

3.1 Types of scientific reports and their purpose

Two main types → **oral form** - it can be both very formal and informal, it can not be taken as a justification of scientific priority



<http://storify.com/rbastow/epso-fespb-plant-congres-2012>



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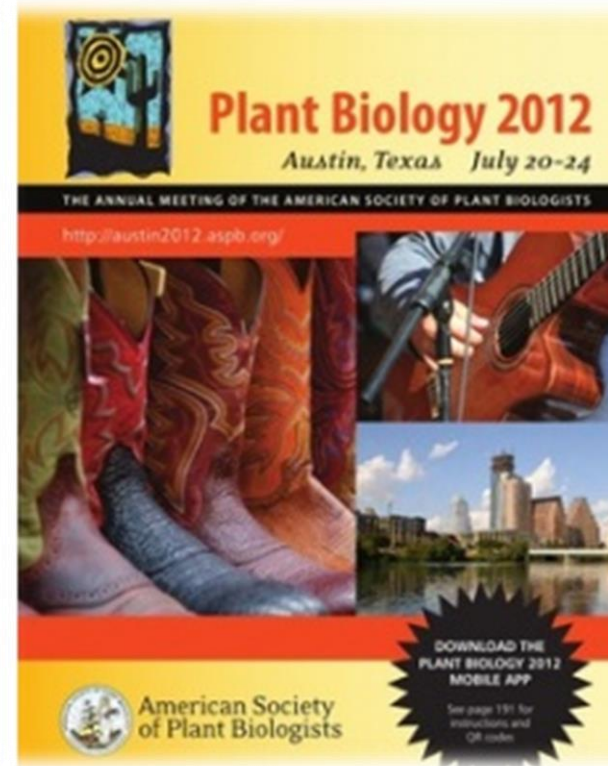
→ **oral form** - it can be both very formal and informal, it can not be taken as a justification of scientific priority

↙ **written form** - peer-reviewed form of contribution, the scientific quality and relevancy of the article reflect both the quality of scientist and reviewers

Types of written contributions:

1) Abstract of oral or poster contribution

- published in the book of abstracts
- it is usually not peer-reviewed



Abstracts

Coomassie Blue G250, which adds negative charge to proteins promoting their unidirectional mobility in the electric field. BN-PAGE has been the method of choice for study of high molecular weight protein complexes in different organisms, including plants. We wanted to test if this method could be used to unravel the structure of *A. thaliana* exocyst, from other organisms known to be an octameric protein complex involved in targeting and tethering of secretory vesicles to the plasma membrane. Using a dodecylmaltside (DDM) as a detergent for solubilization of cell suspension proteins, we were able to visualize co-migration of the SEC3, SEC6, SEC8 and EXO70A1 subunits. After the solubilization with mild detergent concentrations (total protein [IP:DDM ratio of 1.33] and low NaCl concentrations (10 mM and 30 mM), the range of high molecular mass complexes of approximately 300-700 kDa was detected for tested exocyst components. Under the conditions of high detergent concentrations (IP:DDM ratio of 0.67) and no salt added, SEC3 and EXO70A1 seemed to be present in small complexes, while the SEC3 seemed to stay in high molecular weight complexes. The fact that a range of high molecular weight complexes, not a discrete one, was detected by BN is according to our opinion the consequence of the high dynamics of exocyst structure in plant cells.

P14-031 Probing endocytosis with FM-dyes in plants: tracking or dragging?
A. Jelinek¹, J. Petrášek² and E. Zárutková²
¹Institute of Experimental Botany ASCR, Czech Republic
²Corresponding author, e-mail: petrasek@ueb.cas.cz

Amphiphilic styryl dyes of FM family (FM1-43, FM4-64 and FM5-95) are very often used in tracking endocytosis in plants. Their application to plant tissues or cell cultures results in their insertion into plasma membrane (PM), where they start to be fluorescent after incorporation into lipid bilayer. Depending on cell type, they are quickly internalized into cells by active processes of endocytosis followed by their incorporation into endomembrane system including tonoplast and the whole PM recycling machinery. Here we show that besides tracking endocytosis in plant cells FM-dyes (FM4-64 and FM5-95 but not FM1-43) stimulate transient invagination of plasma membrane vesicles containing PM-integral proteins (PIP2-GFP, PIP1-GFP and others). Treatment with specific inhibitors of clathrin-mediated endocytosis (dynasore and tyrostatin A23) suggested the involvement of this type of endocytosis in the processes triggered by FM dyes. This work was supported by the Grant of the Ministry of Education, Youth and Sports of the Czech Republic, project no. LC06034, by the Grant Agency of the Academy of Sciences of the Czech Republic project no. J08/003/0604 and Grant Agency of Charles University project no. 43232455.

P14-032 UDP-glucose dehydrogenase: an important enzyme for plant cell wall biosynthesis
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²Corresponding author, e-mail: rebecca.reboul@sbg.ac.at

Plant primary cell walls contain large amounts of hemicellulose and pectins. 50% of them are synthesized via the conversion of a common precursor UDP-glucuronic acid into sugar nucleotides such as UDP-galacturonic acid or UDP-xylose. The purpose of my study is to better understand the enzyme UDP-glucose dehydro-

genase which catalyses the oxidation of UDP-glucose into UDP-glucuronic acid. This enzyme has a crucial role in the formation of the cell wall. One tool for the comprehension of UGD was the establishment of single and double T-DNA Arabidopsis knockout mutants for the four existing isoforms. Single mutants show little visual phenotypic differences compared to wildtype plants. Therefore we focus on double knockouts: *ugd1ugd4* is bigger than the wildtype and shows thinner, stretched cell walls, whereas *ugd2ugd3* has a dwarf plant phenotype, dark green leaves, reduced root-lengths, longer life cycles and low reproduction rates. Its cell wall composition displays a significant reduction of galacturonic acid, xylose and arabinose. In contrast, *ugd1ugd4* shows minor changes compared to wildtype. This suggests a distinct role of each UGD-isoform for normal plant development. Immunofluorescence using monoclonal antibodies against cell wall epitopes and protein activity measurement are being done to get a better idea of the particularities of these mutants.

P14-033 PIPK family in the moss *Physcomitrella patens*. PpPIP1 is required for normal cell growth and differentiation

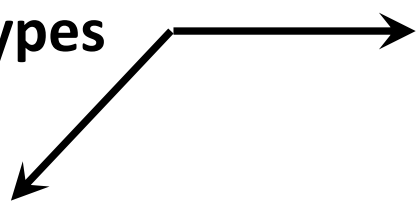
L. Saavedra¹, V. Balbi², K. Mikami³, S. K. Dove⁴ and M. Sommarin⁵
¹Department of Biochemistry, Lund University, Sweden
²Hokkaido University, Laboratory of Breeding Science, Japan
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Phosphoinositides (PIs) are minor lipids in eukaryotic cells but play a major role in many cellular processes. Phosphatidylinositol-4,5-bisphosphate (PIP2/4,5P₂) plays a key role in PI metabolism not only because it is the precursor of inositol-1,4,5-trisphosphate, diacylglycerol and PIP2/4,5P₂, but also due to its involvement in several cellular processes such as exocytosis, cytoskeletal regulation and intracellular vesicular trafficking. We are focusing on phosphatidylinositol phosphate kinase (PIP2K), which catalyses the production of PIP2/4,5P₂. *P. patens* has two PIPK genes, PpPIP1 and PpPIP2, with differently regulated expression and protein sequences displaying a conserved PIPK catalytic domain and eight MORN (Membrane Occupation Recognition Nexus) domains in accordance with the description of PIPKs class IIB in higher plants. In vivo biochemical characterization showed that the two enzymes exhibited different substrate specificities. Interestingly, PpPIP1 can synthesize PIP2/4,5P₂, a PI which has not yet been detected in plant cells. In order to study the physiological role of these proteins, we have disrupted PpPIP1 and PpPIP2 by gene targeting and our preliminary results show a strong phenotype for *pip1* but not for *pip2*. *Pip1* lines are delayed in growth, protoemeral filaments show irregular branching patterns, and gametophores are impaired in rhizoid development. Our data support an essential role for PpPIP1 in cell growth and differentiation.

