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Knowledge and theme discovery across very large biological data sets using distributed queries: a prototype combining unstructured and structured data. PLoS One 2013 Dec 2;8(12):e80503

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vand der Lei J, Pariente A, Trifirò G; EU-ADR consortium. Harmonization Process for the Identification
of Medical Events in Eight European Healthcare Databases: The Experience from the EU-ADR Project. J Am
Med Inform Assoc 2013; 20(1):184-92 126

Hurdle JF, Haroldsen SC, Hammer A, Spigle C, Fraser AM, Mineau GP, Courdy SJ. Identifying Clini-
cal/translational Research Cohorts: Ascertainment via Querying an Integrated Multi-Source Database. J Am
Med Inform Assoc 2013; 20(1):164-71 126

Natter MD, Quan J, Ortiz DM, Bousvaros A, Ilove NT, Inman CJ, Marsolo K, McMurry AJ, Sand-
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