Elsevier EMBASE API

Getting Started Guide and Introduction to New Response Structure

Version 2

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1	January 2023	–	First publication
2	October 2023	–	Updated response structure
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Approval history

Action	Approver	Role	Date

Table of Contents

Overview

Elsevier's EMBASE Application Programming Interface (API) grants programmatic access to the data and indexing of biomedical literature in EMBASE. Any advanced query performed in the EMBASE web interface can also be done via EMBASE API. Furthermore, specific information can be retrieved from a single record. EMBASE API can be used with any tool and/or programming language. This user guide explains how to retrieve data via the EMBASE API.

! Visit the following link to access detailed interface documentation:
Embase API

1. API Specifications

Categories	Medical, Science
API Root-Endpoint	https://api.elsevier.com/content/embase/
Supported Response Formats	XML, JSON
Authentication Model	API Key, Token
Support Email	apisupport@elsevier.com
Developer Support	https://dev.elsevier.com/

! Additional information and specifications can be found at:
Elsevier Developer Portal Documentation: API Specification

2. Authenticate

An application built on the EMBASE API must use a unique caller name known as an Application Caller Name (APIKey) to identify itself, which cannot be reused for another application. Elsevier provides two authentication methods to request API, both requiring an "API Key".

- Institution IP-based authentication access
- Institutional token authentication

! To obtain an API Key and gain access to the EMBASE API, visit:
- Register for an APIKey

To learn more about API keys and authentication, visit:
- API Technical Specifications
- API Authentication

2.1. IP-based authentication

The IP-based method is for institutional subscribers. You must hard-code your API Key into your application and use it to authenticate. You can authenticate by submitting your API Key within a request URL:

```
http://api.elsevier.com/content/embase/article?query=diabetes&APIKey=[YourAPIkey]
```

Or as an http request header (recommended for security):

```
curl -X GET --header 'Accept: application/daas-json' --header 'X-ELS- APIKey: [YourAPIkey]' 'https://api.elsevier.com/content/embase/article?query= diabetes '
```

2.2. Institutional token authentication

An institutional token, or insttoken, is an additional security token submitted in tandem with your APIKey. Insttokens are only available for customers or partners working on behalf of a customer and represents full access to the customer account within Elsevier authentication and entitlements system. All requests must come over an https request header. If you are granted an insttoken, Elsevier provides additional details about restrictions and use.

3. Request

An API URL is called a request while the data sent back to you is called a response.
A request consists of four components:

- Root-endpoint (or route)
- Headers
- Method
- Query parameters

The EMBASE API currently allows a maximum of 6 requests per second per API Key.

3.1. Root-endpoint

The root-endpoint is the starting point of the EMBASE API to which you are placing a request. It follows this structure: root-endpoint/article?

For example, the request URL of a simple query for the term “diabetes” and specifying XML output would look something like this:

```
https://api.elsevier.com/content/embase/article?httpaccept=application/daas-xml&query=diabetes&APIKey=[YourAPIKey]
```

3.2. Headers

The Headers interface of the API allows you to perform various actions on http request and response headers. For the purposes of this guide, we will use the command line utility curl.

Make sure you have curl installed. Type the following command in your system terminal to check the version installed on your system:

```
Curl --version
```

Type curl followed by the root-endpoint you’re requesting. In the case of EMBASE:

```
curl -X GET --header 'Accept: application/daas-json' --header 'X-ELS- APIKey: [apikey]' 'https://api.elsevier.com/content/embase/article?query=diabetes'
```

3.3. Method

The method is the type of request you send to the server. EMBASE API supports two methods (actions) to request data from the server: `GET` and `POST`

Combining your header and root-endpoint with the above actions allows you to search for and retrieve relevant information over the API. The query string must be URLEncoded when making the API call. Use `POST` for requests with very long query strings. Use the following format for `POST` requests:

```
curl -X POST 'https://api.elsevier.com/content/embase/article?apikey=xxx&insttoken=xxx' \
--header 'Content-Type: application/x-www-form-urlencoded' \
--data-urlencode 'query=(\''randomized controlled trial'\''/de OR '\''controlled clinical trial'\''/de OR random*:ti,ab)'
```

