Stephanie Hofmann & Bobby Neuhold

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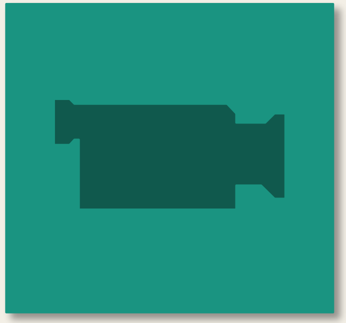

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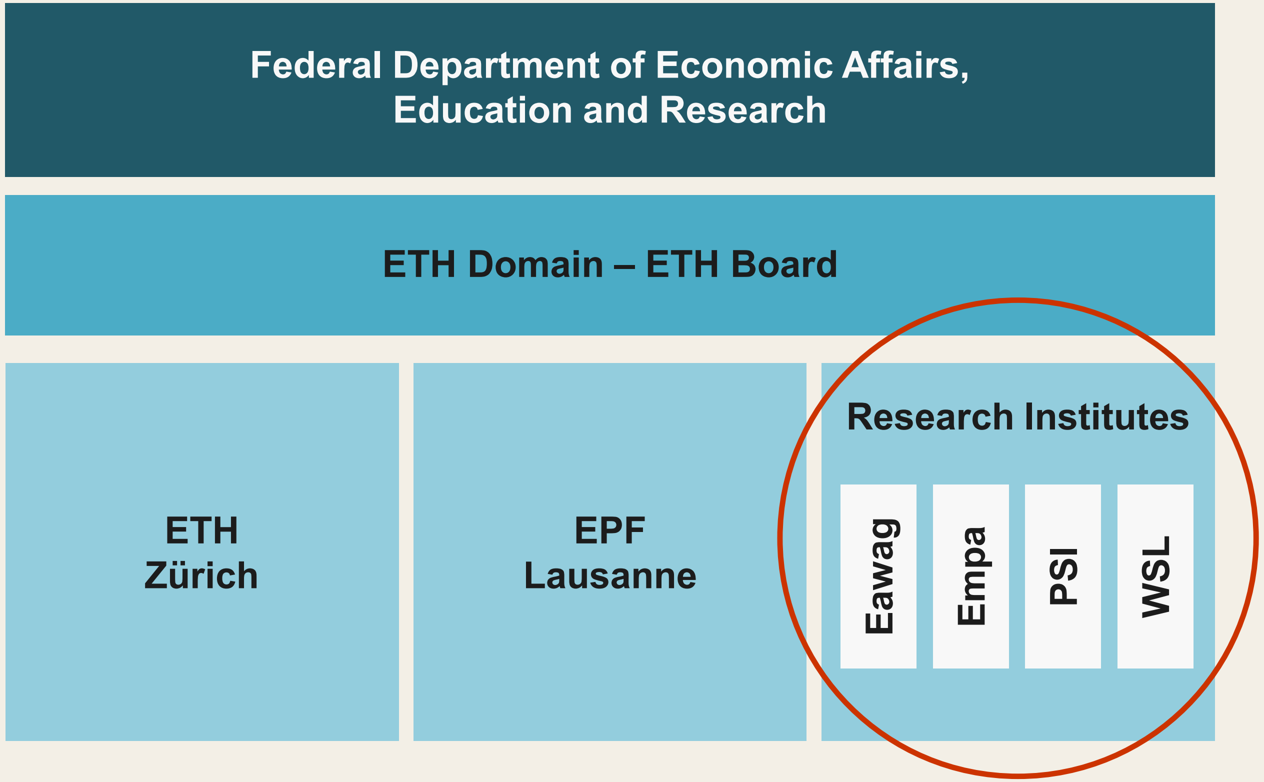

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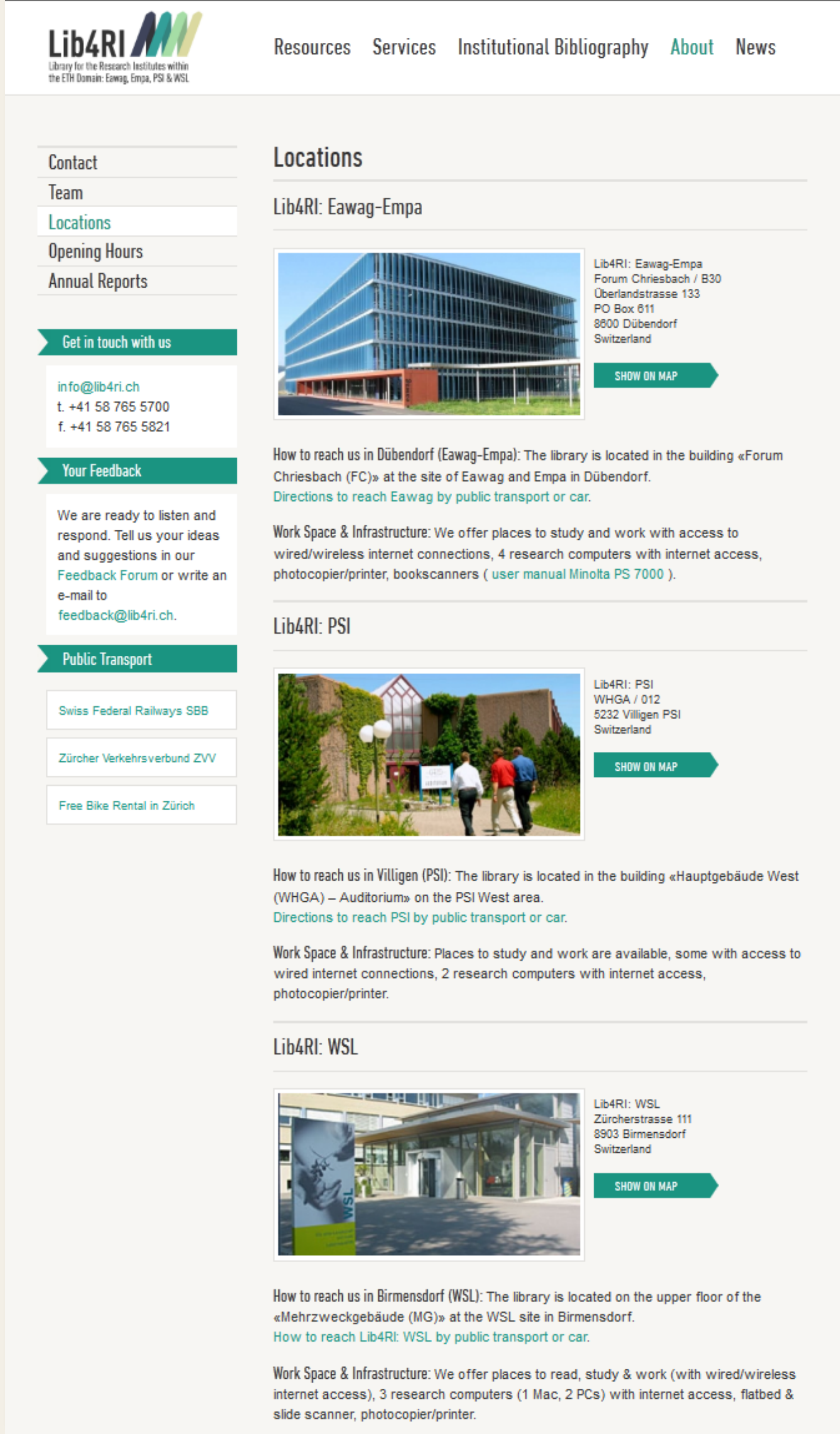

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References

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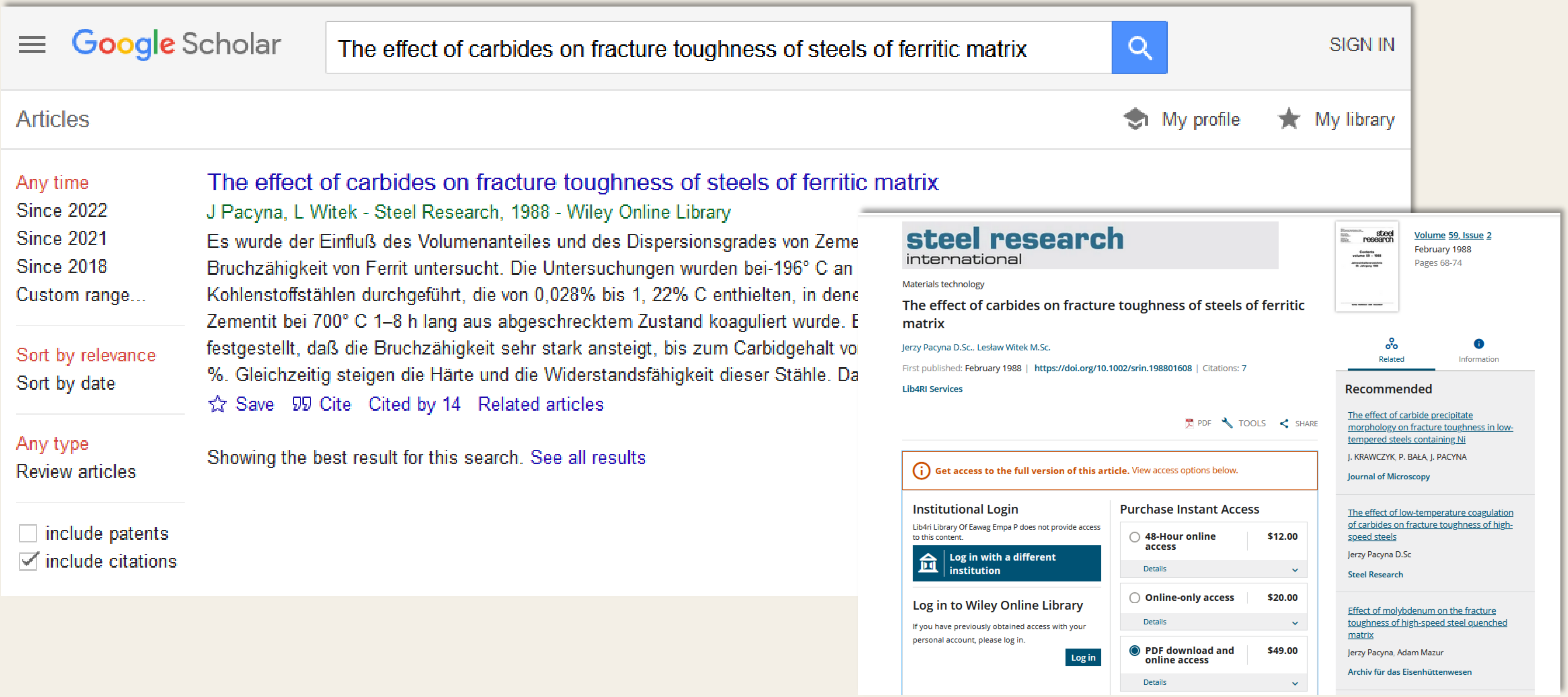

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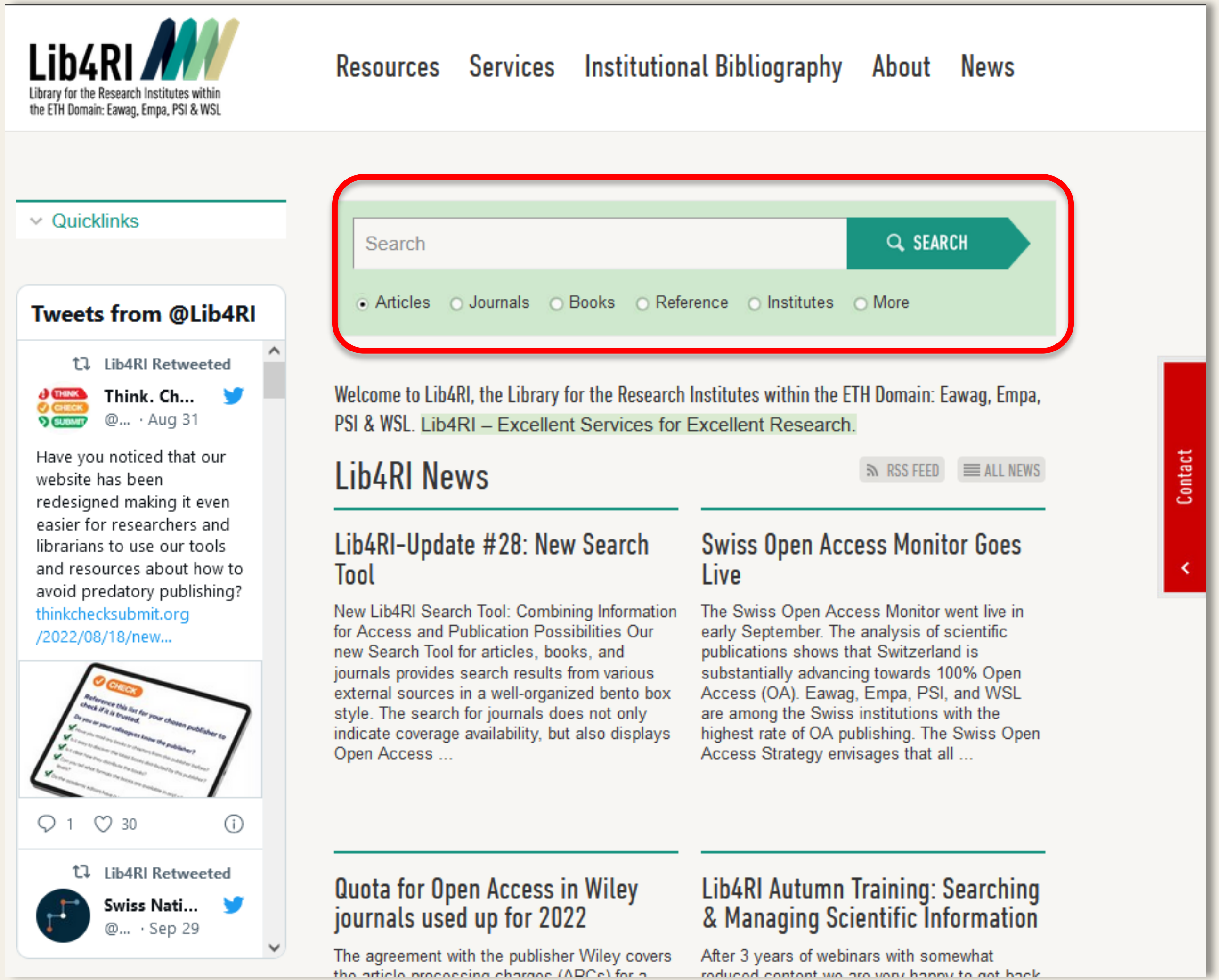

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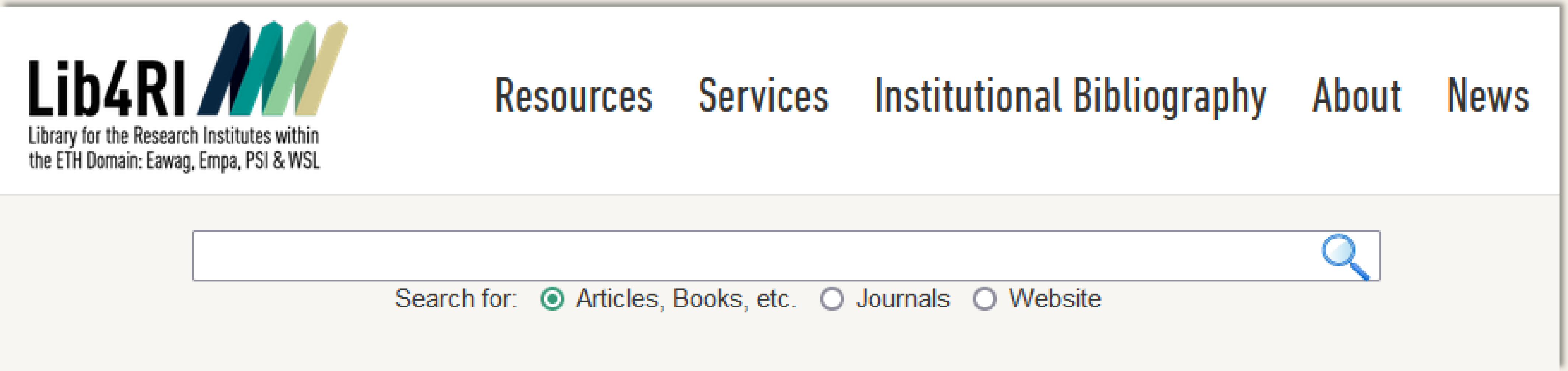

