

Spring 2025

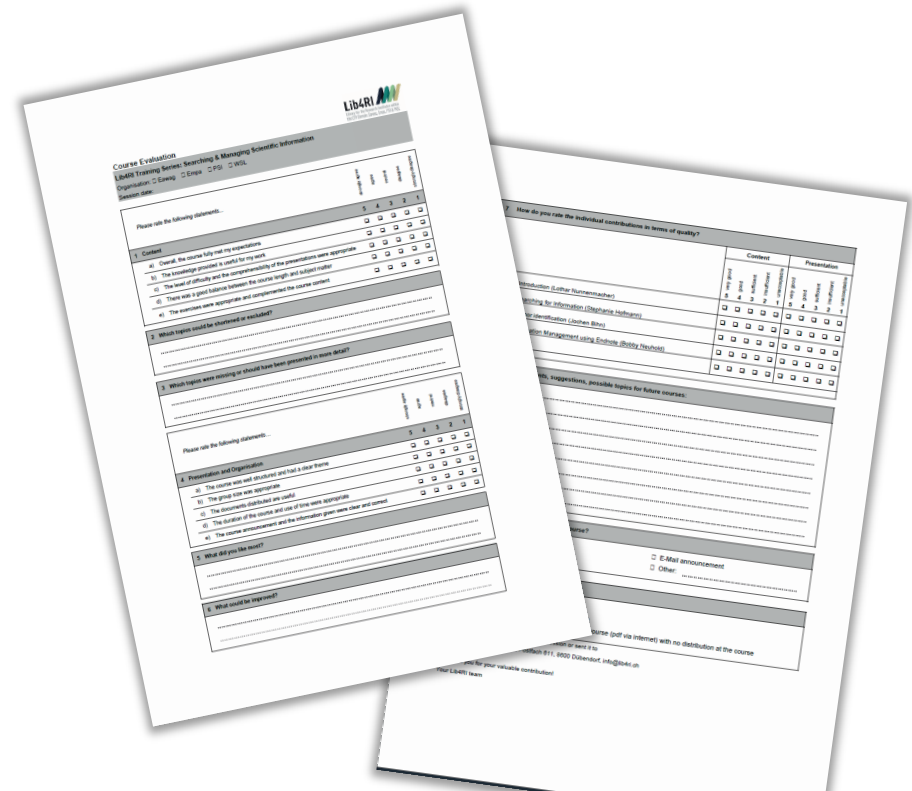
# Lib4RI Training Series: Module 1 - Searching Scientific Information

Bobby Neuhold & Stephanie Hofmann

# Before we start

The **course slides** and supplementary material are available online on our website at [www.lib4ri.ch](http://www.lib4ri.ch) > [Learn](#) > [Trainings](#) > [Searching & Managing Scientific Information](#) > [Course description](#) > [Module 1](#)

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**Course Evaluation**  
 Lib4RI Training Series: Searching & Managing Scientific Information  
 Organization: Eawag, Empa, PSI, WSL  
 Session date: \_\_\_\_\_

Please rate the following statements:

	1	2	3	4	5
1. Content					
a) Overall, the course fully met my expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The knowledge presented is useful for my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The level of difficulty and the comprehensibility of the presentations were appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The level of difficulty and the comprehensibility of the presentations were appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) There was a logical balance between the course length and subject matter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) The exercises were appropriate and complemented the course content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Which topics should be highlighted or excluded?

3. Which topics were missing or should have been presented in more detail?

Please rate the following statements:

	1	2	3	4	5
4. Presentation and Organization					
a) The course was well structured and had a clear theme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The group size was appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The documents provided are useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The duration of the course and use of time were appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) The course announcement and the information given were clear and correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. What did you like best?

6. What could be improved?

**How do you rate the individual contributions in terms of quality?**

	1	2	3	4	5
Introduction (Ludwig Hutterer)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Searching for information (Christiane Hoffmann)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Management (Ludwig Hutterer)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Management using Endnote (Christiane Hoffmann)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Suggestions, possible topics for future courses:

8. How did you receive the course?

☐ E-Mail announcement  
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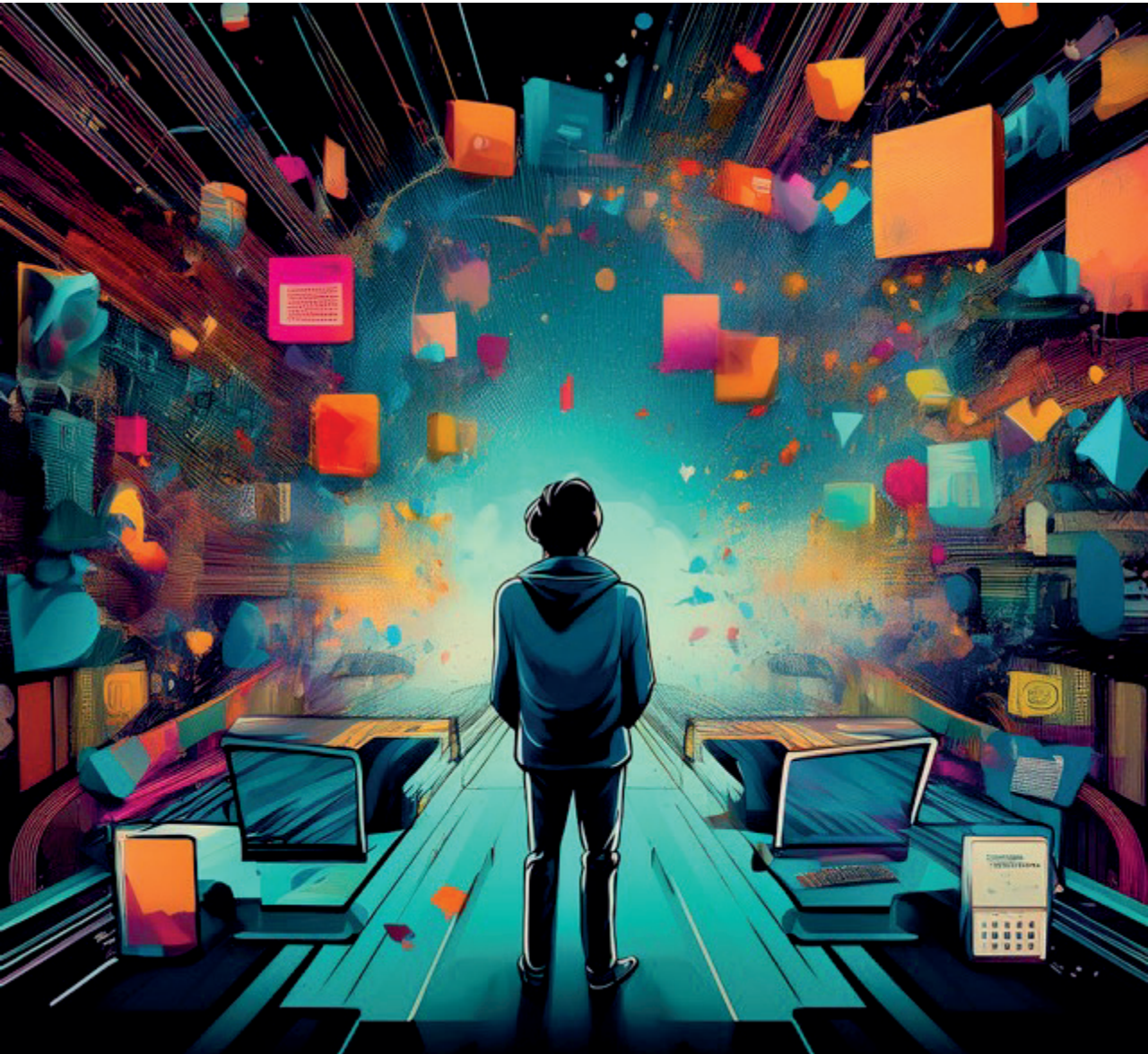
9. How did you receive the course?

