

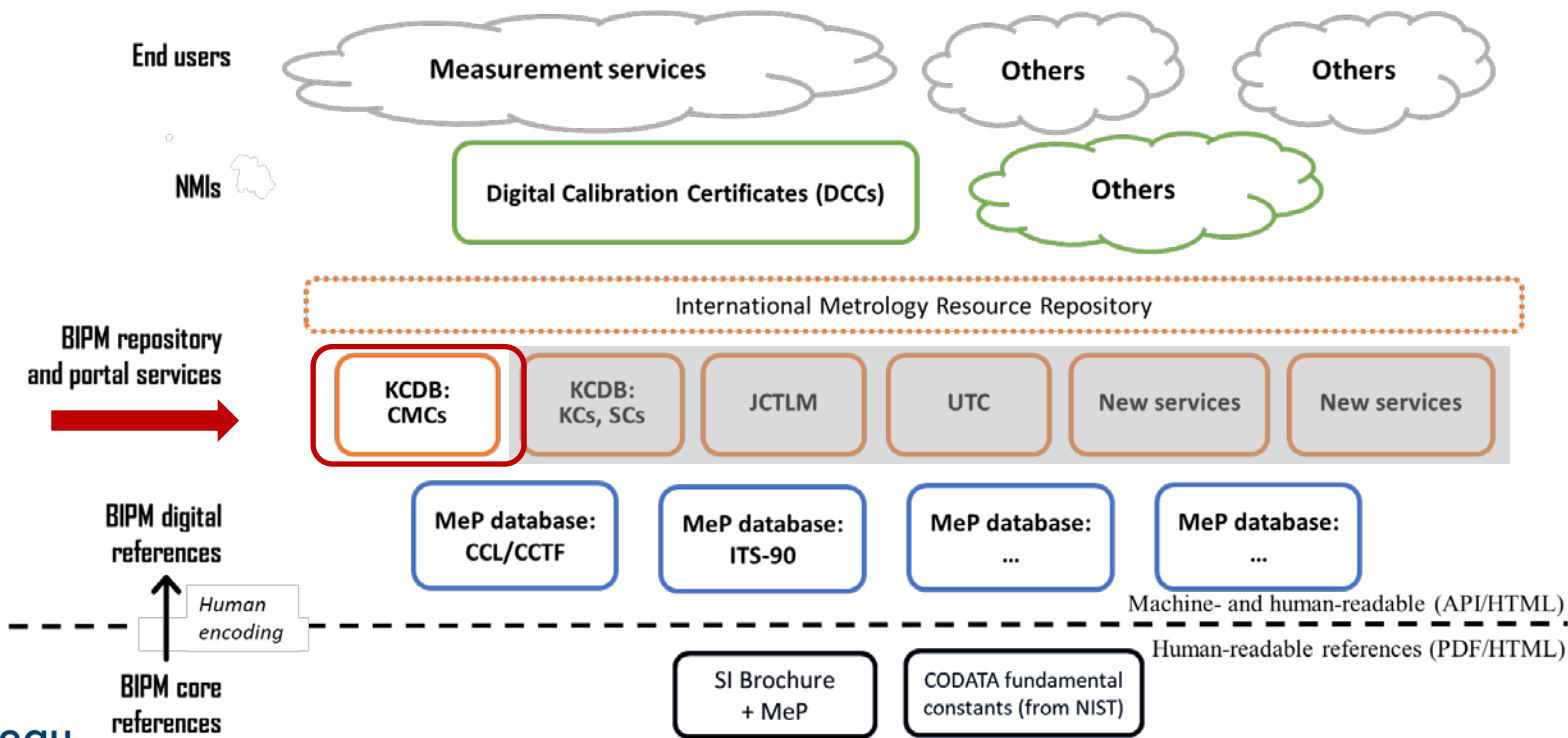


# CIPM MRA and API KCDB

The screenshot shows the homepage of the CIPM MRA API KCDB website. The header includes navigation links for 'to BIPM.org', 'CIPM MRA PARTICIPANTS', 'BIPM.KCDB@bipm.org', 'Logout', and a dropdown menu for 'CHEMISTRY AND BIOLOGY'. The main content area features a navigation bar with 'CMCS', 'COMPARISONS', 'BACK OFFICE', 'NEWS', and 'STATISTICS'. Below this, there are two search sections: 'Calibration and Measurement Capabilities - CMCs' and 'Key and supplementary comparisons', each with a search input field and a 'SEARCH' button. The 'News' section displays a recent article from June 22, 2022, titled 'Radiation processing dose levels - CCRI'. The 'Statistics' section shows a world map with colored regions and labels for participating countries: SIM, EURAMET, COOMET, GULFMET, and APMP.



Application and  
Programming Interface  
for published CMCs  
- API KCDB -



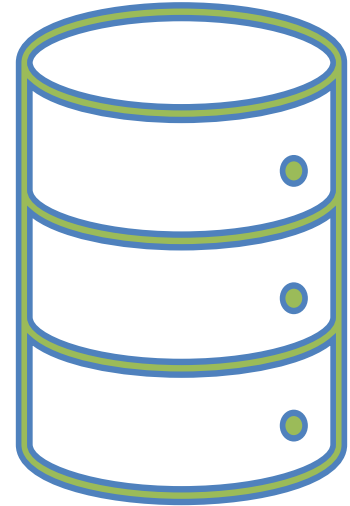
# KCDB web

Calibration and Measurement Capabilities – CMCs

SEARCH



→ [Advanced search](#)