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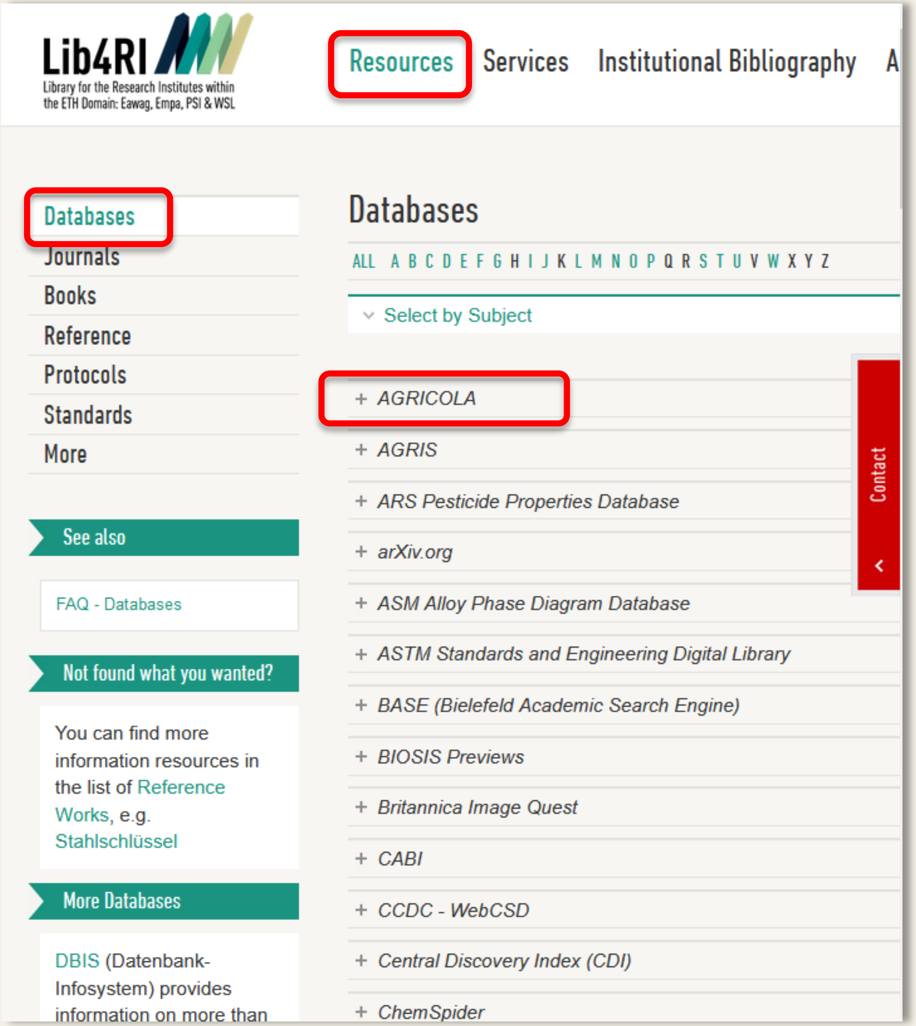
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2. Arvantis, L.G. and G.W. Fowler. (1979) "Some Aspects of Biased Sampling Estimators." *Forest Resource Inventories Workshop Proceedings, Vol. 1, Fort Collins*, 298-309.

3. Kahru A. Ecotoxicological tests in non-ecotoxicological research: Contribution to 3Rs. Use of luminescent photobacteria for evaluating the toxicity of 47 MEIC reference chemicals. ALTEX. 2006;23:302–308.

4. ISO 11348-3:2007 Water quality - Determination of the inhibitory effect of water samples on the light emission of Vibrio fischeri (Luminescent bacteria test) - Part 3: Method using freeze-dried bacteria

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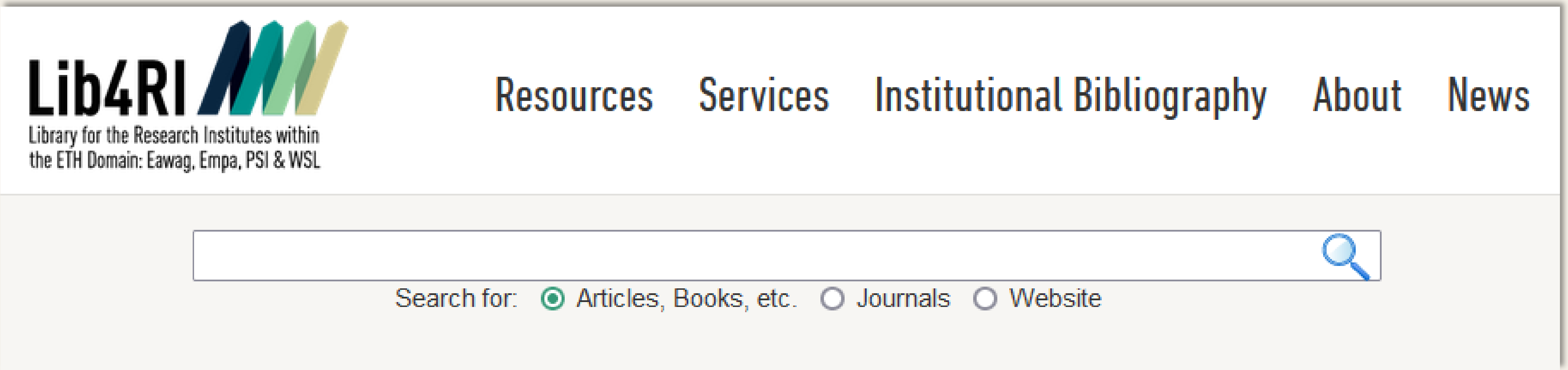

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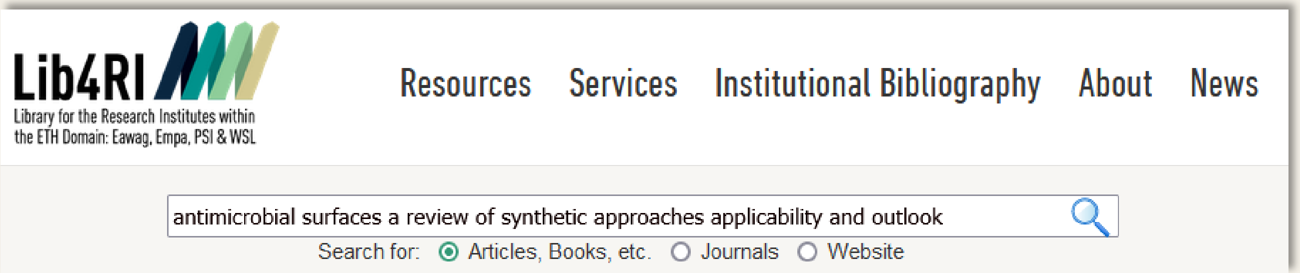

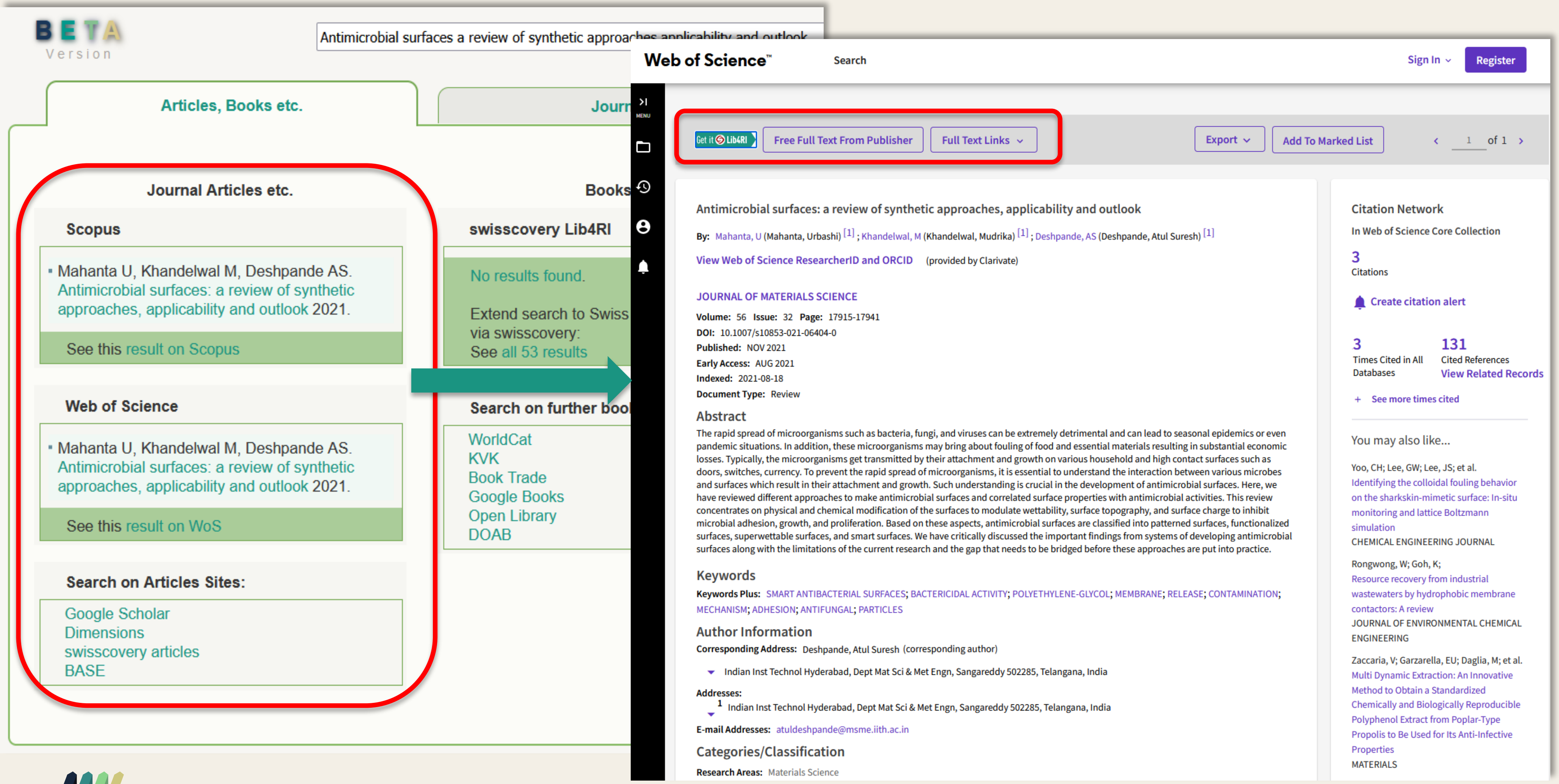

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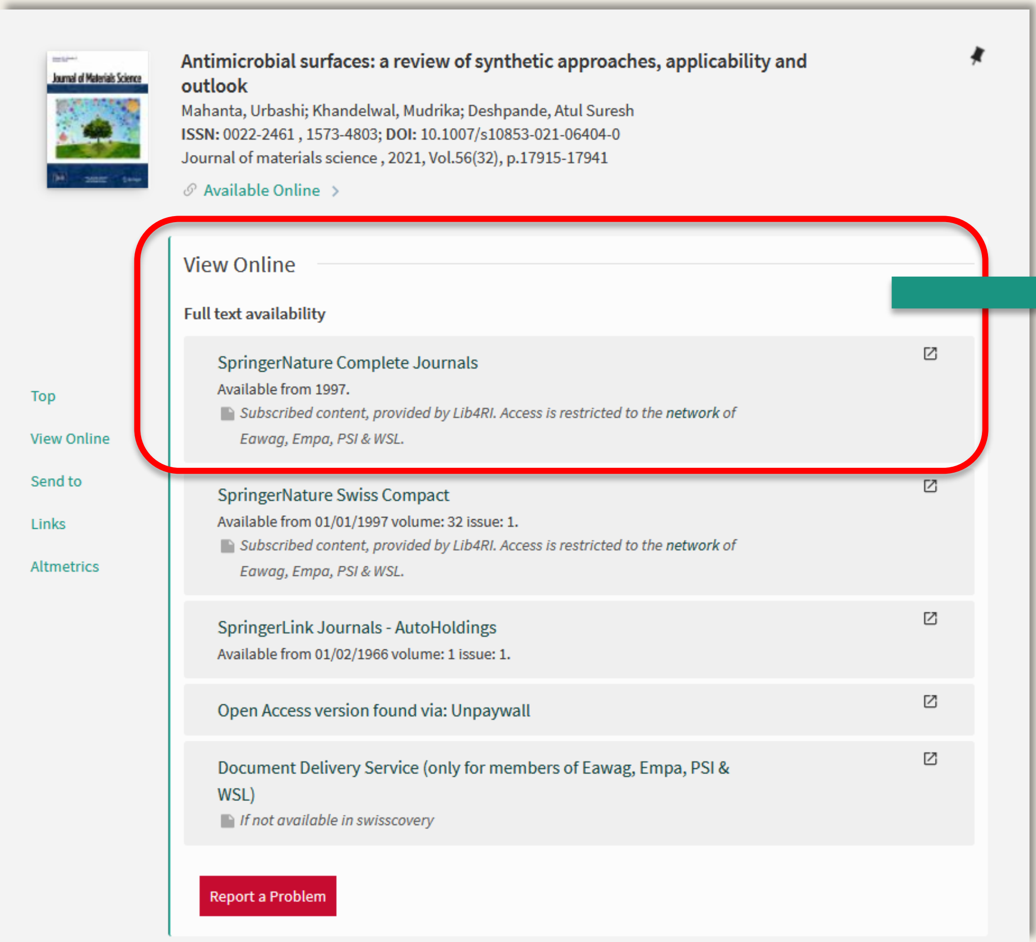

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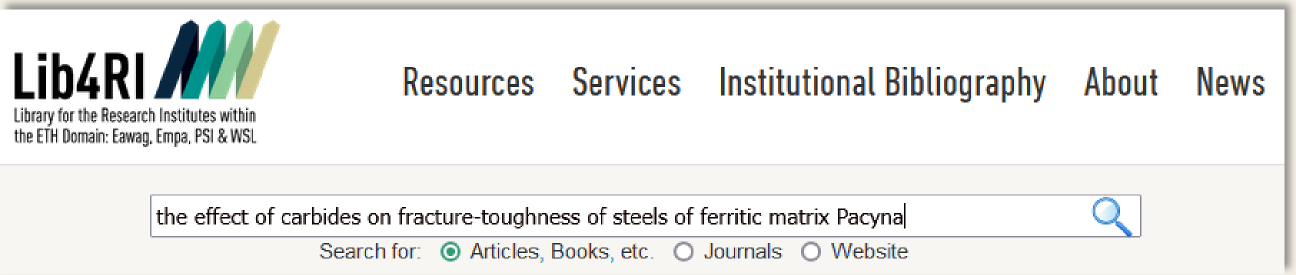

