

Sunday Evening News

Week 22 (2018-05-28 / 06-03)

Selected and edited by **BGF** Jany

Sehr geehrte Kollegen und Kolleginnen, liebe Freunde und Mitstreiter,

Dear all,

zunächst einmal Glückwünsche auch im Namen des WGG: / First of all congratulations also on behalf of the WGG

ASPB's 2018 Election Results

Many thanks to those members who took the time to vote this spring; and hearty congratulations to our newly elected Council members: Judy Callis (incoming president-elect) and **Wayne Parrott** (incoming secretary-elect)! Judy and Wayne will begin their next cycles of service to ASPB on October 1, 2018. Thanks, too, to Laura Wayne and Phil Taylor for their willingness to run and serve if elected.

<http://blog.aspb.org/aspbs-2018-election-results/>

Max-Planck-Gesellschaft

Durchbruch in der Gentechnik: Emmanuelle Charpentier erhält Kavli-Preis

<https://www.mpg.de/12058753/emmanuelle-charpentier-kavli-preis-2018>

Nature

Million-dollar Kavli prize recognizes scientist scooped on CRISPR

Award goes to biochemists **Virginijus Siksnys**, whose lab independently developed the gene-editing tool, **Emmanuelle Charpentier and Jennifer Doudna**.

<https://www.nature.com/articles/d41586-018-05308-5>

Jany: Kommentar

Kommissionsvorschlag zu Erhöhung der Transparenz und Nachhaltigkeit in der Risikobewertung bei Lebens- und Futtermitteln (only in German)

<https://www.biotech-gm-food.com/aktuelles/transparenz-risikobewertung-efsa>

Then / TestBiotech:

Neue wissenschaftliche Fachstelle für Gentechnik und Umwelt

Ergebnisse sollen dem öffentlichen Diskurs dienen

Projektgeber ist das Bundesamt für Naturschutz mit Mitteln aus dem UFOPLAN des Bundesministeriums für Umwelt, Naturschutz und nukleare Sicherheit, Förderkennzeichen 3517841500.

www.fachstelle-gentechnik-umwelt.de

<http://www.testbiotech.org/node/2208>

Ja, es war ein genialer Schachzug von Herrn Then, Testbiotech. Endlich hat Deutschland, wenn nicht gar die EU, eine kompetente wissenschaftliche Fachstelle für Gentechnik und Umwelt. Sie ist nicht nur kompetent, sondern auch vollkommen unabhängig insbesondere von der Wirtschaft (Industrie).

TestBiotech

New scientific center for genetic engineering and environment

Results should serve the public discourse

The project is funded by the Federal Agency for Nature Conservation with funds from the UFOPLAN of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, grant number 3517841500.

Yes, it was a brilliant move by Mr. Then, Testbiotech. Finally, Germany, if not the EU, has a competent scientific center for genetic engineering and the environment. She is not only competent, but also completely independent, especially from the economy (industry).es, it was a brilliant move by Mr. Then, Testbiotech. Finally, Germany, if not the EU, has a competent scientific center for genetic engineering and the environment. She is not only competent, but also completely independent, especially from the industry.

Press releases – Media reports

Enviscope

Trois expertises invalident l'étude Seralini sur les maïs OGM » toxiques »

<https://www.enviscope.com/environnement/trois-expertises-invalident-letude-seralini-sur-les-mais-ogm-toxiques/61656>

AFBV:

In September 2012, Professor Gilles-Eric Séralini published in Food and Chemical Toxicology an article claiming that a genetically modified corn NK 603 induces tumors. Faced with the challenge of this study by the scientific community, GE Seralini defends himself by saying that the 90-day studies required by the European Union are far too short to reveal effects that manifest themselves in the longer term, such as carcinogenesis.

To settle the debate, the French and European authorities then decided to launch three research programs to confirm or invalidate the results of GE Seralini's analyzes: GRACE and G-TwYST programs in Europe and GMO90 + in France for a total cost of 15 million euros. According to the French Association of Plant Biotechnology (AFBV) the results of these experiments now published are clear (the results of the G-Twist study were communicated on April 28, 2018):

- 1) - The results of these research programs confirm the absence of health effects of maize carrying MON 810 and NK 603 in the 90-day studies. This lack of effect had already been observed in previous studies and taken into account in EFSA's assessments.
- 2) - Long-term studies (one year and two years), do not show any toxic effect of the analyzed maize and bring nothing more than 90-day studies as predicted by toxicologists.