☐ E-Mail announcement  
☐ Other: \_\_\_\_\_

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# Basic Search



## Basic Search

1. Finding (scientific) information
2. How to start
3. Where to find what
4. AI powered tools



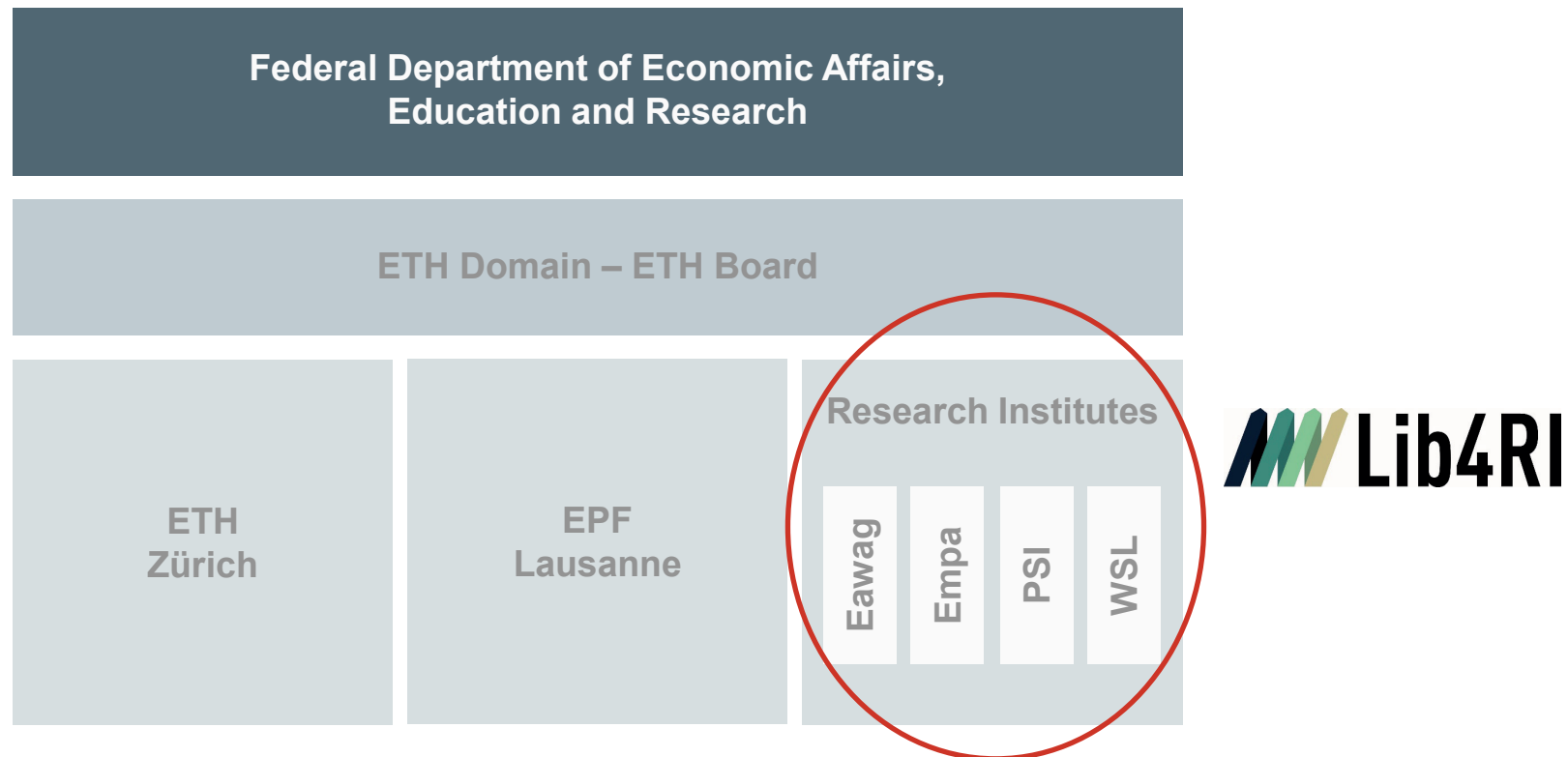
# Finding (scientific) information

# Lib4RI – what is that?



# Lib4RI – what is that?


**Library for the Research Institutes within the ETH Domain: Eawag, Empa, PSI & WSL**



# Lib4RI – overview


- Library locations:
  - Eawag-Empa: Dübendorf
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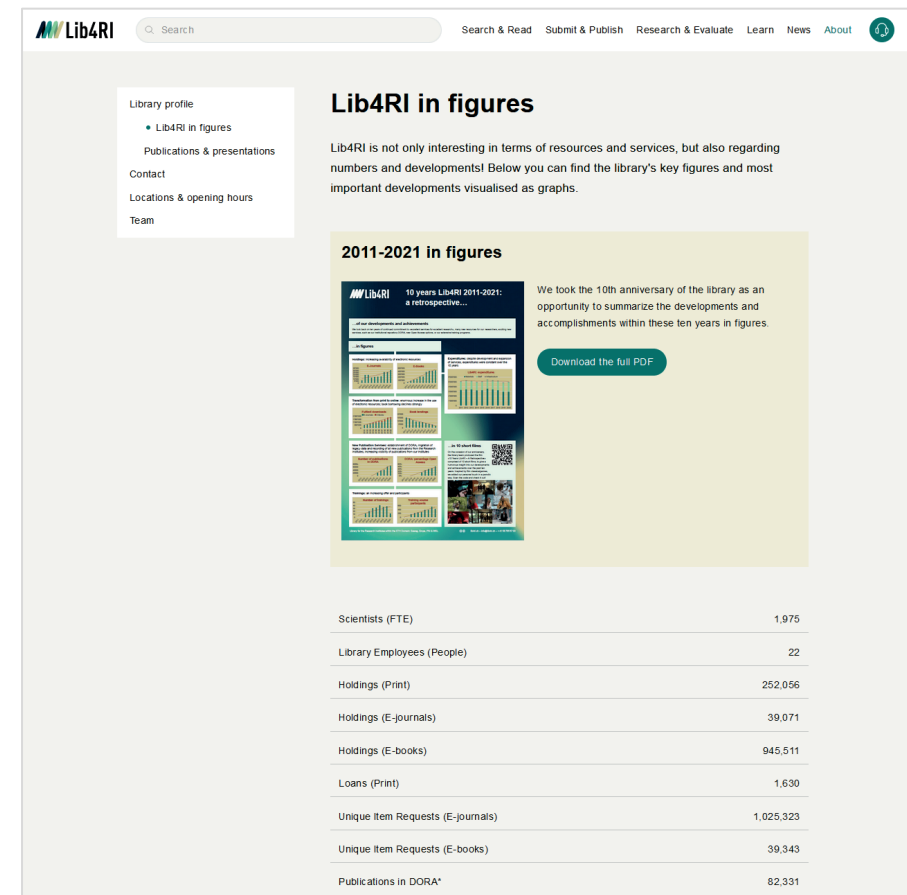
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# How to start ...

# References

## References

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J Pacyna, L Witek - Steel Research, 1988 - Wiley Online Library

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
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### The effect of carbides on fracture toughness of steels of ferritic matrix

Jerzy Pacyna D.Sc., Lesław Witek M.Sc.