The following are the interfaces associated with a search:

URL	Method	Description
https://api.elsevier.com/content/embase/article	GET POST	Use article to search the EMBASE content for records that meet query criteria.
https://api.elsevier.com/content/embase/article/lui/{lui}	GET	Embase Retrieval API (LUI): This represents an article retrieval using a LUI (internal identifier).
https://api.elsevier.com/content/embase/article/pii/{pii}	GET	Embase Retrieval API (PII): This represents an article retrieval using a PII (Publication Item Identifier).
https://api.elsevier.com/content/embase/article/doi/{doi}	GET	Embase Retrieval API (DOI): This represents an article retrieval using a DOI (Digital Object Identifier).
https://api.elsevier.com/content/embase/article/pubmed_id/{id}	GET	Embase Retrieval API (PUBMED_ID): This represents an article retrieval using a MEDLINE PubMed Identifier.

3.4. Query parameters

The last part of the request URL are the query parameters. Query parameters begin with a question mark (?) and each subsequent parameter pair is separated by an ampersand (&). Some commonly used query parameters are listed below.

Query parameter	Description
query	Pass one or more search criteria. Accepts Boolean operators, proximity operators, wildcards (e.g., *, ?), field codes and subheadings.
start	Pass the record number from which to start downloading records retrieved by a request. Note that numbering starts at 1.
count	Pass the number of records to be downloaded. Note that responses cannot exceed 200 records.
httpaccept	Indicate the format for the data download as either XML (application/daas-xml) or JSON (application/daas-json). The API supports a former response structure (used prior to October 2023). To obtain data in that format, use application/xml or application/json, accordingly. See section 6.4 in the Appendix (page 42) for a description of differences.
sort	Pass the criteria by which records in a response should be sorted (e.g., entrydate).

3.5. Field codes

Field codes are used to search specific data fields in EMBASE. The primary content-enhancement entity is descriptor (de). Add them to the parameter query to retrieve records that contain your search word or phrase in the indicated field(s). For example, the following request retrieves all documents added to EMBASE in the week of October 4 to October 11, 2021, starting at record 601 through to record 701. The records are sorted by entrydate and delivered as an XML file.

```
https://api.elseiver.com/content/embase/article?start=601&count=100&sort=entrydate&httpaccept=application/daas-xml&query=? AND [2021-10-04 to 2021-10-10]/ld&APIKey=[YourAPIKey]
```

The field code is ld, which provides the date on which a fully indexed (automatically and manually) record is loaded into EMBASE.

Each code consists of two letters and is preceded by a colon (:) for a phrase or a forward slash (/) for an exact match. However, not all fields currently support both. The following table lists the field codes that can be used in a request.

Code	Field	Example (phrase)	Example (exact)
ab	Abstract	heart:ab	–
ac	Abstract or citation	heart:ac	–
ad	Author address	germany:ad	–
af	Author first name	'mary jane':af	'mary jane'/af
aid	Associated PUI	l628724382:aid	–
an	Accession number	20160043966:an	–
au	Author	smith:au	smith/au
bp	Book publisher	elsevier:bp	–
ca	Country of author	germany:ca	–
cd	CODEN code	OPHTD:cd	–
cl	EMBASE classification	15:cl	–
cn	Clinical trial number	'2006-005504-1':cn	–
ct	Citation	15:ct	–
cy	Country of journal	germany:cy	–
dc	Conference date	'2019 09 19':dc	–
dd	Index term (descriptor – drug terms)	Masked with de	'heparin'/dd
de	Index term (descriptor – combined drug and disease terms)	'aspirin':de	'aspirin'/de
df	Manufacturer ('devices')	siemens:df	siemens/df
dm	Index term (descriptor – disease terms)	Masked with de	'breast cancer'/dm
dn	Tradename ('devices')	signa:dn	signa/dn
do	Digital object identifier (DOI)	'10.1080/095530014551561':do	–
dtype	dbcollection	'embase classic':dtype	–
dv	Index term (descriptor – device terms)	Masked with de	'stent'/dv