AFBV notes that these new studies refute the main conclusions drawn from GE Seralini's studies on the toxicity of the analyzed GMO maize: no potential risk has been identified. In addition, they contradict his proposals on the need to carry out long-term studies. For AFBV It is therefore important that European consumers are now informed of the results of these studies which should reassure them on the quality for their health of genetically modified plants authorized for marketing and on the European evaluation procedure, already the most rigorous world

Bob Dobi

Was The World's Largest Study Of GMOs Just Russian Propaganda?

A Russian group launched a \$25 million study of genetically modified organisms. Then it disappeared.

https://www.buzzfeed.com/danvergano/factor-gmo-fake-science-russia?utm_term=.ysAEpLPKq#.fqKWM1DXp

ZEIT ONLINE

US-Kartellamt erlaubt Bayer Übernahme von Monsanto

Für den Kauf von Monsanto muss Bayer eine Bedingung der USA erfüllen: Der Konzern muss einen Teil seines Saatgutgeschäfts im Wert von neun Milliarden Dollar abstoßen.

<https://www.zeit.de/wirtschaft/unternehmen/2018-05/bayer-uebernahme-monsanto-genehmigung-us-kartellbehoerden>

Manu Joseph

How the defamation of GMOs was achieved

If you hate genetically modified organisms but cannot hold a conversation beyond 30 seconds on the subject, you are in the sway of the propaganda Mark Lynas and friends started. He now says it was mostly bull

<https://www.livemint.com/Leisure/bn6nB3beBsxmi7EZE8Mozl/How-the-defamation-of-GMOs-was-achieved.html>

Informationsdienst Gentechnik

Gentechnikfreie Kartoffeln widerstehen der Krautfäule – und dürfen angebaut werden

<https://www.keine-gentechnik.de/nachricht/33227/#gsc.tab=0>

und

WUR / Marc Wichert

More sustainable potato production through extended IPM for late blight

<https://www.wur.nl/en/newsarticle/More-sustainable-potato-production-through-extended-IPM-for-late-blight.htm>

more press releases or media reports: <https://www.biotech-gm-food.com/presse>

Scientific paper

Nationale Akademie der Wissenschaften Leopoldina, Deutsche Akademie der Technikwissenschaften, Union der deutschen Akademien der Wissenschaften (edt) (2018):

Künstliche Photosynthese - Forschungsstand, wissenschaftlich-technische Herausforderungen und Perspektiven

https://www.akademienunion.de/fileadmin/redaktion/user_upload/Publikationen/Stellungnahmen/Stellungnahme_Ku_nstliche_Photosynthese_2018.pdf

Ricciardi V, Ramankutty N., Mehrabi Z., Jarvis L., Chookolingo B. (2018): **How much of the world's food do smallholders produce?** *Global Food Security*, 17, 64–72;

<https://doi.org/10.1016/j.gfs.2018.05.002>

<https://www.sciencedirect.com/science/article/pii/S2211912417301293>

pdf-file available

Goulson D. and 232 signatories (2018): **Call to restrict neonicotinoids.** *Science*: 360, Issue 6392, pp. 973, DOI: 10.1126/science.aau0432

<http://science.sciencemag.org/content/360/6392/973.1>

Wang L. et al. (2018): **The systemin receptor SYR1 enhances resistance of tomato against herbivorous insects.** *Nature Plants* 4, 152–156, [doi:10.1038/s41477-018-0106-0](https://doi.org/10.1038/s41477-018-0106-0).