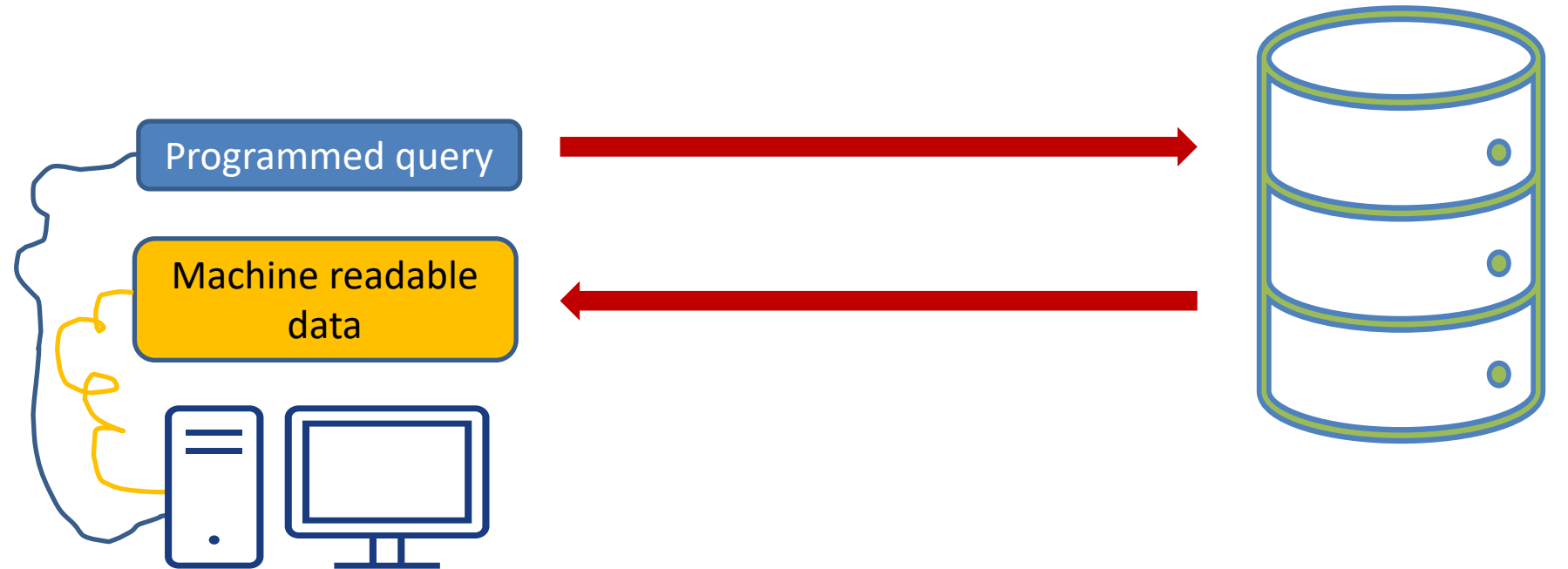


The screenshot shows the KCDB website interface. At the top, it says "All data listed in the KCDB have been reviewed and approved within the CIPM Mutual Recognition Arrangement". Below this is a navigation menu with "CMCS" selected. The main content area shows search results for "resistance". The results list "Japan, NMJJ AIST (National Metrology Institute of Japan)" with details