P14-034 Use of protein-based nanosensors for monitoring metabolite fluctuations in vivo
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¹Department of Plant Biology and Biochemistry, University of Copenhagen, Denmark
²Corresponding author, e-mail: als@life.ku.dk

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Two main types



oral form - it can be both very formal and informal, it can not be taken as a justification of scientific priority

written form - peer-reviewed form of contribution, the scientific quality and relevancy of the article reflect both the quality of scientist and reviewers

Types of written contributions:

2) Original contribution (the article)

- universal communication tool
- it exists in several forms
- writing style should be standardised
- it is always peer-reviewed
- it justifies a scientific priority

LETTER

doi:10.1038/nature11001



Developmental Cell
Short Article

A novel putative auxin carrier family regulates intracellular auxin homeostasis in plants

Elke Barbezil², Martin Kubeš³, Jakub Růžek⁴, Chloé Béziat^{1,2}, Alés Pěnkčí⁵, Bangtan Wang⁶, Michel Ruiz Kosquet^{2,7}, Jinseng Zhu⁸, Petre I. Dobrev⁹, Yuree Lee⁹, Eva Zajímalová¹, Jan Petrášek¹, Markus Geisler¹, Jifri Friml¹ & Jürgen Kleine-Vehn^{1,2}

The phytohormone auxin acts as a prominent signal, providing, by its local accumulation or depletion in selected cells, a spatial and temporal reference for events in the developmental program^{1,2}. The distribution of auxin depends on both auxin metabolism (biosynthesis, conjugation and degradation)^{3,4} and cellular auxin transport^{5,6}. We identified *in silico* a novel putative auxin transport facilitator family, called PIN-LIKES (PLS). Here we illustrate that PLS proteins are required for auxin-dependent regulation of plant growth by determining the cellular sensitivity to auxin. PLS proteins regulate intracellular auxin accumulation at the endoplasmic reticulum and thus auxin availability for nuclear auxin signalling. PLS activity affects the level of endogenous auxin indole-3-acetic acid (IAA), presumably via intracellular accumulation and metabolism. Our findings reveal that the transport machinery to compartmentalize auxin within the cell is of unexpected molecular complexity and demonstrate this compartmentalization to be functionally important for a number of developmental processes.

Prominent auxin carriers with fundamental importance during plant development are PIN-FORMED (PIN) proteins^{7,8}. PIN1-type auxin carriers regulate the directional intercellular auxin transport at the plasma membrane. In contrast, atypical family member PIN5 regulates intracellular auxin compartmentalization into the lumen of the endoplasmic reticulum and its role in auxin homeostasis was recently identified^{9,10}. PIN proteins have a predicted central hydrophilic loop, flanked at each side by five transmembrane domains. We screened *in silico* for novel PIN-like putative carrier proteins with a predicted topology similar to PIN proteins (Fig. 1a and Supplementary Fig. 2) and identified a protein family of seven members (Fig. 1b) in *Arabidopsis thaliana*, which we designated as the PLS proteins. In contrast to the similarities in the predicted protein topology, PIN and PLS proteins do not show pronounced protein sequence identity (10–18%), which limits the identification of PLS proteins by conventional, reciprocal basic local alignment search tool (BLAST) approaches. However, the distinct PIN and PLS protein families contain both the InterPro auxin carrier domain which is an *in silico*-defined domain, aiming to predict auxin transport function (<http://www.ebi.ac.uk/interpro/interpro.html>). The PLS putative carrier family is conserved throughout the whole plant lineage, including unicellular algae (such as *Ostreococcus tauri* and *Chlamydomonas reinhardtii*) (Supplementary Fig. 3) where PIN proteins are absent¹¹, indicating that PLS proteins are evolutionarily older.

PLS genes are broadly expressed in various tissues (Fig. 1c) and PLS2-PLS7 were transcriptionally upregulated by auxin application in wild-type seedlings (Fig. 1d–f and Supplementary Fig. 4), indicating a role in auxin-dependent processes. To investigate the potential function of the putative PLS auxin flux facilitators in plant development we overexpressed PLS proteins using the constitutive, viral 35S promoter. Ectopic expression of PLS genes, such as PLS1 or PLS2,

resulted in dwarfed and/or bushy plants showing severe defects in flower development, leading to sterility in the T1 generation (Fig. 2a–d). Flowers of these PLS-overexpressing plants showed severe patterning defects, such as homeotic transformation of flower organs into new flower buds, triplication of the gynoecium or unfused carpels (Fig. 2b–d). To circumvent sterility, we screened for weaker p35S:PLS lines and isolated moderately PLS5 overexpressing lines showing fertile flower development.

To assess further the developmental importance and potential redundancy of PLS proteins in auxin-regulated processes, we focused

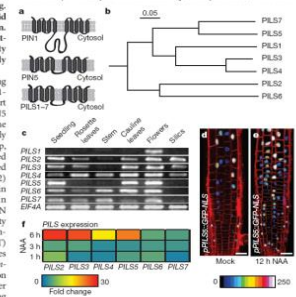


Figure 1 Novel PLS protein family. **a**, Predicted topology of both PIN1/PIN5-type PIN subfamilies and PLS proteins. **b**, Phylogenetic tree of the *A. thaliana* PLS proteins. Scale depicts 0.05 substitutions per position. **c**, Reverse transcription PCR (RT-PCR) of the seven PLS genes and PIN5 (control) in all relevant plant tissues. **d**, **e**, 1-Naphthylmaleimide-5-sulfonyl fluoride (NEM) (10 μM, 12 h)-induced PLS5-GFP-NLS (GFP fused to nuclear localisation signal, NLS) expression in the root transition zones. Colours code (blue to white) depicts (low to high) GFP signal intensity. Propidium iodide-stained cell walls in red. Scale bar, 25 μm. **f**, Quantitative RT-PCR of PLS2 after 10 μM NAA treatment for 1, 3 and 6 h. Colours code from blue (low) to red (high) depicts fold changes (0–30) (see also Supplementary Fig. 4).

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Cytokinin Modulates Endocytic Trafficking of PIN1 Auxin Efflux Carrier to Control Plant Organogenesis

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SUMMARY

Cytokinin is an important regulator of plant growth and development. In *Arabidopsis thaliana*, the two-component phosphorelay mediated through a family of histidine kinases and response regulators is recognized as the principal cytokinin signal transduction mechanism activating the complex transcriptional response to control various developmental processes. Here, we identified an alternative mode of cytokinin action that uses endocytic trafficking as a means to direct plant organogenesis. This activity occurs downstream of known cytokinin receptors but through a branch of the cytokinin signaling pathway that does not involve transcriptional regulation. We show that cytokinin regulates endocytic recycling of the auxin efflux carrier PINFORMED1 (PIN1) by redirecting it for lysitic degradation in vacuoles. Stimulation of the lysitic PIN1 degradation is not a default effect for general downregulation of proteins from plasma membranes, but a specific mechanism to rapidly modulate the auxin distribution in cytokinin-mediated developmental processes.

phosphorylation mechanism. In *Arabidopsis*, cytokinin receptors from the histidine kinase family activate the histidine phosphotransfer proteins that transduce signals toward the B-type response regulators in the nucleus. This transcriptional response is responsible for controlling a variety of developmental processes (Hwang and Sheen, 2001).