Code	Field	Example (phrase)	Example (exact)
ed	Editor	smith:ed	–
em	Author email	'gmail':em	–
exp	Exploded terms	–	'vioxx'/exp
ff	Affiliation	university:ff	university/ff
ib	ISBN	9780128165751:ib	–
id	Luwak unique ID	L2002324214:id	–
ii	Publisher item identifier	s1877117319301061:ii	–
ip	Issue	1:ip	–
is	ISSN	18771173:is	–
it	Publication type	article:it	article/it
jt	Source title	heart:jt	heart/jt
kw	Author keyword	aspirin:kw	aspirin/kw
la	Language of article	german:la	–
ld	Loaded date	–	[2021-10-04 to 2021-10-10]/ld
lc	Conference location	london:lc	–
lnk	Link	diagnosis:lnk	diagnosis/lnk
ls	Language of summary	german:ls	–
mn	Manufacturer ('drugs')	novart:mn	novartis/mn
ms	Molecular sequence number	J04595:ms	–
nc	Conference name	heart:nc	–
oa	Original abstract	'le système de laçage nous a permis':oa	–
oc	ORCID – author unique identifier	1111:oc	'0000-0003-2962-029X'/oc
ok	Original author keywords	he:ok	–
pd	Publication date	1964-01-01:pd	–
pg	Page range	1:pg	–
pt	Source type	journal:pt	–
py	Publication year	2013:py	[2013-2015]/py

Code	Field	Example (phrase)	Example (exact)
rn	CAS registry number	'437 38 7':rn	–
sp	Start page	1:sp	–
ta	Abbreviated journal title	'am j clin h':ta	'am j clin hypn'/ta
ti	Title	heart:ti	–
tn	Tradename ('drug')	rital:tn	'ritalin'/tn
tt	Original non-English title	'éventrations':tt	–
ud	Record update date	2023-01-01:ud	[2023-10-04 to 2023-10-10]/ud
ui	MEDLINE ID	26715567:ui	–
vi	Volume	1:vi	–

3.6. Subheadings

Subheadings are EMTREE terms used as concept qualifiers for drugs, diseases and devices to indicate the context in which index terms are used in a document. Subheadings in EMBASE are linked to either disease, device or drug terms and can be used to construct a request. Simliar to field codes, subheadings can be added to the parameter `query` to retrieve records that contain your search word or phrase in the indicated subheading(s). They are appended to the search word or phrase with a forward slash (/). The following table lists the subheadings that can be used in a request.

Drug subheadings

Description	Code	Explanation
adverse drug reaction	dd_ae	Identifies a drug for which an undesired side effect is reported (when used at therapeutic dose ranges in humans).
clinical trial	dd_ct	Used when the clinical trial of a drug is reported.
drug administration	dd_ad	Used when the route of drug administration is emphasized.
drug analysis	dd_an	Points at the identification, determination or structural analysis of a drug or potential drug.
drug combination	dd_cb	Identifies drugs given in combination or concomitantly.
drug comparison	dd_cm	Highlights two or more drugs compared within the same study.