on DC resistance standards and sources, including a table of relative expanded uncertainty values (5.6E-2 μΩ/Ω to 0.54 μΩ/Ω).

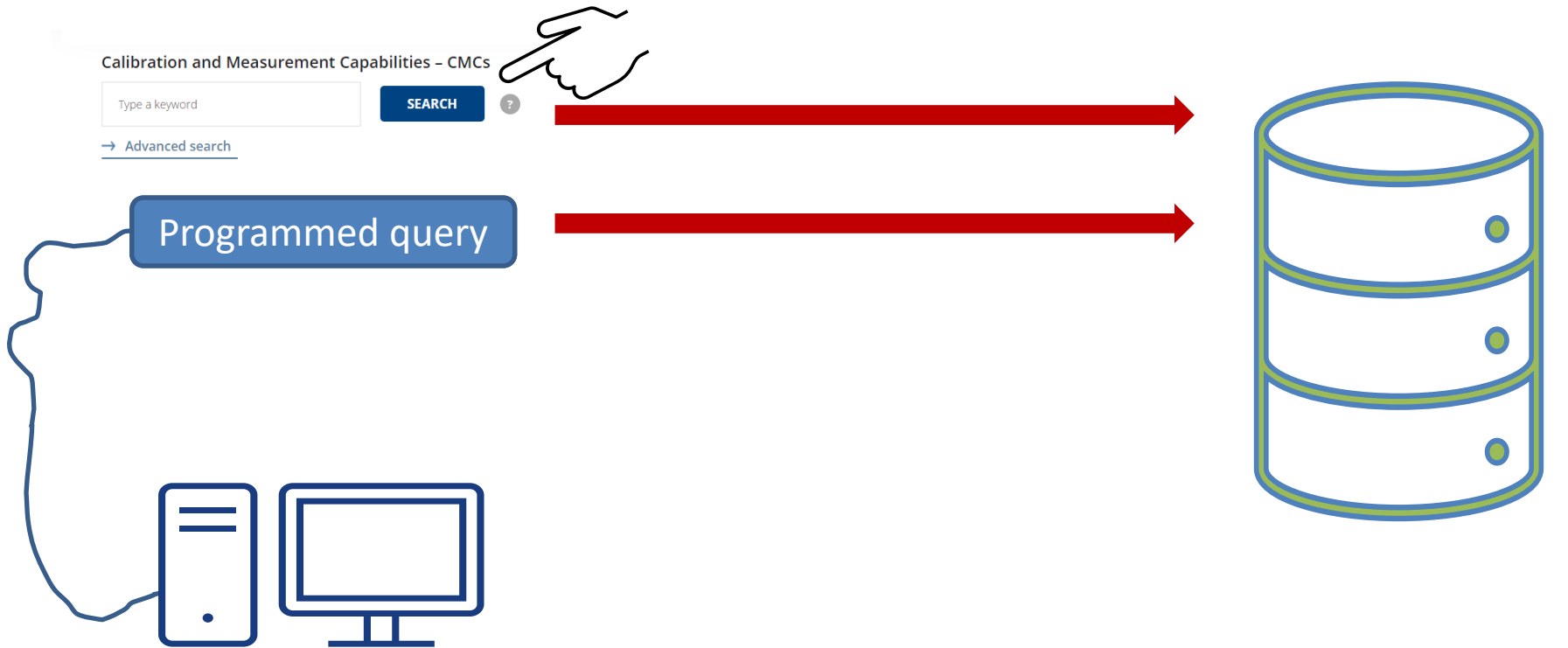
[www.bipm.org](http://www.bipm.org)

<https://www.bipm.org/kcdb/>

# API - Application Programming Interface



# API - Application Programming Interface



# Advantages of an API KCDB

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## Possibility ...