An important part of the cytokinin-mediated regulation of development involves an interaction with the auxin pathway. A specific developmental output is ensured by the crosstalk between these two signaling pathways. Previous work has revealed that the communication primarily occurs at the transcriptional regulation level (Müller and Sheen, 2008; Dello Iaco et al., 2008; Zhao et al., 2010). Here, we identify a different mode of cytokinin action that uses endocytic trafficking as a means to modulate the auxin activity and to direct plant organogenesis. This cytokinin activity requires cytokinin receptors but does not involve transcriptional regulation. We show that cytokinin regulates endocytic recycling of the auxin efflux carrier PIN1 (Gälweiler et al., 1998) to the plasma membrane by redirecting it for lysitic degradation in vacuoles. This rapid, nontranscriptional, regulation of the PIN1 abundance enables a precise control of auxin fluxes and distribution during LR organogenesis and might also contribute to other cytokinin-mediated developmental regulations, such as root meristem differentiation.

RESULTS

Cytokinin Rapidly Reduces PIN1 at Plasma Membranes during LR Organogenesis

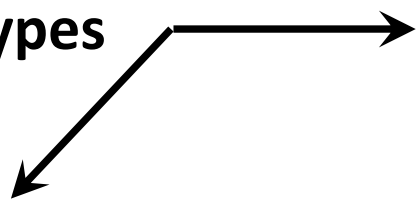
To follow the development of lateral root primordia (LRP) and monitor the impact of hormonal and genetic manipulations on the progress of LRP through defined developmental stages, we have established a real-time *in vivo* analysis. Within 8 hr, LRP of untreated seedlings typically underwent several rounds of anticlinal and periclinal divisions, progressing from the early first-to-second developmental stage (Malamy and Benfey, 1997) (Figure 1A; see Figure S1A available online). As expected,

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written form - peer-reviewed form of contribution, the scientific quality and relevancy of the article reflect both the quality of scientist and reviewers

Types of written contributions:

3) Review article

- summary of already published results
- it exists in several forms
- brings new interpretations
- critical thinking is highly needed
- it is always peer-reviewed

Development 136, 2675-2688 (2008) doi:10.1242/dev.03075

PRIMER 2675

Auxin transport routes in plant development

Jan Petrášek^{1,2} and Jiří Friml^{3,4*}

The differential distribution of the plant signaling molecule auxin is required for many aspects of plant development. Local auxin maxima and gradients arise as a result of local auxin metabolism and, predominantly, from directional cell-to-cell transport. In this primer, we discuss how the coordinated activity of several auxin influx and efflux systems, which transport auxin across the plasma membrane, mediates directional auxin flow. This activity crucially contributes to the correct setting of developmental cues in embryogenesis, organogenesis, vascular tissue formation and directional growth in response to environmental stimuli.

Introduction
The plant hormone auxin (the predominant form of which is indole-3-acetic acid, IAA) is a major coordinating signal in the regulation of plant development. Many aspects of auxin action depend on its differential distribution within plant tissues, where it forms local maxima and gradients between cells. Besides local biosynthesis and the release of active forms from inactive precursors, the major determinant of differential auxin distribution is its directional transport between cells. This regulated polar auxin transport (PAT) within plant tissues appears to be unique to auxin, as it has not been detected for any other signaling molecule. Molecular biology and genetics approaches in the model system *Arabidopsis thaliana* have contributed fundamentally to our understanding of the mechanisms of auxin transport. Currently, a large body of evidence supports the concept that intercellular auxin movement depends on several auxin-transporting mechanisms, which include both passive and active processes that transport auxin over long and short distances. Of these, the major mechanism for controlling auxin distribution during plant development appears to be the active directional cell-to-cell movement of auxin that is mediated by plasma membrane-based influx and efflux carriers (see Glossary, Box 1). Here, we summarize the present state of knowledge on how the various auxin transport mechanisms cooperate during plant development to fine-tune auxin distribution. We describe the basic pathways of auxin transport and discuss auxin transport routes during diverse developmental processes, such as embryogenesis, root and shoot organogenesis, vascular tissue formation and tropisms (see Glossary, Box 1).

Auxin transport systems in plants
In plants, auxin is generally transported by two distinct pathways. Throughout the plant, most IAA is probably transported away from the source tissues (young leaves and flowers) by an unregulated bulk flow in the mature phloem (see Glossary, Box 1). In addition, a slower, regulated, carrier-mediated cell-to-cell directional transport moves auxin in the vascular cambium from the shoot towards the root apex (Goldsmith, 1977), and also mediates short-range auxin movement in different tissues. These two pathways seem to be connected at the level of phloem loading in leaves (Marchant et al., 2002) and phloem unloading in roots (Swarg et al., 2001). A series of classical physiological experiments (Box 2) predicted the existence of carrier-type auxin influx and efflux components that mediate PAT. The asymmetric cellular localization of these transporters has been proposed to determine the direction of auxin flow. During the past two decades, candidates for auxin carrier proteins and for the relevant regulatory mechanisms have been identified (Fig. 1). Heterologous expression experiments in cultured plant cells, yeast, *Xenopus laevis* oocytes and mammalian cells have demonstrated the auxin-transporting capacity of these carrier proteins (Vieten et al., 2007). Expression and localization studies of auxin carrier proteins, as well as specific defects in differential auxin distribution (Box 3) in plants that lack the function of these carriers, established that carrier-dependent PAT is absolutely required for the generation and maintenance of local auxin maxima and gradients.

Influx carriers
For auxin influx, the characterization of an agravitropic (see Glossary, Box 1) *auxin resistant 1* mutant (*acr1*) of *Arabidopsis* that shows resistance to an exogenous synthetic auxin, 2,4-D, led to the identification of the AUXIN-LIKE AUXIN (AUX/LAX) family of transmembrane proteins, which are similar to amino acid permeases, a group of proton-gradient-driven transporters (Bonnet et al., 1996; Swarg et al., 2008). To date, four auxin influx carriers with specific functions have been described in *Arabidopsis*, and the functions of some homologs in other plants have also been studied (Table 1). Recently, AUX1 and LAX3 has been shown to mediate IAA uptake when heterologously expressed in *Escherichia coli* (Yang et al., 2006; Swarg et al., 2008), which provides biochemical evidence for their role as auxin influx carriers.

Efflux carriers
The investigation of several *Arabidopsis* mutants, namely of the allelic root mutants *agravitropic 1* (*agr1*), *wavy roots 6* (*wav6*) (Bell and Malter, 1990; Okada and Shimizu, 1990) and *ethylene insensitive root 1* (*eir1*) (Roman et al., 1995), and the floral mutant *pin-formed1* (*pin1*) (Okada et al., 1991), resulted in the identification of auxin efflux carrier candidates. The root agravitropic phenotypes, as well as the *pin1* phenotype with defects in organ initiation and phyllotaxy (see Glossary, Box 1), can be phenocopied by the pharmacological inhibition of auxin efflux. Additionally, these mutants display decreased PAT in shoots and roots. The corresponding PIN1 gene encodes a plant-specific protein with two transmembrane regions separated by a hydrophilic loop (Galweiler et al., 1998). Concomitantly, the *agr1*, *wav6* and *eir1* mutants have been shown to be allelic with a mutant that carries a mutation in another PIN family member, PIN2. The *AGR1*, *WAV6*, *EIR1* and *PIN2* genes encode a homologous protein designated PIN2 (Chen et al., 1998; Luschig

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Polar Targeting and Endocytic Recycling in Auxin-Dependent Plant Development

