UniProt/Swiss-Prot: <https://www.uniprot.org/statistics/Swiss-Prot>

Variable Control:

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| **URI used** | https://purl.uniprot.org/uniprot/A4H7G5/ |
| **Analysis date** | 29/04/2020 |
| **Acronyms** | |
| **RaCE -** Researcher Compliance Experiment | |
| **MaCE -** Machine Compliance Experiment | |

FINDABLE

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| **Principle** | F1 | |
| **Description** | (Meta)data is assigned persistent and globally unique identifiers. | |
| **RaCE** | **/ \* Globally Unique? \* /**  The standardization, documentation, and use of URIs makes Identifiers globally unique.  **/ \* Persistent? \* /**  According to Re3Data the identifiers are persistent.  https://www.re3data.org/repository/r3d100010357  Identifiers are persistent when found on identifiers.org:  https://registry.identifiers.org/registry/uniprot  **/\*Comments\*/**  Local identifiers are standardized and documented. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **DESCRIÇÃO MÉTRICA** | **ANÁLISE** |
| **Unique Identifier**  Test whether the metadata resource has a unique identifier | It has an Uniform Resource Identifier type identifier. |
| **Identifier Persistence**  Metric to test whether the metadata resource's unique identifier is likely to be persistent. The known scheme is registered with FAIRSharing (https://fairsharing.org/standards/?q=&selected\_facets=type\_exact:identifier%20schema). For URLs that do not follow a scheme in FAIRSharing , we tested known URL persistence schemes ( purl , oclc , fdlp , purlz , w3id, ark ). | The metadata's unique identifier is persistent in the style of the PURL schema and identifiers.org. |
| **Data Identifier Persistence**  Metric to test whether the unique identifier for the data resource is likely to be persistent. The known scheme is registered with FAIRSharing (https://fairsharing.org/standards/?q=&selected\_facets=type\_exact:identifier%20schema). For URLs that do not follow a scheme in FAIRSharing , we tested known URL persistence schemes ( purl , oclc , fdlp , purlz , w3id, ark ). | The metadata's unique identifier is persistent in the style of the PURL schema and identifiers.org. |
| **Result of MaCE (by color)** | **Unique Identifier** |  |
| **Identifier Persistence** |  |
| **Data Identifier Persistence** |  |
| **Recommendations** | **Unique Identifier** | There are no improvements. |
| **Identifier Persistence** | There are no improvements. |
| **Data Identifier Persistence** | There are no improvements. |

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| **Principle** | F2 | |
| **Description** | Data is described with rich metadata. | |
| **RaCE** | **/ \* Is there metadata standardization? \* /**  Yes, the data are standardized in several formats.  **/ \* Is the metadata complete? \* /**  Intrinsic, contextual metadata are identified and give a sense of provenance.  **/ \* Comments \* /**  There isn't . | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Structured Metadata**  Tests whether a machine is capable of finding structured metadata. They can be (for example) RDFa , embedded json , json-ld or structured metadata negotiated by content, such as RDF Turtle . | Yes, RDFa- style metadata is returned from Extruct |
| **Grounded Metadata**  Tests if a machine is able to find the type metadata ' grounded '. that is, metadata terms that are in a resolvable namespace, where the resolution leads to a definition of the meaning of the term. Examples include JSON-L D, embedded schema or any form of RDF. This test currently excludes XML, even when terms are spaced by name. Future versions of this test may be more flexible. | Yes, it is possible to find ' grounded ' metadata mainly when accessing the metadata via rdf and SPARQL endpoint . |
| **Result of MaCE (by color)** | **Structured Metadata** |  |
| **Grounded Metadata** |  |
| **Recommendations** | **Structured Metadata** | There are no improvements. |
| **Grounded Metadata** | There are no improvements. |

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| **Principle** | F3 | |
| **Description** | Metadata must clearly and explicitly include the data identifier described. | |
| **RaCE** | **/ \* Is it possible to identify the data in the metadata? How is it done? \* /**  Through the standardization of repository identifiers, data is clearly identified in the metadata  **/ \* Are there different identifiers for metadata and data? \* /**    There is not, it uses the same identifiers. They can be extracted by adding the format you want (among the existing ones).    **/ \* Comments \* /**    Reference other IDs external to the repository. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Data Identifier Explicitly in Metadata**  Metric for testing whether metadata contains the data's unique identifier. This is done by looking for a variety of properties, including foaf : primaryTopic , schema : mainEntity , schema : distribution , sio: is-about and iao : is-about . The codeRepo sitory scheme is used for software versions . | Yes, this metric is met when accessing the record's rdf . |
| **Metadata Identifier Explicitly in Metadata**  Metric to test whether the metadata contains the unique identifier for the metadata itself. This is done using a variety of scraping tools , including the resolution of DOI metadata, the use of the Python tool ' extruct ' and other ... | Yes, this metric is met by performing the extract in the registry, it contains identifiers of the type DOI, it is possible to extract data via JSON. |
| **Result of MaCE (by color)** | **Data Identifier Explicitly in Metadata** |  |
| **Metadata Identifier Explicitly in Metadata** |  |
| **Recommendations** | **Data Identifier Explicitly in Metadata** | There are no improvements. |
| **Metadata Identifier Explicitly in Metadata** | There are no improvements. |