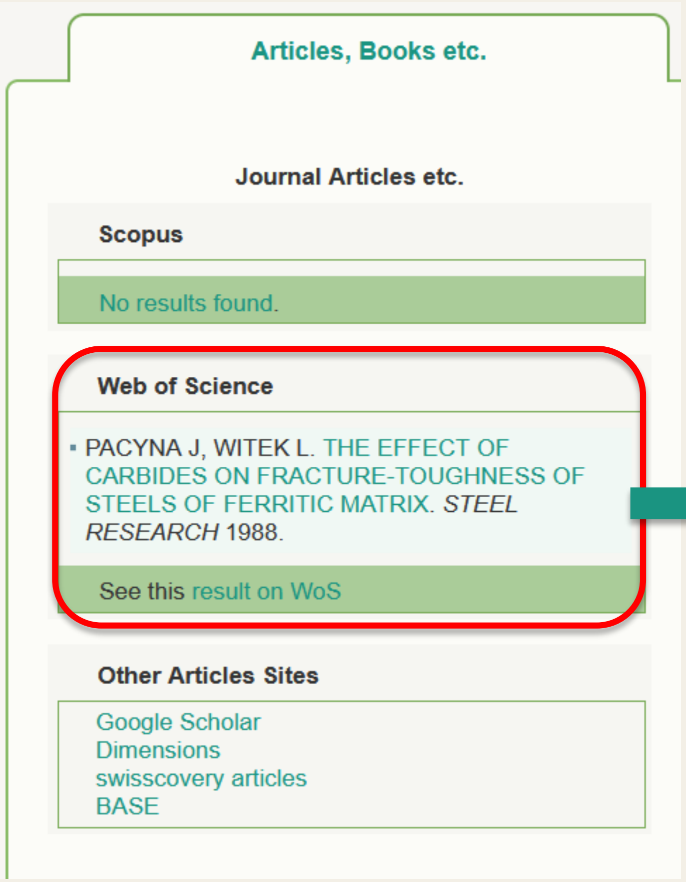

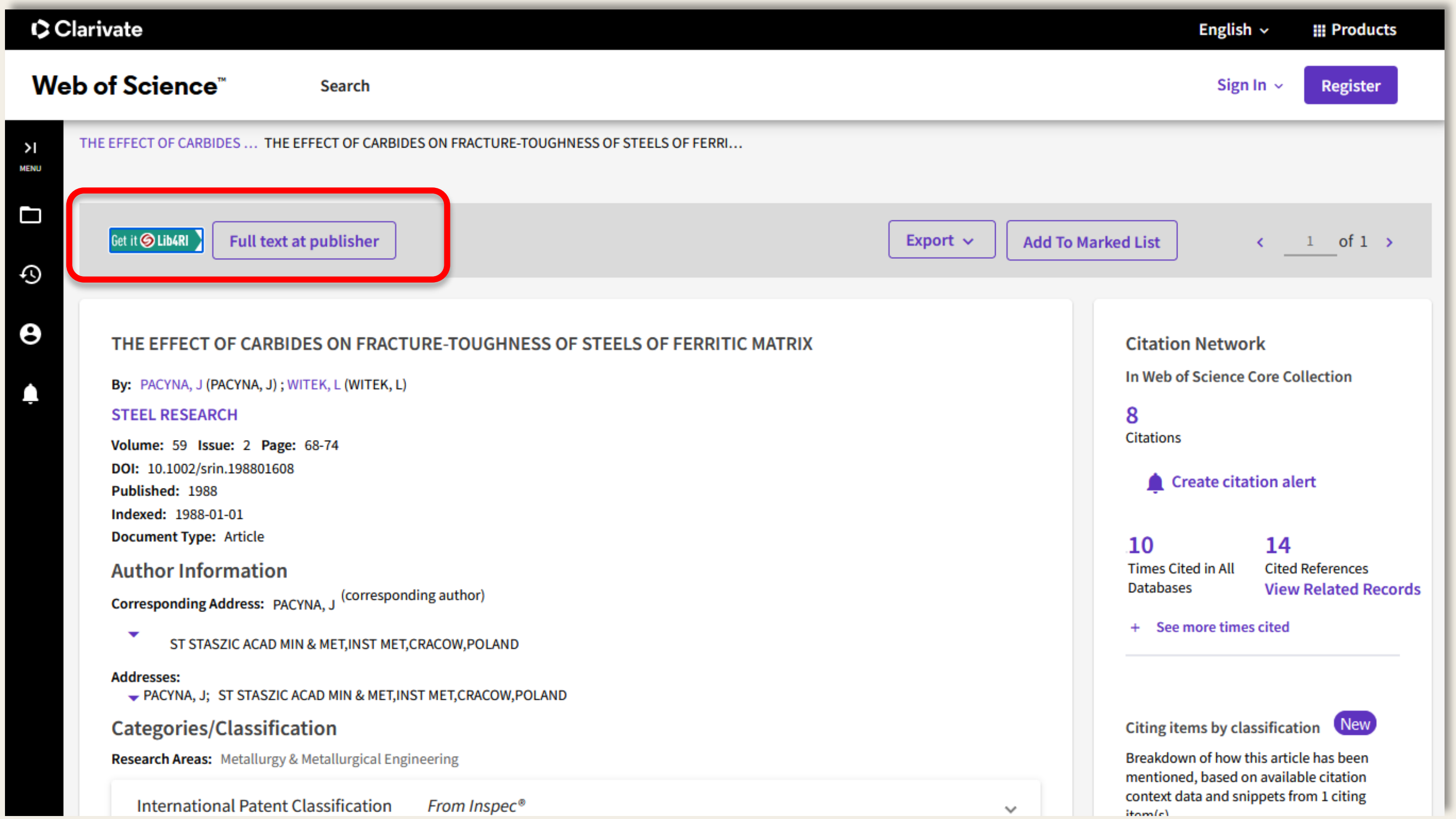

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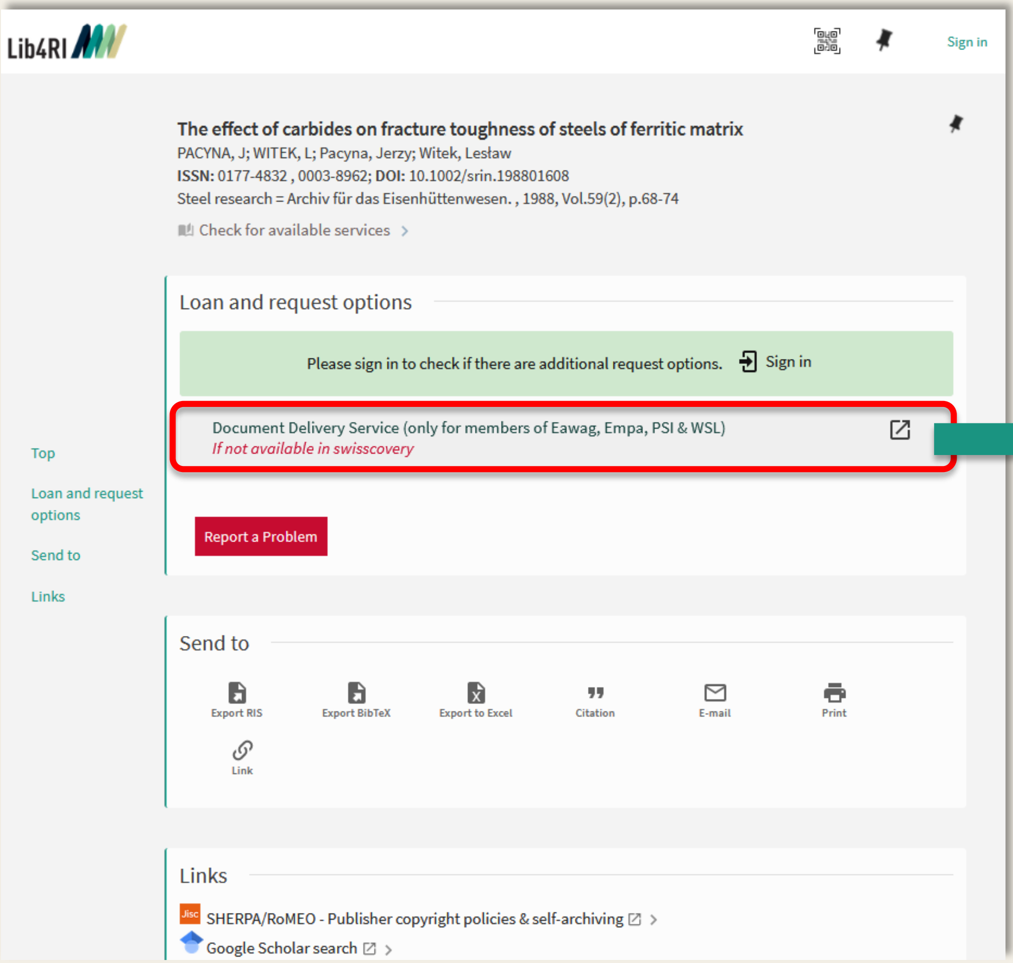

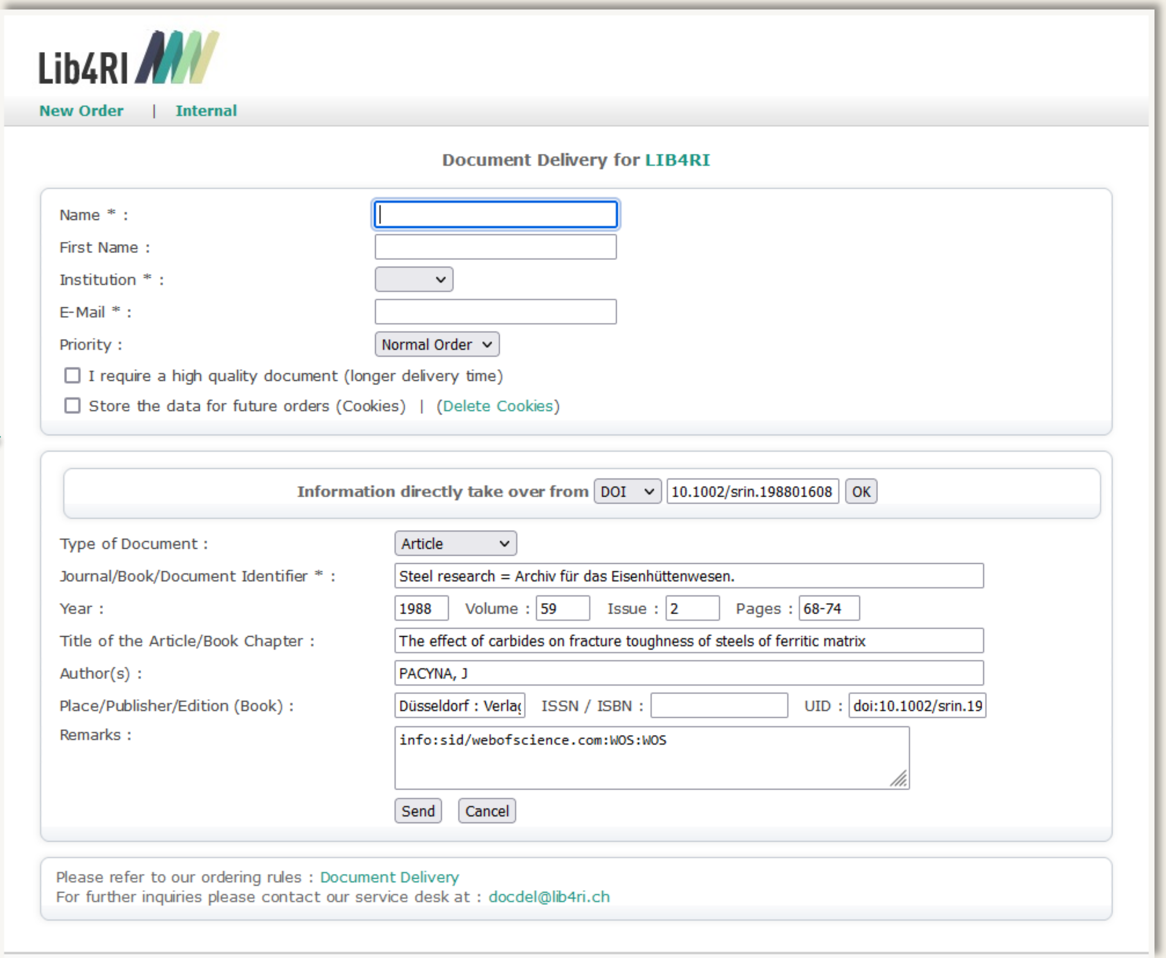

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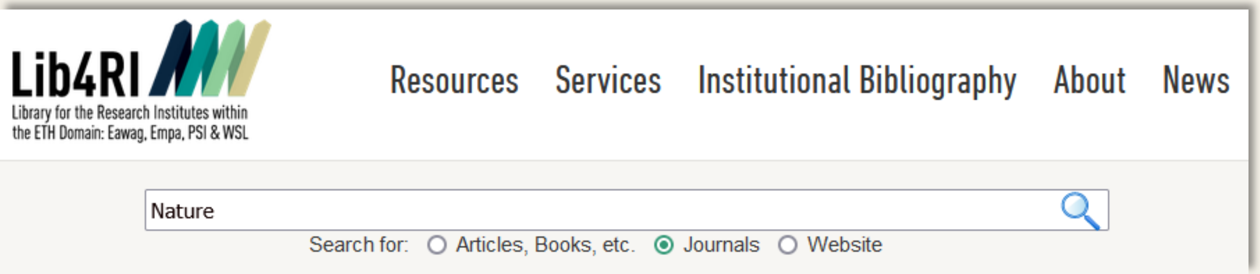