The discovery in tomato of systemin, the first plant peptide hormone^{1,2}, was a fundamental change for the concept of plant hormones. Numerous other peptides have since been shown to play regulatory roles in many aspects of the plant life, including growth, development, fertilization and interactions with symbiotic organisms^{3,4,5,6}. Systemin, an 18 amino acid peptide derived from a larger precursor protein⁷, was proposed to act as the spreading signal that triggers systemic defence responses observed in plants after wounding or attack by herbivores^{1,7,8}. Further work culminated in the identification of a leucine-rich repeat receptor kinase (LRR-RK) as the systemin receptor 160 (SR160)^{9,10}. SR160 is a tomato homologue of Brassinosteroid Insensitive 1 (BRI1), which mediates the regulation of growth and development in response to the steroid hormone brassinolide^{11,12,13}. However, a role of SR160/BRI1 as systemin receptor could not be corroborated by others^{14,15,16}. Here, we demonstrate that perception of systemin depends on a pair of distinct LRR-RKs termed SYR1 and SYR2. SYR1 acts as a genuine systemin receptor that binds systemin with high affinity and specificity. Further, we show that presence of SYR1, although not decisive for local and systemic wound responses, is important for defence against insect herbivory.

<https://www.nature.com/articles/s41477-018-0106-0>

Zhang X. et al. (2018): **Novel transgenic pigs with enhanced growth and reduced environmental impact,** *elife*: <https://doi.org/10.7554/eLife.34286.001>

In pig production, inefficient feed digestion causes excessive nutrients such as phosphorus and nitrogen to be released to the environment. To address the issue of environmental emissions, we established transgenic pigs harboring a single-copy quad-cistronic transgene and simultaneously expressing three microbial enzymes, β -

glucanase, xylanase, and phytase in the salivary glands. All the transgenic enzymes were successfully expressed, and the digestion of non-starch polysaccharides (NSPs) and phytate in the feedstuff was enhanced. Fecal nitrogen and phosphorus outputs in the transgenic pigs were reduced by 23.2–45.8%, and growth rate improved by 23.0% (gilts) and 24.4% (boars) compared with that of age-matched wild-type littermates under the same dietary treatment. The transgenic pigs showed an 11.5–14.5% improvement in feed conversion rate compared with the wild-type pigs. These findings indicate that the transgenic pigs are promising resources for improving feed efficiency and reducing environmental impact.

<https://elifesciences.org/articles/34286>

Wang L. et al. (2018): The systemin receptor SYR1 enhances resistance of tomato against herbivorous insects. *Nature Plants* 4, 152–156, [doi:10.1038/s41477-018-0106-0](https://doi.org/10.1038/s41477-018-0106-0).

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<https://www.nature.com/articles/s41477-018-0106-0>

Lopez-Calcagno P.E., Fisk S., Brown K.L., Bull S.E., Paul F. South P.F., Christine A. Raines C. A. (2018): "Overexpressing the H-protein of the glycine cleavage system increases biomass yield in glasshouse and field grown transgenic tobacco plants" *Plant Biotechnology Journal* (2018). [DOI: 10.1111/pbi.12953](https://doi.org/10.1111/pbi.12953)

Photorespiration is essential for C3 plants, enabling oxygenic photosynthesis through the scavenging of 2-phosphoglycolate. Previous studies have demonstrated that overexpression of the L and H-proteins of the photorespiratory glycine cleavage system results in an increase in photosynthesis and growth in *Arabidopsis thaliana*. Here we present evidence that under controlled-environment conditions an increase in biomass is evident in tobacco plants overexpressing the H-protein. Importantly, the work in this paper provides a clear demonstration of the potential of this manipulation in tobacco grown in field conditions, in two separate seasons. We also demonstrate the importance of targeted overexpression of the H-protein using the leaf specific promoter ST-LS1. Although increases in the H-protein driven by this promoter have a positive impact on biomass, higher levels of overexpression of this protein driven by the constitutive CaMV 35S promoter, result in a reduction in the growth of the plants. Furthermore in these constitutive overexpressor plants, carbon allocation between soluble carbohydrates and starch is altered, as is the protein lipoylation of the enzymes pyruvate dehydrogenase (PDH) and alpha-ketoglutarate (KDH) complexes. Our data provide a clear demonstration of the positive effects of overexpression of the H-protein to improve yield under field conditions.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/pbi.12953>

and

University of Illinois at Urbana-Champaign

Scientists boost crop production by 47 percent by speeding up photorespiration

<https://phys.org/news/2018-05-scientists-boost-crop-production-percent.html#jCp>