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| **Principle** | F4 | |
| **Description** | (Meta)data is recorded or indexed in searchable resources. | |
| **RaCE** | **/ \* The URI or local ID returns the record in engines of search? \* /**  Yes, it is returned. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Searchable in Major Search Engine**  It tests whether a machine is able to discover the resource by searching, using Google. | The searcher used the identifier and returned the record of (meta)data |
| **Result of MaCE (by color)** | **Searchable in Major Search Engine** |  |
| **Recommendations** | **Searchable in Major Search Engine** | There are no improvements. |

ACCESSIBLE

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| **Principle** | A1 |
| **Description** | (Meta)data is retrieved by its identifier using standardized communication protocols. |
| **RaCE** | **/ \* The database use standardized protocols? \* /**    Yes, it uses standardized protocols for data access.    **/ \* The database has proprietary software for data access? \* /**    It does not have any proprietary software.    **/\*Comments\*/**    It is possible to access via FTP. |
| **Result of RaCE (by color)** |  |
| **Recommendations** | There are no improvements. |
| **MaCE** | There is no FAIR METRICS GEN2 for this principle. |
| **Result of MaCE (by color)** | There is no FAIR METRICS GEN2 for this principle. |
| **Recommendations** | There is no FAIR METRICS GEN2 for this principle. |

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| **Principle** | A1.1 | |
| **Description** | Protocol is open, free and universally implemented. | |
| **RaCE** | **/ \* Does it have open, free and universally implemented access? \* /**  Yes, no registration or proprietary software is required to access (meta)data.  **/ \* Comments \* /**  There isn't. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Uses Open Free Protocol for data Retrieval**  The data can be recovered by an open and free protocol. Tests the data GUID for resolution protocol. Currently passes InChI keys , DOIs , identifiers and URLs . The recognition of other identifiers will be added at the request of the community. | Yes, this metric is met where through Extruct or any other means made available by the repository (RDF, XML) identifiers, URLs and DOIs are passed. Easily recovered via SPARQL endpoint. |
| **Uses Open Free Protocol for Metadata Retrieval**  Metadata can be retrieved using an open and free protocol. Tests the metadata GUID for resolution protocol. Currently passes InChI keys , DOIs , identifiers and URLs . The recognition of other identifiers will be added at the request of the community. | Yes, this metric is met where through Extruct or any other means made available by the repository (RDF, XML) identifiers, URLs and DOIs are passed. Easily recovered via SPARQL endpoint. |
| **Result of MaCE (by color)** | **Uses Open Free Protocol for data Retrieval** |  |
| **Uses Open Free Protocol for Metadata Retrieval** |  |
| **Recommendations** | **Uses Open Free Protocol for data Retrieval** | There are no improvements. |
| **Uses Open Free Protocol for Metadata Retrieval** | There are no improvements. |

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| **Principle** | A1.2 | |
| **Description** | The protocol allows for authentication and authorization when necessary. | |
| **RaCE** | **/ \* Does the protocol allow authentication and authorization? \* /**    There is no such restriction. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Data Authentication and Authorization**  Test a discovered data GUID for the ability to implement authentication and authorization in resolution protocol. Currently passes InChI keys , DOIs , identifiers and URLs . He also searches the metadata for the Dublin Core ' accessRights ' property , which can point to a document that describes the data access process. The recognition of other identifiers will be added at the request of the community. | The GUID returned from the metadata is a URI, known for allowing authentication / authorization. |
| **Metadata Authentication and Authorization**  Tests the metadata GUID for the ability to implement authentication and authorization in its resolution protocol. Currently passes InChI keys , DOIs , identifiers and URLs . The recognition of other identifiers will be added at the request of the community. | The GUID returned from the metadata is a URI, known to allow authentication / authorization. |
| **Result of MaCE (by color)** | **Data Authentication and Authorization** |  |
| **Metadata Authentication and Authorization** |  |
| **Recommendations** | **Data Authentication and Authorization** | There are no improvements. |
| **Metadata Authentication and Authorization** | There are no improvements. |

