

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

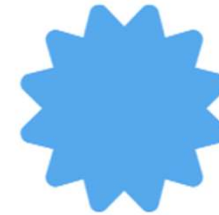
[illegible]

Publish



Certification

Certify your Research Data on the blockchain.



This protects your intellectual property and safeguards against potential future scooping by generating a unique identifier from your data that is then stored on the chain. A certificate is then created to provide proof that this information belongs to you or your organization.

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON

External JSON

Dataset:

FRIM - Fruit Integrative Modelling

bloxberg Server URL:

https://certify.bloxberg.org/

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

0x00

Publish

1

▶ Metadata file

👁 META_frim1.json

▶ bloxberg metadata

👁 bloxberg_metadata_frim1.json

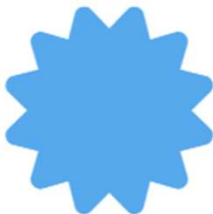
▶ bloxberg query

👁 bloxberg_query_frim1.json



Certification

Certify your Research Data on the blockchain.



This protects your intellectual property and safeguards against potential future scooping by generating a unique identifier from your data that is then stored on the chain. A certificate is then created to provide proof that this information belongs to you or your organization.

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

0x1234567890123456789012345678901234567890

Publish

1

- ▶ Metadata file
 - ▶ bloxberg metadata
 - ▶ bloxberg query
- 👁 META_frim1.json
 - 👁 bloxberg_metadata_frim1.json
 - 👁 bloxberg_query_frim1.json

Metadata File

```
{
  "profile": "https://pmb-bordeaux.fr/maggot/conf/maggot-schema.json",
  "title": "frim1",
  "fulltitle": "FRIM - Fruit Integrative Modelling",
  "license": "Etalab V2.0 license",
  "depositor": "Jacob Daniel",
  "publication_idnumber": "10.1104/pp.113.231241",
  "publication_url": "https://doi.org/10.1104/pp.113.231241",
  "description": "The project aimed to build a virtual tomato fruit that enables the prediction of metabolite levels given genetic and environmental inputs, by an iterative process between laboratories which combine expertise in fruit biology, ecophysiology, theoretical and experimental biochemistry, and biotechnology.",
  "publication_citation": "Biais B, Bénard C, Beauvoit B, Colombié S, Prodhomme D, Ménard G, Bernillon S, Gehl B, Gautier H, Ballias P, Mazat J-P, Sweetlove L, Génard M, Gibon Y. 2014. Remarkable reproducibility of enzyme activity profiles in tomato fruits grown under contrasting environments provides a roadmap for studies of fruit metabolism. Plant Physiology 164, 1204-1221",
  "status": "Processed",
  "access_rights": "Public",
  "publication_idtype": "doi",
  "contacts": [
    "Gibon Yves"
  ],
  "authors": [
    "Bénard Camille",
    "Biais Benoit",
    "Beauvoit Bertrand",
    "Colombié Sophie"
  ],
  "collectors": [
    "Bénard Camille",
    "Biais Benoit",
    "Ballias Patricia",
    "Maucourt Mickaël"
  ],
  "curators": [
    "Moing Annick",
    "Jacob Daniel"
  ],
  "leader": [
    "Gibon Yves"
  ],
  "wpleader": [
    "Vercambre Gilles"
  ],
  "producer": [
    "Bordeaux Metabolome"
  ]
}
```

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON

External JSON

Dataset:

FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

0x1234567890123456789012345678901234567890

Publish

1

▶ Metadata file

▶ bloxberg metadata

▶ bloxberg query

👁 META_frim1.json

👁 bloxberg_metadata_frim1.json

👁 bloxberg_query_frim1.json

Metadata of the Metadata File

```
{
  "@context": {
    "dc": "http://purl.org/dc/terms/"
  },
  "@type": "Dataset",
  "dc:creator": "https://orcid.org/0000-0001-8161-1089",
  "dc:language": "en",
  "dc:format": "application/json",
  "dc:title": "FRIM - Fruit Integrative Modelling",
  "dc:subject": "https://id.loc.gov/authorities/subjects/sh96000740",
  "dc:date": "2023-11-27T16:17:11.3629640Z",
  "dc:description": "The project aimed to build a virtual tomato fruit that enables the prediction of metabolite levels given genetic and environmental inputs, by an iterative process between laboratories which combine expertise in fruit biology, ecophysiology, theoretical and experimental biochemistry, and biotechnology.",
  "dc:publisher": [
    "https://ror.org/00ccdp17"
  ],
  "dc:rights": "http://spdx.org/licenses/CC-BY-NC-SA-4.0.json",
  "dc:identifier": {
    "@value": "https://pmb-bordeaux.fr/magot/metadata/frim1?format=magot",
    "@type": "http://purl.org/dc/terms/URI"
  }
}
```

