

OrganismTagger: Detection, normalization, and grounding of organism entities in biomedical documents

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Title	OrganismTagger: Detection, normalization, and grounding of organism entities in biomedical documents
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Abstract	<p>Motivation: Semantic tagging of organism mentions in full-text articles is an important part of literature mining and semantic enrichment solutions. Tagged organism mentions also play a pivotal role in disambiguating other entities in a text, such as proteins. A high-precision organism tagging system must be able to detect the numerous forms of organism mentions, including common names as well as the traditional taxonomic groups: genus, species, and strains. In addition, such a system must resolve abbreviations and acronyms, assign the scientific name, and if possible link the detected mention to the NCBI Taxonomy database for further semantic queries and literature navigation.</p> <p>Results: We present the OrganismTagger, a hybrid rule-based/machine learning system to extract organism mentions from the literature. It includes tools for automatically generating lexical and ontological resources from a copy of the NCBI Taxonomy database, thereby facilitating system updates by end-users. Its novel ontology-based resources can also be reused in other semantic mining and linked data tasks. Each detected organism mention is normalized to a canonical name through the resolution of acronyms and abbreviations and subsequently grounded with an NCBI Taxonomy database ID. In particular, our system combines a novel machine-learning approach with rule-based and lexical methods for detecting strain mentions in documents. On our manually annotated OT corpus, the OrganismTagger achieves a precision of 95%, a recall of 94% and a grounding accuracy of 97.5%. On the manually annotated corpus of Linnaeus-100, the results show a precision of 99%, recall of 97% and grounding accuracy of 97.4%.</p>

	Availability: The OrganismTagger, including supporting tools, resources, training data and manual annotations, as well as end-user and developer documentation, is freely available under an open source license at http://www.semanticsoftware.info/organism-tagger [9].
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