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| **Principle** | A2 | |
| **Description** | Metadata must be accessible even when data is no longer available. | |
| **RaCE** | **/ \* Is there a data versioning policy ? \* /**  Yes, there is versioning of (meta)data.  https://www.uniprot.org/uniprot/O00597  **/ \* (Meta)data can be erased? \* /**  Yes, they can be deleted.  **/ \* (Meta)data can be updated? \* /**  Yes, they can be updated.  **/ \* Is it possible to access metadata of data that no longer exists? \* /**  Yes, it is possible .  https://www.uniprot.org/uniprot/O00597  **/ \* Is there a persistence policy ? \* /**  No persistence policy was found.  **/ \* Comments \* /**  There are no comments . | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Metadata Persistence**  Metric to test whether metadata contains a persistence policy, explicitly identified by a key persistencePolicy (in hashed data) or by a http://www.w3.org/2000/10/swap/pim/doc# persistencePolicy predicate in linked data. | It was not possible to find any persistence policy using any approach |
| **Result of MaCE (by color)** | **Metadata Persistence** |  |
| **Recommendations** | **Metadata Persistence** | In order to comply with this metric, a persistence policy must be indicated in the source code of the record. |

INTEROPERABLE

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| **Principle** | I1 | |
| **Description** | (Meta)data use formal, accessible, shared and widely applicable language for knowledge representation. | |
| **RaCE** | **/ \* Is there a use of languages ​​to represent knowledge? \* /**    Yes, languages ​​are used to represent knowledge.    **/ \* Taxonomies, ontologies, controlled vocabularies are referenced or found in the repository? (Must meet F 1) \* /**    They are found controlled vocabularies, thesauri and taxonomies general, it is said that follow FAIR Principles.  http://insideuniprot.blogspot.com/2016/11/being-fair-at-uniprot.html  **/ \* Comments \* /**    There is n't . | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Metadata Knowledge Representation Language (WEAK)**  Maturity indicator to test whether metadata uses a formal language widely applicable to knowledge representation. This particular test has a broad view of what defines a ' knowledge representation language '; in this assessment, anything that can be represented as structured data will be accepted. | Yes, this metric is met, knowledge representation languages ​​with RDF are returned. |
| **Metadata Knowledge Representation Language (STRONG)**  Maturity indicator to test whether metadata uses a formal language widely applicable to knowledge representation. This particular test has a broad view of what defines a 'knowledge representation language '; in this evaluation, a knowledge representation language is interpreted as one in which the terms are semantically based on ontologies. Any form of RDF will pass this test (including RDF that is automatically extracted by third party analyzers, such as Apache Tika ). | Yes, it's based on GO (Gene Ontology ) https://www.uniprot.org/help/gene\_ontology |
| **Result of MaCE (by color)** | **Metadata Knowledge Representation Language (WEAK)** |  |
| **Metadata Knowledge Representation Language (STRONG)** |  |
| **Recommendations** | **Metadata Knowledge Representation Language (WEAK)** | There are no improvements. |
| **Metadata Knowledge Representation Language (STRONG)** | There are no improvements. |

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| **Principle** | I2 | |
| **Description** | (Meta)data using the following vocabulary FAIR Principles. | |
| **RaCE** | **/ \* Vocabularies following the FAIR Principles? \* /**    They say they follow.  http://insideuniprot.blogspot.com/2016/11/being-fair-at-uniprot.html  **/ \* Comments \* /**    There is n't . | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | Não há. | |
| **MaCE** | **Metadata Uses Fair Vocabularies (WEAK)**  Maturity indicator to test whether linked data metadata uses resolved terms. This only test if they resolve, and FAIR data does not resolve, so it is a rather weak test. | Yes, it meets this metric using Extruct , https://demos.algorithmia.com/web-page-inspector |
| **Metadata Uses FAIR Vocabularies (STRONG)**  Maturity indicator to test whether linked data metadata uses resolved linked data (FAIR) terms. | No predicates resolved for linked data were found . |
| **Result of MaCE (by color)** | **Metadata Uses FAIR Vocabularies (WEAK)** |  |
| **Metadata Uses FAIR Vocabularies (STRONG)** |  |
| **Recommendations** | **Metadata Uses FAIR Vocabularies (WEAK)** | There are no improvements. |
| **Metadata Uses FAIR Vocabularies (STRONG)** | For linked data to be used, for this to occur, data must be written in knowledge representation languages.  Use of FAIR DATA POINTS would assist in meeting this metric. |