Jürgen Kleine-Vehn and Jiří Friml

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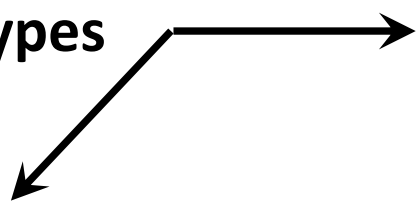
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Key Words
trafficking, endocytosis, polar auxin transport, PIN proteins

Abstract
Plant development is characterized by a profound phenotypic plasticity that often involves redefining of the developmental fate and polarity of cells within differentiated tissues. The plant hormone auxin and its directional intercellular transport play a major role in these processes because they provide positional information and link cell polarity with tissue patterning. This plant-specific mechanism of transport-dependent auxin gradients depends on subcellular dynamics of auxin transport components, in particular on endocytic recycling and polar targeting. Recent insights into these cellular processes in plants have revealed important parallels to yeast and animal systems, including clathrin-dependent endocytosis, retromer function, and transcytosis, but have also emphasized unique features of plant cells such as diversity of polar targeting pathways; integration of environmental signals into subcellular trafficking; and the link between endocytosis, cell polarity, and cell fate specification. We review these advances and focus on the translation of the subcellular dynamics to the regulation of whole-plant development.

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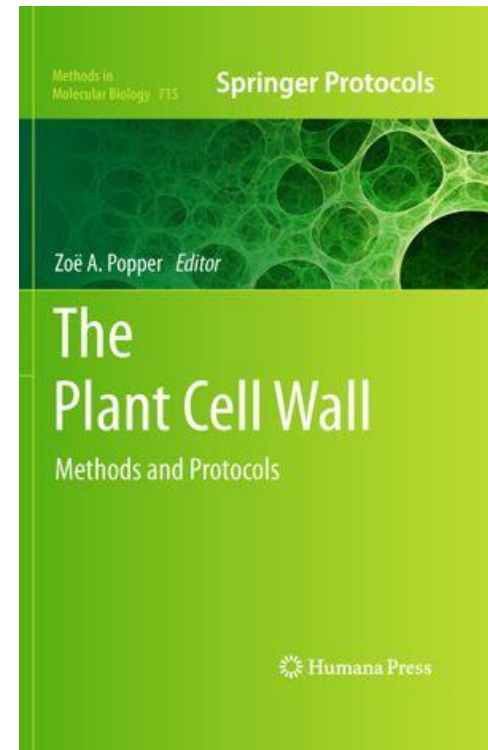
written form - peer-reviewed form of contribution, the scientific quality and relevancy of the article reflect both the quality of scientist and reviewers

Chapter 14

Types of written contributions:

4) Monographs, books

- collections of already published data
- the book has long-term validity
- it is always peer-reviewed
- it usually does not justify scientific priority



Formation of Cellulose-Based Composites with Hemicelluloses and Pectins Using *Gluconacetobacter* Fermentation

Deirdre Mikkelsen and Michael J. Gidley

Abstract

Gluconacetobacter xylinus synthesises cellulose in an analogous fashion to plants. Through fermentation of *Ga. xylinus* in media containing cell wall polysaccharides from the hemicellulose and/or pectin families, composites with cellulose can be produced. These serve as general models for the assembly, structure, and properties of plant cell walls. By studying structure/property relationships of cellulose composites, the effects of defined hemicellulose and/or pectin polysaccharide structures can be investigated. The macroscopic nature of the composites also allows composite mechanical properties to be characterised.

The method for producing cellulose-based composites involves revising and then culturing *Ga. xylinus* in the presence of desired hemicelluloses and/or pectins. Different conditions are required for construction of hemicellulose- and pectin-containing composites. Fermentation results in a floating mat or pellicle of cellulose-based composite that can be recovered, washed, and then studied under hydrated conditions without any need for intermediate drying.

Key words: Plant cell wall, Cellulose, Composites, *Gluconacetobacter xylinus*, Pectin, Hemicellulose, Arabinosyran, β -Glucan, Xyloglucan

1. Introduction

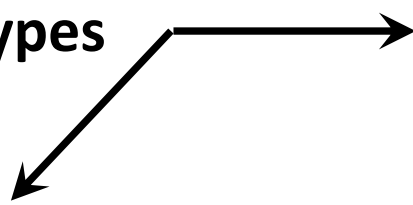
The cell walls of plants are typically complex in terms of their measured average composition, with variation being exhibited not only between different plant types, but also between local tissue types and even within a single cell wall. While some information on the relationships between composition and properties of cell walls can be deduced through studies of e.g. plant mutants lacking defined compositional features, the isolation of plant cell wall material for the study of structure/property relationships has

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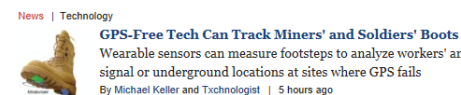
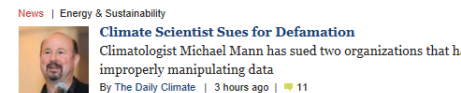
written form - peer-reviewed form of contribution, the scientific quality and relevancy of the article reflect both the quality of scientist and reviewers

Types of written contributions:

5) Popularization article or book

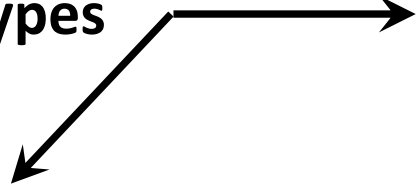
- must be accessible to broad reading community (public)
- it should be ideally peer-reviewed
- [Scientific American](#), in the Czech

Republic [Vesmír](#) - from 1871



3.1 Types of scientific reports and their purpose

Two main types



oral form - it can be both very formal and informal, it can not be taken as a justification of scientific priority

written form - peer-reviewed form of contribution, the scientific quality and relevancy of the article reflect both the quality of scientist and reviewers

Types of written contributions:

6) Bachelor, diploma, dissertation and habilitation the

- it is rigorously peer-reviewed
- it could contain findings that can be published in a form of parallel scientific paper
- it justifies a scientific priority
- **E-thesis** - electronic form of Ph.D. theses



3.1 Types of scientific reports and their purpose

Nature, from 1869

Main multidisciplinary scientific journals

nature

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COP architects furious at lack of climate justice at pivotal summit

Scientists who worked on the original UN climate convention doubt that COP26 will deliver for low income countries.



Astrophysicists unveil glut of gravitational-wave detections

The latest bounty of 35 events features oddball black holes and a miniature neutron star.

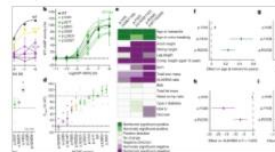
Davide Castelvecchi



How protein-based COVID vaccines could change the pandemic

Jabs from Novavax and other biotech firms are coming. Scientists say they have a lot to offer.

Elie Dolgin



MC3R links nutritional state to childhood growth and the timing of puberty

MC3R deficiency is associated with a delay in the onset of puberty, and a reduction in growth and lean mass.

B. Y. H. Lam, A. Williamson ... S. O'Rahilly



Daily briefing: What happened when one lab gave its reagents away

"We dared to ask: what if we just give everything away?" Plus, scammers impersonate guest editors to get sham papers published, and the world's climate pledges might be built on flawed data.

Elen Gohem



Contents Subscribe

OLDER LOGOS

A selection of logos from *Nature's* past. The lower-case 'n' was introduced in 1974.



nature

3.1 Types of scientific reports and their purpose

Science, from 1880

Main multidisciplinary scientific journals

Science

NEWS CAREERS COMMENTARY JOURNALS | COVID-19

SCIENCE ROBOTICS | 10 NOVEMBER 2021

Individualization of exosuit assistance based on measured muscle dynamics during versatile walking

R. W. NUCKOLS, S. LEE, ET AL.

An ankle exosuit tuned to the measured muscle dynamics of the user during multiple walking tasks improves energy economy.

