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BioPortal: Ontologies and Integrated Data Resources at the Click of a Mouse

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BioPortal is a Web portal that provides access to a library of biomedical ontologies and terminologies developed in OWL, RDF(S), OBO format, Protégé frames, and Rich Release Format (http://bioportal.bioontology.org). BioPortal functionality, driven by a service-oriented architecture, includes the ability to browse, search and visualize ontologies (Figure 1). The Web interface also facilitates community-based participation in the evaluation and evolution of ontology content. Registered users are able to add mappings between terms, to add comments on individual terms within the ontology, and to provide reviews of ontologies (Figure 2). This user-generated content provides a critical evaluation and feedback mechanism for ontology developers. BioPortal also enables integrated search of biomedical data resources such as the Gene Expression Omnibus (GEO), ClinicalTrials.gov, and ArrayExpress, through the ontology-based indexing of these resources with ontologies in BioPortal (Figure 3). Thus, BioPortal not only provides investigators, clinicians, and developers a 'one-stop shop' to view and programmatically access biomedical ontologies, but also provides support to integrate data from a variety of biomedical resources.

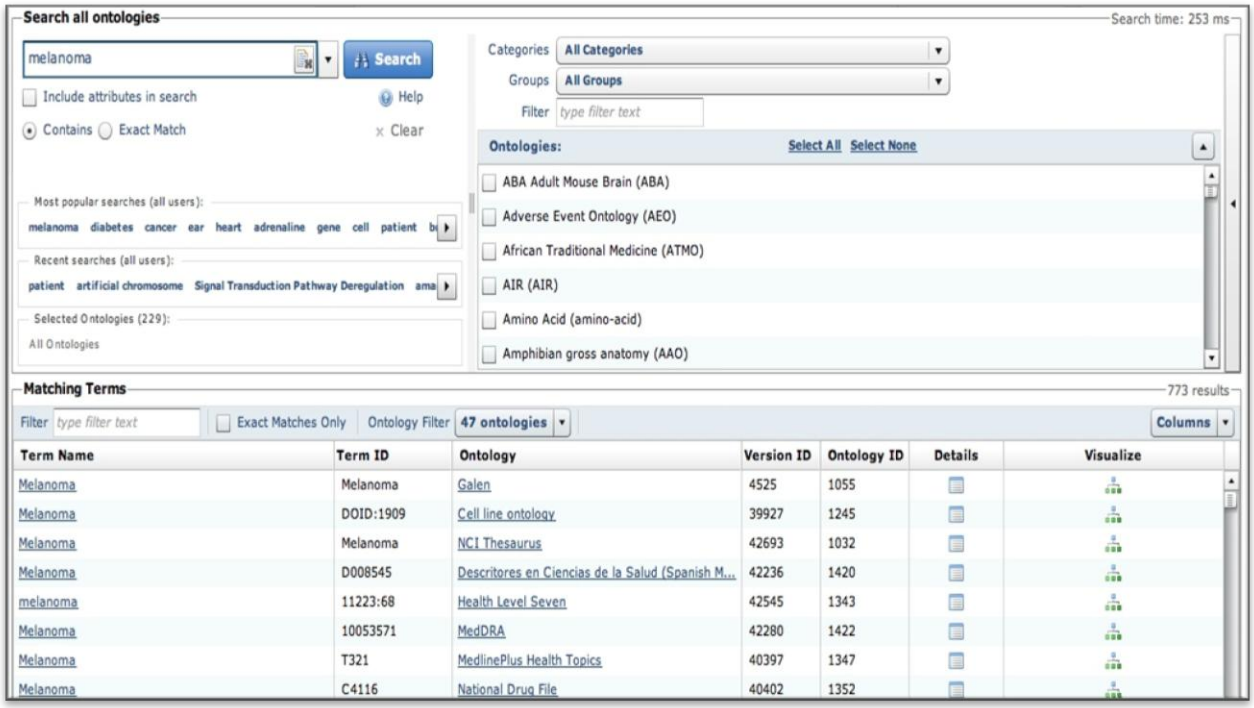

Figure 1. The BioPortal Search interface. The Search tab allows users to limit their search to "Contains" or "Exact Match" (a) and the ontology content can be limited by "Categories", "Groups", or to a specific ontology (b). Search results (c) display the "Term Name", "Identifier", and "Ontology Name". Additional term details are displayed in the term "Details" pop-up and the ontology structure can be viewed in the "Visualize" pop-up.

