Kegg: <https://www.genome.jp/kegg/>

Variable Control:

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| **URI used** | https://www.genome.jp/kegg-bin/show\_organism?org=T00004 |
| **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, identifiers are not persistent.  [https: //www.re3da ta.org/repository/r3d100011570](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://www.re3data.org/repository/r3d100011570)  Identifiers are persistent when found on identifiers.org:  https://registry.identifiers.org/registry/kegg.genome  **/\*Comments\*/**  Local identifiers are standardized and documented. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations?** | There are no improvements | |
| **MaCE** | **METRIC DESCRIPTION** | **ANALYZE** |
| **Unique Identifier**  Test whether the metadata resource has a unique identifier | It has a 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 ). | His persistence was found on 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 ). | His persistence was found on Identifiers.org |
| **Result of RaCE (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.  **/ \* Is the metadata complete? \* /**  Perhaps, there is metadata external to the repository, where the connection could be better. Ex: Use DOI type CURIE identification in articles.  **/ \* 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, it is possible to find RDF-style files and JSON-LD ( [https://demos.algorithmia.com/web-page-inspector](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://demos.algorithmia.com/web-page-inspector) ) to be extracted |
| **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-LD, 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 RDF-style files and JSON-LD ( [https://demos.algorithmia.com/web-page-inspector](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://demos.algorithmia.com/web-page-inspector)) to be extracted |
| **Result of RaCE (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? \* /**  Yes, the identifier for the data is explicit.  **/ \* Are there different identifiers for metadata and data? \* /**    There is not, it uses the same identifiers.    **/\*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. | From the RDF file it is possible to find the unique identifier for the data.    Used: Extruct and Web Page Inspector |
| **Metadata Identifier Explicitly in Metadata**  Metric to test whether metadata contains the unique identifier for the metadata itself. This is done using a variety of scraping tools, including resolving DOI metadata, using the Python tool ' extruct ' and other ... | Exclusive identifiers was found. |
| **Result of RaCE (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 RaCE (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** | **/ \* Do you use standardized protocols? \* /**    Yes, it uses standardized protocols for data access.    **/ \* Do you have proprietary software for data access? \* /**    It does not have any proprietary software.    **/\*Comments\*/**    It is possible to access via FTP, but must be registered and have a paid subscription to access the system |
| **Result of RaCE (by color)** |  |
| **Recommendations?** | There are no improvements. |
| **MaCE** | There is no FAIR METRICS GEN2 for this Principle. |
| **Result of RaCE (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? \* /**    There are no restrictions on access to (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 your resolution protocol. Currently passes InChI keys, DOIs, identifiers and URLs. The recognition of other identifiers will be added at the request of the community. | Several identifiers are returned that link to the data, even those that are not in the repository. DOI, URL, proper identifiers are examples of return when using JSON. |
| **Uses Open Free Protocol for Metadata Retrieval**  The metadata can be retrieved by an open and free protocol. Tests the metadata GUID for your resolution protocol. Currently passes InChI keys, DOIs, identifiers and URLs. The recognition of other identifiers will be added at the request of the community. | Metadata is recovered, but it is not structured, only some are if and only if the rdf file is downloaded, if it does not happen, they are extracted as plain text. |
| **Result of RaCE (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? \* /**    Yes, to use the FTP service, registration and payment of a fee is required to allow access to be granted. With the right to restricted access it is possible to download the entire database. | |
| **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 your resolution protocol. Currently passes InChI keys, DOIs, identifiers and URLs. He also searches for metadata by Dubl in Core's ' 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 to allow 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. Recognition from 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 RaCE (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? \* /**  It was not possible to identify.  **/ \* (Meta)data can be erased? \* /**  Yes, they can be deleted. Seen and m: https://www.genome.jp/kegg/docs/updnote.html#deleted  **/ \* (Meta)data can be updated? \* /**  Yes, they can be updated. Seen at: https://www.genome.jp/kegg/docs/updnote.html  **/ \* Is it possible to access metadata of data that no longer exists? \* /**  In [https://www.genome.jp/kegg/docs/updnote.html#deleted it](https://translate.google.com/translate?hl=pt-BR&prev=_t&sl=pt&tl=en&u=https://www.genome.jp/kegg/docs/updnote.html%23deleted#deleted) is possible to identify data that does not exist, contains some metadata, but without metadata to identify the data holder. In addition, it cites external repositories in reference to the deleted record.  **/ \* Is there a persistence polic? \* /**  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/pi m / doc # persistencePolicy predicate in linked data. | It was not possible to find any persistence policy using any approach |
| **Result of RaCE (by color)** | **Metadata Persistence** |  |
| **Recommendations?** | **Metadata Persistence** | In order to comply with this metric, it is necessary to indicate a persistence policy in the registration source code. |

