transparency of Information

Date:	Tuesday 29th January 2019
Time:	10:00am — 4:30pm
Venue:	Thon Hotel Brussels City Centre

https://www.publicpolicyexchange.co.uk/event.php?evID=2893&mc_cid=33a44d9195&mc_eid=b89825d9e5

23rd Annual ICABR Conference
The ICABR Conference is pleased to invite abstract submissions or session proposals for the ***23rd Annual ICABR Conference***, June 4-7, 2019, in Ravello, Italy. This year's theme is the *Regulation and Finance of Innovations for a Sustainable Bioeconomy*.

Submission of abstracts or proposals are due by January 20, 2019. Further submission information is available at the 2019 conference submissions webpage.
IMPORTANT DATES

January 20, 2019:	Deadline for abstract and session proposals
January 31, 2019:	Notification of acceptance
April 15, 2019:	Paper submissions due
April 15, 2019:	Last day of 'Early Bird' registration
June 4–7, 2019:	Conference – Ravello, Italy

Wie immer wird für Hinweise und der Zusendung von Publikationen und sonstigen Informationen gedankt. pdf-Dateien können meist direkt aus den links heruntergeladen werden.

Bitte besuchen sie auch die Webseite des Wissenschaftlerkreis Grüne Gentechnik e.V. (WGG): www.wgg-ev.de .

*As always, I thank you all for hints and for publications. M*ost of the pdf files can be downloaded directly from the links.

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