Drug subheadings

Description	Code	Explanation
drug concentration	dd_cr	Used when information is published on the concentration of a drug in body fluids or tissues.
drug development	dd_dv	Used to indicate the stages of drug development from screening, isolation and synthesis up to testing in animals, but excluding trials in humans.
drug dose	dd_do	Used when drug dosage, including the relation between dosage and effects over time, is a significant factor.
drug interaction	dd_it	Highlights interactions between drugs, or between a drug and food, alcohol or other chemicals in humans or animals.
drug therapy	dd_dt	Identifies a drug used to treat disease (including curative, palliative, symptomatic or prophylactic treatment).
drug toxicity	dd_to	Identifies a drug or chemical that is toxic in animals (including LD50 tests), in animal or human cells and tissues, and in other toxicity studies. In humans, used to signal toxicity at non-therapeutic dose ranges, or when lasting damage is caused at therapeutic dose ranges.
endogenous compound	dd_ec	Used for a substance that is endogenous to the organism, tissue, cells or body fluids being studied.
pharmaceutics	dd_pr	Indicates the formulation of a drug or drug mixture, including the physical and chemical properties of drugs relevant to drug pharmacy.
pharmacoeconomics	dd_pe	Used to point at an economic evaluation of drug therapy, including cost analysis, treatment outcome and quality of life studies.
pharmacokinetics	dd_pk	Points at the kinetics of absorption, distribution, biotransformation or elimination of a drug in humans and animals.
pharmacology	dd_pd	Identifies the mechanism of action of a drug, including drug binding to receptors and drug sensitivity/resistance studies (other than for microorganisms).
special situation for pharmacovigilance	dd_pv	Used when a drug is used in situations like prenatal drug exposure, drug exposure during lactation, off label drug use, drug misuse, drug abuse, drug overdose, occupational drug exposure, medication error, liver failure, kidney failure, disease transmission, counterfeit drug, drug quality defect, compassionate use, named-patient program, elderly patient, and pediatric patient. Subheadins relevant to pharmacovigilance are aligned with EMA and FDA definitions. Details can be found in the Appendix.
unexpected outcome of drug treatment	dd_tm	Used when a drug is reported for lack of drug effect, partial drug response, unexpected therapeutic effect and disease worsening. Details can be found in the Appendix.

Disease subheadings

Description	Code	Explanation
complication	dm_co	Identifies a disorder or symptom that arises as a complication of a pre-existing disease or medical procedure other than drug treatment
congenital disorder	dm_cn	Used when attention is drawn to the congenital nature of a disease or malformation, including hereditary disorders present at birth.
diagnosis	dm_di	Indicates that information is published on the diagnosis of disease or the application of diagnostic tests
disease management	dm_dm	Identifies a disease for which information is published on the evaluation of health care, including cost aspects, treatment outcome or quality of life studies.
drug resistance	dm_dr	Identifies a disease for which resistance to drug treatment (other than drug tolerance) is a significant aspect.
drug therapy	dm_dt	Identifies a disease or condition treated with a drug.
epidemiology	dm_ep	Highlights that information is given on the epidemiology of a disease, including its morbidity and mortality.
etiology	dm_et	Points at information on both the etiology (causative factors) and pathogenesis (pathological mechanisms) of a disease.
prevention	dm_pc	Identifies a disease for which information is published on its prevention and control, including prophylactic treatment with drugs or vaccines.
radiotherapy	dm_rt	Indicates a treatment of a disease using radiotherapy.
rehabilitation	dm_rh	Used when information is published on procedures to rehabilitate patients recovering from a disease.
side effect	dm_si	Points at a condition which arises as an undesired effect of a drug used at therapeutic dose ranges in humans, including drug-induced disease.
surgery	dm_su	Used when information is published on the application of surgical procedures or techniques to treat a disease.
therapy	dm_th	Used when information is published on any treatment of a disease other than drug therapy, radiotherapy or surgery.

Device subheadings

Description	Code	Explanation
adverse device effect	dv_am	Used to identify a device that is used for diagnostic, therapeutic or procedural purposes in humans or animals, and for which an undesired effect is reported.
clinical trial	dv_ct	Used when the clinical trial of a device is reported.
device comparison	dv_dc	Highlights that two or more devices are compared within the same study.
device economics	dv_de	Used to point at an economic evaluation of a device, including cost analysis, treatment outcome and quality of life studies.