- to provide machine readable CMCs that can be referred to by Digital Calibration Certificates issued by National Metrology Institutes
- to follow the life cycle of a CMC by accessing obsolete data (presently not openly available)
- to enlarge statistical data treatment
- to combine CMC data with other types of information (“big data”)
- to adapt part of the contents to other languages than English

# Get access to information on API KCDB

The image shows a screenshot of the KCDB website. At the top, there is a navigation bar with links for 'to BIPM.org', 'CIPM MRA PARTICIPANTS', 'BIPM.KCDB@bipm.org', 'Logout', and a dropdown menu for 'CHEMISTRY AND BIOLOGY'. Below this is the KCDB logo and a statement: 'All data listed in the KCDB have been reviewed and approved within the CIPM Mutual Recognition Arrangement'. A main navigation bar contains links for 'CMCS', 'COMPARISONS', 'BACK OFFICE', 'NEWS', and 'STATISTICS'. The page content includes search boxes for 'Calibration and Measurement Capabilities - CMCS' and 'Key and supplier', a 'News' section with a recent article from June 2022, and a 'Statistics' section. A dark blue dropdown menu is open, listing various navigation options: 'KCDB', 'What is the KCDB', 'Help on the KCDB', 'FAQ', 'API KCDB', 'Contact', 'Participants', 'About the CIPM MRA', 'JCRB', 'Policy documents', 'Guidance on Comparisons', and 'Guidance on CMCS'. A large yellow arrow points to the 'API KCDB' option in the dropdown menu.

← to BIPM.org

CIPM MRA PARTICIPANTS BIPM.KCDB@bipm.org Logout CHEMISTRY AND BIOLOGY

KCDB

All data listed in the KCDB have been reviewed and approved within the CIPM Mutual Recognition Arrangement

CMCS COMPARISONS BACK OFFICE NEWS STATISTICS

Calibration and Measurement Capabilities - CMCS

Type a keyword SEARCH

→ Advanced search

Key and supplier

Type a keyword or id

→ Advanced search

News

22 JUNE 2022

Radiation processing dose levels - CCRI

A supplementary comparison of standards for absorbed dose to water in  $^{60}\text{Co}$  fields used for calibrations at radiation processing dose levels has been completed, and the Fibnal Report can be consulted in the KCDB - [CCRI\(III\)-S3](#). This is a comparison in the field of Ionizing Radiation in which 7 state economies participated.

Statistics

SIM

KCDB

What is the KCDB

Help on the KCDB

FAQ

API KCDB

Contact

Participants

About the CIPM MRA

JCRB

Policy documents

Guidance on Comparisons

Guidance on CMCS

CLASSIFIC

Acoustics

Vibration

Chemistry

Electricity

Ionizing R

Length



# Get access to information on API KCDB



ABOUT THE KCDB

KCDB REPORTS

STATISTICS

HELP ON THE KCDB

FAQ

API KCDB

## API KCDB

### Terms of use

The BIPM maintains the [KCDB website](#) to assure public access to comparison and calibration-and-measurement (CMC) data within the frame of the International Committee for Weights and Measures Mutual Recognition Arrangement (CIPM MRA). The data included has been peer reviewed and approved for mutual recognition through the processes defined for the CIPM MRA. The data are since the 29 October 2019 provided digitally by the participating institutes, having access and control of the contents.

### Licence

The Application Programming Interface has been developed for CMCs that are included in the Key Comparison Database (API KCDB) and is openly available.

API KCDB



### Guidance

API KCDB Guide

"What is an API?"