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
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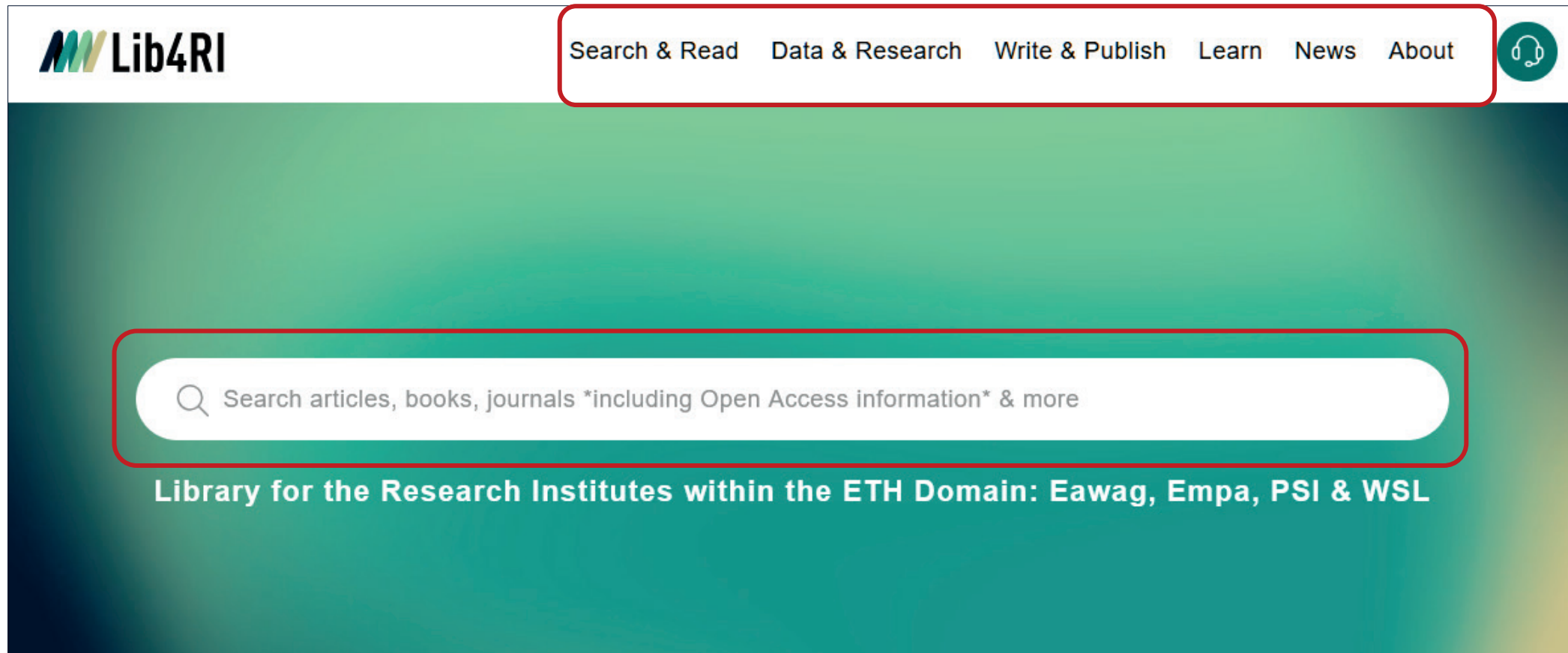
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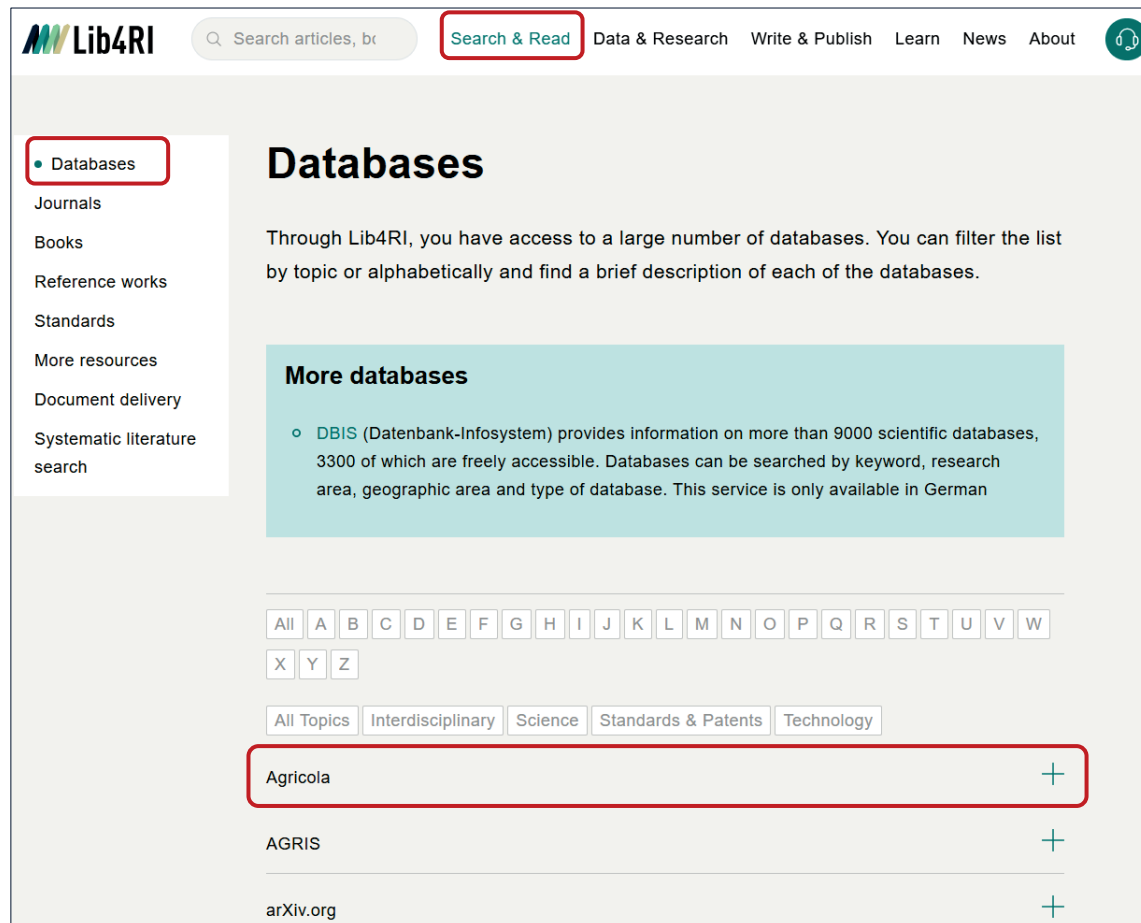
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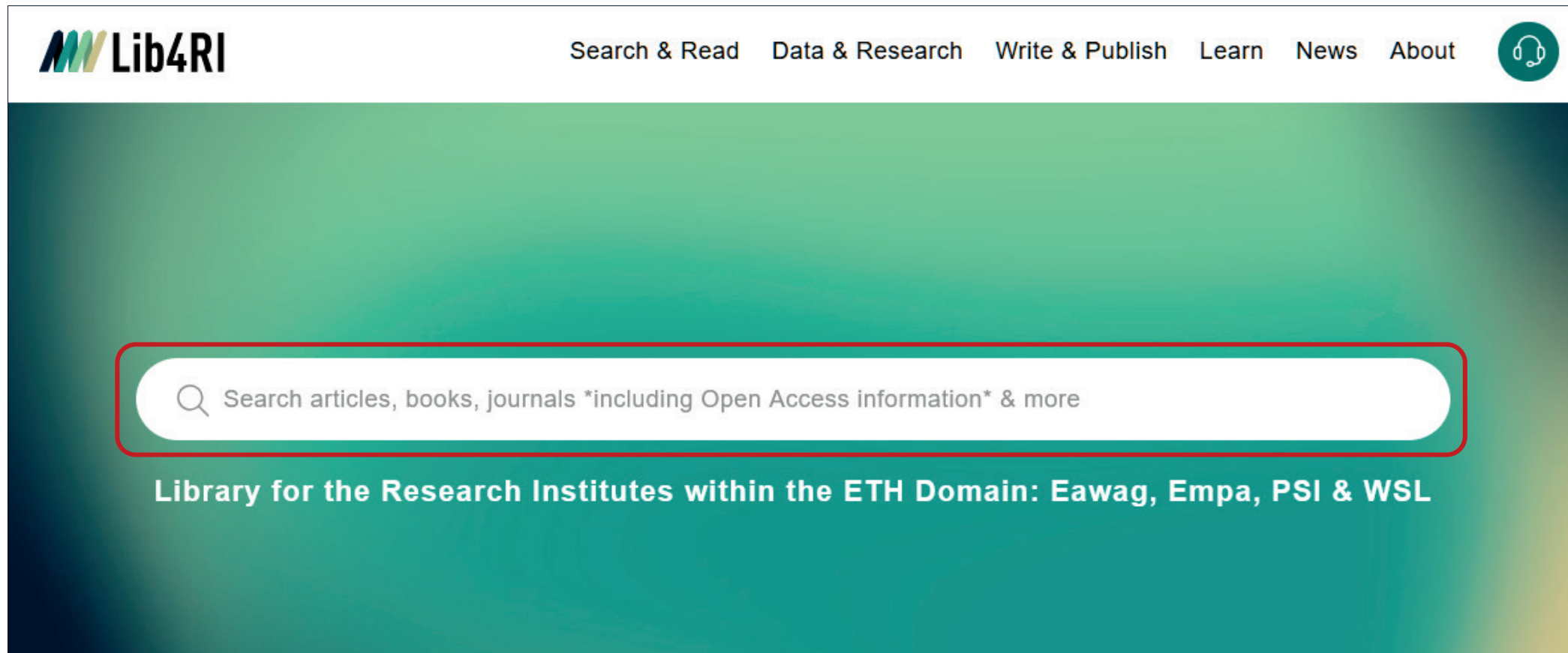
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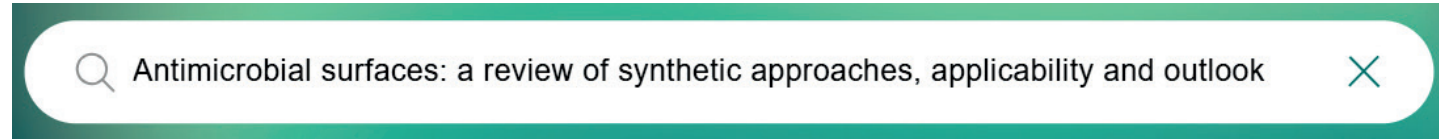
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By: Mahanta, U (Mahanta, Urbashi)<sup>[1]</sup>; Khandelwal, M (Khandelwal, Mudrika)<sup>[1]</sup>; Deshpande, AS (Deshpande, Atul Suresh)<sup>[1]</sup>

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DOI: 10.1007/s10853-021-06404-0  
Published: NOV 2021  
Early Access: AUG 2021  
Indexed: 2021-08-18  
Document Type: Review

**Abstract**

The rapid spread of microorganisms such as bacteria, fungi, and viruses can be extremely detrimental and can lead to seasonal epidemics or even pandemic situations. In addition, these microorganisms may bring about fouling of food and essential materials resulting in substantial economic losses. Typically, the microorganisms get transmitted by their attachment and growth on various household and high contact surfaces such as doors, switches, currency. To prevent the rapid spread of microorganisms, it is essential to understand the interaction between various microbes and surfaces which result in their attachment and growth. Such understanding is crucial in the development of antimicrobial surfaces. Here, we have reviewed different approaches to make antimicrobial surfaces and correlated surface properties with antimicrobial activities. This review concentrates on physical and chemical modification of the surfaces to modulate wettability, surface topography, and surface charge to inhibit microbial adhesion, growth, and proliferation. Based on these aspects, antimicrobial surfaces are classified into patterned surfaces, functionalized surfaces, superwettable surfaces, and smart surfaces. We have critically discussed the important findings from systems of developing antimicrobial surfaces along with the limitations of the current research and the gap that needs to be bridged before these approaches are put into practice.