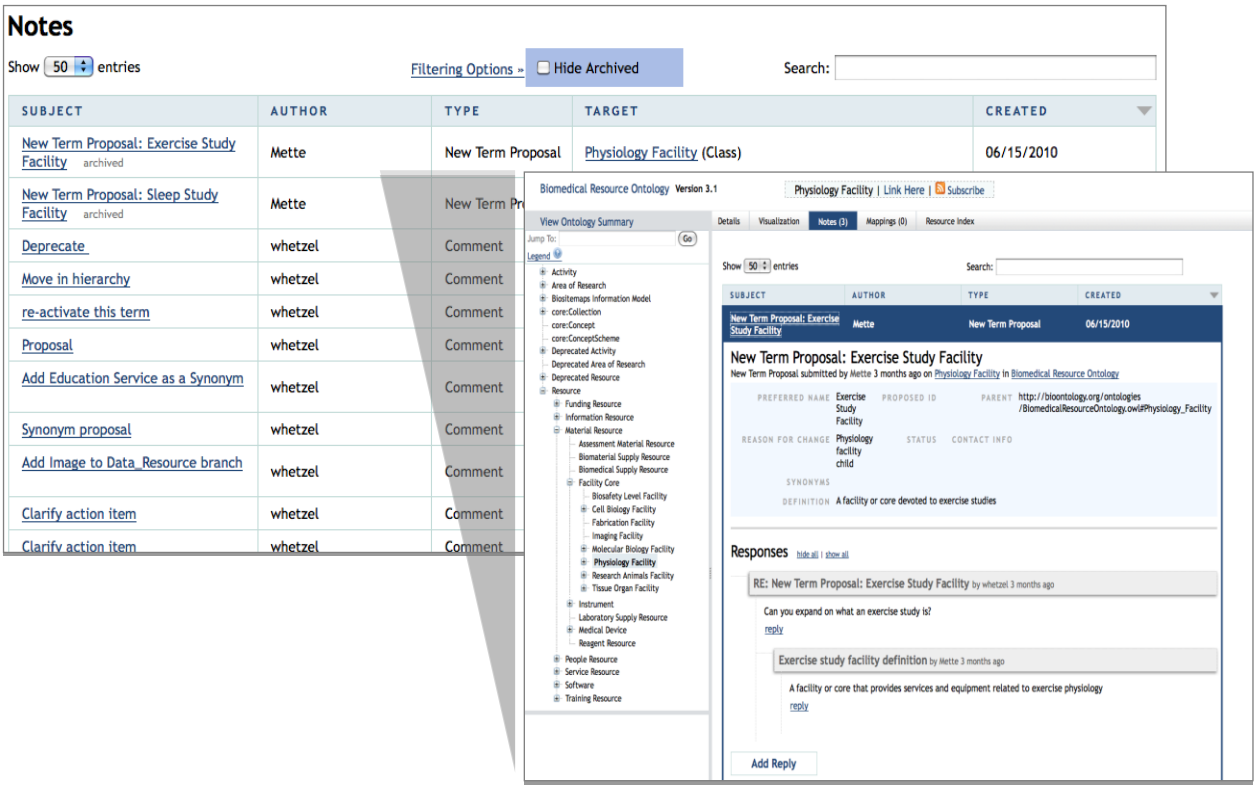

Figure 2. The "Notes" page displays a summary of all Notes posted to an ontology and can be sorted by author, type, term name, and date.

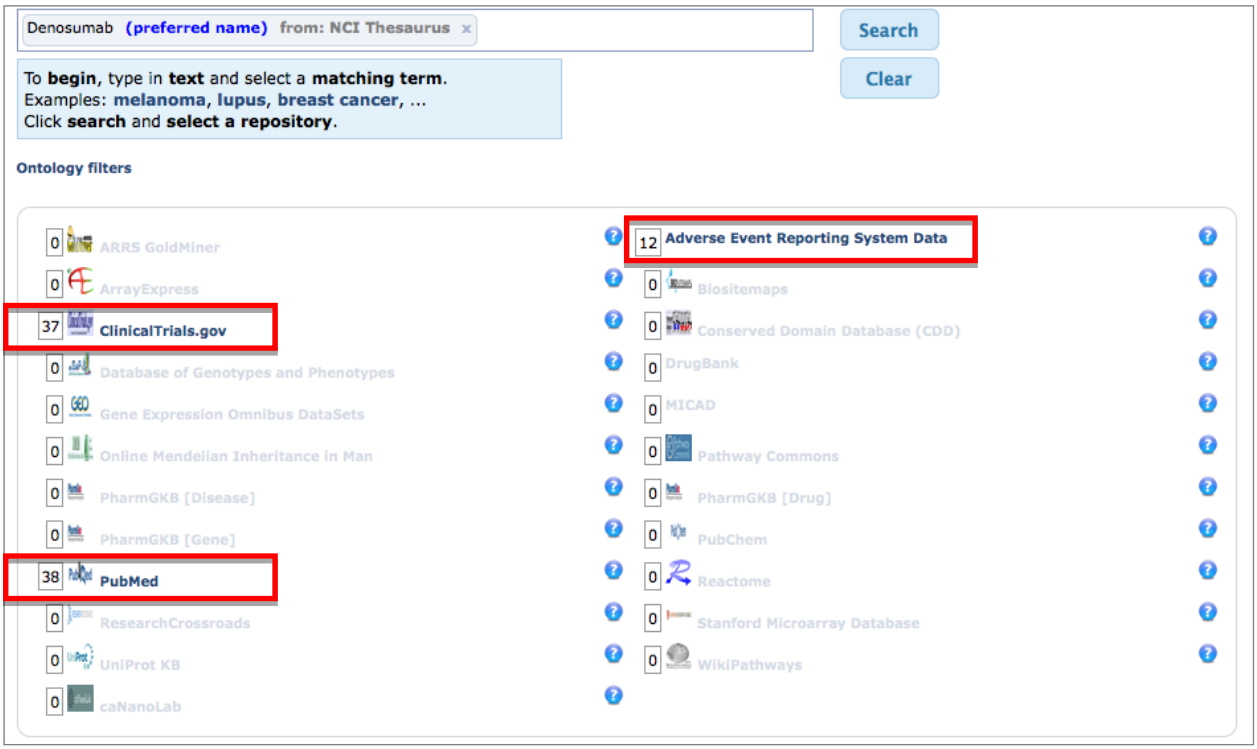

Figure 3. The "All Resources" tab allows users to search for data records tagged with ontology terms of interest and to find related records in other resources via shared ontology annotations.