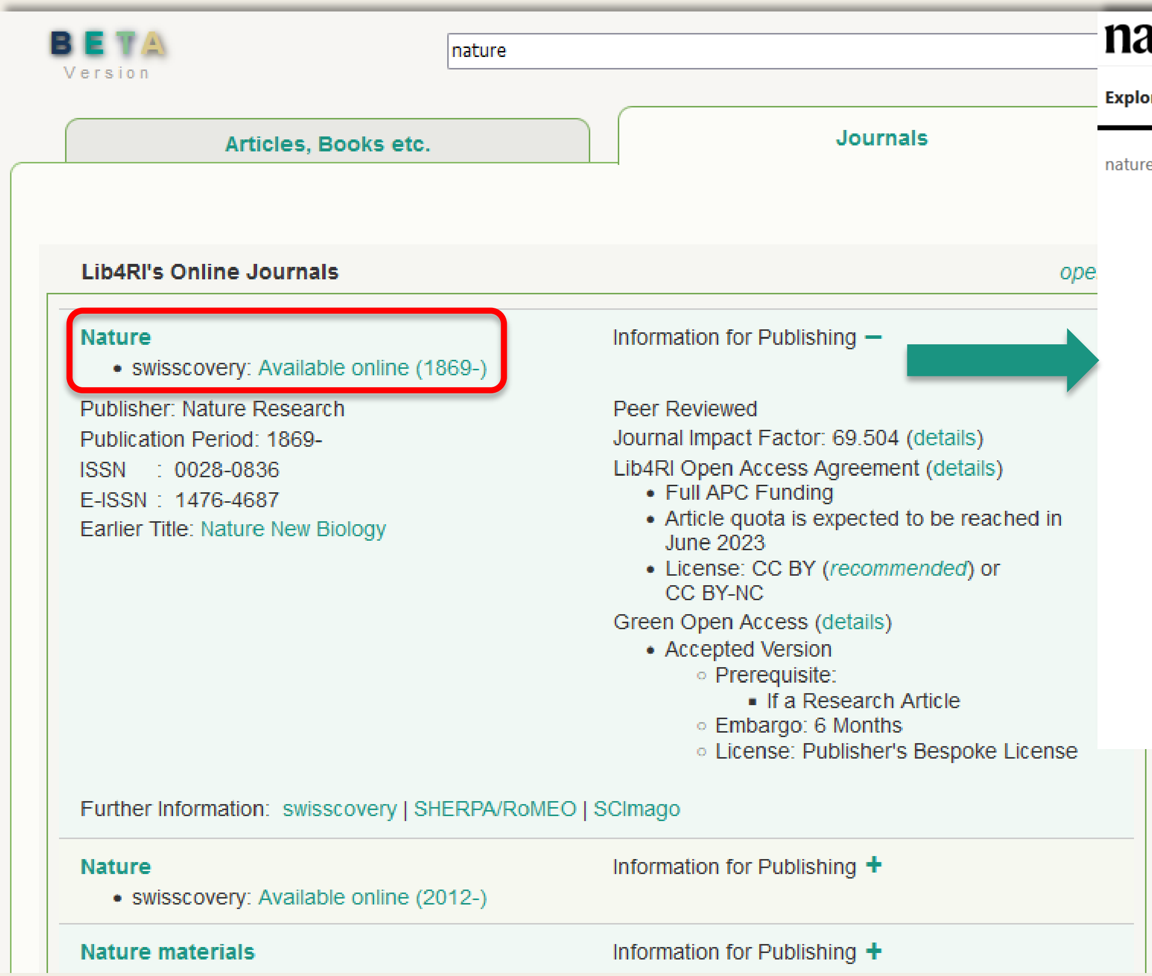

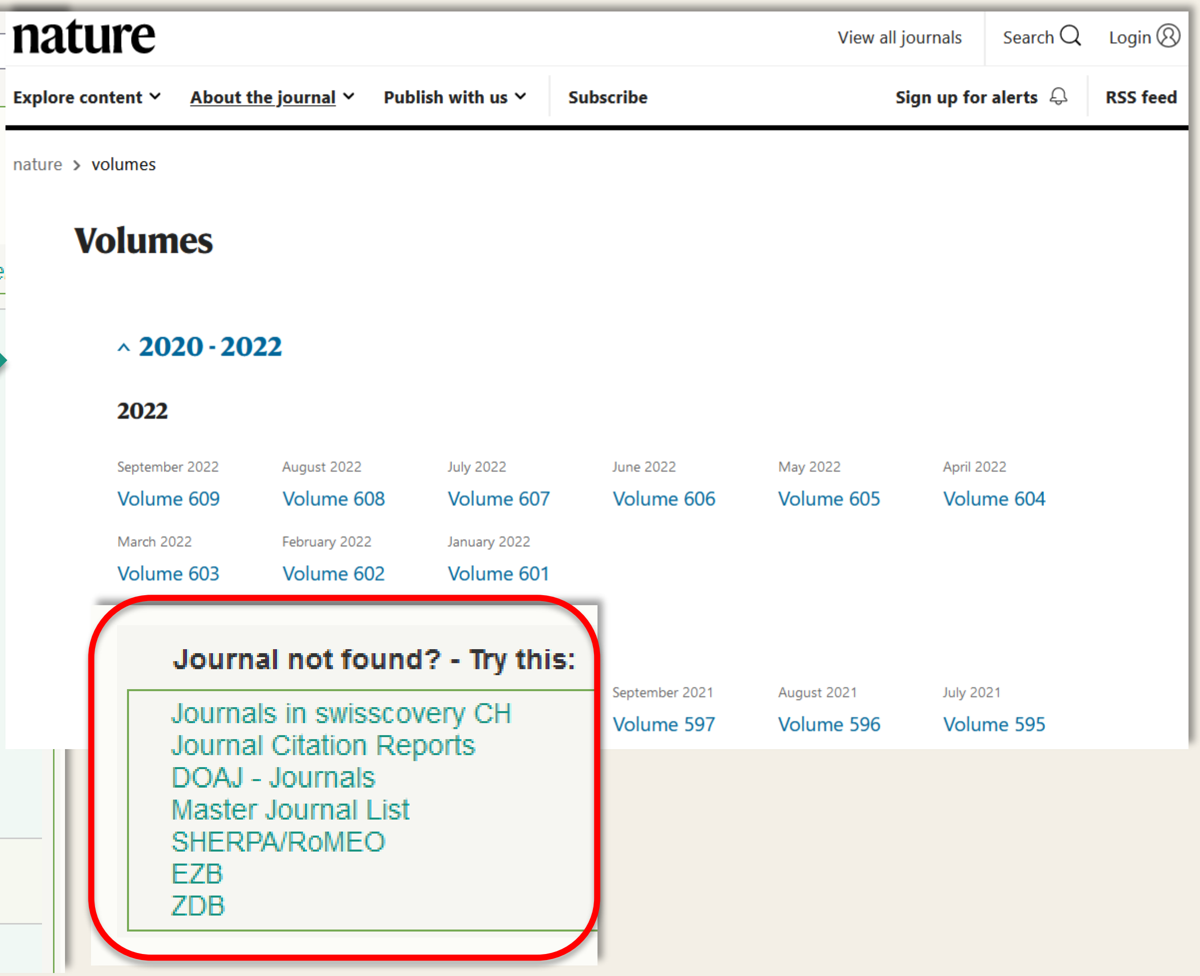

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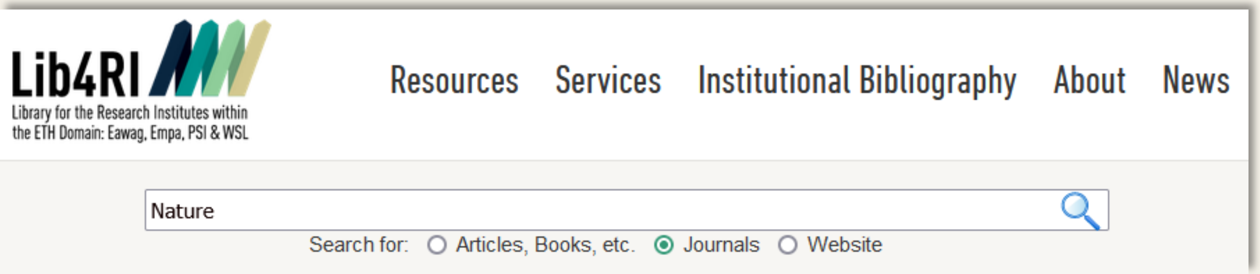

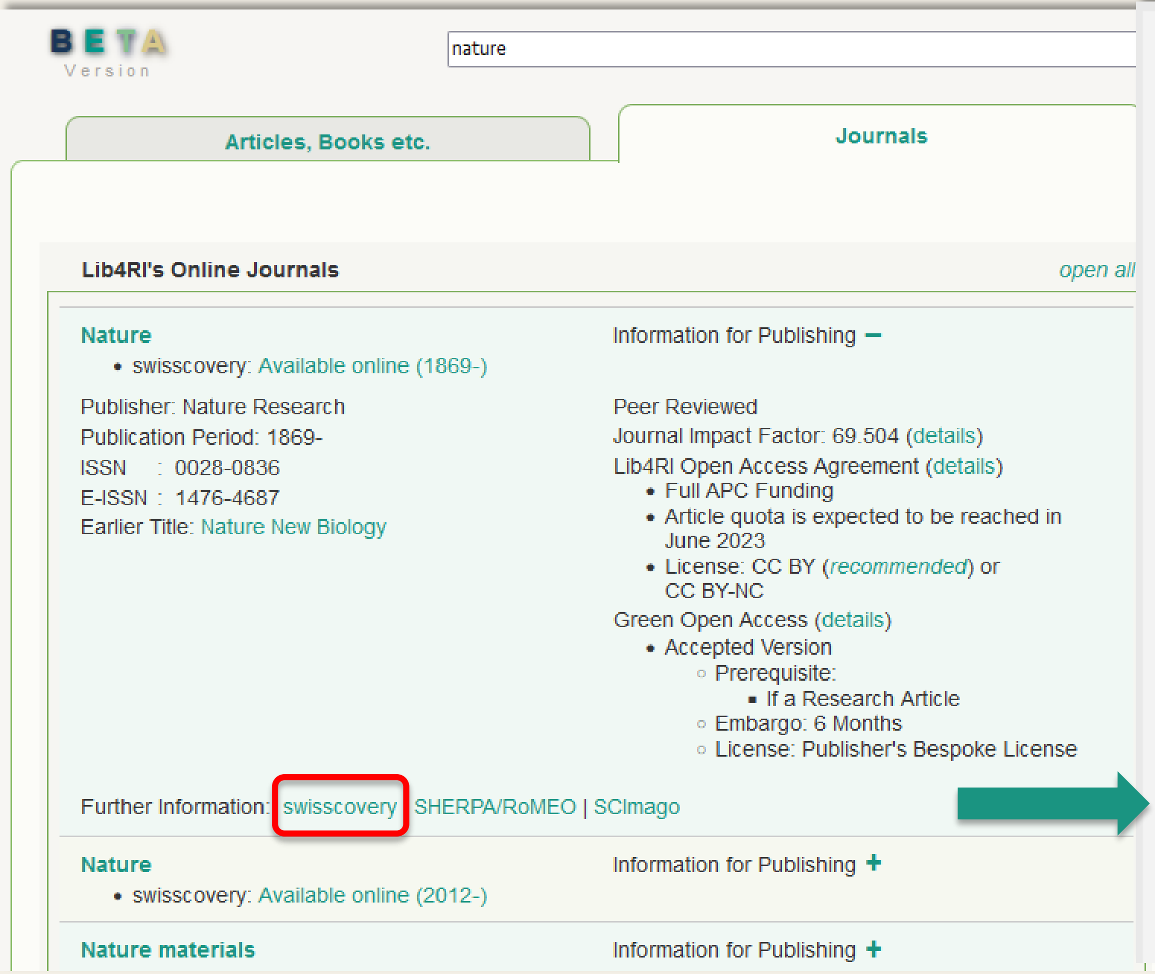

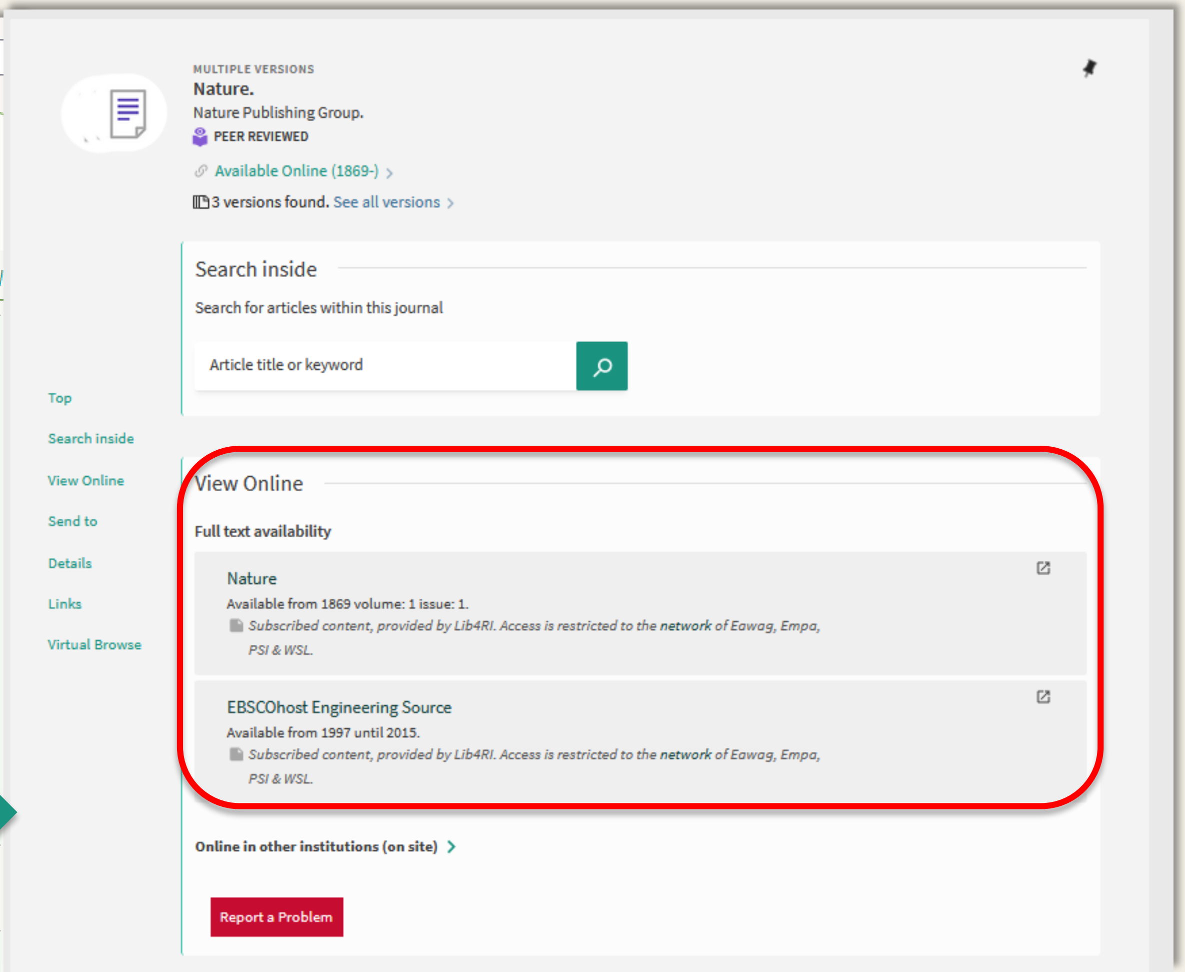

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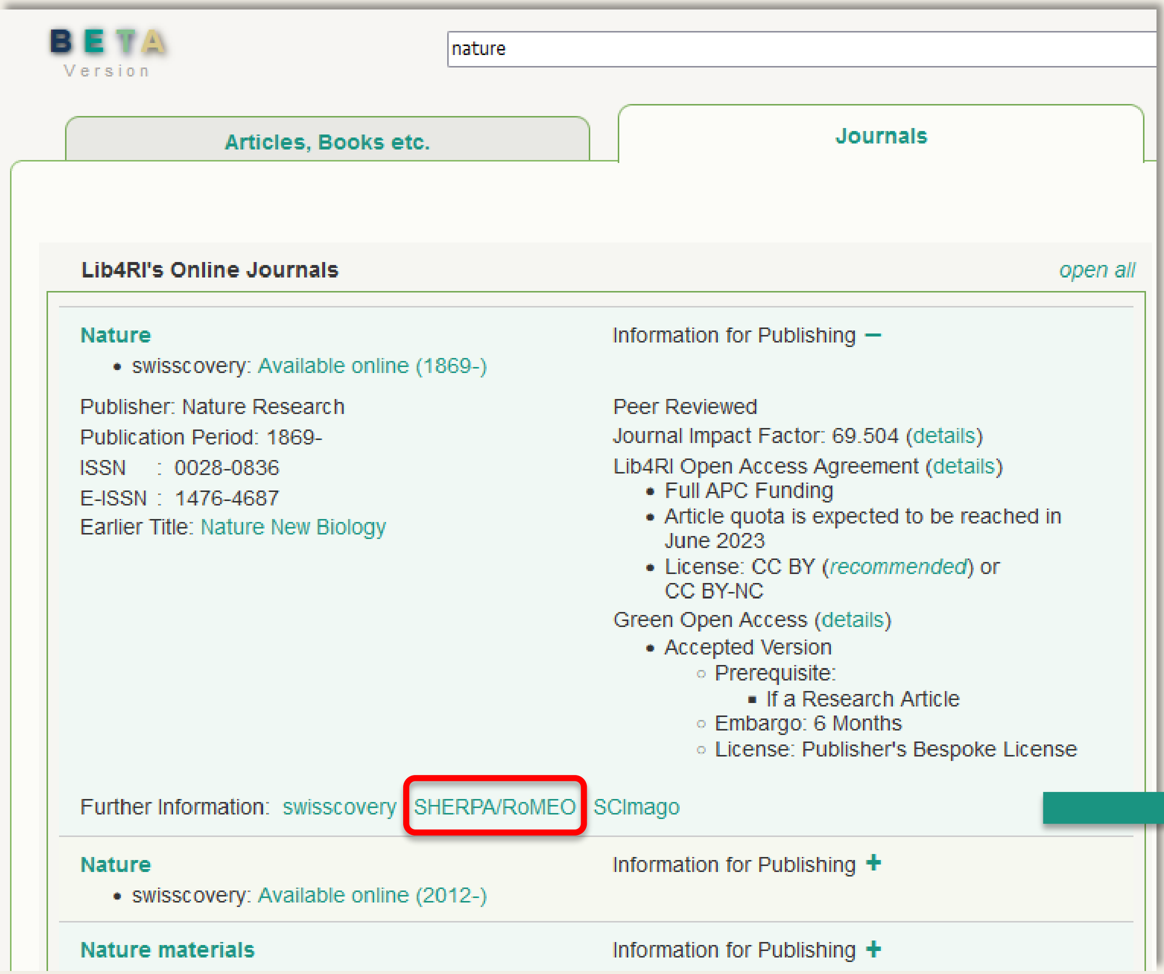

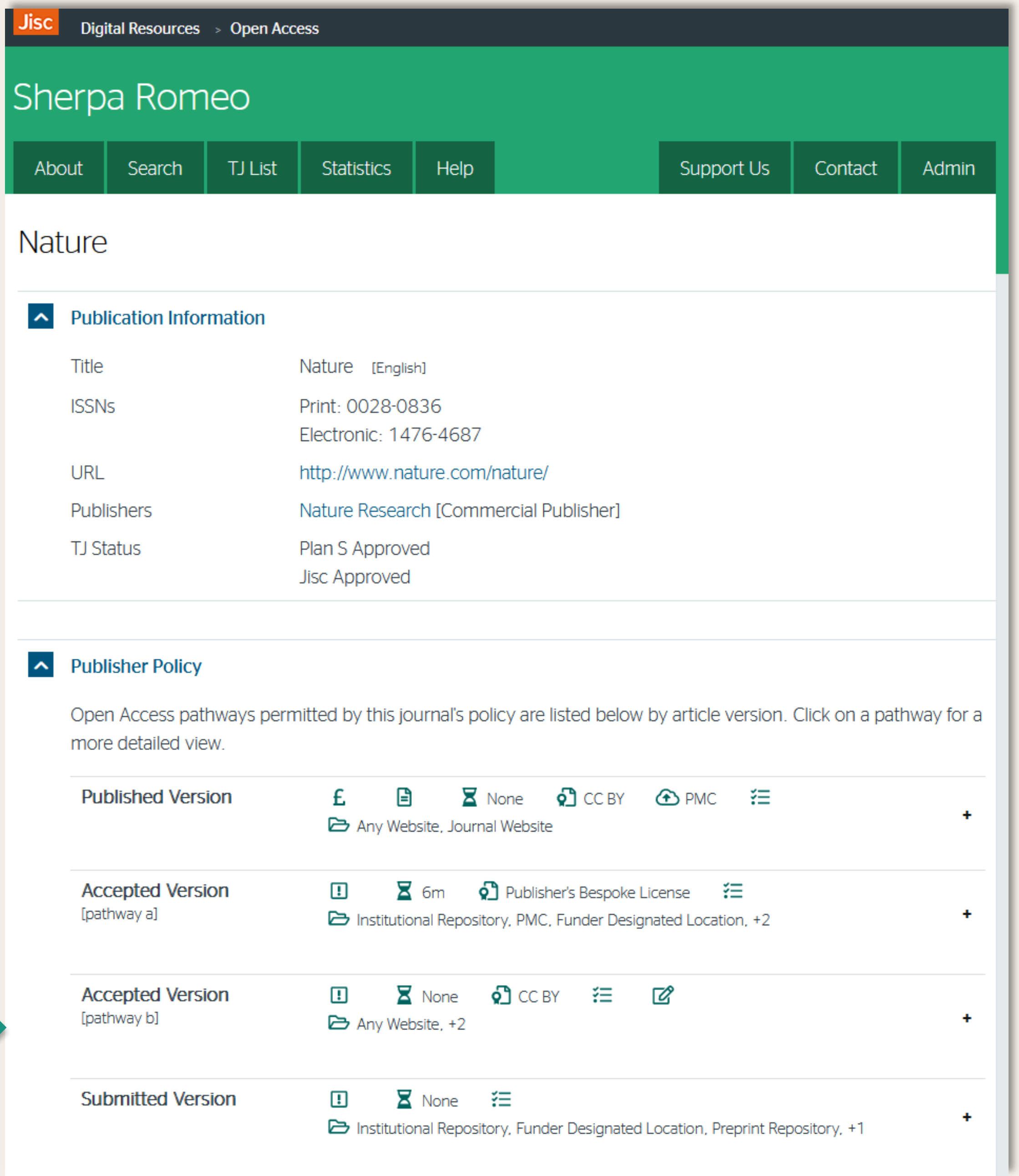

Searching Journals – Useful websites

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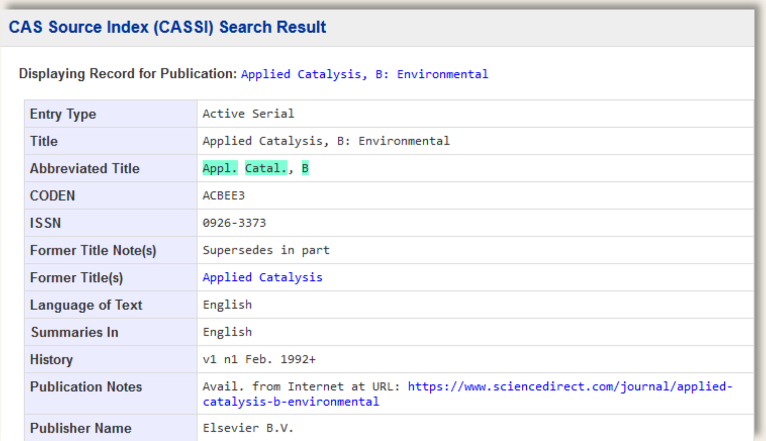