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? \* /**    It does not use any knowledge representation language.    **/ \* Taxonomies, ontologies, controlled vocabularies are referenced or found in the repository? (Must meet F 1) \* /**    Controlled vocabularies, thesaurus and general taxonomies are found, however not all of them meet Principle F1.    **/ \* Comments \* /**    There isn’t. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations?** | It is necessary to use some knowledge representation language (RDF, OWL, DAML-OIL, JSON LD, are highly used examples).  Taxonomies, ontologies, controlled vocabularies must comply with Principle F1. | |
| **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. | It has a data structuring through rdf file and through the html / text structuring (free version). |
| **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 ). | It has RDF file that can be extracted with metadata. |
| **Result of RaCE (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 don't follow.    **/\*Comments\*/**    The controlled vocabulary is well documented and found in all instances of registration in the repository. | |
| **Result of RaCE (by color)** |  | |
| **Recommendations?** | Vocabularies must meet all FAIR Principles, as they can be "called" the base repository, vocabularies that serve FAIR Principles facilitate the design of a repository based on FAIR Principles.    Using FAIR DATA POINT can be a way to meet this Principle. | |
| **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. | It makes use of linked data. |
| **Uses FAIR Vocabularies (STRONG) Metadata**  Maturity indicator to test whether linked data metadata uses resolved linked data (FAIR) terms. | No resolved predicates were found for linked data. |
| **Result of RaCE (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 Principle** | (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.    **/ \* 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, through the generated RDF file it is possible to obtain qualified references. In addition, the metadata itself (other than the rdf file) references external links to the repository. |
| **Result of RaCE (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 isn't . |
| **Result of RaCE (by color)** |  |
| **Recommendations?** | There are no improvements. |
| **MaCE** | There is no FAIR METRICS GEN2 for this Principle. |
| **Result of RaCE (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. | No License properties were found in the metadata. |
| **Metadata Includes License (Strong)**  Maturity indicator to test whether the linked data metadata contains an explicit license pointer. Tests: xhtml , dvia , dcterms , cc , data.gov.au and Schema license predicates on linked data and validates the value of these properties. | No License properties in itself was found in the metadata. |
| **Result of RaCE (by color)** | **Metadata Includes License (Weak)** |  |
| **Metadata Includes License (Strong)** |  |
| **Recommendations?** | **Metadata Includes License (Weak)** | It is necessary to include in the records means so that it is possible to identify the use licenses. Use of xhtml , dvia , dcterms , cc , data.gov.au and Schema licenses in linked data are examples to meet this metric. |
| **Metadata Includes License (Strong)** | It is necessary to include in the records means so that it is possible to identify the use licenses. Use of xhtml , dvia , dcterms , cc , data.gov.au and Schema licenses in linked data are examples to meet this metric. |

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| **Principle** | R1.2 |
| **Description** | (Meta)data are associated with detailed provenance. |
| **RaCE** | **/ \* Provenance (Meta)data is identified? \* /**    Yes, the provenance metadata is identified, access via FTP has more provenance data.    **/ \* There are documents to describe the provenance \* /**    There are no provenance documents. Possibly in the restricted area there is some kind of doc. |
| **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 RaCE (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 RaCE (by color)** | There is no FAIR METRICS GEN2 for this Principle. |
| **Recommendations?** | There is no FAIR METRICS GEN2 for this Principle. |