**Keywords**

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STEEL RESEARCH

Volume: 59 Issue: 2 Page: 68-74  
DOI: 10.1002/srin.198801608  
Published: 1988  
Indexed: 1988-01-01  
Document Type: Article

**Author Information**

Corresponding Address: PACYNA, J (corresponding author)

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




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Books etc.

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- Linkov I, Steevens J. *Nanomaterials : risks and benefits*. Springer; 2009.
- Perrett S et al. *Biological and Bio-inspired Nanomaterials : Properties and Assembly Mechanisms*. Springer Singapore; 2019.
- Brayner R et al. *Nanomaterials: A Danger or a Promise? : A Chemical and Biological Perspective*. Springer London; 2013.
- Bachheti RK, Husen A. *Nanomaterials for Environmental and Agricultural Sectors*. Springer Nature Singapore; 2023.
- Rai M, Biswas JK. *Nanomaterials: Ecotoxicity, Safety, and Public Perception*. Springer International Publishing; 2018.
- Bachheti RK et al. *Metal and Metal-Oxide Based Nanomaterials : Synthesis, Agricultural, Biomedical and Environmental Interventions*. Springer Nature Singapore; 2024.
- Rai M, Nguyễn TA. *Nanomaterials recycling*. Elsevier; 2022.
- Nalwa HS, Zhao Y. *Nanotoxicology : interactions of nanomaterials with biological systems*. American Scientific Publ; 2007.
- Puzyn T, Leszczynski J. *Towards efficient designing of safe nanomaterials : innovative merge of computational approaches and experimental techniques*. RSC Pub; 2012.
- Gomes C de SF, Rautureau M. *Minerals latu sensu and human health : benefits, toxicity and pathologies*. Springer; 2021.

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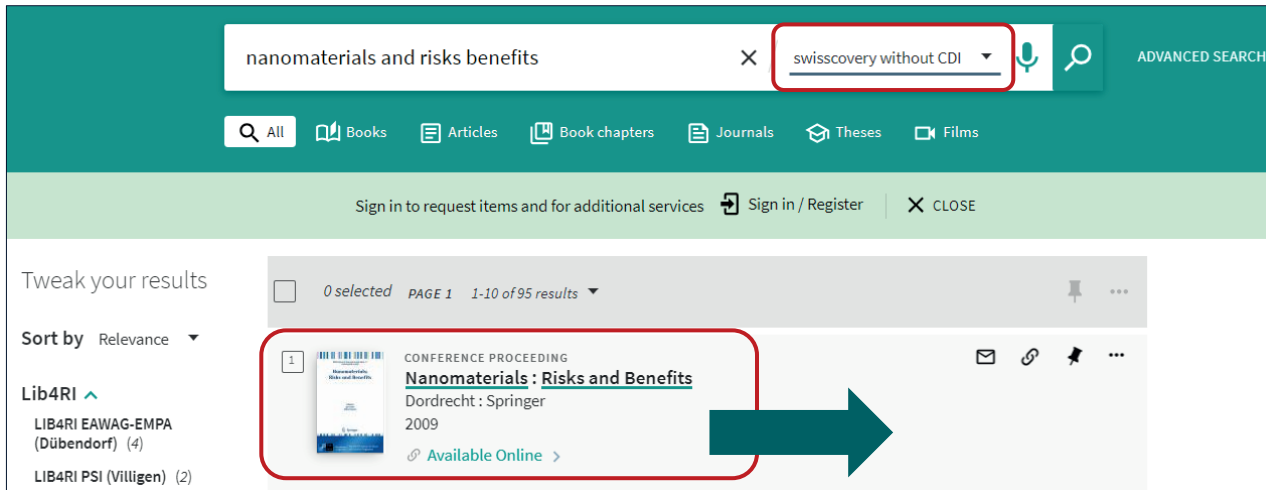
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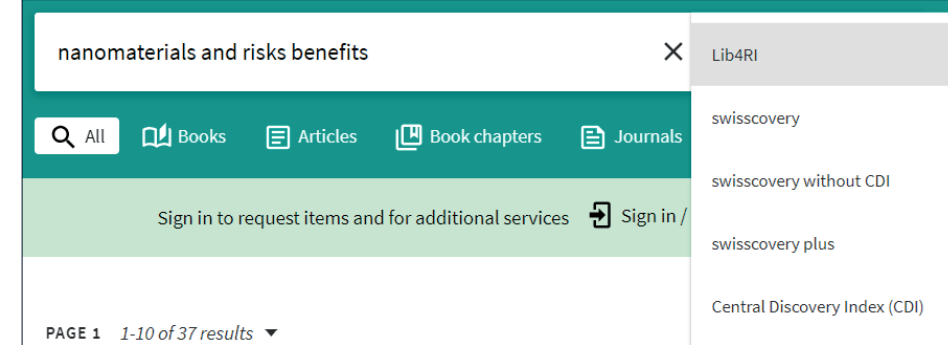
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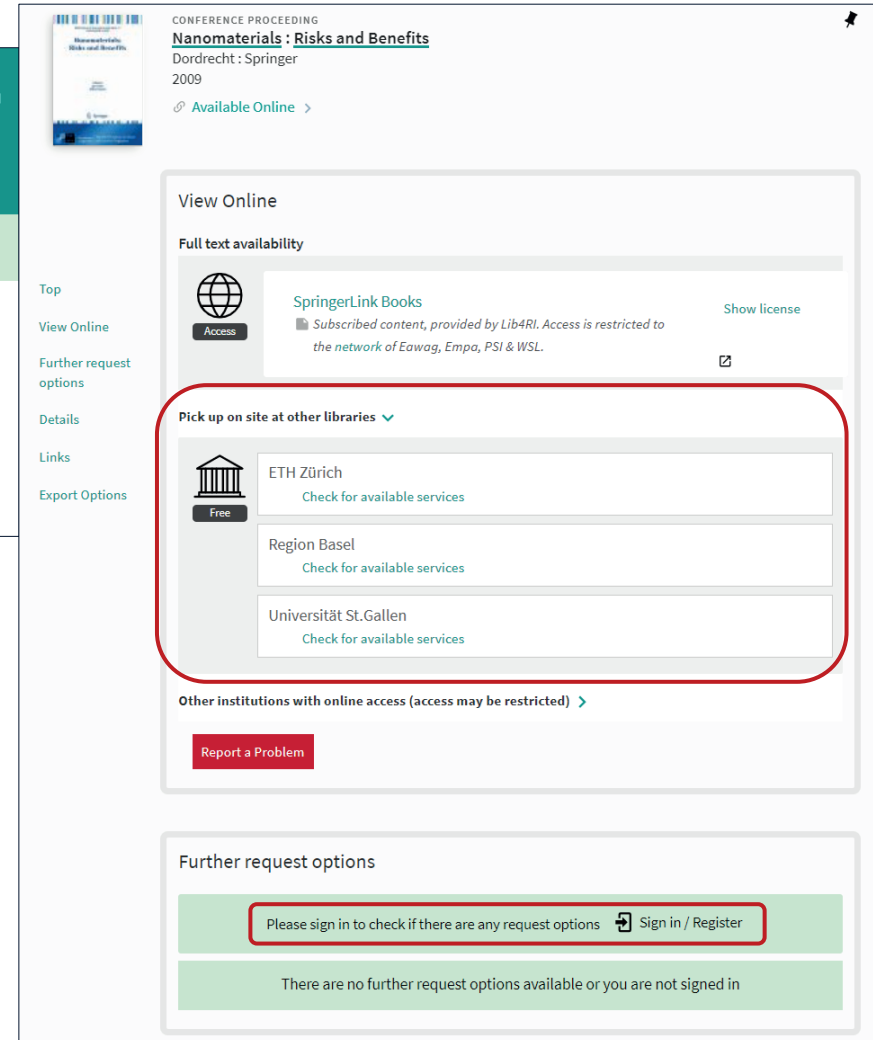


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- Munn CB. *Marine microbiology : ecology & applications*. Garland Science, an imprint of Taylor and Francis; 2011.
- Mazumdar A. *Systems biogeochemistry of major marine biomes*. Wiley; 2022.
- Schink B. *Advances in Microbial Ecology*. Springer US; 2000.
- Margesin R et al. *Psychrophiles: From Biodiversity to Biotechnology*. Springer Berlin Heidelberg; 2008.
- Trudinger PA, Walter MR. *Biogeochemistry of ancient and modern environments : proceedings of the Fourth International Symposium on Environmental Biogeochemistry (ISEB) and Conference on Biogeochemistry in relation to the mining industry and environmental pollution*. Springer-Verlag; 1980.
- Westbroek P, DeJong EW. *Biomining and biological metal accumulation : biological and geological perspectives : papers presented at the fourth International Symposium on Biomining, Renesse, the Netherlands, June 2-5, 1982*. D. Reidel Publishing Company; 1983.