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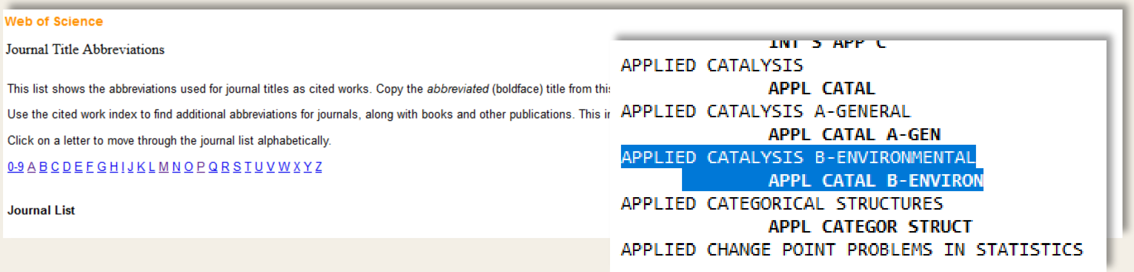

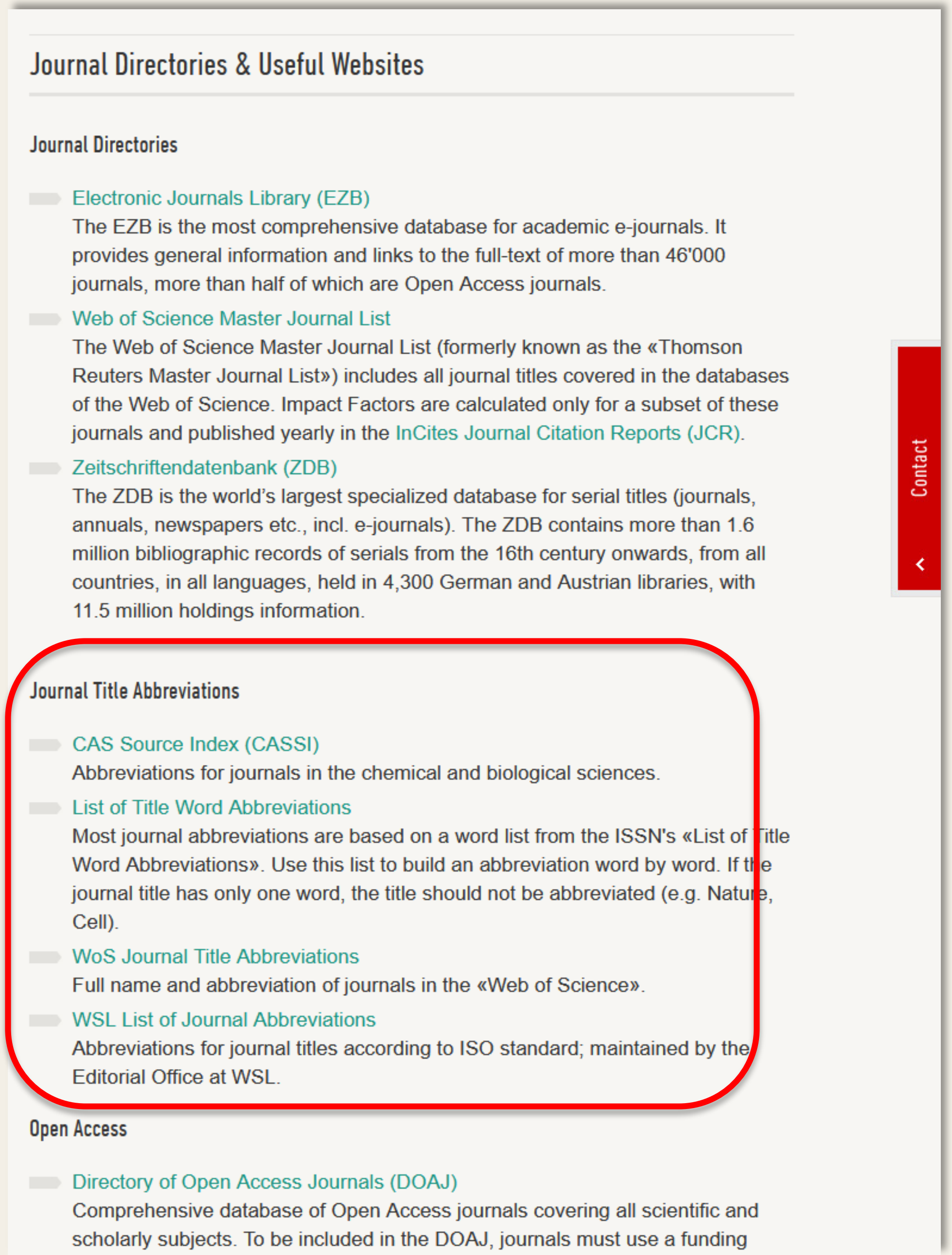

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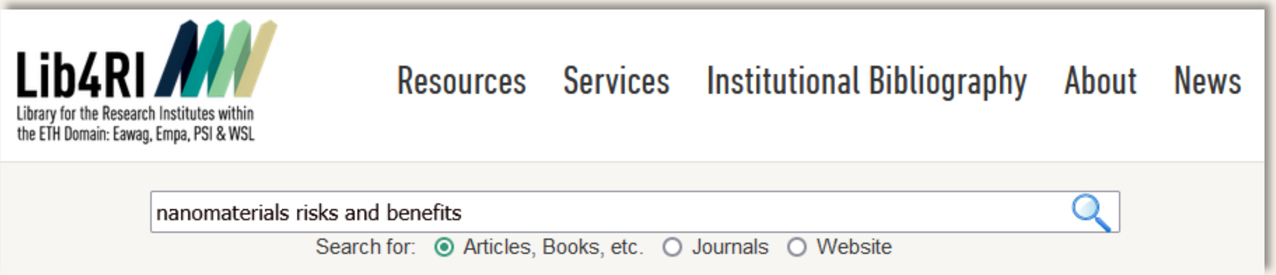

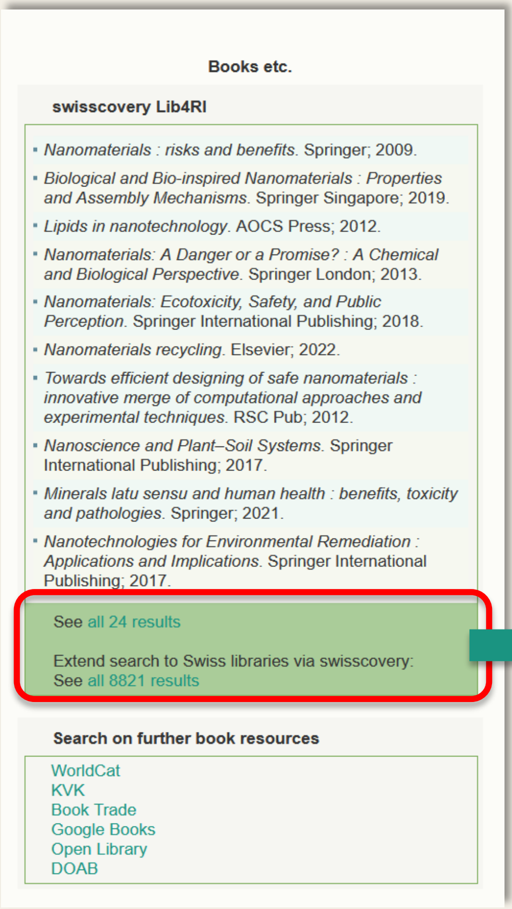

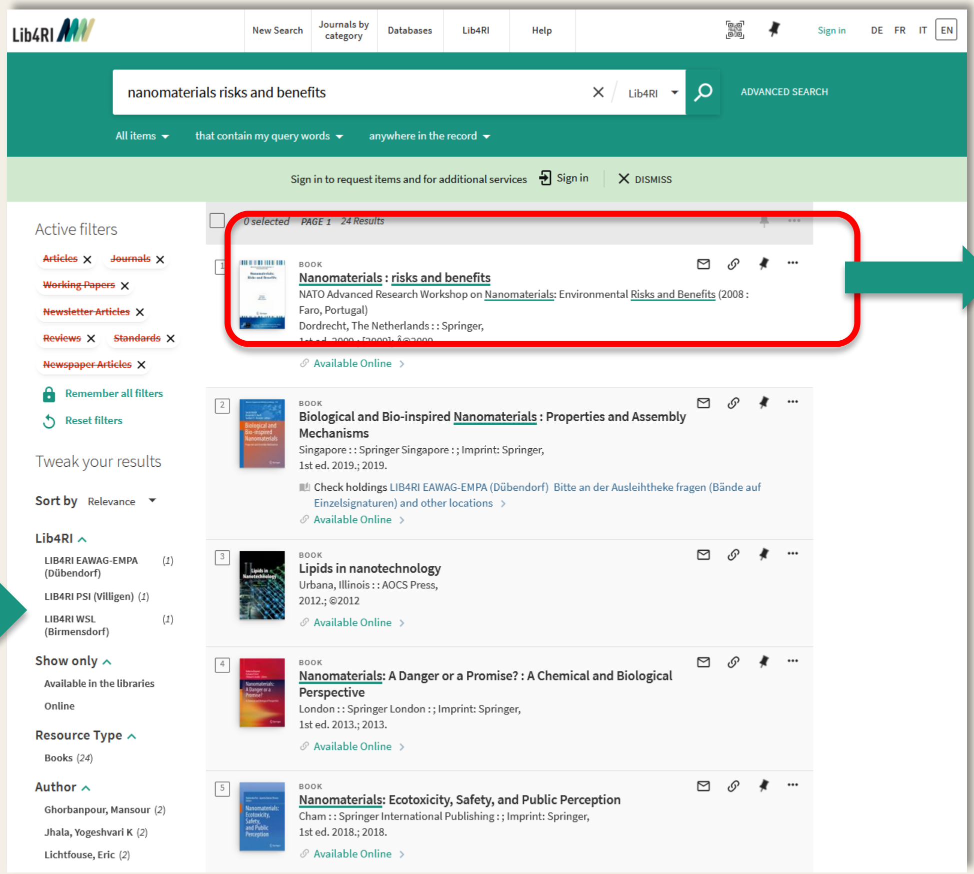

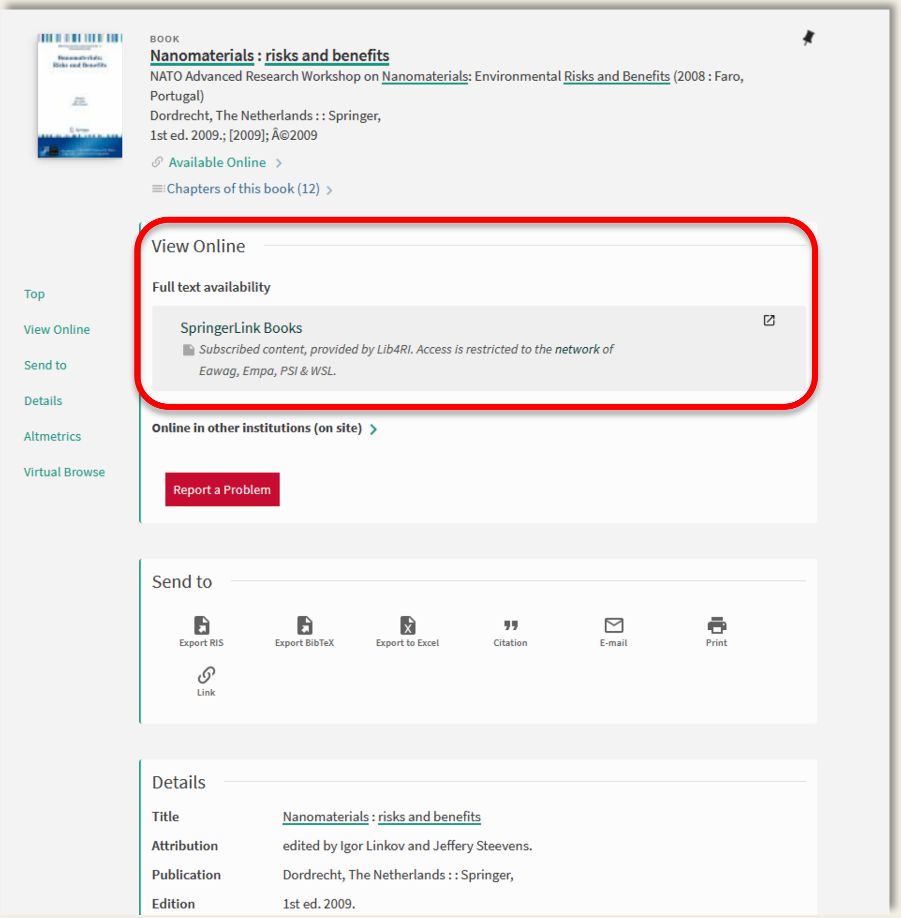

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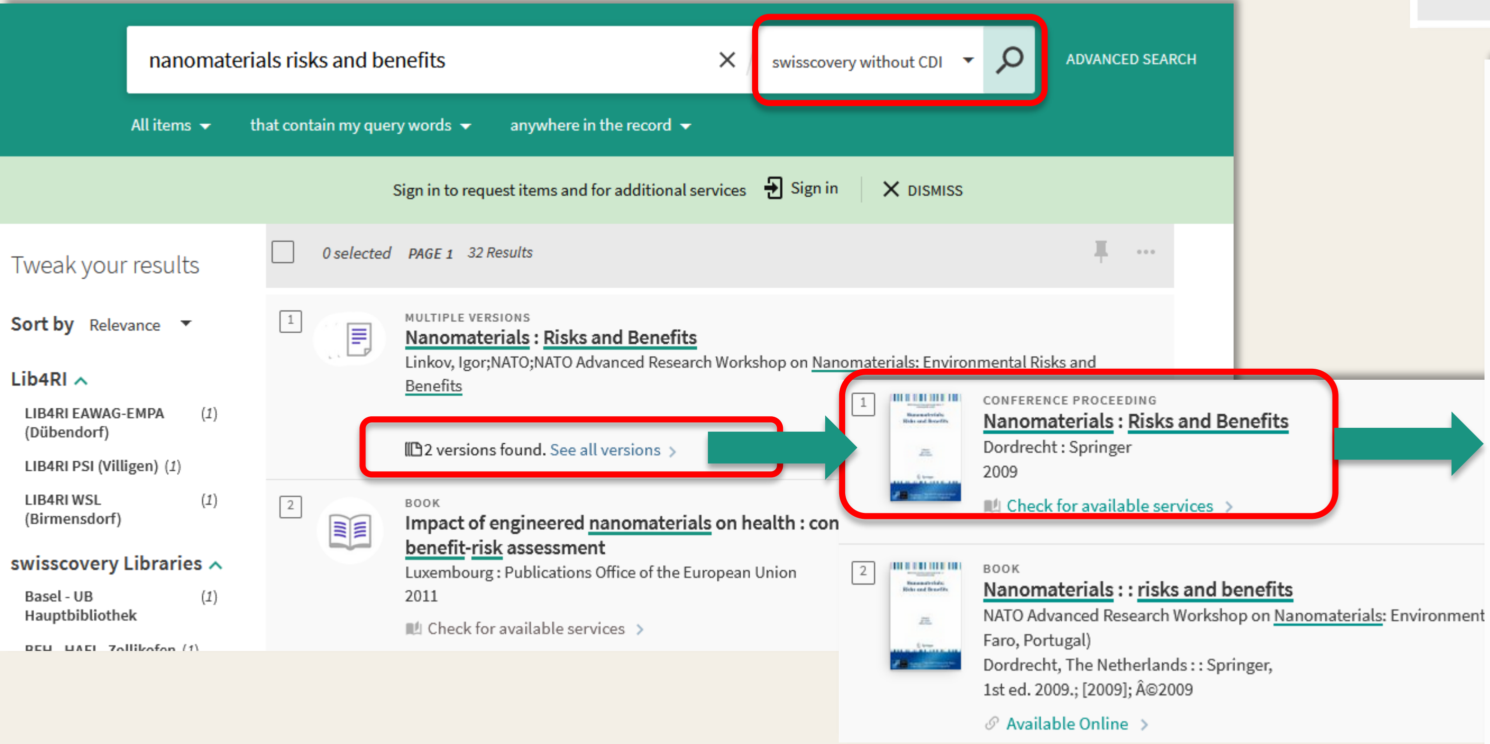