Same as

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

0x00

Publish

1

- ▶ Metadata file
- ▶ bloxberg metadata
- ▶ bloxberg query

- 👁 META_frim1.json
- 👁 bloxberg_metadata_frim1.json
- 👁 bloxberg_query_frim1.json

Metadata of the Metadata File

```
{
  "@context": {
    "dc": "http://purl.org/dc/terms/"
  },
  "@type": "Dataset",
  "dc:creator": "https://orcid.org/0000-0001-8161-1089",
  "dc:language": "en",
  "dc:format": "application/json",
  "dc:title": "FRIM - Fruit Integrative Modelling",
  "dc:subject": "https://id.loc.gov/authorities/subjects/sh96000740",
  "dc:date": "2023-11-27T16:17:11.3629640Z",
  "dc:description": "The project aimed to build a virtual tomato fruit that enables the prediction of metabolite levels given genetic and environmental inputs, by an iterative process between laboratories which combine expertise in fruit biology, ecophysiology, theoretical and experimental biochemistry, and biotechnology.",
  "dc:publisher": [
    "https://ror.org/00ccpdp17"
  ],
  "dc:rights": "http://spdx.org/licenses/CC-BY-NC-SA-4.0.json",
  "dc:identifier": {
    "@value": "https://pmb-bordeaux.fr/maggot/metadata/frim1?format=maggot",
    "@type": "http://purl.org/dc/terms/URI"
  }
}
```

Same as

Hash sha256

Request

```
{
  "publicKey": "0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53",
  "crid": [
    "ae008cc8ebd20834befa9442db0e59d53effe5ba6cbb8612f9544f8be2fec2b0"
  ],
  "cridType": "sha2-256",
  "enableIPFS": false,
  "metadataJson": "{ \"@context\": { \"dc\": \"http://purl.org/dc/terms/\" }, \"@type\": \"Dataset\", \"dc:creator\": \"https://orcid.org/0000-0001-8161-1089\", \"dc:language\": \"en\", \"dc:format\": \"application/json\", \"dc:title\": \"FRIM - Fruit Integrative Modelling\", \"dc:subject\": \"https://id.loc.gov/authorities/subjects/sh96000740\", \"dc:date\": \"2023-11-27T16:17:11.3629640Z\", \"dc:description\": \"The project aimed to build a virtual tomato fruit that enables the prediction of metabolite levels given genetic and environmental inputs, by an iterative process between laboratories which combine expertise in fruit biology, ecophysiology, theoretical and experimental biochemistry, and biotechnology.\", \"dc:publisher\": [\"https://ror.org/00ccpdp17\"], \"dc:rights\": \"http://spdx.org/licenses/CC-BY-NC-SA-4.0.json\", \"dc:identifier\": { \"@value\": \"https://pmb-bordeaux.fr/maggot/metadata/frim1?format=maggot\", \"@type\": \"http://purl.org/dc/terms/URI\" } }"
```

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:






0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

0x1234567890123456789012345678901234567890

Publish

2

- ▶ Metadata file   META_frim1.json
- ▶ bloxberg metadata  bloxberg_metadata_frim1.json
- ▶ bloxberg query  bloxberg_query_frim1.json
- ▶ bloxberg response  bloxberg_response_frim1.json

```
[
  {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://w3id.org/bloxberg/schema/research_object_certificate_v1"
    ],
    "type": [
      "VerifiableCredential",
      "BloxbergCredential"
    ],
    ...
    "proof": {
      "type": "MerkleProof2019",
      "created": "2023-10-31T08:18:52.993006",
      "proofValue": "z7veGuiqoKR3AS5A6VJKrNwcowzhzPvSz9MSMz8661R7iJ1FtnmVUbSJLwna4b9f4MNsJ634P7m51PW
KYmUhEowJFpyuYDBmx3AT8bFYP3cQ22kDea7gTYiLRdPtVApGUDwDg86MwozSE4o76FhFDWkUKnTetca5f63Gebifrk8S9
Ro1B4yN4Qx7PRqTPESaiUadffofXiwbxtTiQ7ipTQPuk5auhJbt1S4wCj3ELaFL4pYozYBUPVrNjgFWiVQxeTHR1NBqh
C9JHxmrJfkuXJvL15aJEHwW2XhE86zYuKHuSPmUrCm8",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "ecdsa-koblitz-pubkey:0xD748BF41264b906093460923169643f458DbC32e",
      "ens_name": "mpd1.berg"
    }
  }
]
```

EXPERIMENTAL - bloxberg Blockchain ?