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| **Principle** | I3 | |
| **Description** | (Meta)data includes qualified references for other (meta)data. | |
| **RaCE** | **/ \* Is there use of structured data languages? \* /**    Uses RDF.    **/ \* Is there qualification among (meta)data entities? \* /**    It is found from the RDF file, they have qualification.    **/ \* Comments \* /**    There isn't . | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | There are no improvements. | |
| **MaCE** | **Metadata Contains Qualified Outward References**  Maturity indicator to test whether metadata is externally linked to third-party resources. It only tests metadata that can be represented as linked data. | Yes, this metric is met by accessing the record's RDF. |
| **Result of MaCE (by color)** | **Metadata Contains Qualified Outward References** |  |
| **Recommendations** | **Metadata Contains Qualified Outward References** | There are no improvements. |

REUSABLE

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| **Principle** | R1 |
| **Description** | (Meta)data are richly described with the plurality of precise and relevant attributes. |
| **RaCE** | **/ \* Is there a standardization of (meta)data? \* /**    Yes, the data is standardized for submission.    **/ \* Is there reference to metadata in other repositories? \* /**    Yes, there is an explicit reference to other external repositories    **/ \* Comments \* /**    There is n't . |
| **Result of RaCE (by color)** |  |
| **Recommendations** | There are no improvements. |
| **MaCE** | There is no FAIR METRICS GEN2 for this principle. |
| **Result of MaCE (by color)** | There is no FAIR METRICS GEN2 for this principle. |
| **Recommendations** | There is no FAIR METRICS GEN2 for this principle. |

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| **Principle** | R1.1 | |
| **Description** | (Meta)data is published with clear and accessible data usage licenses. | |
| **RaCE** | **/ \* Usage licenses are found in the registry? \* /**    Do not.    **/ \* Are usage licenses found in the repository? \* /**    Yes.    **/ \* Link to use licenses \* /**  [https://www.re3data.org/repository/r3d10 0011570](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://www.re3data.org/repository/r3d100011570)  [https://fairsharing.org/FAIRsharing.327nbg](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://fairsharing.org/FAIRsharing.327nbg) | |
| **Result of RaCE (by color)** |  | |
| **Recommendations** | The use licenses are found in the repository, however they are not referenced in the records. | |
| **MaCE** | **Metadata Includes License (Weak)**  Maturity indicator to test whether metadata contains an explicit license pointer. This test 'weak' will use a regular expression that is not case-sensitive and sweep the style metadata key / value, as well as metadad the linked data. Tests: xhtml , dvia , dcterms , cc , data.gov.au and Schema license predicates on linked data and validates the value of these properties. | Yes, this goal is met, the use license is returned. |
| **Metadata Includes License (Strong)**  Maturity indicator to test whether the linked data metadata contains an explicit pointer to the license. Tests: xhtml , dvia , dcterms , cc , data.gov.au and Schema license predicates on linked data and validates the value of these properties. | No explicit pointers to Machine-Readable referring to the use license were found. |
| **Result of MaCE (by color)** | **Metadata Includes License (Weak)** |  |
| **Metadata Includes License (Strong)** |  |
| **Recommendations** | **Metadata Includes License (Weak)** | There are no improvements. |
| **Metadata Includes License (Strong)** | There are no improvements. |

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| **Principle** | R1.2 |
| **Description** | (Meta)data are associated with detailed provenance. |
| **RaCE** | **/ \* Provenance (meta)data is identified? \* /**    Yes, the source metadata is identified.    **/ \* There are documents to describe the provenance \* /**    There are detailed documents of provenance, [https://www.uniprot.org/help/unirule](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://www.uniprot.org/help/unirule) |
| **Result of RaCE (by color)** |  |
| **Recommendations** | Even if the (meta)data is associated with detailed provenance, there is no connection or documents that refer to the conception of a provenance. |
| **MaCE** | There is no FAIR METRICS GEN2 for this principle. |
| **Result of MaCE (by color)** | There is no FAIR METRICS GEN2 for this principle. |
| **Recommendations** | There is no FAIR METRICS GEN2 for this principle. |

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| **Principle** | R1.3 |
| **Description** | (Meta)data meet community standards relevant to the domain. |
| **RaCE** | It is not possible to analyze this Principle . |
| **Result of RaCE (by color)** | It is not possible to analyze this Principle . |
| **Recommendations** | It is not possible to analyze this Principle . |
| **MaCE** | There is no FAIR METRICS GEN2 for this principle. |
| **Result of MaCE (by color)** | There is no FAIR METRICS GEN2 for this principle. |
| **Recommendations** | There is no FAIR METRICS GEN2 for this principle. |