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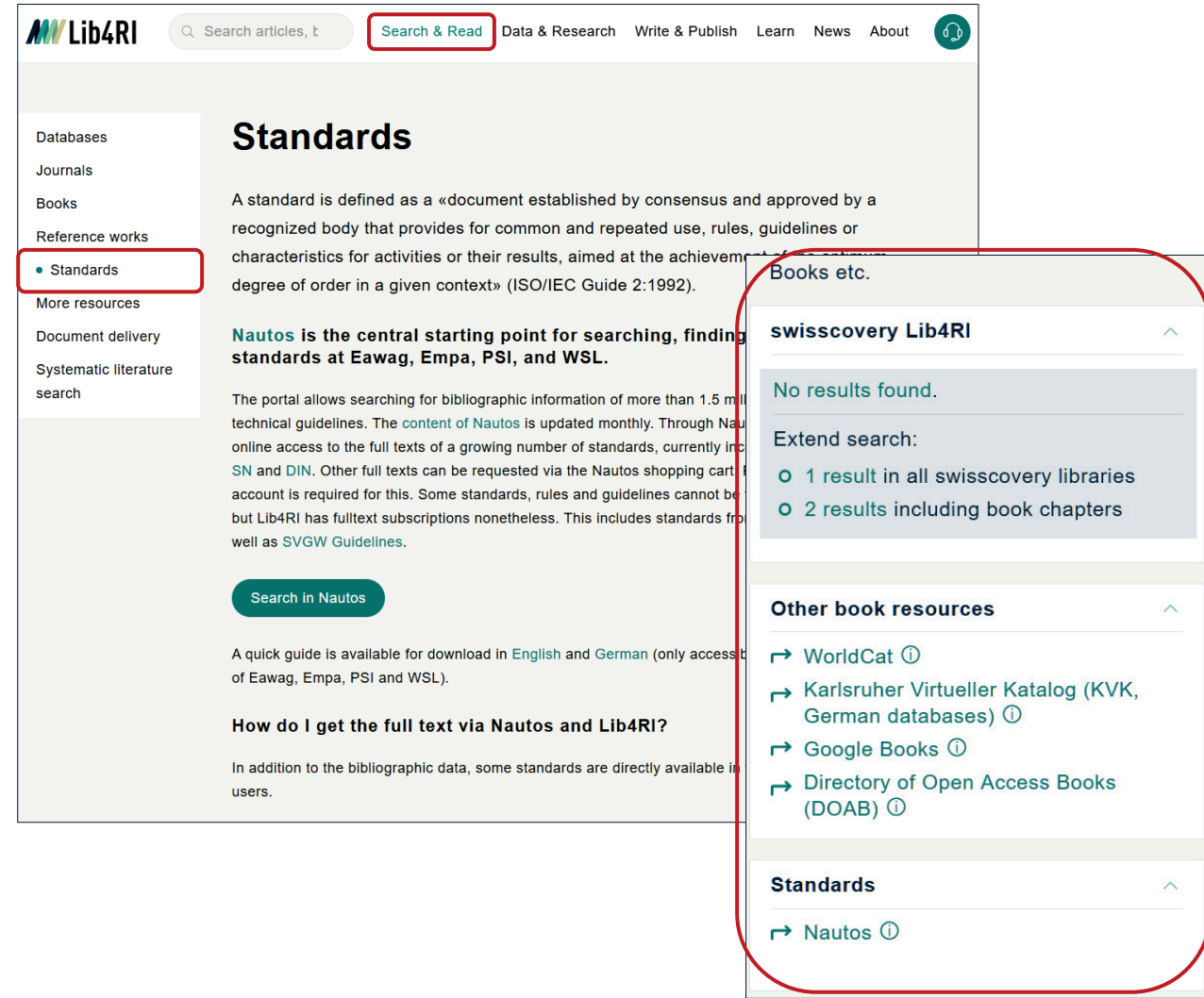
<b>Title</b>	Systems biogeochemistry of major <u>marine</u> biomes
<b>Attribution</b>	edited by Aninda Mazumdar.
<b>Publication</b>	Hoboken, New Jersey : Wiley,
<b>Edition, date</b>	[2022] ©2022
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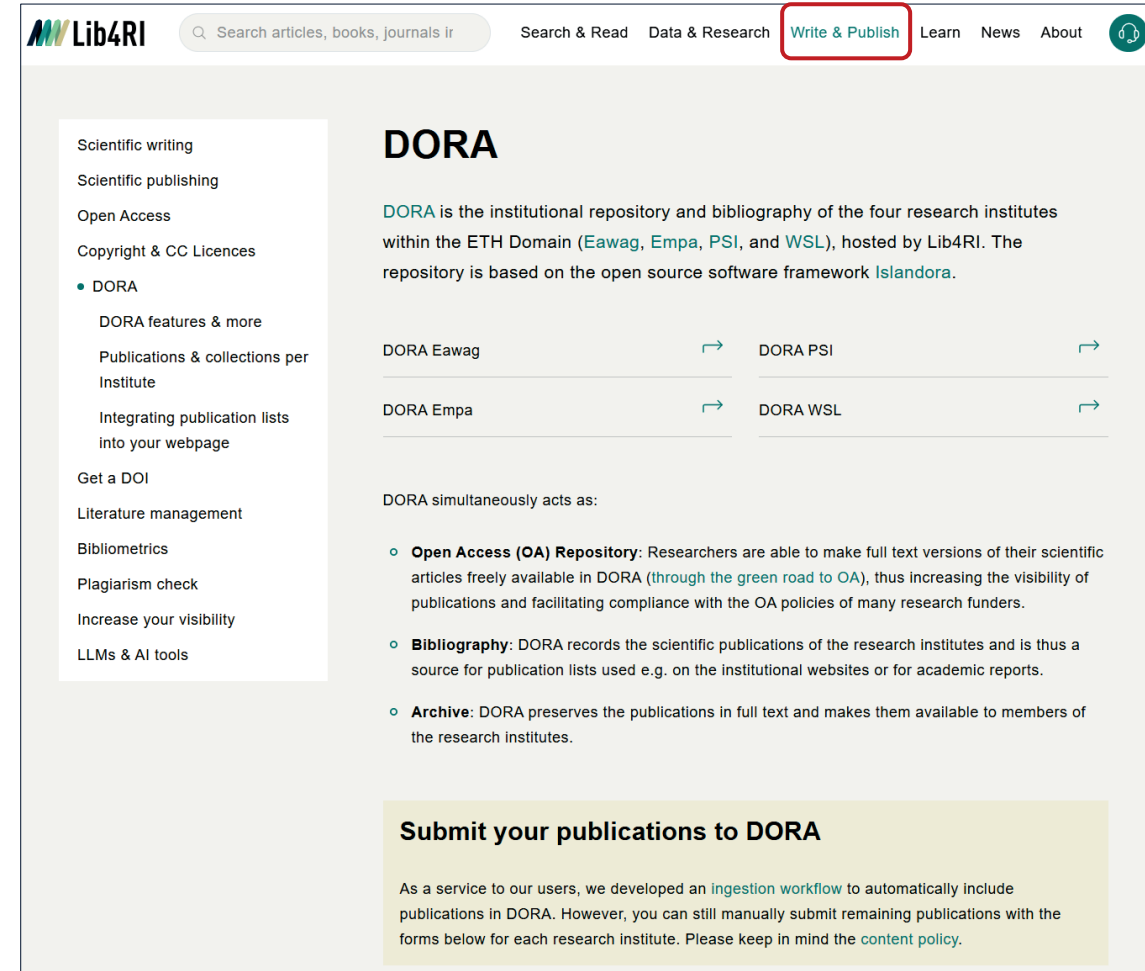
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# DORA – your institutional repository

# DORA - your institutional repository

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The screenshot shows the DORA website interface. At the top, there is a navigation bar with the Lib4RI logo, a search bar, and links for 'Search & Read', 'Data & Research', 'Write & Publish' (highlighted with a red box), 'Learn', 'News', and 'About'. A sidebar on the left lists various services: Scientific writing, Scientific publishing, Open Access, Copyright & CC Licences, DORA (selected), DORA features & more, Publications & collections per Institute, Integrating publication lists into your webpage, Get a DOI, Literature management, Bibliometrics, Plagiarism check, Increase your visibility, and LLMs & AI tools. The main content area is titled 'DORA' and explains that it is the institutional repository and bibliography for the four research institutes within the ETH Domain (Eawag, Empa, PSI, and WSL), hosted by Lib4RI. It mentions that the repository is based on the open source software framework Islandora. Below this, there are links to DORA Eawag, DORA Empa, DORA PSI, and DORA WSL. A section titled 'DORA simultaneously acts as:' lists three roles: Open Access (OA) Repository, Bibliography, and Archive. At the bottom, a yellow box titled 'Submit your publications to DORA' explains the ingestion workflow and mentions the content policy.

