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► **To cite this version:**

Patricia L. Whetzel, Clement Jonquet, Cherie H. Youn, Michael Dorf, Ray Fergerson, et al.. The NCBO Annotator: OntologyBased Annotation as a Web Service. 2nd International Conference on Biomedical Ontology (ICBO 2011), Demo session, O. Bodenreider, M. E. Martone, A. Ruttenberg, Jul 2011, Buffalo, NY, United States. pp.302-303. hal-04271625

HAL Id: hal-04271625

<https://hal.science/hal-04271625>

Submitted on 15 Nov 2023

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The NCBO Annotator: Ontology-Based Annotation as a Web Service

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The NCBO Annotator Web Service (http://www.bioontology.org/wiki/index.php/Annotator_Web_service) provides a mechanism to generate ontology-based annotations by tagging textual metadata submitted to the Web service (e.g. text of interest to the user) with ontology terms from BioPortal (<http://bioportal.bioontology.org/>). The Web service can be customized for various use cases through selection of parameters such as the choice of ontologies, stop words, and UMLS Semantic Types (Figure 1). The annotation process generates direct annotations and can also generate expanded annotations based on the *is-a* hierarchy of the ontology and/or mappings

between ontologies (Figures 2, 3). The Annotator Web service is a RESTful Web service and a number of sample clients have been developed (http://www.bioontology.org/wiki/index.php/Annotator_Client_Examples), including an Excel Addin. The ease of access to this annotation functionality makes the task of creating ontology-based annotations accessible for any biomedical researcher. Use cases of the NCBO Annotator include triaging literature to prioritize curation of publications and annotating free text data descriptions from life science databases and clinical records to enhance information retrieval.

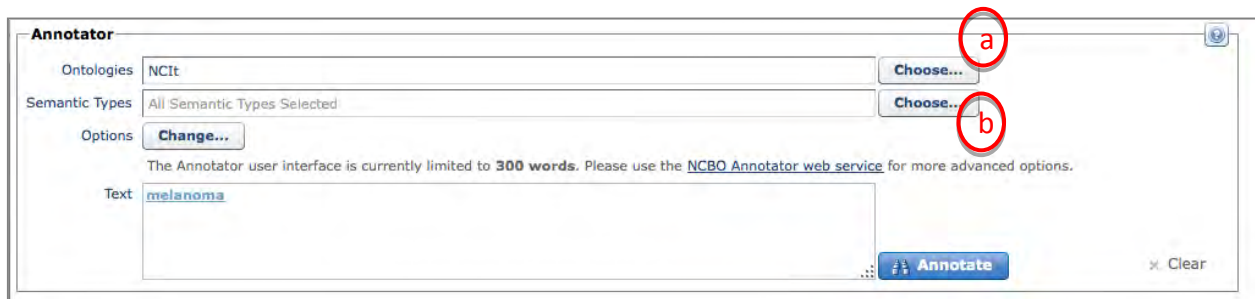


Figure 1. The NCBO Annotator Web interface on BioPortal.

Users can select which ontologies to use for annotation (a) and results can be filtered to terms within UMLS Semantic Types (b).

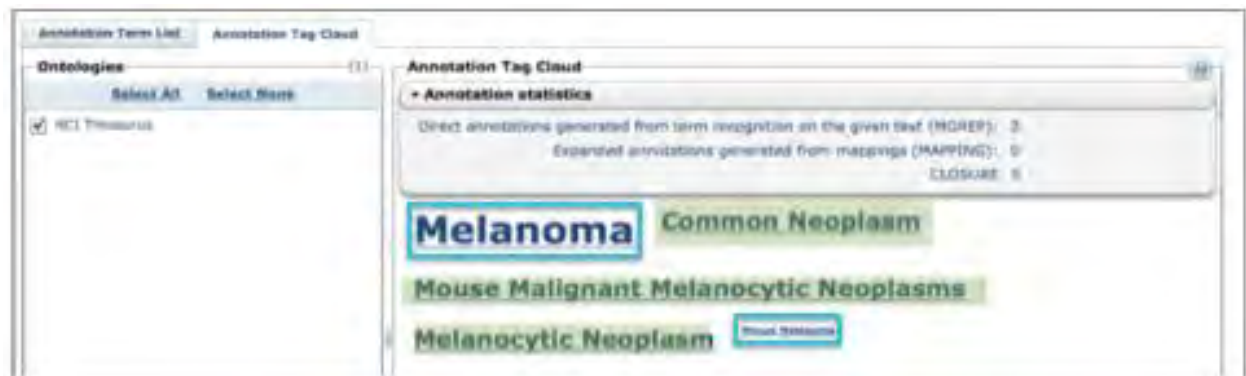


Figure 2. Results from the NCBO Annotator including expanded annotations based on the *is-a* hierarchy of the ontology. The direct annotations are highlighted in blue and the expanded annotations are highlighted in green.

Annotator

Ontologies: NCI,CST Choose...

Semantic Types: All Semantic Types Selected Choose...

Options: Change...

The Annotator user interface is currently limited to **300 words**. Please use the [NCBO Annotator web service](#) for more advanced options.

Text: melanoma

Annotate Clear

Annotation Term List **Annotation Tag Cloud**

Ontologies (2)

[Select All](#) [Select None](#)

- COSTART
- NCI Thesaurus

Annotation Tag Cloud

Annotation statistics

- Direct annotations generated from term recognition on the given text (MGREP): 2
- Expanded annotations generated from mappings (MAPPING): 3
- Expanded annotations generated from the is_a transitive closure (ISA_CLOSURE): 0

SKIN MELANOMA [Melanoma](#) [Mouse Melanoma](#)

Figure 3. Results from the NCBO Annotator including expanded annotations based on mappings between ontologies. The term “skin melanoma” from COSTART is returned as a result of the mapping expansion.