EFSA

Christiaens O., Dzhambazova T., Kostov K., Arpaia S., Joga M.R., Urru I., Sweet J., Smagghe G. (2018): Literature review of baseline information on RNAi to support the environmental risk assessment of RNAi-based GM plants. EFSA supporting publication 2018:EN-1424. 173 pp. [doi:10.2903/sp.efsa.2018.EN-1424](https://doi.org/10.2903/sp.efsa.2018.EN-1424)

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/sp.efsa.2018.EN-1424>

Pankin A., Altmüller J., Becker C. and von Korff M. (2018): Targeted resequencing reveals genomic signatures of barley domestication. *New Phytologist*, 218(3):1247-1259, <https://doi.org/10.1111/nph.15077>

Barley (*Hordeum vulgare*) is an established model to study domestication of the Fertile Crescent cereals. Recent molecular data suggested that domesticated barley genomes consist of the ancestral blocks descending from multiple wild barley populations. However, the relationship between the mosaic ancestry patterns and the process of domestication itself remained unclear.

To address this knowledge gap, we identified candidate domestication genes using selection scans based on targeted resequencing of 433 wild and domesticated barley accessions. We conducted phylogenetic, population structure, and ancestry analyses to investigate the origin of the domesticated barley haplotypes separately at the neutral and candidate domestication loci.

We discovered multiple selective sweeps that occurred on all barley chromosomes during domestication in the background of several ancestral wild populations. The ancestry analyses demonstrated that, although the ancestral blocks of the domesticated barley genomes were descended from all over the Fertile Crescent, the candidate domestication loci originated specifically in its eastern and western parts.

These findings provided the first molecular evidence implicating multiple wild or protodomesticated lineages in the process of barley domestication initiated in the Levantine and Zagros clusters of the origin of agriculture.

<https://nph.onlinelibrary.wiley.com/doi/abs/10.1111/nph.15077>

Maximilian Griesmann et al. (2018): **Phylogenomics reveals multiple losses of nitrogen-fixing root nodule symbiosis.** *Science*: eaat1743; DOI: 10.1126/science.aat1743

The root nodule symbiosis of plants with nitrogen-fixing bacteria impacts global nitrogen cycles and food production but is restricted to a subset of genera within a single clade of flowering plants. To explore the genetic basis for this scattered occurrence, we sequenced the genomes of ten plant species covering the diversity of nodule morphotypes, bacterial symbionts and infection strategies. In a genome-wide comparative analysis of a total of 37 plant species, we discovered signatures of multiple independent loss-of-function events in the indispensable symbiotic regulator *NODULE INCEPTION* (*NIN*) in ten out of 13 genomes of non-nodulating species within this clade. The discovery that multiple independent losses shaped the present day distribution of nitrogen-fixing root nodule symbiosis in plants reveals a phylogenetically wider distribution in evolutionary history and a so far underestimated selection pressure against this symbiosis.

<http://science.sciencemag.org/content/early/2018/05/23/science.aat1743>

Oktaviani N.A., Matsugami A., Malay A.D., Hayashi F., Kaplan D.L. & Numata K. (2018): **Conformation and dynamics of soluble repetitive domain elucidates the initial β -sheet formation of spider silk.** *Nature Communications* (2018). DOI: 10.1038/s41467-018-04570-5

The β -sheet is the key structure underlying the excellent mechanical properties of spider silk. However, the comprehensive mechanism underlying β -sheet formation from soluble silk proteins during the transition into insoluble stable fibers has not been elucidated. Notably, the assembly of repetitive domains that dominate the length of the protein chains and structural features within the spun fibers has not been clarified. Here we determine the conformation and dynamics of the soluble precursor of the repetitive domain of spider silk using solution-state NMR, far-UV circular dichroism and vibrational circular dichroism. The soluble repetitive domain contains two major populations: ~65% random coil and ~24% polyproline type II helix (PPII helix). The PPII helix conformation in the glycine-rich region is proposed as a soluble prefibrillar region that subsequently undergoes intramolecular interactions. These findings unravel the mechanism underlying the initial step of β -sheet formation, which is an extremely rapid process during spider silk assembly.