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### Ugly ducklings - the dark side of plastic materials in contact with potable water

Neu L, Bänziger C, Proctor CR, Zhang Y, Liu W-T & Hammes F

**Citation**

APA

Neu, L., Bänziger, C., Proctor, C. R., Zhang, Y., Liu, W. T., & Hammes, F. (2018). Ugly ducklings - the dark side of plastic materials in contact with potable water. *npj Biofilms and Microbiomes*, 4(1), 7 (11 pp.). <https://doi.org/10.1038/s41522-018-0050-9>

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Bath toys pose an interesting link between flexible plastic materials, potable water, external microbial and nutrient contamination, and potentially vulnerable end-users. Here, we characterized biofilm communities inside 19 bath toys used under real conditions. In addition, some determinants for biofilm formation were assessed, using six identical bath toys under controlled conditions with either clean water prior to bathing or dirty water after bathing. All examined bath toys revealed notable biofilms on their inner surface, with average total bacterial numbers of  $5.5 \times 10^6$  cells/cm<sup>2</sup> (clean water controls),  $9.5 \times 10^6$  cells/cm<sup>2</sup> (real bath toys), and  $7.3 \times 10^7$  cells/cm<sup>2</sup> (dirty water controls). Bacterial community compositions were diverse, showing many rare taxa in real bath toys and rather distinct communities in control bath toys, with a noticeable difference between clean and dirty water control biofilms. Fungi were identified in 58% of all real bath toys and in all dirty water control toys. Based on the comparison of clean water and dirty water control bath toys, we argue that bath toy biofilms are influenced by (1) the organic carbon leaching from the flexible plastic material, (2) the chemical and biological tap water quality, (3) additional nutrients from care products and human body fluids in the bath water, as well as, (4) additional bacteria from dirt and/or the end-users' microbiome. The present study gives a detailed characterization of bath toy biofilms and a better understanding of determinants for biofilm formation and development in systems comprising plastic materials in contact with potable water.

[Details](#)

<b>Publication Type</b>	Journal Article
<b>Title</b>	Ugly ducklings - the dark side of plastic materials in contact with potable water
<b>Author(s)</b>	Neu, Lisa (Environmental Microbiology UMIK) Bänziger, Carola (Environmental Microbiology UMIK) Proctor, Caitlin R. (Environmental Microbiology UMIK) Zhang, Ya Liu, Wen-Tso Hammes, Frederik (Environmental Microbiology UMIK)
<b>Journal</b>	npj Biofilms and Microbiomes
<b>Volume</b>	4
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- Roels E et al. Processing of self-healing polymers for soft robotics. *Advanced Materials* 2022. <https://doi.org/10.1002/adma.202104798>.
- Terryn S et al. A review on self-healing polymers for soft robotics. *Materials Today* 2021. <https://doi.org/10.1016/j.mattod.2021.01.009>.


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### A review on self-healing polymers for soft robotics

Terryn S, Langenbach J, Roels E, Brancart J, Bakkali-Hassani C, Poutrel Q-A, [Georgopoulou A](#), George Thuruthel T, Safaei A, Ferrentino P, [Sebastian T](#), Norvez S, Iida F, Bosman AW, Tournilhac F, [Clemens F](#), Van Assche G & Vanderborght B

**Citation**  
 APA ▼ Terryn, S., Langenbach, J., Roels, E., Brancart, J., Bakkali-Hassani, C., Poutrel, Q. A., ... Vanderborght, B. (2021). A review on self-healing polymers for soft robotics. *Materials Today*, 47, 187-205. <https://doi.org/10.1016/j.mattod.2021.01.009>

**Persistent URL** <https://www.dora.lib4ri.ch/empa/islandora/object/empa:24889>

The intrinsic compliance of soft robots provides safety, a natural adaptation to its environment, allows to absorb shocks, and protects them against mechanical impacts. However, a literature study shows that the soft polymers used for their construction are susceptible to various types of damage, including fatigue, overloads, interfacial debonding, and cuts, tears and perforations by sharp objects. An economic and ecological solution is to construct future soft robotic systems out of self-healing polymers, incorporating the ability to heal damage. This review paper proposes criteria to evaluate the potential of a self-healing polymer to be used in soft robotic applications. Based on these soft robotics requirements and on defined performance parameters of the materials, linked to the mechanical and healing properties, the different types of self-healing polymers already available in literature are critically assessed and compared. In addition to a description of the state of the art on self-healing soft robotics, the paper discusses the driving forces and limitations to spur the interdisciplinary combination between self-healing polymer science and soft robotics.

[▼ Details](#)

**Publication Type** Journal Article

**Title** A review on self-healing polymers for soft robotics


**Author(s)** Terryn, Seppe  
 Langenbach, Jakob  
 Roels, Ellen  
 Brancart, Joost  
 Bakkali-Hassani, Camille  
 Poutrel, Quentin-Arthur  
[Georgopoulou, Antonia \(201 High Performance Ceramics\)](#)

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- Cui J et al. Nanomagnetic encoding of shape-morphing micromachines. *Nature* 2019. <https://doi.org/10.1038/s41586-019-1713-2>.

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## Nanomagnetic encoding of shape-morphing micromachines

Cui J, Huang T-Y, Luo Z, Testa P, Gu H, Chen X-Z, Nelson BJ & Heyderman LJ

### Citation

APA

Cui, J., Huang, T. Y., Luo, Z., Testa, P., Gu, H., Chen, X. Z., ... Heyderman, L. J. (2019). Nanomagnetic encoding of shape-morphing micromachines. *Nature*, 575(7781), 164-168. <https://doi.org/10.1038/s41586-019-1713-2>

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Shape-morphing systems, which can perform complex tasks through morphological transformations, are of great interest for future applications in minimally invasive medicine, soft robotics, active metamaterials and smart surfaces. With current fabrication methods, shape-morphing configurations have been embedded into structural design by, for example, spatial distribution of heterogeneous materials, which cannot be altered once fabricated. The systems are therefore restricted to a single type of transformation that is predetermined by their geometry. Here we develop a strategy to encode multiple shape-morphing instructions into a micromachine by programming the magnetic configurations of arrays of single-domain nanomagnets on connected panels. This programming is achieved by applying a specific sequence of magnetic fields to nanomagnets with suitably tailored switching fields, and results in specific shape transformations of the customized micromachines under an applied magnetic field. Using this concept, we have built an assembly of modular units that can be programmed to morph into letters of the alphabet, and we have constructed a microscale 'bird' capable of complex behaviours, including 'flapping', 'hovering', 'turning' and 'side-slipping'. This establishes a route for the creation of future intelligent microsystems that are reconfigurable and reprogrammable in situ, and that can therefore adapt to complex situations.

### Details

#### Publication Type

Journal Article

#### Title

Nanomagnetic encoding of shape-morphing micromachines

#### Author(s)

[Cui, Jizhai \(3701 Mesoscopic Systems\)](#)  
[Huang, Tian-Yun](#)  
[Luo, Zhaochu \(3701 Mesoscopic Systems\)](#)  
[Testa, Paolo \(3701 Mesoscopic Systems\)](#)  
[Gu, Hongri](#)  
[Chen, Xiang-Zhong](#)  
[Nelson, Bradley J.](#)  
[Heyderman, Laura J. \(3700 Multiscale Materials Experiments\)](#)

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## Glacier runoff variations since 1955 in the Maipo River basin, in the semiarid Andes of central Chile

Ayala Á, Fariás-Barahona D, Huss M, Pellicciotti F, McPhee J & Farinotti D

Citation  
APA

Ayala, Á., Fariás-Barahona, D., Huss, M., Pellicciotti, F., McPhee, J., & Farinotti, D. (2020). Glacier runoff variations since 1955 in the Maipo River basin, in the semiarid Andes of central Chile. *Cryosphere*, 14(6), 2005-2027. <https://doi.org/10.5194/tc-14-2005-2020>

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As glaciers adjust their size in response to climate variations, long-term changes in meltwater production can be expected, affecting the local availability of water resources. We investigate glacier runoff in the period 1955–2016 in the Maipo River basin (4843 km<sup>2</sup>, 33.0–34.3° S, 69.8–70.5° W), in the semiarid Andes of Chile. The basin contains more than 800 glaciers, which cover 378 km<sup>2</sup> in total (inventoried in 2000). We model the mass balance and runoff contribution of 26 glaciers with the physically oriented and fully distributed TOPKAPI (Topographic Kinematic Approximation and Integration)-ETH glacio-hydrological model and extrapolate the results to the entire basin. TOPKAPI-ETH is run at a daily time step using several glaciological and meteorological datasets, and its results are evaluated against streamflow records, remotely sensed snow cover, and geodetic mass balances for the periods 1955–2000 and 2000–2013. Results show that in 1955–2016 glacier mass balance had a general decreasing trend as a basin average but also had differences between the main sub-catchments. Glacier volume decreased by one-fifth (from 18.6±4.5 to 14.9±2.9 km<sup>3</sup>). Runoff from the initially glacierized areas was 177±25 mm yr<sup>-1</sup> (16±7 % of the total contributions to the basin), but it shows a decreasing sequence of maxima, which can be linked to the interplay between a decrease in precipitation since the 1980s and the reduction of ice melt. Glaciers in the Maipo River basin will continue retreating because they are not in equilibrium with the current climate. In a hypothetical constant climate scenario, glacier volume would reduce to 81±38 % of the year 2000 volume, and glacier runoff would be 78±30 % of the 1955–2016 average. This would considerably decrease the drought mitigation capacity of the basin.