# Access API KCDB

## API KCDB

1.0.6 OAS3

/api/kcdb/v3/api-docs

Application API KCDB BIPM

### cmc-search-data-controller API for CMC queries



**POST** /cmc/searchData/chemistryAndBiology Advanced search for CHEM-BIO domain

**POST** /cmc/searchData/physics Advanced search for PHYSICS domain

**POST** /cmc/searchData/quickSearch Quick search

**POST** /cmc/searchData/radiation Advanced search for RADIATION domain

**GET** /cmc/searchData/xsdSchema Retrieve XSD

### reference-data-controller API to recover reference data for CMC queries



Schemas



- possibility to program advanced (menu based) or quick (search word) search
- queries and results in xml or json
- supported by a guide for users not acquainted with the KCDB contents

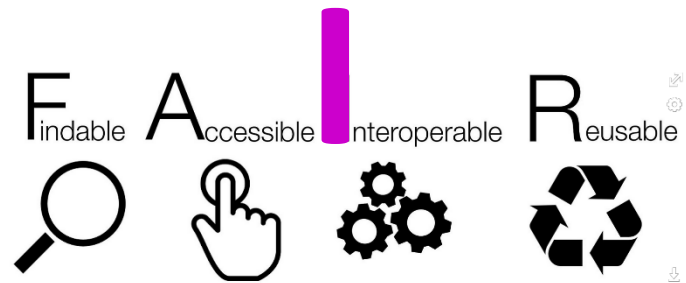
API KCDB  
GUIDE

# Example of API KCDB query - xml

```
<?xml version="1.0" encoding="UTF-8"?>
<SearchCriteriaPhysics>
  <page>0</page>
  <pageSize>20</pageSize>
  <showTable>>false</showTable>
  <metrologyAreaLabel>EM</metrologyAreaLabel>
  <branchLabel>EM/DC</branchLabel>
  <physicsCode>1.1.1</physicsCode>
  <keywords>voltage</keywords>
  <countries>
    <countryLabel>JP</countryLabel>
  </countries>
  <publicDateFrom>2005-01-31</publicDateFrom>
  <publicDateTo>2022-05-30</publicDateTo>
</SearchCriteriaPhysics>
```

```
<ResultsPhysics>
  .
  <status>Published</status>
  <statusCode>2021-07-13</statusCode>
  <kcdbCode>APMP-EM-JP-00000D0A-2</kcdbCode>
  <metrologyAreaLabel>EM</metrologyAreaLabel>
  <rmo>APMP</rmo>
  <countryValue>Japan</countryValue>
  <nmiCode>NMIJ AIST</nmiCode>
  <nmiName>National Metrology Institute of Japan</nmiName>
  <nmiServiceCode>NMIJ/1.1.1</nmiServiceCode>
  <quantityValue>DC voltage sources: single values</quantityValue>
  <cmc>
    <lowerLimit>1.0</lowerLimit>
    <upperLimit>10.0</upperLimit>
    <unit>V</unit>
  </cmc>
  <cmcUncertainty>
    <lowerLimit>8.0</lowerLimit>
    <upperLimit>45.0</upperLimit>
    <unit>nV</unit>
  </cmcUncertainty>
  .
  <subServiceValue>DC voltage sources</subServiceValue>
  <individualServiceValue>Single values</individualServiceValue>
</ResultsPhysics>
```

# API KCDB and FAIR



Permit a universal exchange of data

# API KCDB and FAIR

## Preliminary **data model**

developed by the « expert group » under the auspices of  
CIPM TG-DSI

**Number**

3

**Unit**

$\mu\text{V}$

**QuantityKind**

voltage

**Scale**

rational

+ M-layer

# API KCDB and FAIR

## Preliminary **data model**

developed by the « expert group » under the auspices of  
CIPM TG-DSI

<b>Number</b>	10	55
<b>Unit</b>	dimensionless	dimensionless
<b>QuantityKind</b>	mole fraction	mass fraction
<b>Scale</b>	rational	rational