RIKEN

Scientists discover key mechanism behind the formation of spider silk

<https://phys.org/news/2018-05-scientists-key-mechanism-formation-spider.html#jCp>

EFSA (European Food Safety Authority), Alvarez F, Devos Y, Georgiadis M, Messean A and Waigmann E, (2018): **Statement on annual post-market environmental monitoring report on the cultivation of genetically modified maize MON 810 in 2016.** *EFSA Journal*

2018;16(5):5287, 34 pp. <https://doi.org/10.2903/j.efsa.2018.5287>

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5287>

Cairns T.M., Nai C. and Meyer V. (2018): **How a fungus shapes biotechnology: 100 years of *Aspergillus niger* research.** *Fungal Biol Biotechnol* 5:13 <https://doi.org/10.1186/s40694-018-0054-5>

In 1917, a food chemist named James Currie made a promising discovery: any strain of the filamentous mould *Aspergillus niger* would produce high concentrations of citric acid when grown in sugar medium. This tricarboxylic acid, which we now know is an intermediate of the Krebs cycle, had previously been extracted from citrus fruits for applications in food and beverage production. Two years after Currie's discovery, industrial-level production using *A. niger* began, the biochemical fermentation industry started to flourish, and industrial biotechnology was born. A century later, citric acid production using this mould is a multi-billion dollar industry, with *A. niger* additionally producing a diverse range of proteins, enzymes and secondary metabolites. In this review, we assess main developments in the field of *A. niger* biology over the last 100 years and highlight scientific breakthroughs and discoveries which were influential for both basic and applied fungal research in and outside the *A. niger* community. We give special focus to two developments of the last decade: systems biology and genome editing. We also summarize the current international *A. niger* research

community, and end by speculating on the future of fundamental research on this fascinating fungus and its exploitation in industrial biotechnology.

<https://fungalbiolbiotech.biomedcentral.com/track/pdf/10.1186/s40694-018-0054-5>

Jiang J., Kao L.M., Aktas O.N., Gupta R.S. (2018) **Food Allergies: An Overview**. In: Stukus D. (eds) Allergies and Adolescents. Springer, Cham; https://doi.org/10.1007/978-3-319-77485-5_9

Miller Henry (20180310) **How Authentic Is Public Input on Science-Driven Public Policy? American Greatness** <https://amgreatness.com/>, <https://amgreatness.com/2018/03/10/how-authentic-is-public-input-on-science-driven-public-policy/>

and <http://www.ask-force.org/web/Discourse/Miller-How-Authentic-Is-Public-Input-on-Science-Driven-Public-Policy-20180310.pdf>

Cutler Craig (2018) **The 9.9 Percent Is the New American Aristocracy. The class divide is already toxic, and is fast becoming unbridgeable. You're probably part of the problem.** The Atlantic. The Atlantic Press, Washington DC, USA 32 pp,

<https://www.theatlantic.com/magazine/archive/2018/06/the-birth-of-a-new-american-aristocracy/559130/>

and <http://www.ask-force.org/web/Discourse/Cuttler-9-9-Percent-New-American-Aristocracy-2018.pdf>

Sunstein, C. R. (2014) **Conspiracy Theories and other dangerous ideas**. Simon & Schuster; Auflage: Reprint (18. März 2014), 289 pp, ASIN: B00DTDFGTU/ASIN: B00DTDFGTU

https://www.amazon.de/Conspiracy-Theories-Other-Dangerous-English-ebook/dp/B00DTDFGTU/ref=sr_1_1?s=digital-text&ie=UTF8&qid=1524993074&sr=1-1&keywords=Conspiracy+Theories+and+Other+Dangerous+Ideas

Sunstein, C. R. and Vermeule, A. (2009) Conspiracy Theories: Causes and Cures* Journal of Political Philosophy 17 (2) 202-227 pp ISBN/1467-9760, <http://dx.doi.org/10.1111/j.1467-9760.2008.00325.x>

and <http://www.ask-force.org/web/Discourse/Sunstein-Conspiracy-Theories-2009.pdf>

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. Hier finden Sie weitere interessante Informationen.

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

This file is saved at <https://www.biotech-gm-food.com/sunday-evening-news/> as well as at <https://www.wgg-ev.de/infos/wgg-nachrichten/>

Klaus-Dieter Jany
Nelkenstrasse 36
D-76351 Linkenheim-Hochstetten
jany@biotech-gm-food.com

1. Vorsitzender des WGG e.V.
Postfach 120721
D-60114 Frankfurt/Main
zentrale@wgg-ev.de