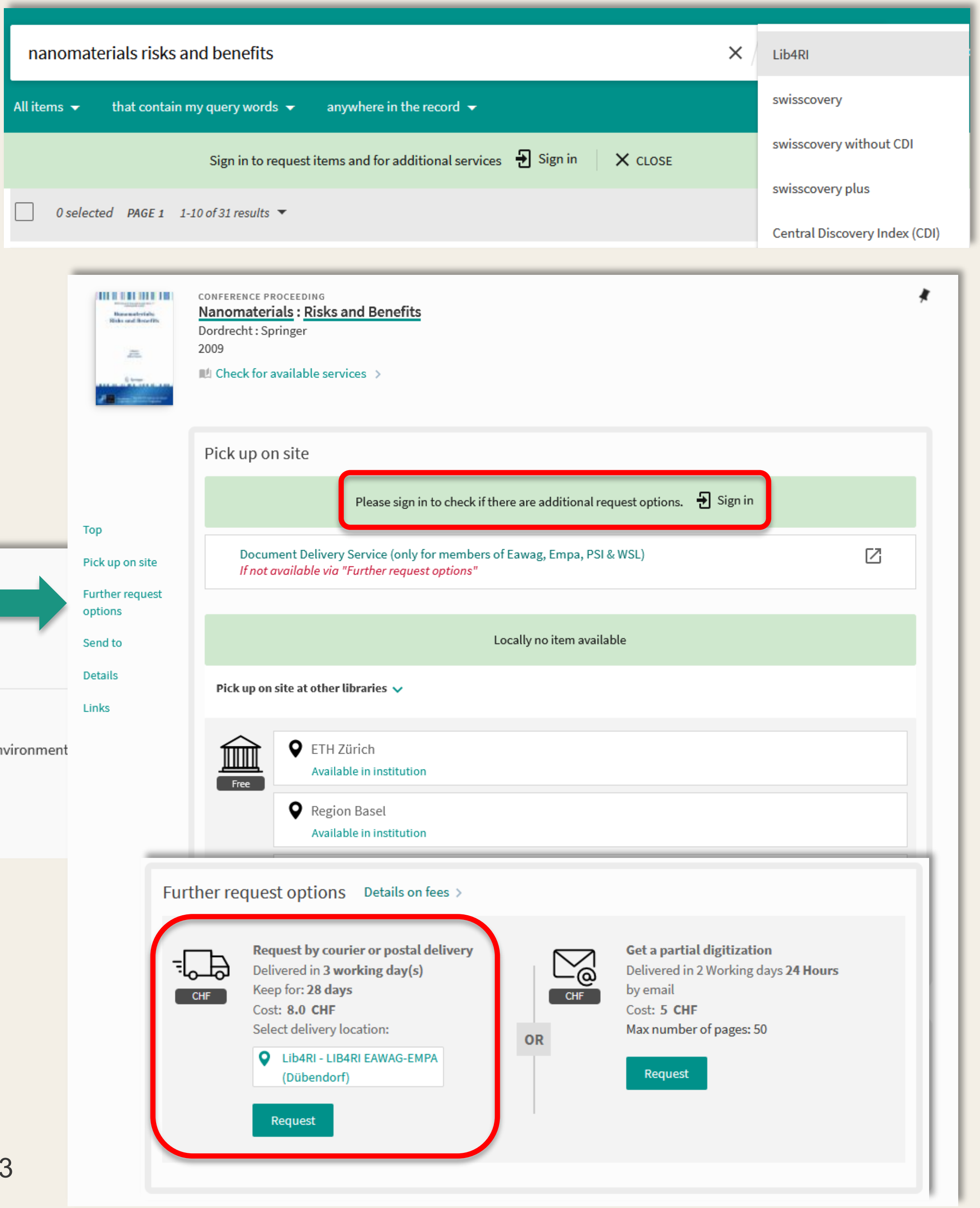

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- *Marine microbiology : ecology & applications*. Garland Science, an imprint of Taylor and Francis; 2011.
- *Systems Biogeochemistry of Major Marine Biomes*. John Wiley & Sons, Incorporated; 2022.
- *Advances in Microbial Ecology*. Springer US; 2000.
- *Psychrophiles: From Biodiversity to Biotechnology*. Springer Berlin Heidelberg; 2008.
- *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.
- *Biomineralization and biological metal accumulation : biological and geological perspectives : papers presented at the fourth International Symposium on Biomineralization, Renesse, the Netherlands, June 2-5, 1982*. D. Reidel Publishing Company; 1983.

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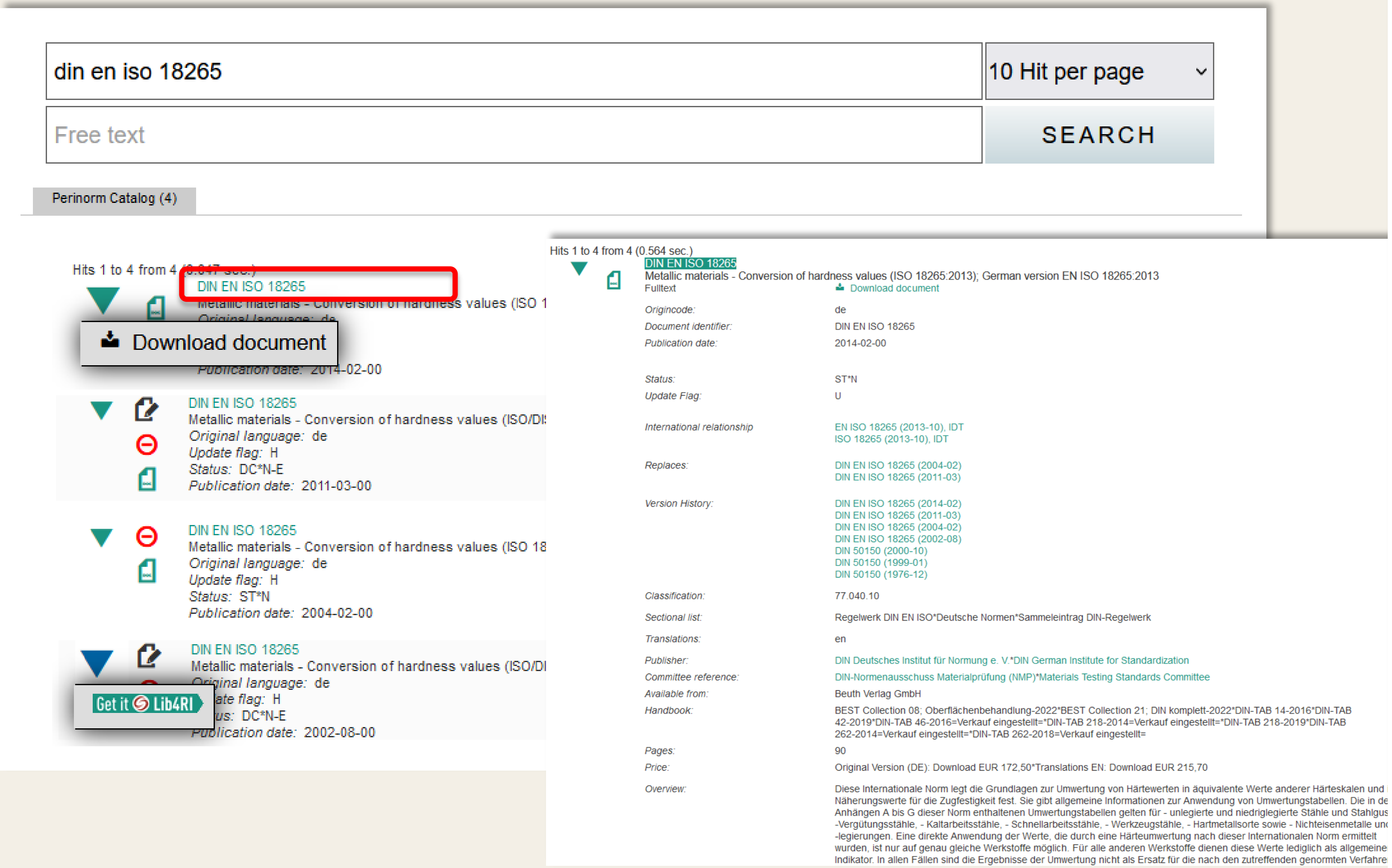

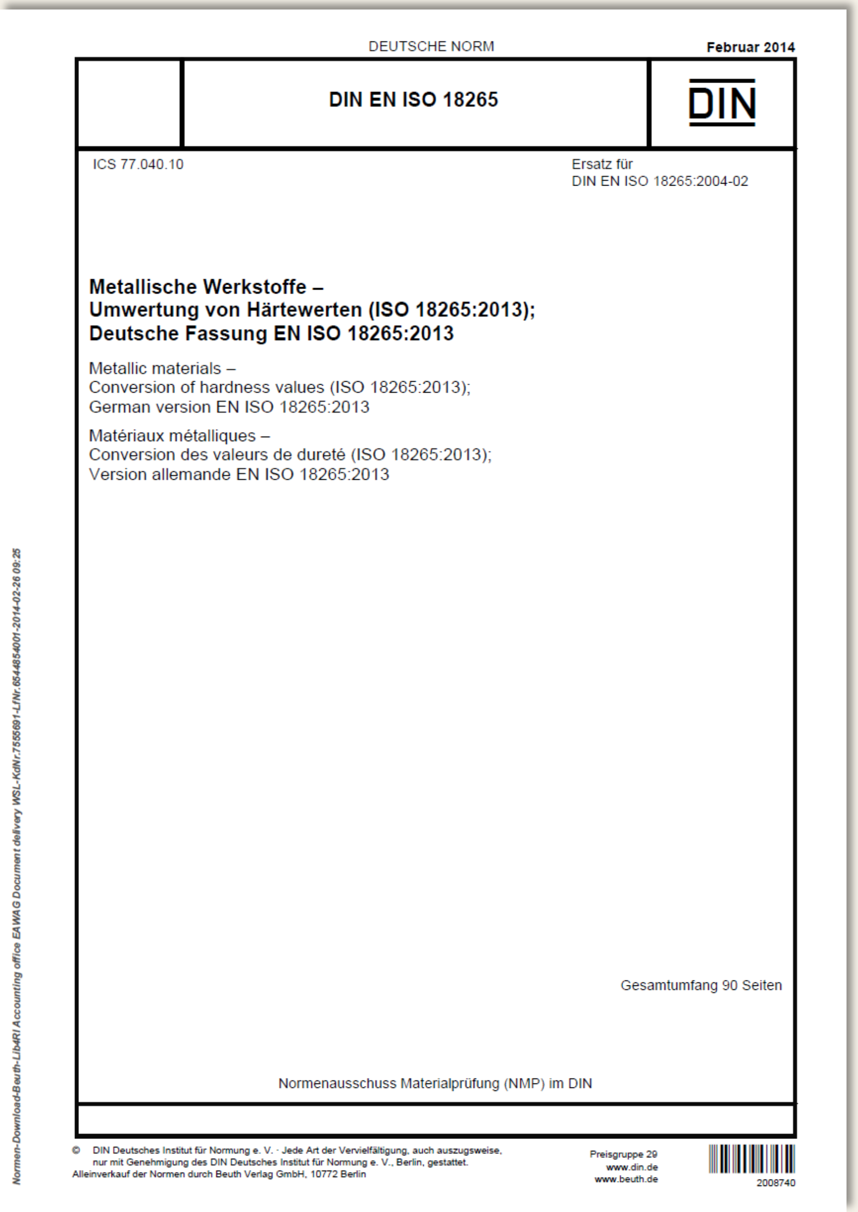
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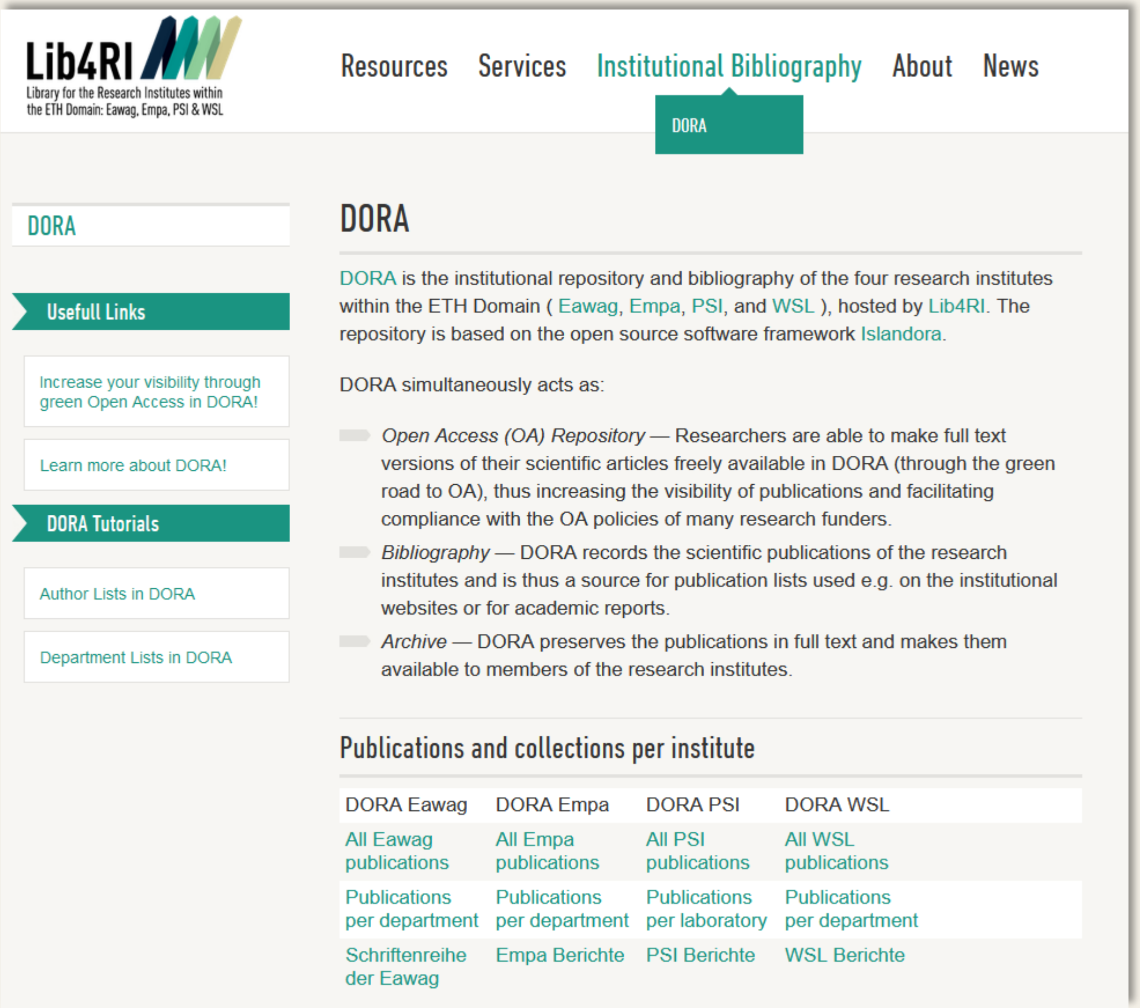