# API KCDB and FAIR

```
<?xml
<SearchCriteriaPhysics>
  <unit>V</unit>
  <parentCode>
    <parentCode><unit> $\mu$ V</unit>
  </parentCode>
  <showQuantityValue>DC voltage sources:
  <multipleValues>
    <br>single values</quantityValue>
  </multipleValues>
  <physicsCode>1.1.1</physicsCode>
  <keywords>voltage</keywords>
  <countries>
    <countryLabel>JP</countryLabel>
  </countries>
  <publicDateFrom>2005-01-31</publicDateFrom>
  <publicDateTo>2022-05-30</publicDateTo>
</SearchCriteriaPhysics>
```

```
<unit>V</unit>
</parentCode>
</parentCode>
</showQuantityValue>
</multipleValues>
  Institute of Japan</nmiName>
  <serviceCode>
    <quantityValue>DC voltage sources: single values</quantityValue>
  </serviceCode>
  <cmc>
    <lowerLimit>1.0</lowerLimit>
    <upperLimit>10.0</upperLimit>
    <unit>V</unit>
  </cmc>
  <cmcUncertainty>
    <lowerLimit>8.0</lowerLimit>
    <upperLimit>45.0</upperLimit>
    <unit>nV</unit>
  </cmcUncertainty>
  .
  <subServiceValue>DC voltage sources</subServiceValue>
  <individualServiceValue>Single values</individualServiceValue>
</ResultsPhysics>
```

# API KCDB and FAIR

`<unit>V</unit>`

`<unit>μV</unit>`

`<quantityValue>DC voltage sources:  
single values</quantityValue>`

web ontology

web ontology

All data, including meta data, to become interoperable:  
use recognized systems, standards and web ontologies

SI

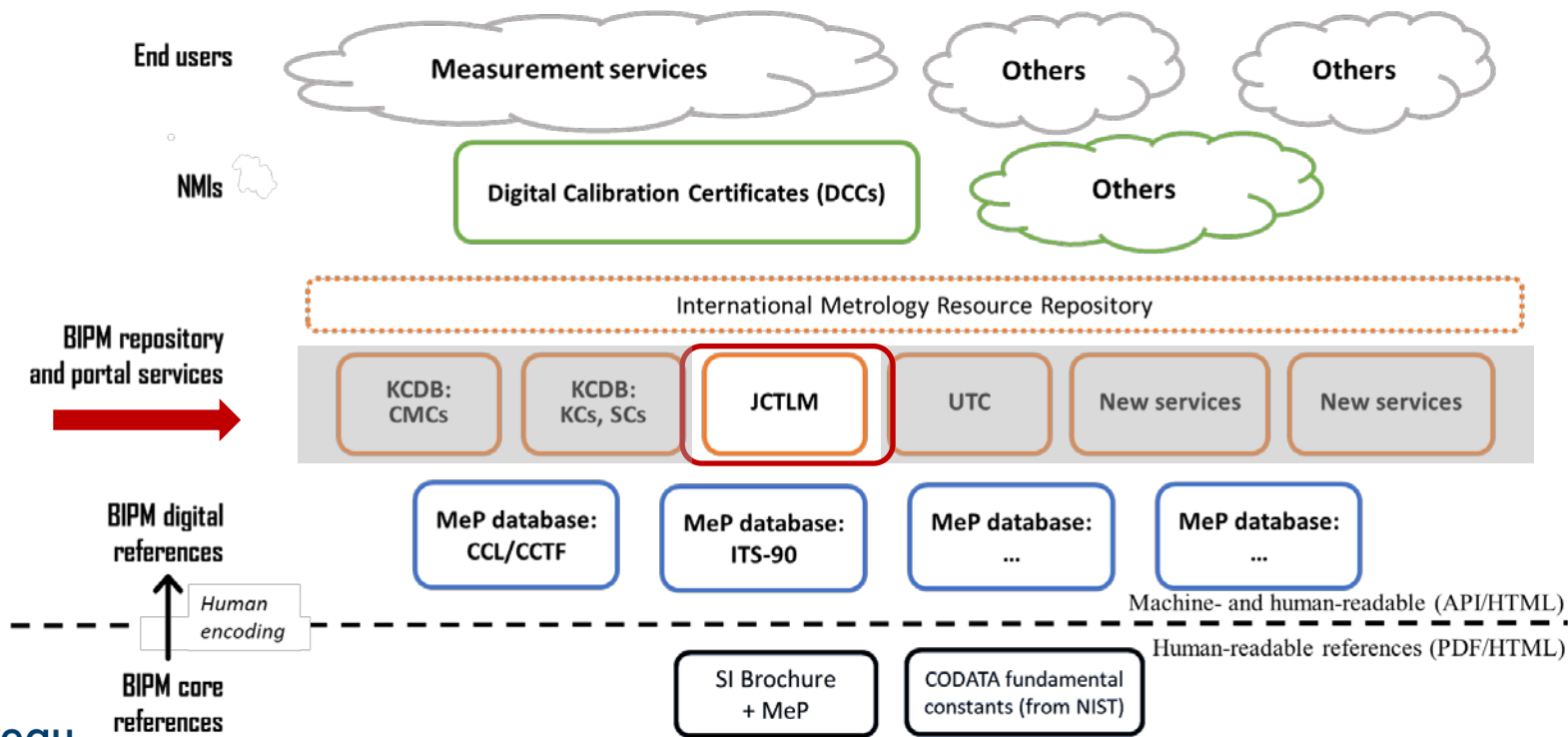
ISO, IEC, CIE, ICRU...

