

Search engine optimization for scientific publications: How one can find your needle in the haystack

WHAT IS SEARCH ENGINE OPTIMIZATION (SEO) AND WHY IS IT IMPORTANT?

Since the introduction of the Internet there has been a massive improvement of connections between scientists, patients, stakeholders and other persons interested in scientific publications. With the development of web 2.0, global connections and the rise of social media platforms such as Twitter, Instagram, Facebook and others, there has been a tremendous amount of data published with unimaginable large numbers of exabytes. With this, search engines such as Google have been playing a very important role in finding the relevant information you need on the Internet. Next to the production of general data, there has also been a major increase in the production and publications of scientific data, which has been estimated to cover approximately 50 million scientific papers up till 2009 since the year 1665, and additionally, this pool of scientific papers is currently growing with >7.5 million each year.^{1,2} Moreover, there is a growing number of publications each year with an accompanying growth in the number of scientific journals.^{1,3} Still, when adjusted for a stable number of scientific journals, the number of publication per journal per year keeps rising.³ It is no surprise that this gigantic and incomprehensible number of scientific papers need to be tracked down and found in the right way. At this point, approximately 53% of the traffic to scientific websites such as Wiley, come from search engines. One does not need to be a scientist to understand that only if you can (easily) get found, you can get read, shared and eventually cited. To be able to get found, you need to tag and optimize your paper the right way so search engines such as Google can correctly index the paper and lead interested persons to the right papers. As an author, or as a journal, you want people to find *your* article better than anyone else's. This is what Search engine optimisation (SEO) is about.

HOW TO OPTIMIZE YOUR SCIENTIFIC MANUSCRIPT FOR SEARCH ENGINES

The general rules for SEO can be found on the Wiley website as well as in some of the online published webinars.⁴ Also, there are an abundance of websites on SEO, but not specifically on scientific

publications. Nevertheless, we will lay out the general rules for SEO here by combining the information from the website and the webinars from the Wiley website.⁴ At the United European Gastroenterology journal, we have a team of trainee-editors who will perform SEO on each article title/abstract/keywords, but not on the full manuscript.⁵ In the article by Rodriguez-Lago et al., the production process is further described.⁵ When following the below steps, this would ease the SEO process further.

Rule number 1: Think about important keywords that describe your article

This rule has been under-highlighted and is not being given the attention it deserves. It is pivotal to select keywords that are *consistently* used in your area of expertise, where it is important that the "keywords" are more short "key phrases" rather than single words. When submitting a manuscript, in general authors can select up to 10 attributes. Most of the editorial manager programs provide with a list of keywords. (See Box 1) However, these keywords are too generic and do not take the articles in the right way, and do generally not capture the contents of the article. Therefore, be creative and put in yourself at least 5-7 keywords. Be advised that these are the keywords that are being used to tag your paper for online use. If uncertain, first perform a search using the keywords and observe the number of hits. The larger the number, the more often it is being used for your specific area. Another way of finding specific keywords could

Box 1 Use specific, and not too general keywords:

Title: Gallbladder polyps growth rate is an independent risk factor for neoplastic polyps

- Too general keywords: ultrasound, cancer risk, gall stones, bile, gastroenterology.
- Specific keywords: gallbladder cancer risk, polyp growth rate, gallbladder polyp, neoplastic polyps.

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be through Google Trends or Google Adwords, albeit these are more dedicated to commercial companies rather than scientific publications.

Rule number 2: Keep your title search engine friendly –Short and simple

The most important issue for search engines to index your article is about the length of the title. If the title is too long, search engines will dislike this and this will eventually lead to your article not being found. It is very important to have the most important 1-2 keywords within the first 65 characters of the title, especially so your area of interest is directly highlighted. In Box 2, we show an example of the optimization of a title. Moreover, try to describe the contents of your article briefly (e.g. use conclusions) and keep it simple.

Rule number 3: Optimize your abstract

Search engines will generally show the first 2 sentences of an abstract. This means that essential keywords must be provided in the first 2 sentences. For some scientific areas this could also mean that

the conclusion is already in the first 2 sentences, albeit this a rather seldom observation. Throughout the abstract, repeat keywords 3–6 times but avoid ‘keyword stuffing’. In case of the latter over-emphasis, search engines may un-index the article making it less well findable.

Rule number 4: Use your important keywords throughout the article

As a general rule of thumb, one could use 1-2 keywords in the title, 2-3 (up to 6) in the abstract, and add at least 5-7 keywords attached to your article. Moreover, it is recommended to put keywords in subheadings, as subheadings are being regarded as a structure of an article and therefore tip-off search engine indexing. You can repeat your keyword throughout the abstract if you have only limited number of specific keyword but do not exaggerate.

Rule number 5: Be consistent throughout the article

Refer to author names and initials in a consistent manner throughout the paper. Do not use a lot of variations of your keywords. Be consistent with any previous publications. Do not come up with never used abbreviations no one (and no search engine) knows about.

Rule number 6: Build links

It is vital to have your article produced across social media, networks, institutional sites and endorsement through colleagues. It is not always about the quantity but it is especially important if persons that are highly respected by the field, endorse your paper. This will also tip off search engines and improve your articles visibility online. The more links from respected individuals or trusted sites, the more powerful the effect.

CONCLUSIONS

Search Engine Optimization (SEO) is becoming more and more important in the era of web 2.0 and the emerging role of social media in the scientific community. In order to get shared and get cited, your article must first be found. This could be achieved by following some easy steps to optimize a scientific manuscript for search engines. Writers and editors should focus on simple and short titles and abstract and use appropriate specific keywords known in the scientific field, and use these consistently throughout the article.

Box 2 Examples how to optimize the title of a scientific manuscript

Original title before SEO: Real-world incidence, prevalence and outcomes of treatment in ulcerative colitis: results from a nationwide registry database in Denmark

Comments:

- Words such as incidence, prevalence and outcomes are too generic
- The area of interest (ulcerative colitis) is placed somewhere in the middle of the title where it should be placed within the first 65 characters and preferably in the first 2 words
- The title is too long and does not exactly cover the conclusions of the article

Title after SEO (after careful check of the article conclusions): Ustekinumab treatment in ulcerative colitis improves clinical remission rates in a real-world nationwide registry study

Comments:


- Keep the title ‘simple’ and ‘friendly’ for search engines
- Try to cover conclusions
- Bring important keywords to the beginning to the title

KEYWORDS

article findability, guidance on SEO, improvement of citations, scientific publications, scientific SEO, search engine optimization, SEO

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

Willem Pieter Brouwer¹ 

Marcus Hollenbach² 

¹*Departments of Gastroenterology and Hepatology, Erasmus MC University Medical Centre, Rotterdam, The Netherlands*

²*Division of Gastroenterology, Medical Department II, University of Leipzig Medical Center, Leipzig, Germany*

Correspondence

Willem Pieter Brouwer, Department of Gastroenterology and Hepatology, Erasmus MC University Medical Centre, Rotterdam, The Netherlands.

Email: w.p.brouwer@erasmusmc.nl

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ORCID

Willem Pieter Brouwer  <https://orcid.org/0000-0001-8713-1481>

Marcus Hollenbach  <https://orcid.org/0000-0002-2654-3164>

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