Details

Publication Type

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Title

Glacier runoff variations since 1955 in the Maipo River basin, in the semiarid Andes of central Chile

Author(s)

Ayala, Álvaro (Mountain Hydrology and Mass Movements)  
Fariás-Barahona, David  
Huss, Matthias (Mountain Hydrology and Mass Movements)  
Pellicciotti, Francesca (Mountain Hydrology and Mass Movements)  
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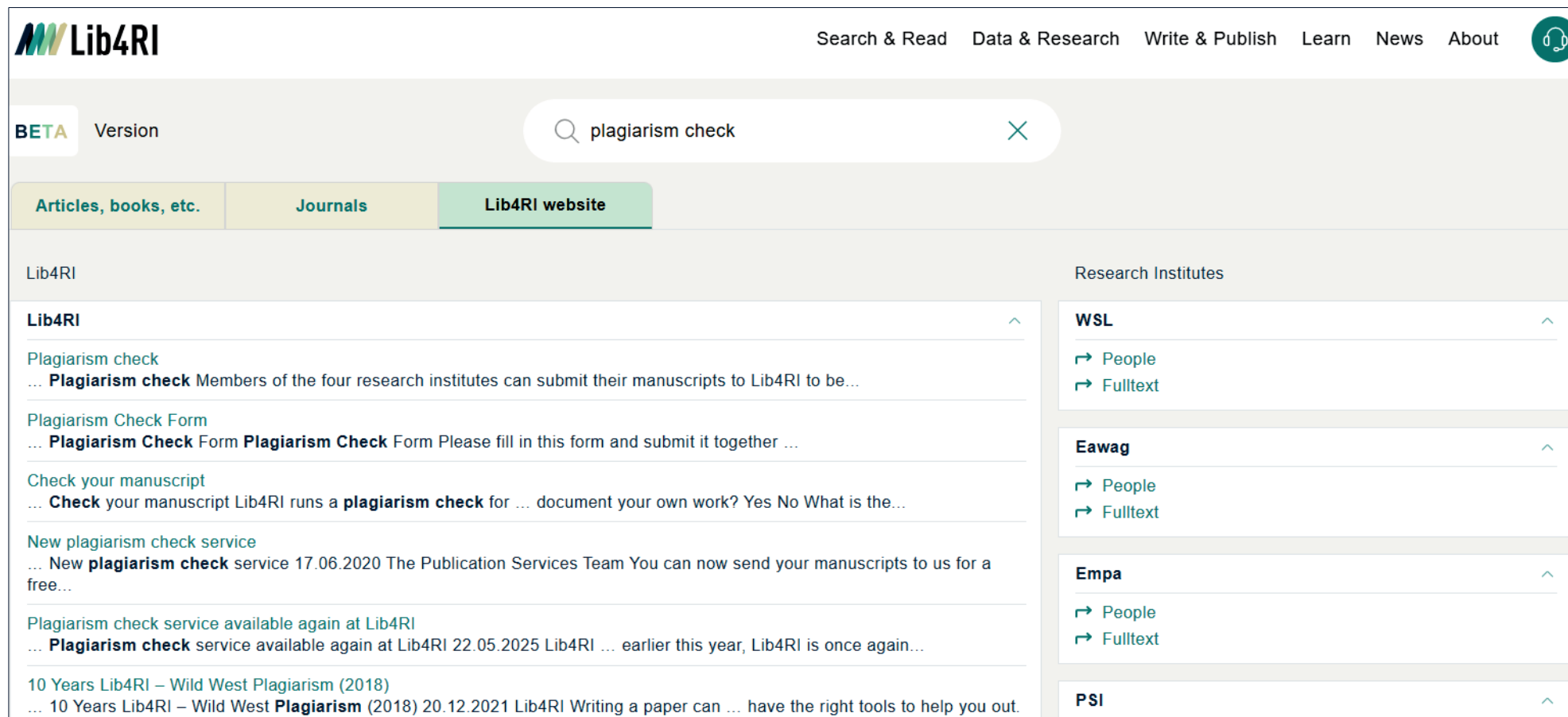


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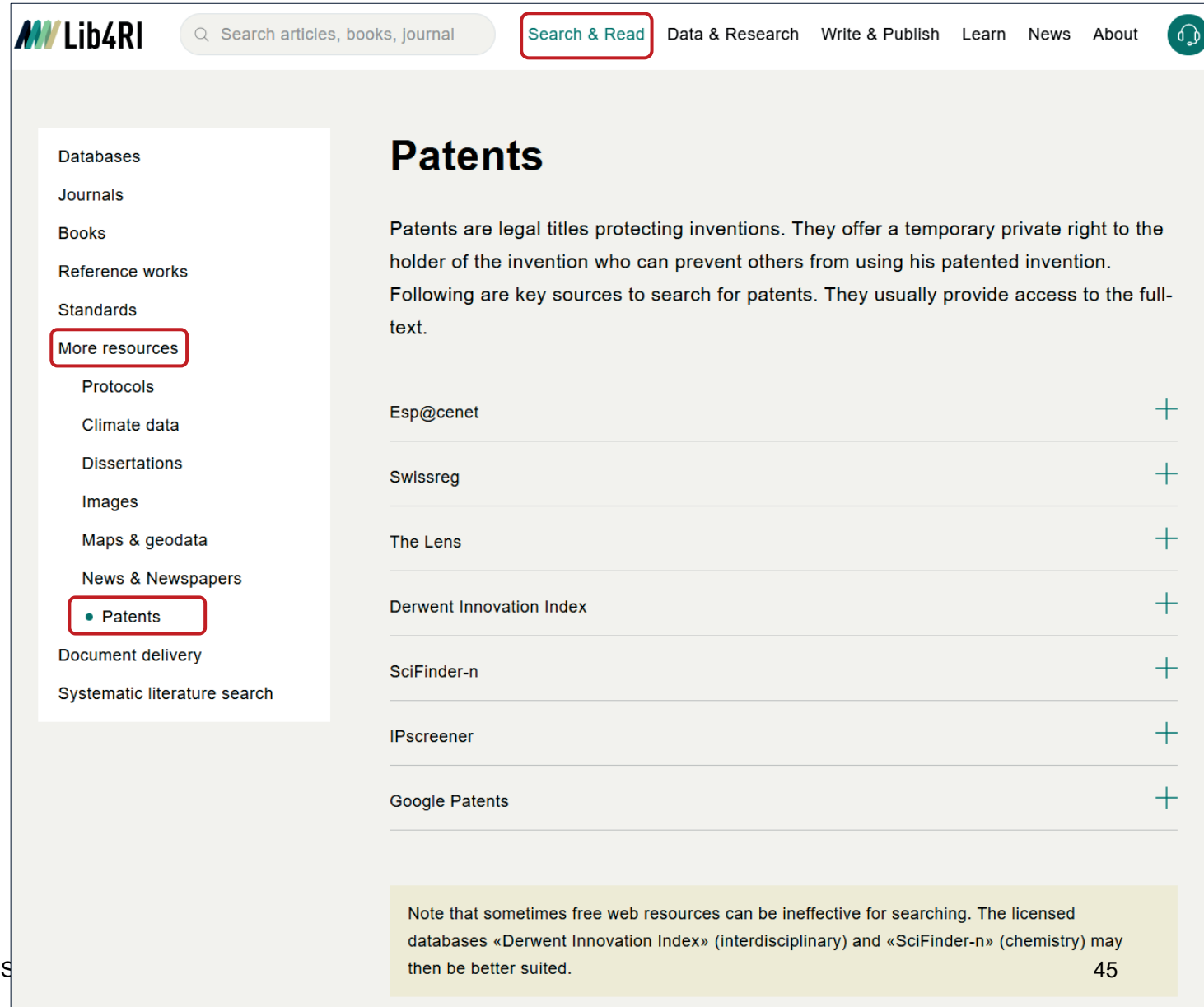
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## Patents