SCIENCE TRANSLATIONAL MEDICINE | 10 NOV 2021

Immune regulation of pain: Friend and foe

BY ANNEMIEKE KAVELAARS, COBI J. HEIJNEN, ET AL.

SCIENCE SIGNALING | 9 NOV 2021

Dynamic variability in SHP-1 abundance determines natural killer cell responsiveness

BY ZEGUANG WU, SOO PARK, ET AL.

SCIENCE | 4 NOV 2021

Children and COVID-19 in schools

BY SHAMEZ N. LADHANI

SCIENCE ADVANCES | 10 NOV 2021

Structure of the hexameric fungal plasma membrane proton pump in its autoinhibited state

BY SABINE HEIT, MAXWELL M. G. GEURTS, ET AL.

CAREERS | 4 NOV 2021

How a grad school assignment led me to a career investigating research misconduct

BY JULIA BEHNFELDT

LATEST NEWS

10 NOV 2021
Watch itchy fish rub up against the worst possible scratching post: hungry sharks

10 NOV 2021
Is the end in sight for famous dark matter claim?

10 NOV 2021
Beech leaf disease is ravaging North American trees

10 NOV 2021
How agriculture gave rise to one of the world's most mysterious language families

7 NOV 2021
A prominent virologist warns COVID-19 pill could unleash dangerous mutants. Others see little cause for alarm

5 NOV 2021
Pfizer antiviral slashes COVID-19 hospitalizations

Science
AAAS

American Association
for the Advancement
of Science

3.1 Types of scientific reports and their purpose

PNAS, from 1915

Main multidisciplinary scientific journals

NEW RESEARCH IN

PNAS commits to immediately and freely sharing research data and findings relevant to the novel coronavirus (COVID-19) outbreak. See the free collection of PNAS coronavirus papers and learn more about our response to COVID-19.



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Front Matter



Opinion: How to build ethical and equitable opioid responses

Current policy responses entail a counterproductive integration of public health and law enforcement that creates new forms of surveillance and criminalization.

PNAS

Proceedings of the National
Academy of Sciences of the
United States of America

3.1 Types of scientific reports and their purpose

Cell, from 1974

Main experimental biology journals

Current issue



Table of contents >

> View archive

FREE FEATURED REVIEW

Cytoplasmic DNA: sources, sensing, and role in aging and disease

Adams and colleagues



ARTICLE

Spatially confined sub-tumor microenvironments in pancreatic cancer

Khokha and colleagues

Open Access



FREE FEATURED RESOURCE

Biosensors based on peptide exposure show single molecule conformations in live cells

Hahn and colleagues



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Online now

ARTICLE

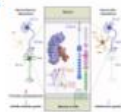
Identification of a Therapeutic Interfering Particle — a single-administration SARS-CoV-2 antiviral intervention with a high barrier to resistance

Weinberger and colleagues

ARTICLE

RTN4/NoGo-receptor binding to BAI adhesion-GPCRs regulates neuronal development

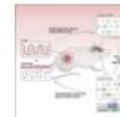
Südhof and colleagues



ARTICLE

Insular cortex neurons encode and retrieve specific immune responses

Rolls and colleagues



ARTICLE

Mammalian hybrid pre-autophagosomal structure HyPAS generates autophagosomes

Deretic and colleagues



3.1 Types of scientific reports and their purpose

Online journals - open access publishers

BioMed Central - from 2000, now it is a part of Springer Nature



BMC, research in progress

A pioneer of open access publishing, BMC has an evolving portfolio of high quality peer-reviewed journals including broad interest titles such as BMC Biology and BMC Medicine, specialist journals such as Malaria Journal and Microbiome, and the [BMC Series](#).

Expanding beyond biomedicine into the physical sciences, mathematics and engineering disciplines, BMC now offers a wider portfolio of subject fields on a single open access platform.

At BMC, research is always in progress. We are committed to continual innovation to better support the needs of our communities, ensuring the integrity of the research we publish, and championing the benefits of open research. BMC is part of Springer Nature.



BMC 20th anniversary

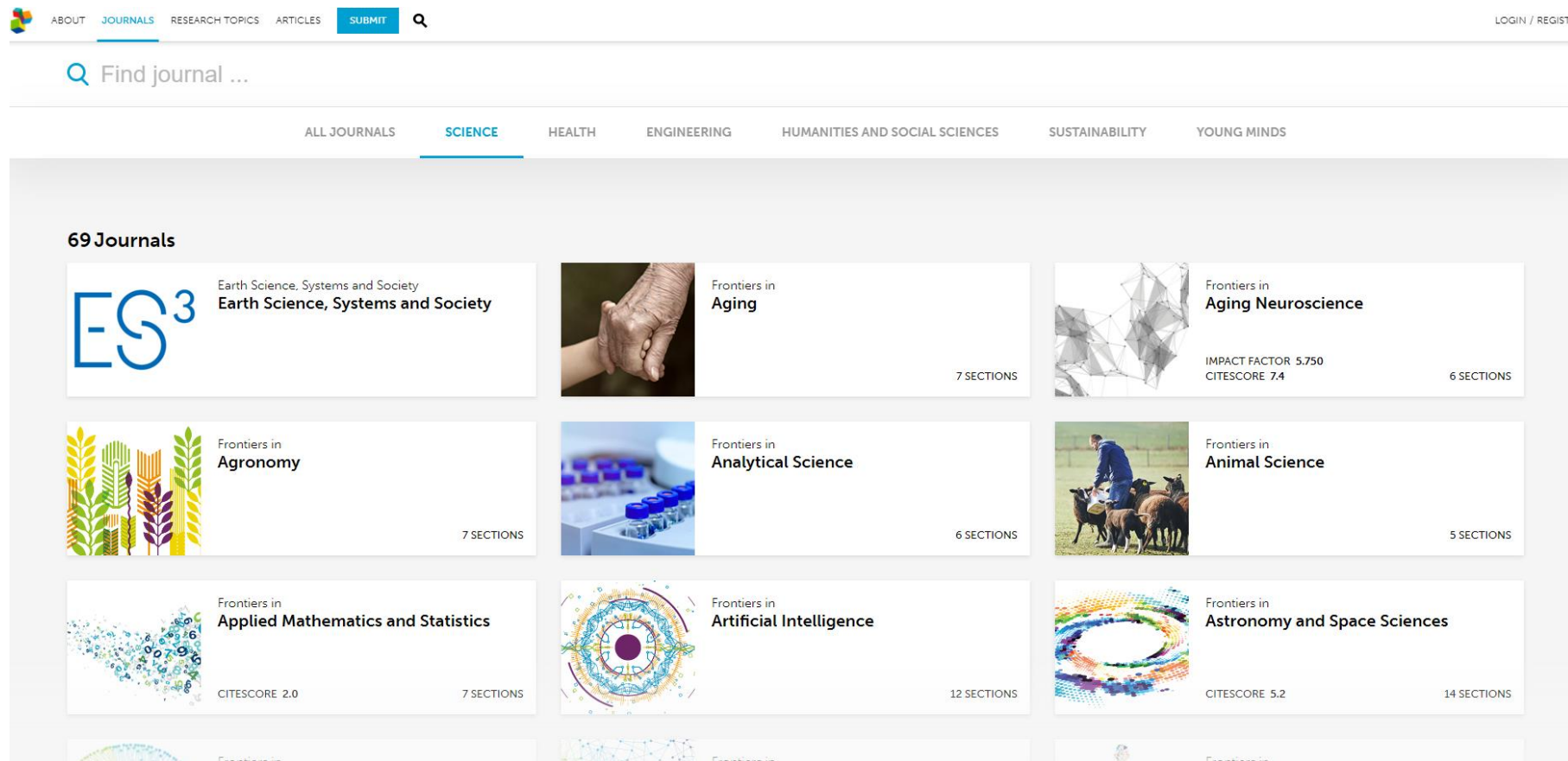
This year BMC is celebrating its 20th year anniversary. We are excited about everything we have achieved in that time, especially about BMC's leadership role in the global growth of open access. We invite you to join us, as we look at BMC's achievements and future endeavours through interviews, videos and other resources we have created to commemorate our journey.