QUDT, UCUM...

*e.g. International Organization for Standardization  
International Electrotechnical Commission  
International Commission on Illumination  
International Commission on Radiation Units and Measurements  
etc. etc.*

*e.g. Quantity, Unit, Dimension and Type ontology  
Unified Code for Units of Measure*





> You are here : JCTLM-DB > Reference materials > List

**Result of the search: list of higher-order reference materials**

**JCTLM Newsletters**

- Issue 7 - June 2020
- Previous Issues

**JCTLM Database**

- Search Form
- List of reference materials no longer listed in the JCTLM Database
- List of reference measurement methods no longer listed in the JCTLM Database
- Contact us
- Survey Form

**JCTLM Members and Stakeholders Meeting**

- 2019 Workshop Presentations and Posters

**JCTLM**

- Presamble
- Joint Committee for Traceability in Laboratory Medicine (JCTLM)

**Your search criteria:** Higher-order reference materials; Analyte: HbA<sub>1c</sub>; category: -; Matrix category: -

[Save as PDF](#) [Modify your selection](#)

**Results of the search**

HbA <sub>1c</sub> in lyophilized human blood hemolysates		
<b>Laboratoire National de Métrologie et d'Essais (LNE), France</b>		
Phone: +33 (0)1 40 43 40 75		Email: <a href="mailto:vincent.delattour@lne.fr">vincent.delattour@lne.fr</a>
Fax: +33 (0)1 40 43 37 05		Web: <a href="http://www.lne.eu/">http://www.lne.eu/</a>
Name of the reference material	LNE HbA <sub>1c</sub> -401, HbA <sub>1c</sub> in lyophilized human blood hemolysates	
Quantity	Amount-of-substance ratio	
Analyte certified/assigned value	32.5 mmol/mol	
Expanded uncertainty (level of confidence 95 %)	1.0 mmol/mol	
Comparability assessment study among listed RMIs	Please contact the LNE for trueness control data using ReCCs 305 HbA <sub>1c</sub> Lot 2 HbA <sub>1c</sub> material listed in the database	
Reference(s) on commutability	Information on commutability is available in the certificate and certification report of the CRM and a publication on trueness assessment of HbA <sub>1c</sub> routine assays is also under preparation.	
Traceability	SI	
CRM listing	<a href="#">List 1</a>	

