

PhytoHub, an online platform to gather expert knowledge on polyphenols and other dietary phytochemicals

F. Giacomoni¹, A. Bento da Silva², M.R. Bronze², C. Gladine¹, P. Hollman³, R. Kopec⁴, D. Low¹, P. Micheau¹, C. Nunes dos Santos⁵, B. Pavot¹, G. Schmidt⁶, C. Morand¹, M. Urpi-Sarda⁷, N. Vazquez-Manjarrez¹, M-A Verny¹, W. Wiczkowski⁸, C. Knox⁹, [C. Manach¹](mailto:claudine.manach@inra.fr)

¹INRA, Human Nutrition Unit, Clermont-Ferrand, France; ²ITBQ Oeiras, Lisbon, Portugal; ³RIKILT Wageningen University, The Netherlands; ⁴The Ohio State University, Columbus, USA; ⁵iBET, Oeiras, Portugal; ⁶Norwegian Institute of Food, Fisheries and Aquaculture Research, Norway; ⁷University of Barcelona, Spain; ⁸Institute of Animal Reproduction and Food Research of Polish Academy of Sciences, Olsztyn, Poland; ⁹OMx, Edmonton, Canada
claudine.manach@inra.fr

PhytoHub (www.phytohub.eu) is an open-access database dedicated to phytochemicals present in commonly consumed foods. The V1.4 current version contains >960 dietary phytochemicals (including 511 polyphenols) and 375 known human or animal metabolites of these compounds. For every compound PhytoHub provides a downloadable chemical structure as well as identifiers, synonyms and physico-chemical properties, occurrence in foods, known metabolites with biofluid location and associated references, as well as mass spectral data with search possibilities for use in metabolomics. Some data are compiled from diverse databases/spectral libraries or computed directly from the chemical structure, whereas data on dietary sources and known metabolites are manually extracted from the literature by experts in the field. This is a major strength of PhytoHub as it provides information that cannot be found yet on any other database. For example, PhytoHub contains 61 dietary betalains and 16 phytoprostanes, while these families are virtually absent from all existing databases. Similarly, when entered by experts, the list of metabolites is much longer than in the most comprehensive databases available so far (HMDB, Phenol-Explorer): 34 metabolites of orange flavanones metabolites and 31 resveratrol metabolites have for instance been inventoried in PhytoHub so far.

Compiling all the available and new knowledge on dietary phytochemicals, with deep expertise on every family of compounds is beyond the capacity of any single team. We thus decided to associate as many experts as possible to contribute to PhytoHub data curation. An intuitive web interface has been developed to facilitate data entry by invited experts, with traceability of data modifications. The system has been tested by partners of the COST Action POSITIVE, and is now fully functional, with video tutorials to help the users. The procedure to add a new compound, a new food source for a phytochemical, a new human metabolite, a new reference, or to make a correction in some data takes only a few minutes, and the changes immediately appear on the online version. This data entry system opens exciting possibilities to accelerate the gathering of expert knowledge and make it available for all. Further developments are currently discussed to make PhytoHub even more useful for researchers in the field of plant food bioactives, with the integration of critically reviewed data about the biological effects in humans as well as more experimental spectral data useful for metabolomics studies.

We cordially invite all our colleagues of the polyphenol community, who would like to share some of their knowledge and/or results from their own publications in PhytoHub, to contact us for more information and participation to the next webinar organized for future curators.

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