3.1 Types of scientific reports and their purpose

Online journals - open access publishers

Frontiers - from 2007



The screenshot displays the Frontiers website interface. At the top, there is a navigation bar with links for ABOUT, JOURNALS, RESEARCH TOPICS, ARTICLES, and a SUBMIT button. A search bar is located below the navigation bar. The main content area is divided into sections for ALL JOURNALS, SCIENCE (selected), HEALTH, ENGINEERING, HUMANITIES AND SOCIAL SCIENCES, SUSTAINABILITY, and YOUNG MINDS. Under the SCIENCE section, there are 69 journals listed in a grid. Each journal entry includes a cover image, the journal title, and the number of sections. Some entries also display impact factors and CITESCORE scores.

Journal Title	Sections	Impact Factor / CITESCORE
Earth Science, Systems and Society	7 SECTIONS	-
Frontiers in Aging	7 SECTIONS	-
Frontiers in Aging Neuroscience	6 SECTIONS	IMPACT FACTOR 5.750 CITESCORE 7.4
Frontiers in Agronomy	7 SECTIONS	-
Frontiers in Analytical Science	6 SECTIONS	-
Frontiers in Animal Science	5 SECTIONS	-
Frontiers in Applied Mathematics and Statistics	7 SECTIONS	CITESCORE 2.0
Frontiers in Artificial Intelligence	12 SECTIONS	-
Frontiers in Astronomy and Space Sciences	14 SECTIONS	CITESCORE 5.2



3.1 Types of scientific reports and their purpose

Online journals - open access publishers

MDPI - from 1996

MDPI 25th Anniversary Journals Information Author Services Initiatives About Sign In / Sign Up Submit

Advancing Open Science for more than 25 years
MDPI is a pioneer in scholarly open access publishing and has supported academic communities since 1996. [→ Go to anniversary page](#)

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Remote Sensing
Combining Optical and Radar Satellite Imagery to Investigate the Surface Properties and Evolution of the Lordsburg Playa, New Mexico, USA

Recent Articles
Open Access Article
Coupling Mixed Mode Chromatography/ESI Negative MS Detection with Message-Passing Neural Network Modeling for Enhanced Metabolome Coverage and Structural Identification
by Gang Xing, Vishnu Sresht, Zhongyuan Sun, Yuji Shi and Michelle F. Clasquin
Metabolites 2021, 11(11), 772; <https://doi.org/10.3390/metabo11110772> (registering DOI) - 11 Nov 2021
Abstract A key unmet need in metabolomics continues to be the specific, selective, accurate detection of traditionally difficult to retain molecules including simple sugars, sugar phosphates, carboxylic acids, and related amino acids. Designed to retain the metabolites of central carbon metabolism, this Mixed Mode [...] [Read more.](#)

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[More News & Announcements...](#)

Blog Posts
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Maximising the Impact of Your Graphical Abstracts



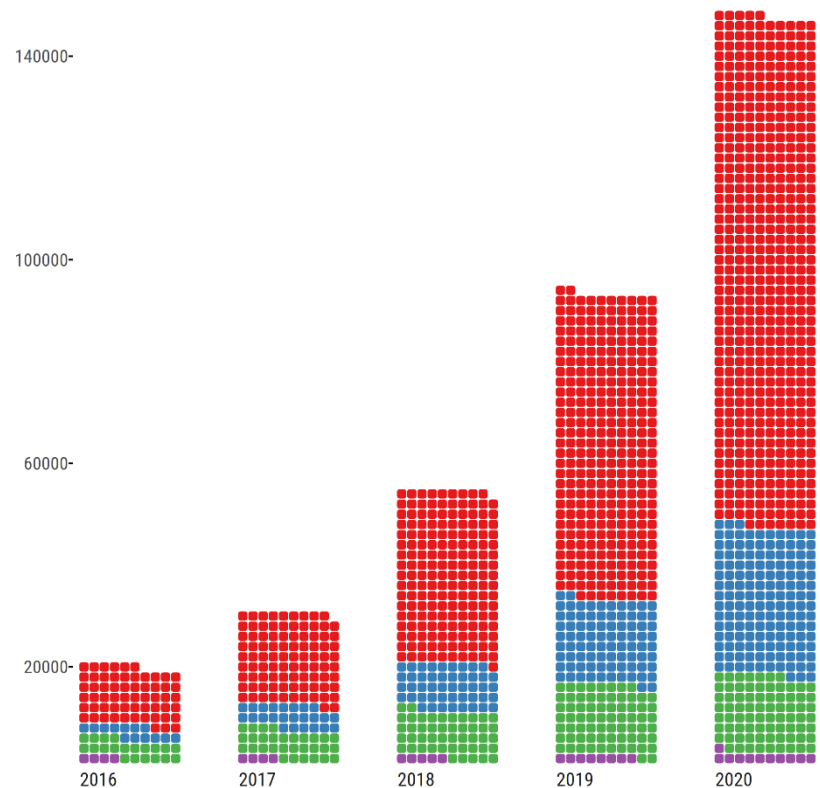
**MDPI -
Multidisciplinary
Digital
Publishing
Institute**

3.1 Types of scientific reports and their purpose

Online journals - the number of special issues is steadily increasing

Articles in Normal, Special Issues, Sections and Collections at MDPI

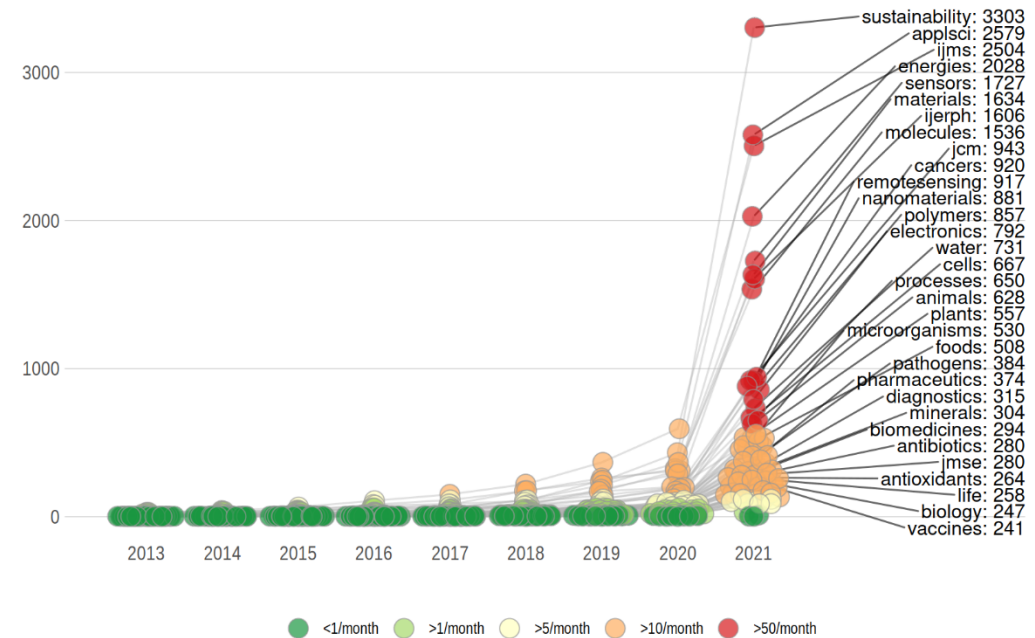
74 journals with an Impact Factor. One square = 200 articles