HbA <sub>1c</sub> in lyophilized human blood hemolysates		
<b>Laboratoire National de Métrologie et d'Essais (LNE), France</b>		
Phone: +33 (0)1 40 43 40 75		Email: <a href="mailto:vincent.delattour@lne.fr">vincent.delattour@lne.fr</a>
Fax: +33 (0)1 40 43 37 05		Web: <a href="http://www.lne.eu/">http://www.lne.eu/</a>
Name of the reference material	LNE HbA <sub>1c</sub> -402, HbA <sub>1c</sub> in lyophilized human blood hemolysates	
Quantity	Amount-of-substance ratio	
Analyte certified/assigned value	50.9 mmol/mol	
Expanded uncertainty (level of confidence 95 %)	2.1 mmol/mol	
Comparability assessment study among listed RMIs	Please contact the LNE for trueness control data using ReCCs 309 HbA <sub>1c</sub> Lot 2 HbA <sub>1c</sub> material listed in the database	
Reference(s) on commutability	Information on commutability is available in the certificate and certification report of the CRM and a publication on trueness assessment of HbA <sub>1c</sub> routine assays is also under preparation.	
Traceability	SI	
CRM listing	<a href="#">List 1</a>	

HbA <sub>1c</sub> in lyophilized human blood hemolysates		
<b>Laboratoire National de Métrologie et d'Essais (LNE), France</b>		
Phone: +33 (0)1 40 43 40 75		Email: <a href="mailto:vincent.delattour@lne.fr">vincent.delattour@lne.fr</a>
Fax: +33 (0)1 40 43 37 05		Web: <a href="http://www.lne.eu/">http://www.lne.eu/</a>
Name of the reference material	LNE HbA <sub>1c</sub> -403, HbA <sub>1c</sub> in lyophilized human blood hemolysates	

## Joint Committee for Traceability in Laboratory Medicine

Database containing reference materials and analytic methods consultable via the website application

<https://www.bipm.org/jctlm/>

# The New JCTLM Database: Added Attributes

```
Select a node...
└─ object {2}
  └─ RM : HbA1c in lyophilized human blood hemolysates
    └─ data [1]
      └─ 0 {10}
        country : FR
        nmiCode : LNE
        nmiName : Laboratoire National de Métrologie et d'Essais (LNE), France
        nmiPhone : +33 (0)1 40 43 40 75
        nmiFax : +33 (0)1 40 43 37 05
        nmiEmail : vincent.delatour@lne.fr
        nmiWeb : http://www.lne.eu/
      └─ RF data-1 {8}
        Name of the reference material : LNE HbA1c 401, HbA1c in lyophilized human blood hemolysates
        Quantity : Amount-of-substance ratio
        Analyte certified/assigned value : 32.5 mmol/mol
        Expanded uncertainty(level of confidence 95 %) : 1.8 mmol/mol
        Comparability assessment : Please contact the LNE for trueness control data using ReCCs JDS HbA1c Lot 2 HbA1c material listed in the database
        Reference(s) on commutability: : Information on commutability is available in the certificate and certification report of the CRM and a publication on trueness assessment of HbA1c routine assays is also under preparation.
        Traceability : SI
        CRM listing : List I includes Certified Reference Materials and Reference Measurement Procedures for well-defined chemical entities or internationally recognized reference method-defined measurands.
      └─ RF data-2 {8}
        Name of the reference material : LNE HbA1c 401, HbA1c in lyophilized human blood hemolysates
        Quantity : Amount-of-substance ratio
        Analyte certified/assigned value : 50.9 mmol/mol
```

JCTLM API – to become FAIR  
machine readable via  
JSON & XML formats

[curl -X POST](https://www.bipm.org/api/jctlm/searchData/RM)  
["https://www.bipm.org/api/jctlm/searchData/RM" -H "accept: application/xml" -H "Content-Type: application/json" -d {"RM": {"HbA1", "ID": "C15RM64"}}](https://www.bipm.org/api/jctlm/searchData/RM)

... and to become Interoperable by  
applying a web ontology

Thank you

**B**ureau  
International des  
Poids et  
Mesures



[www.bipm.org](http://www.bipm.org)