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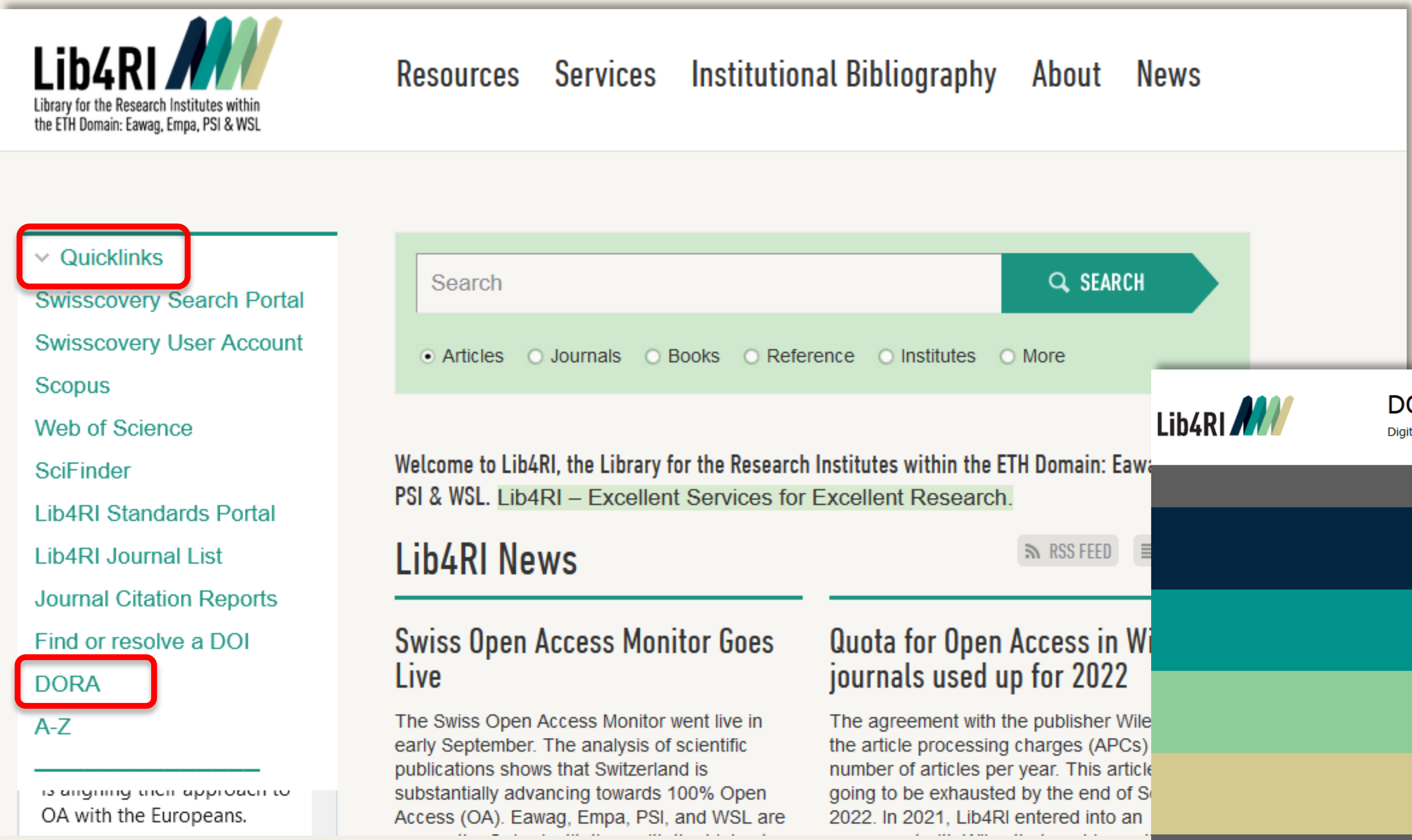

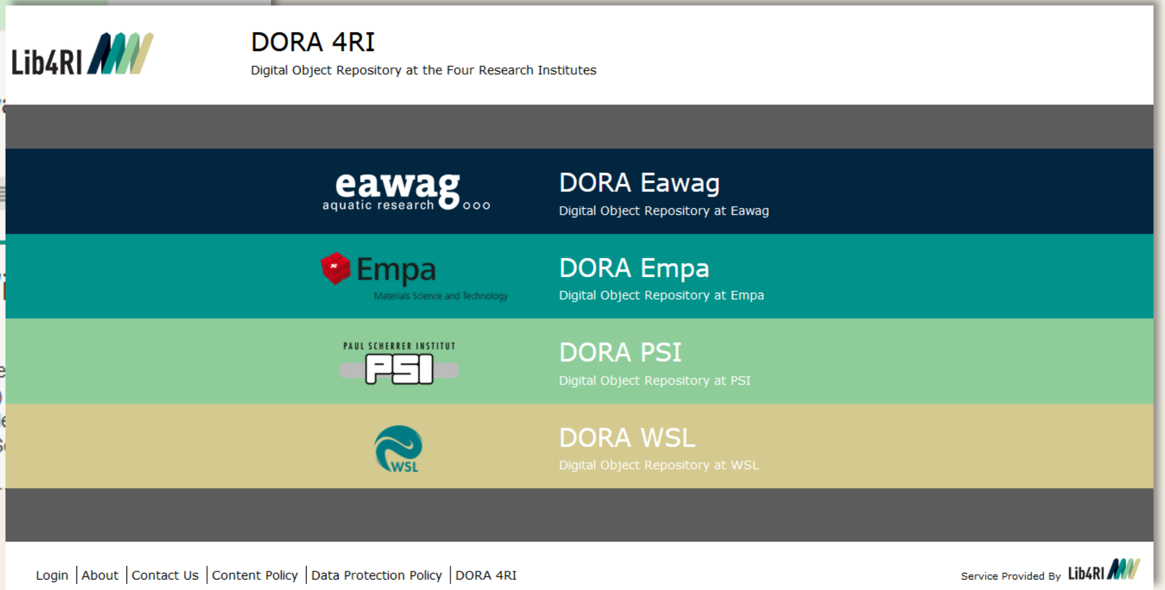

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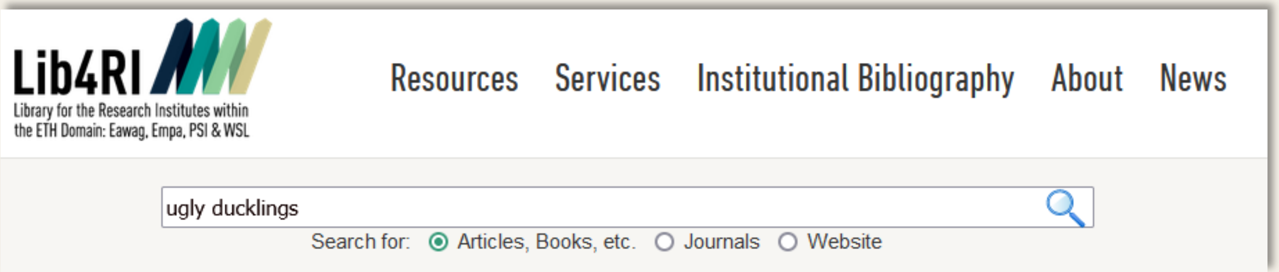

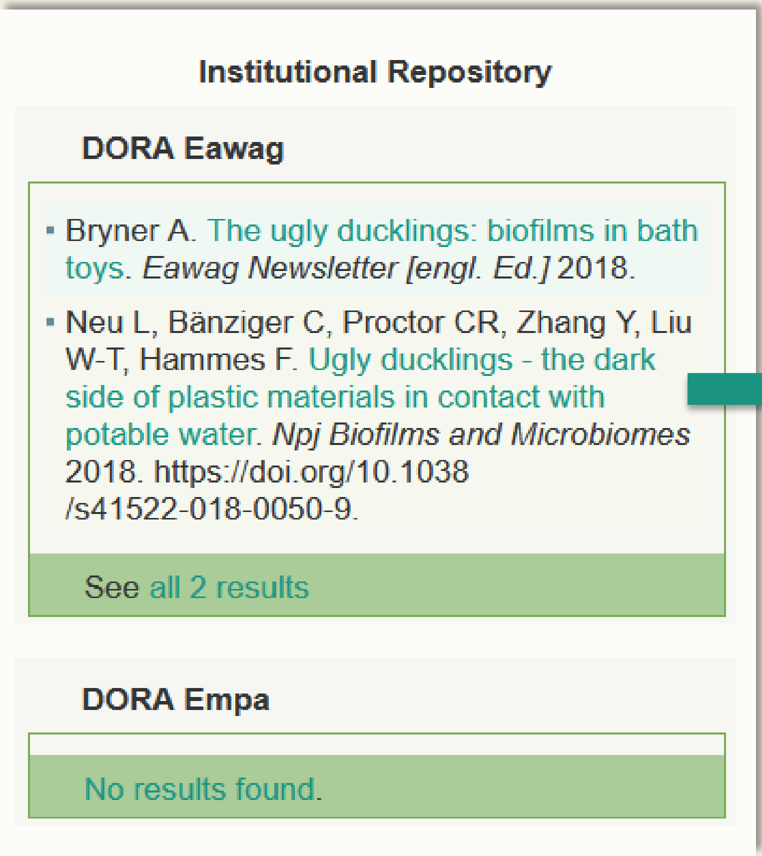

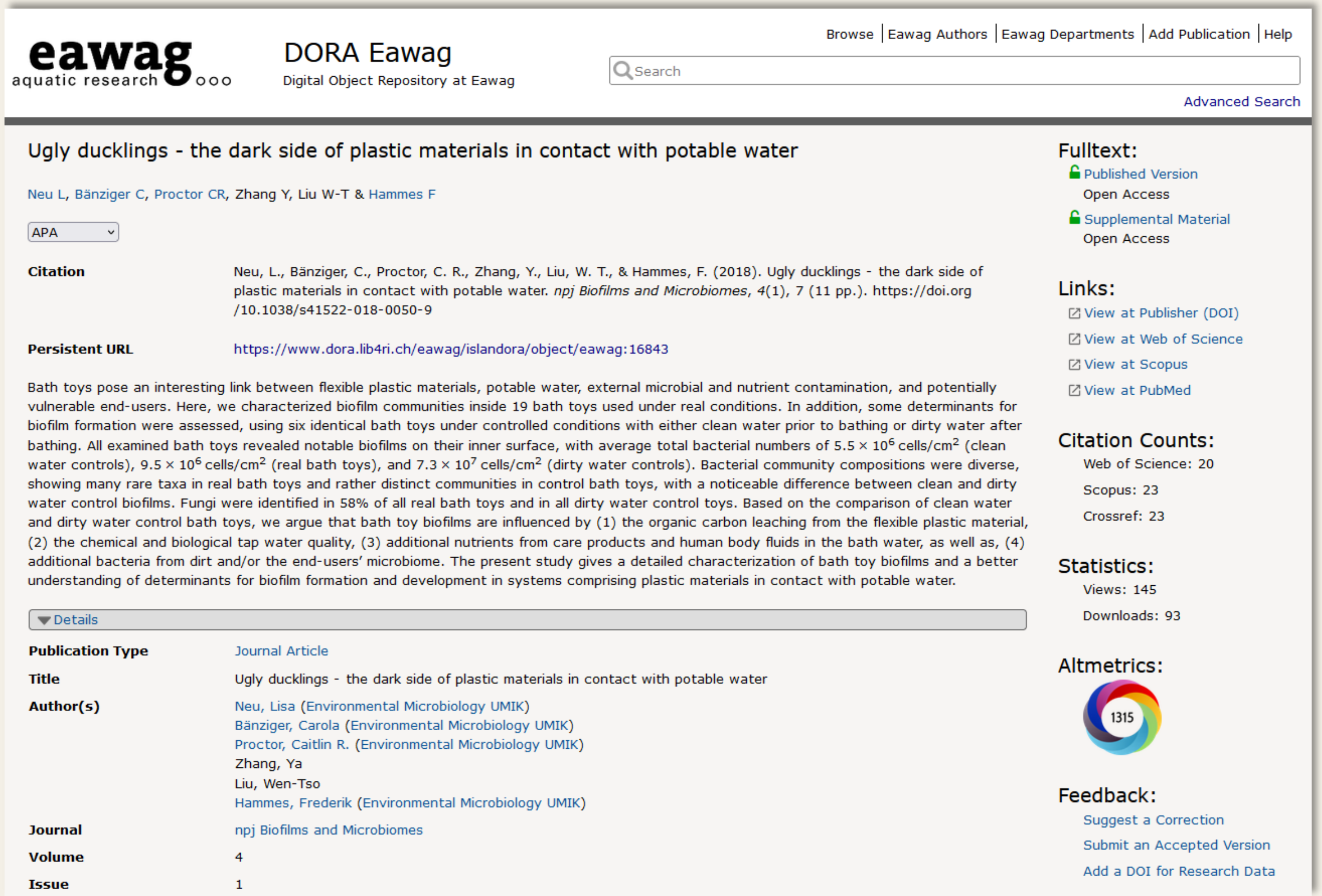

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Ugly ducklings - the dark side of plastic materials in contact with potable water

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

APA

Citation 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 5.5×10^6 cells/cm^2 (clean water controls), 9.5×10^6 cells/cm^2 (real bath toys), and 7.3×10^7 cells/cm^2 (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

Publication Type	Journal Article
Title	Ugly ducklings - the dark side of plastic materials in contact with potable water
Author(s)	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)
Journal	npj Biofilms and Microbiomes
Volume	4
Issue	1