Data:MDPI -- code: @paolocrosetto

Number of Special Issues at MDPI

75 journals with an Impact Factor



code @paolocrosetto -- data scraped from MDPI website

[Is MDPI a predatory publisher? – Paolo Crosetto \(wordpress.com\)](https://www.wordpress.com)

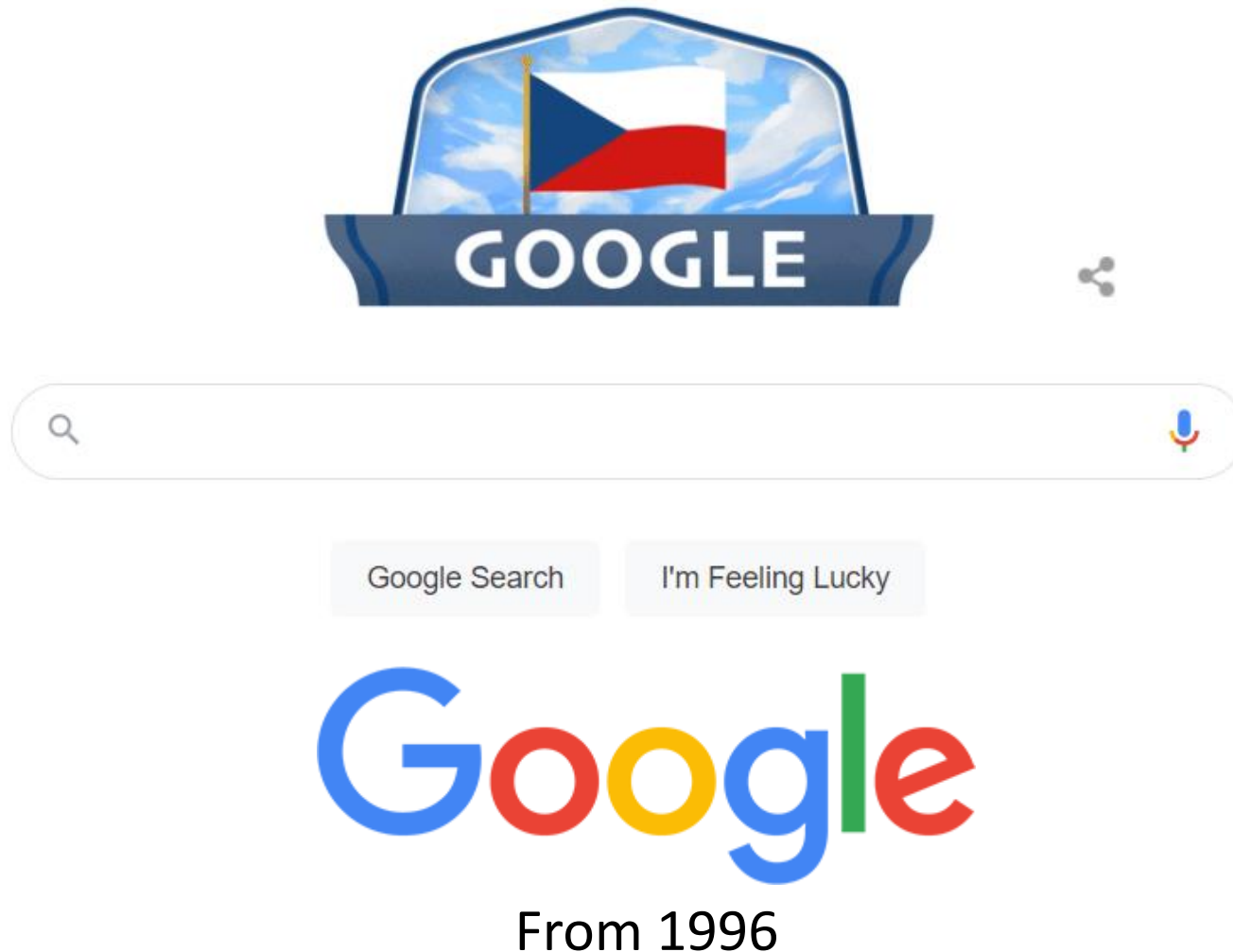
3.1 Types of scientific reports and their purpose

Committee on Publication Ethics



3.2 Internet information resources

Web search engines



WIKIPEDIA

English
The Free Encyclopedia
4 000 000+ articles

日本語
フリー百科事典
815 000+記事

Español
La enciclopedia libre
900 000+ artículos

Русский
Свободная энциклопедия
875 000+ статей

Italiano
L'enciclopedia libera
939 000+ voci

Português
A enciclopédia livre
742 000+ artigos

Deutsch
Die freie Enzyklopädie
1 430 000+ Artikel

Français
L'encyclopédie libre
1 270 000+ articles

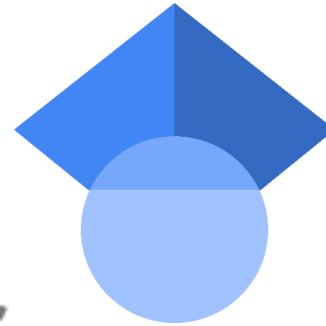
Polski
Wolna encyklopedia
908 000+ haseł

中文
自由的百科全書
500 000+ 條目

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 Tìm kiếm • Пошук • Cerca • Søk • Haku • Hledání • Keresés • 찾기 • Cari • Ara • جستجو • Căutare • بحث •
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 Traži • खोज

3.2 Internet information resources

Specialized search engines



Google Scholar

- It searches for scholarly literature across many disciplines and sources, including theses, books, abstracts and articles
- It searches primarily repositories of universities and publishers
- [How to use Google scholar: the ultimate guide - Paperpile](#)

Google Scholar

Articles Case law

Stand on the shoulders of giants

3.2 Internet information resources

Types of scientific literature databases

- **Bibliographic** - contain records of published scientific articles, books, conference abstracts, etc.
- **Full text** - in addition to a bibliographic record, they contain full length articles and books
- **Personal** - is maintained by users through constant updating, serves as a handy assistant for writing scientific texts

3.2 Internet information resources

Electronic resources at Charles University

- **E-resources** are listed for each faculty
- **UKAŽ** tool searches for printed, digitized and electronic resources at CU
- **Repositories** of bachelor, master and dissertation theses

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New resources

8.10.2021
[AccessPhysiotherapy](#)

30.9.2021
[JoVE Cancer Research](#)
online version of Encyclopedia of Experiments - Cancer Research

27.9.2021
[eHRAF World Cultures](#)
factual ethnographic database

27.9.2021
[eHRAF Archaeology](#)
factual archaeological database

21.5.2021
[MedicinesComplete](#)
factual database from pharmacology

[More...](#)

3.2 Internet information resources

Electronic resources at Faculty of Science, CU

List of electronic resources:

- **subscribed bibliographic databases** - ISI WOS, Scopus, etc.
- **subscribed full text databases** - EBSCO, JSTOR, Kluwer, Springer, Wiley, etc.
- **free databases** - Pubmed, Pubmed Central, High Wire press, etc.



FACULTY OF SCIENCE
Charles University

Research Support Department

menu

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 - ▶ Libraries
 - Electronic Resources**
 - ▶ Foreigners in Czechia
 - ▶ Unique author identifiers (UAI)
- ▶ Public Relations Department

Faculty / Research Support Department / Electronic Resources

Electronic Resources

This section contains references to licensed electronic resources (databases, e-journals, e-books) accessible from the computers of Faculty of Science, bought from the budget of Charles University and Faculty of Science within purposefully created partnerships (to projects etc.).