Certification of metadata file on the bloxberg blockchain

Internal JSON

External JSON

Dataset:

FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

Publish

2

▶ Metadata file

▶ bloxberg metadata

▶ bloxberg query

▶ bloxberg response

👁 META_frim1.json

👁 bloxberg_metadata_frim1.json

👁 bloxberg_query_frim1.json

👁 bloxberg_response_frim1.json

```
[
  {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://w3id.org/bloxberg/schema/research_object_certificate_v1"
    ],
    "type": [
      "VerifiableCredential",
      "BloxbergCredential"
    ],
    "proof": {
      "type": "MerkleProof2019",
      "created": "2023-10-31T08:18:52.993006",
      "proofValue": "z7veGuiqoKR3AS5A6VJKrNwcowzhzPvSz9MSMz8661R7iJ1FtnmVUbSjLwna4b9f4MNsJ634P7m51PWKYmUhEowJFpyuYDBmx3AT8bFYP3cQ22kDea7gTYiLRdPtVApGUDwDg86MwozSE4o76FhFDWkUKnTetca5f63Gebifrk8S9Ro1B4yN4QxF7PRqTPESaiUadffofXiwbxtTiQ7ipTQPuk5auhJbt1S4wCj3ELaFL4pYozYBUPVrNjgFWiVQxeTHR1NBqhC9JHxmrJfkuXJvL15aJEHwW2XhE86zYuKHuSPmUrCm8",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "ecdsa-koblitz-pubkey:0xD748BF41264b906093460923169643f458DbC32e",
      "ens_name": "mpdl.berg"
    }
  }
]
```

Proof of Authority

Transactions and blocks are validated by approved accounts, known as validators.

However the process is automated and does not require validators to be constantly monitoring their computers.

https://en.wikipedia.org/wiki/Proof_of_authority

Certification of metadata file on the bloxberg blockchain

Internal JSON External JSON

Dataset: FRIM - Fruit Integrative Modelling

bloxberg Server URL:

<https://certify.bloxberg.org/>

Wallet bloxberg:

0xC604ffa8adE14dc9A22B6B19bdFC07E489156E53

API bloxberg:

Publish

3

- | | |
|------------------------|----------------------------------|
| ▶ Metadata file | 👁 META_frim1.json |
| ▶ bloxberg metadata | 👁 bloxberg_metadata_frim1.json |
| ▶ bloxberg query | 👁 bloxberg_query_frim1.json |
| ▶ bloxberg response | 👁 bloxberg_response_frim1.json |
| ▶ bloxberg certificate | 👁 bloxberg_certificate_frim1.zip |

Success : the metadata file has been certified on the bloxberg blockchain
Download the ZIP which contains the corresponding certificate as a PDF file

```
[
  {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://w3id.org/bloxberg/schema/research_object_certificate_v1"
    ],
    "type": [
      "VerifiableCredential",
      "BloxbergCredential"
    ],
    "proof": {
      "type": "MerkleProof2019",
      "created": "2023-10-31T08:18:52.993006",
      "proofValue": "z7veGuIqpKR3ASSA6VJKrNwcowzhzPvSz9MSMz8661R7iJ1FtnmVUbSJJLwna4b9f4fNsJ634P7m51PW
KYmUhEowJfPyuYDBmx3AT8bFYP3cQ22kDea7gTYiLRdPtVApGUDwDg86MwozSE4o76FhFDwKUKnTetca5f63GebifrkS9
Ro1B4yN4QxF7PRqTPESaiUadffofXiwbxtTiQ7ipTPuk5auhJbt1S4wCj3ELaFL4pYozYBUPVrNjgFwiVQxeTHR1N8qh
C9JHxmRj3fkuXjVl15aJEHwW2XhE86zYuKHuSPmUrCm8",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "ecdsa-koblitz-pubkey:0xD748BF41264B906093460923169643f458DbC32e",
      "ens_name": "mpdl.berg"
    }
  }
]
```