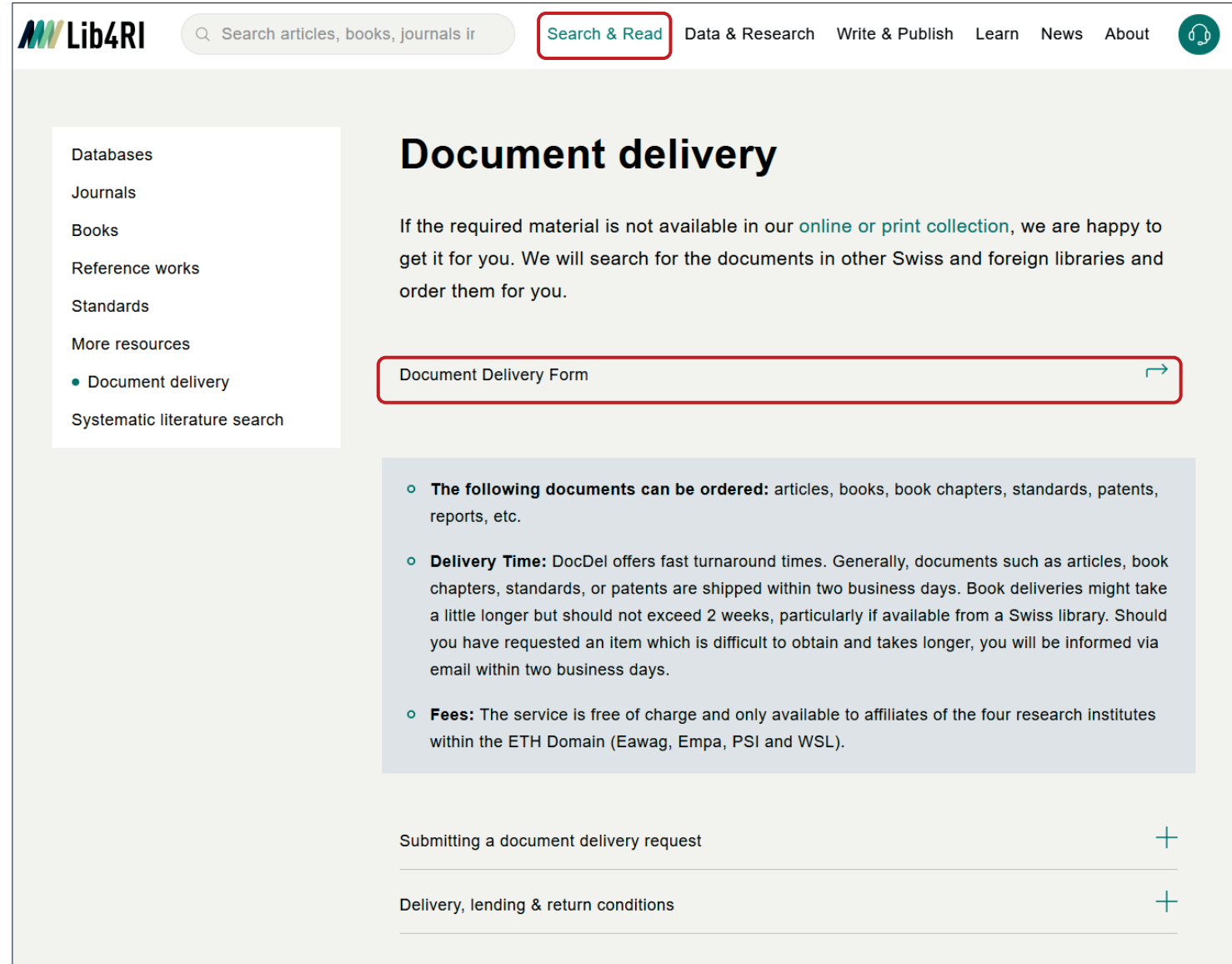
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# AI powered tools



# Literature search – powered by AI

- Yes, there are numerous AI tools (10'000, 36'000, ?)
- Find the right tool:
  - [There's An AI For That](#)
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  - ...
- ChatGPT ?
  - Custom ChatGPT with: Consensus, SciSpace, Dimensions



## Some tips for effective prompting

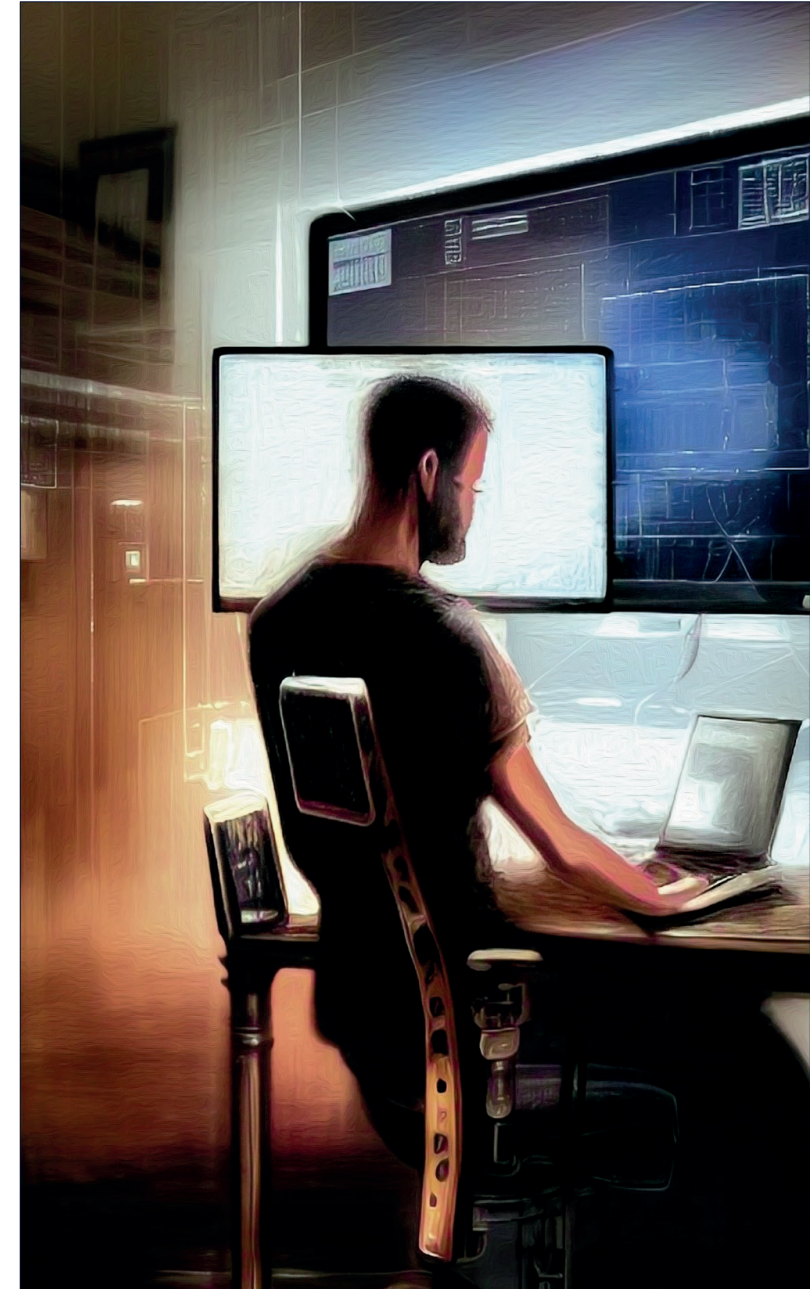
- **Clarity and precision:** Clear and precise instructions prevent misunderstandings by the machine.
- **Contextual relevance:** A good prompt takes into account the context of the request.
- **Targeting:** Targeted prompts lead to targeted responses.
- **Linguistic nuance:** The way a prompt is phrased has a significant impact on the response.
- **Feedback loops:** Iterative adjustment of the prompt can help to improve results step by step.



# Literature search – powered by AI

## Features of AI tools

- Summaries
- Extraction of key information
- Suggestions for related publications
- Integration of AI assistants
- Automatic translation



## AI tools for academic literature research can be divided into "Finders" and "Connectors"

"Finders" act as a library catalogue. You can enter a keyword, a phrase or a complete question.

- Semantic Scholar
- Elicit
- Consensus
- SciSpace
- ...

"Connectors" are based on a publication. Just enter part of the publication's metadata (preferably the DOI) into the tool in order to find related literature.

- Research Rabbit
- Open Knowledge Map
- Inciteful
- Litmap
- ...

## Conclusions ... for now

- Results strongly dependent on the scientific discipline and language of the publications
  - Data basis is limited, often not transparent
  - Sources behind paywalls may be missing or not analysed
  - Often only the basic version is free of charge
  - Quality of sources is not necessarily verified and should be checked for accuracy and citation
  - Data protection / privacy / licensing
- 
- **Useful entry point / additional tool !**
  - **Try it!**
  - **Be critical!**

# Thanks for your interest, keep being curious!

**Any questions? We are happy to help!**

Bobby Neuhold & Stephanie Hofmann  
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