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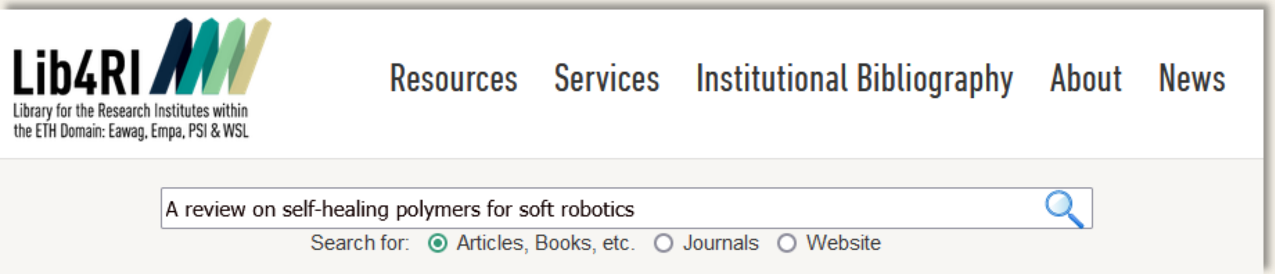
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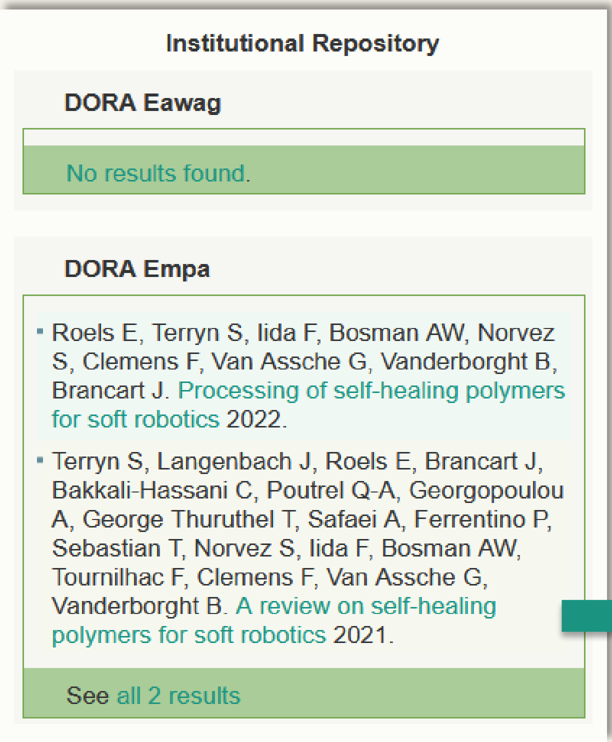
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Terryn S, Langenbach J, Roels E, Brancart J, Bakkali-Hassani C, Poutrel Q-A, Georgopoulou A, George Thuruthel T, Safaei A, Ferrentino P, Sebastian T, Norvez S, Iida F, Bosman AW, Tournilhac F, Clemens F, Van Assche G, Vanderborght B. A review on self-healing polymers for soft robotics 2021.
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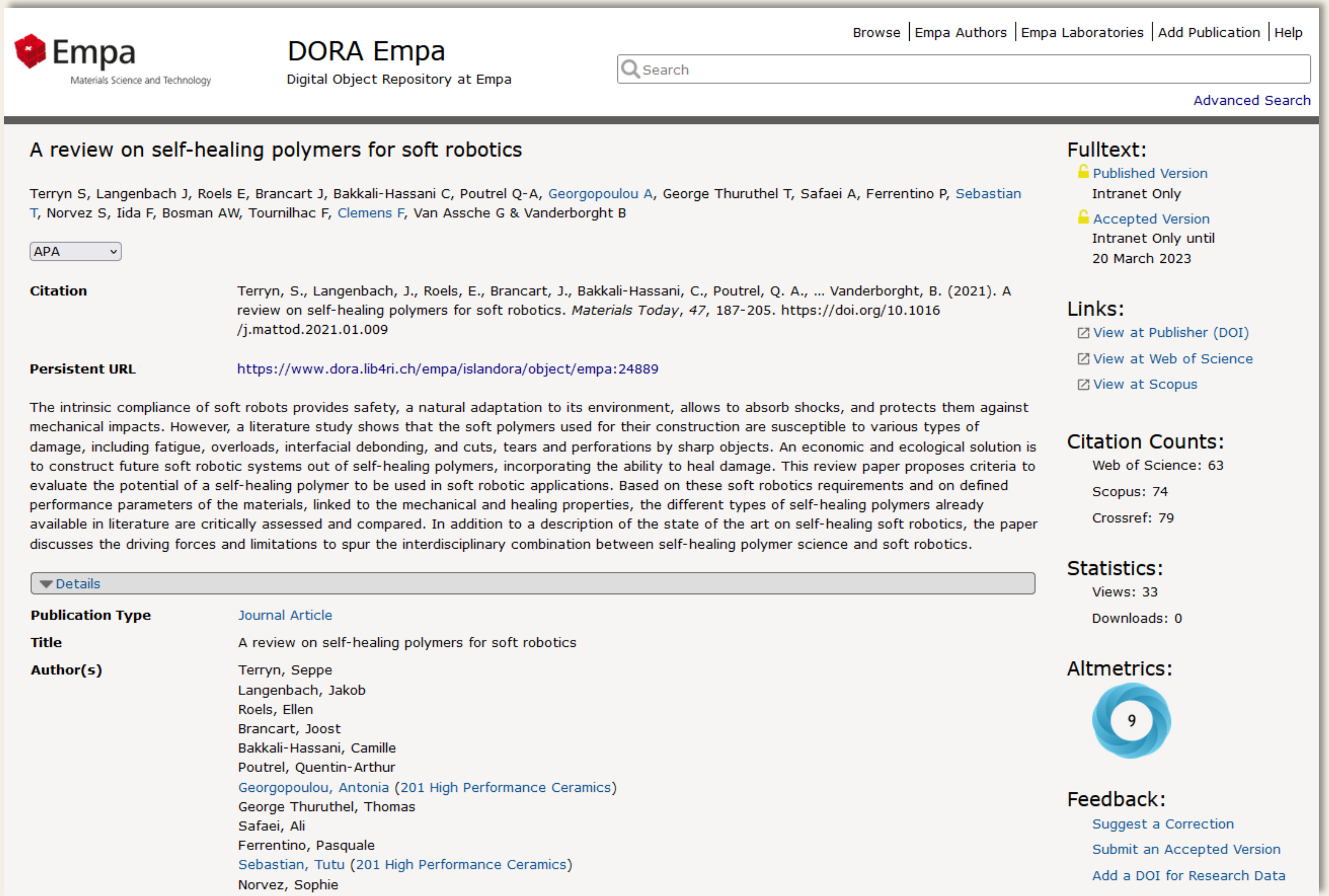
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Terryn S, Langenbach J, Roels E, Brancart J, Bakkali-Hassani C, Poutrel Q-A, Georgopoulou A, George Thuruthel T, Safaei A, Ferrentino P, Sebastian T, Norvez S, Iida F, Bosman AW, Tournilhac F, Clemens F, Van Assche G & Vanderborght B
APA
Citation
Terryn, 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
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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)
George Thuruthel, Thomas
Safaei, Ali
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- Cui J, Huang T-Y, Luo Z, Testa P, Gu H, Chen X-Z, Nelson BJ, Heyderman LJ. Nanomagnetic encoding of shape-morphing micromachines 2019.

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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

APA

Citation 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)
Journal	Nature
Volume	575
Issue	7781

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- Ayala Álvaro, Farías-Barahona D, Huss M, Pellicciotti F, McPhee J, Farinotti D. Glacier runoff variations since 1955 in the Maipo River basin, in the semiarid Andes of central Chile 2020.

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

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

APA

Citation Ayala, Á., Farías-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^2, 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^2 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^3). Runoff from the initially glacierized areas was 177±25 mm yr^{-1} (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	Journal Article
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) Farías-Barahona, David Huss, Matthias (Mountain Hydrology and Mass Movements) Pellicciotti, Francesca (Mountain Hydrology and Mass Movements) McPhee, James Farinotti, Daniel (Mountain Hydrology and Mass Movements)
Journal	Cryosphere

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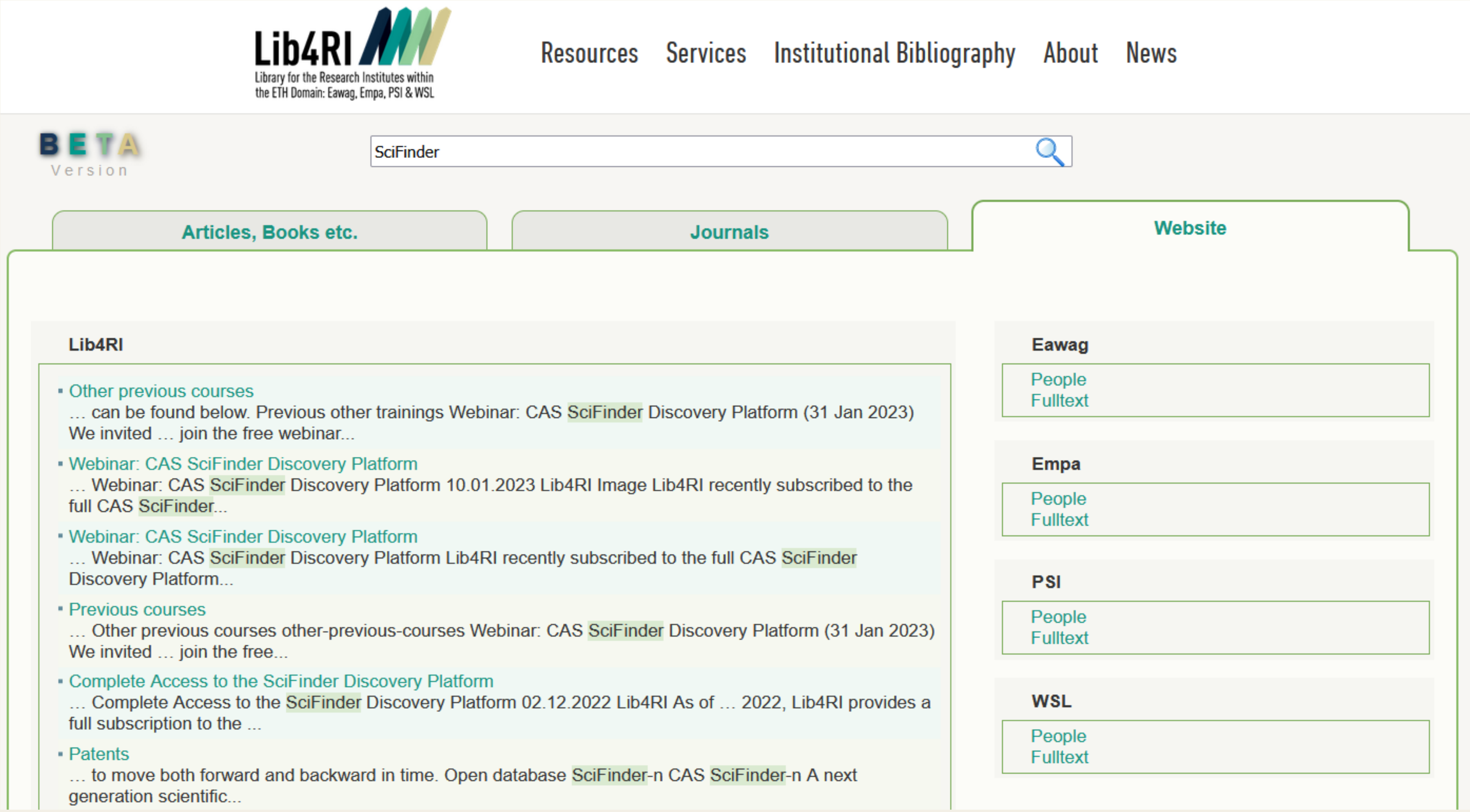

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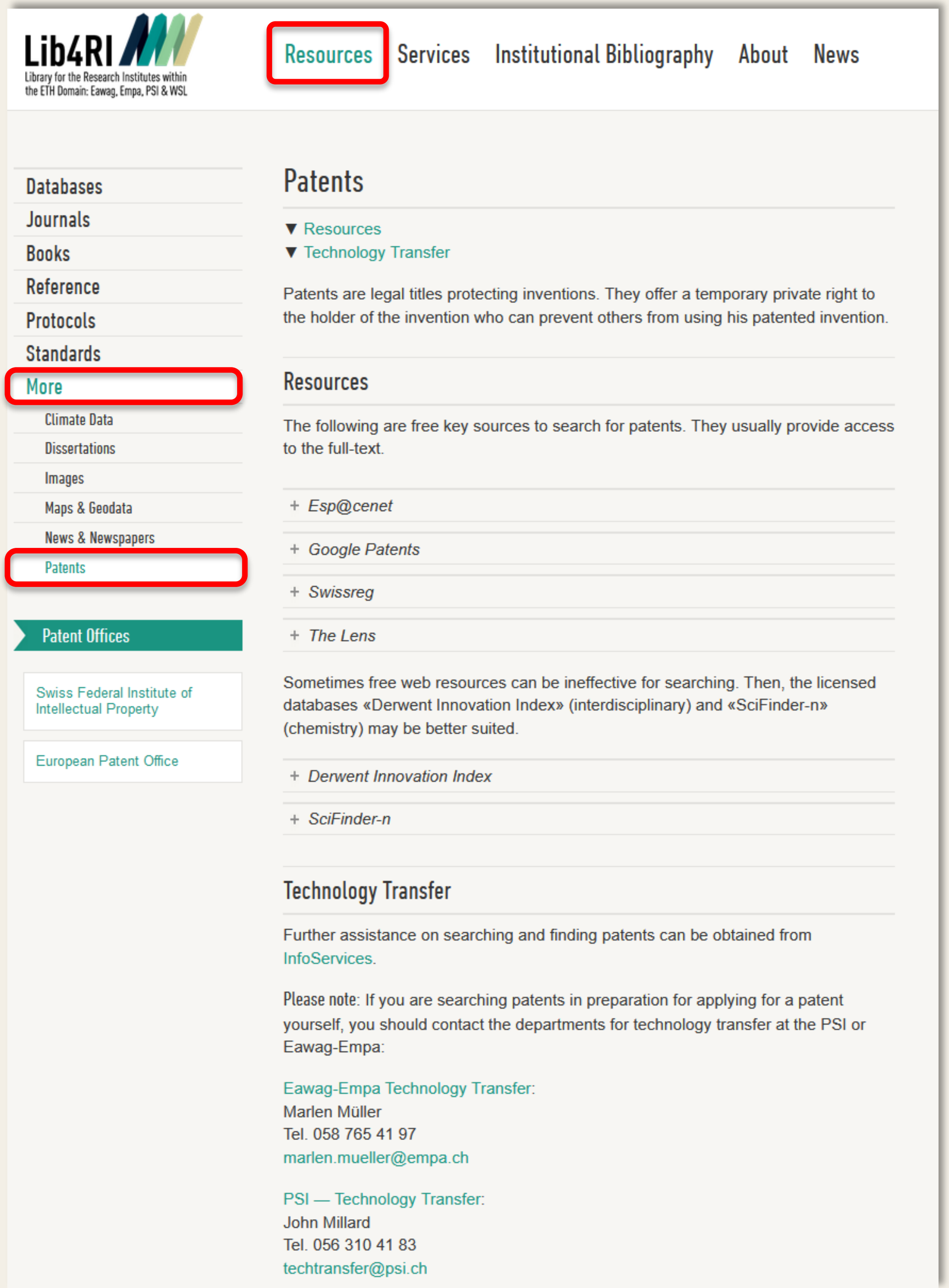

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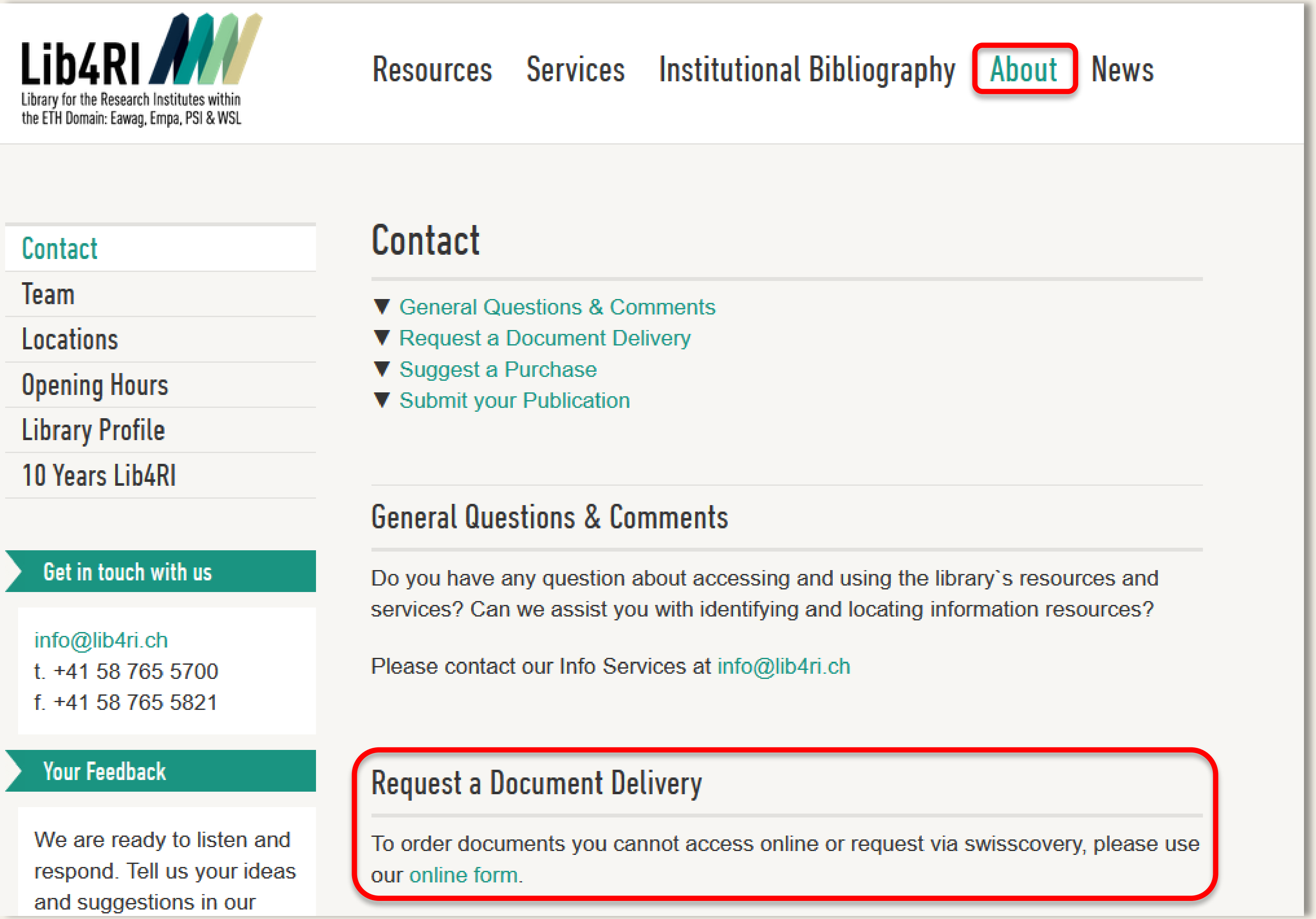

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