Authorized users can get to network available titles also through remote access

LIST:

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[E-books](#)

[E-journals](#) (link to remote access)

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UKAŽ

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[Academic Search Ultimate](#)

[EBSCO eBooks](#)

[JSTOR](#)

[Oxford University](#)

[Science Direct](#)

[Scopus](#)

[Springer](#)

[Taylor & Francis](#)

[Web of Science](#)

[Wiley](#)

3.2 Internet information resources

Bibliographic databases available at Faculty of Science, CU

ISI Web of Knowledge

- a commercial bibliographic database of scientific literature, established by Thomson Reuters and maintained by [Clarivate Analytics](#)
- it is usually **subscribed by the institution**
- users can register to get much wider range of services
- **links to full texts** provided
- new interface from 2021

The screenshot shows the Web of Science search interface. At the top, there is a navigation bar with the Clarivate logo, language selection (English), and a Products menu. Below this, the 'Web of Science' logo is followed by navigation links for Search, Marked List, History, and Alerts. On the right side of the navigation bar, there are links for Sign In and a Register button. The main content area has a purple header with the text 'Discover multidisciplinary content from the world's most trusted global citation database.' Below the header is a search box with a dropdown menu set to 'Web of Science Core Collection' and 'Editions: All'. The search box is divided into four tabs: DOCUMENTS, AUTHORS, CITED REFERENCES, and STRUCTURE. The search input field contains the text 'Example: liver disease india singh'. Below the search input, there are buttons for '+ Add row' and '+ Add date range', followed by an 'Advanced Search' link. To the right of the search input are 'Clear' and 'Search' buttons. At the bottom of the page, there are logos for Clarivate, Charles University in Prague, and Web of Science.

3.2 Internet information resources

Bibliographic databases available at Faculty of Science, CU

Scopus

- a commercial bibliographic database of scientific literature maintained by **Elsevier**
- it is usually **subscribed by the institution**
- users can register to get much wider range of services
- **links to full texts** provided

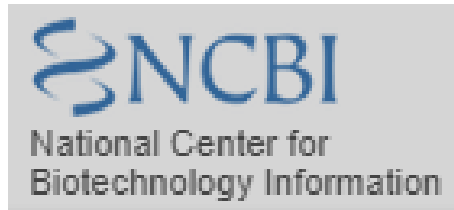


Scopus

The screenshot shows the Scopus homepage. At the top right, there are navigation links for 'Search', 'Sources', 'Lists', and 'SciVal', along with a help icon, a notification bell, and a university logo. The main heading is 'Start exploring' with the tagline 'Discover the most reliable, relevant, up-to-date research. All in one place.' Below this are three tabs: 'Documents', 'Authors', and 'Affiliations'. A search bar is present with a dropdown menu set to 'Search within Article title, Abstract, Keywords' and a 'Search documents *' button. Below the search bar are links for '+ Add search field', '+ Add date range', and 'Advanced document search >'. At the bottom, there are links for 'Search History' and 'Saved Searches' with a 'New' badge.

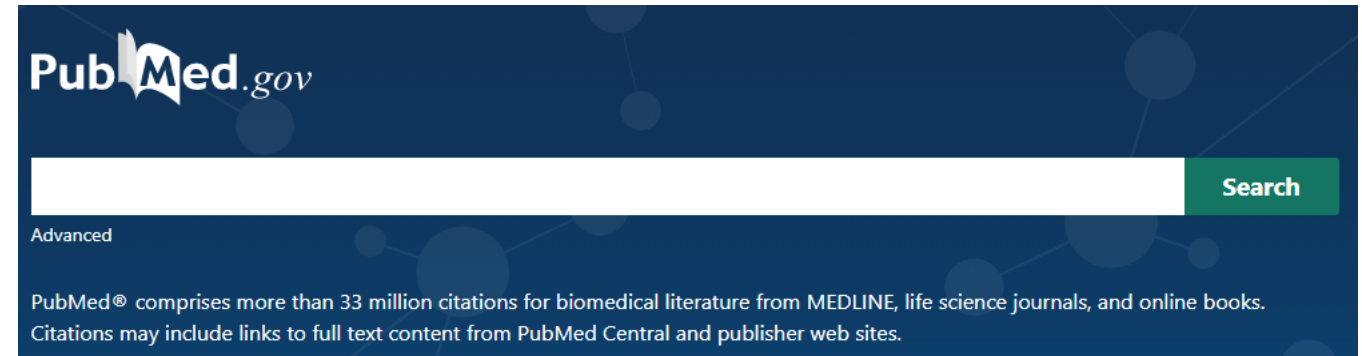
3.2 Internet information resources

Bibliographic databases available at Faculty of Science, CU



NCBI Pubmed

- **free access**, good coverage
- operated by **NCBI** (National Center for Biotechnology Information)
- online early and pre-print articles could be found here
- combination of bibliographic (**Pubmed**) and full text (**Pubmed Central, PMC**) databases



Learn



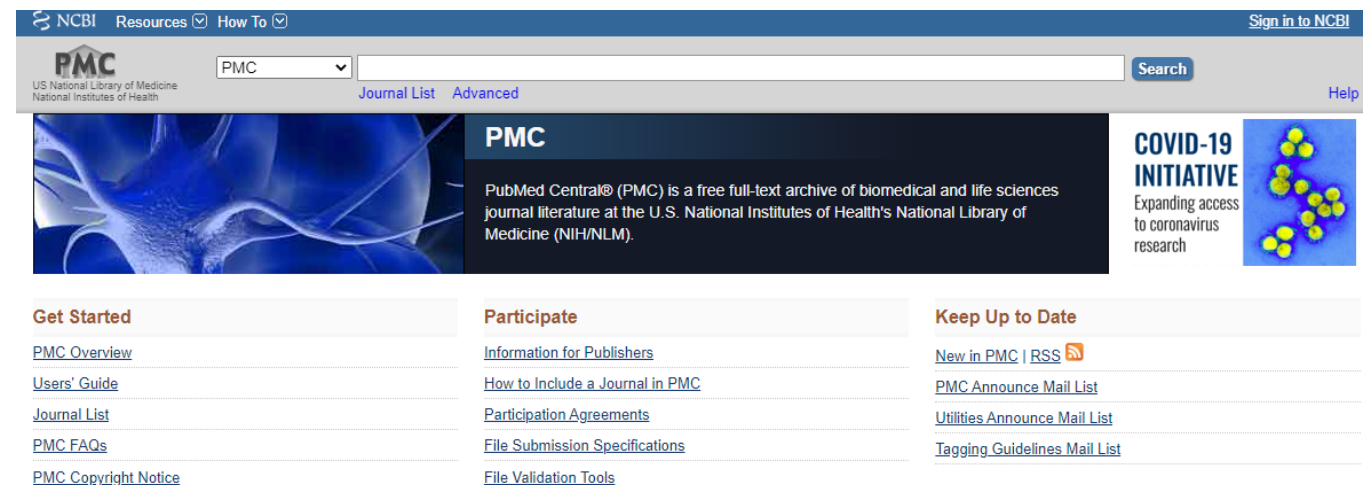
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Download



Explore



3.2 Internet information resources

Preprint servers

- **free** online archive for **unpublished original contributions**

- operated by **Cold Spring Harbor Laboratory**

- authors obtain a **feedback** from the scientific community **before** they submit the paper to peer-reviewed journals

- **bioRxiv, medRxiv**



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BMJ Yale

HOME | ABOUT | SUBMIT | NEWS & NOTES | ALERTS / RSS

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