Drug subheadings pertaining to administration route

Administration route	Code	Example
buccal	dd_bd	'nicotine'/dd_bd
epidural	dd_ei	'nicotine'/dd_ei
inhalational	dd_ih	'decongestive agent'/dd_ih
intraarterial	dd_ia	'bleomycin'/dd_ia
intraarticular	dd_ar	'hyaluronic acid'/dd_ar
intrabronchial	dd_br	'fluticasone propionate'/dd_br
intrabursal	dd_bu	'betamethasone'/dd_bu
intracameral	dd_cl	'dexamethasone derivative'/dd_cl
intracardiac	dd_ic	'epinephrine'/dd_ic
intracavernous	dd_ca	'alprostadil alfadex'/dd_ca

Drug subheadings pertaining to administration route

Administration route	Code	Example
intracerebral	dd_ce	'deferoxamine'/dd_ce
intracerebroventricular	dd_cv	'deferoxamine'/dd_cv
intracisternal	dd_ci	'clonidine'/dd_ci
intradermal	dd_dl	'insulin derivative'/dd_dl
intraduodenal	dd_du	'mucolytic agent'/dd_du
intragastric	dd_ig	'botulinum toxin a'/dd_ig
intralesional	dd_il	'triamcinolone acetonide'/dd_il
intralymphatic	dd_ly	'antibiotic agent'/dd_ly
intramuscular	dd_im	'haloperidol'/dd_im
intranasal	dd_na	'caffeine'/dd_na
intraocular	dd_io	'bevacizumab'/dd_io
intraosseous	dd_os	'antibiotic agent'/dd_os
intraperitoneal	dd_ip	'drug'/dd_ip
intrapleural	dd_pl	'drug'/dd_pl
intraspinal	dd_sp	'morphine'/dd_sp
intrathecal	dd_tl	'morphine'/dd_tl

Drug subheadings pertaining to administration route

Administration route	Code	Example
intratracheal	dd_tr	'morphine'/dd_tr
intratumoral	dd_tu	'drug'/dd_tu
intratympanic	dd_ty	'gentamicin'/dd_ty
intraurethral	dd_ur	'alprostadil alfadex'/dd_ur
intrauterine	dd_ut	'levonorgestrel'/dd_ut
intravaginal	dd_va	'estrogen'/dd_va
intravenous	dd_iv	'vincristine'/dd_iv
intravesical	dd_ve	'mitomycin derivative'/dd_ve
intravitreal	dd_vi	'foscarnet'/dd_vi
oral	dd_po	'paracetamol'/dd_po
parenteral	dd_pa	'morphine'/dd_pa
periocular	dd_oc	'dexamethasone'/dd_oc
rectal	dd_rc	'theophylline'/dd_rc
regional perfusion	dd_rp	'antibiotics'/dd_rp
retrobulbar	dd_rb	'mepivacaine'/dd_rb
subconjunctival	dd_cj	'mepivacaine'/dd_cj

Drug subheadings pertaining to administration route

Administration route	Code	Example
subcutaneous	dd_sc	'insulin'/exp/dd_sc
sublabial	dd_sb	'glyceryl trinitrate'/dd_sb
sublingual	dd_li	'alprazolam'/exp/dd_li
topical	dd_tp	'fluocinonide'/exp/dd_tp
transdermal	dd_td	'buprenorphine'/exp/dd_td

3.7. Examples of requests

The following are examples of requests using subheadings, explosion terms (see section 4.4 for definitions), wildcards and Boolean operators.

A search for records that include both search terms 'acetylsalicylic acid' and 'drug potentiation' in any data field.

```
https://api.elsevier.com/content/embase/article?sort=entrydate&httpaccept=application/daas-xml&query='acetylsalicylic acid' AND 'drug potentiation'&APIKey=[YourAPIKey]
```

A search for records that include both terms 'acetylsalicylic acid' and 'drug potentiation' in any data field. Of these records, those with the term 'breast cancer' in any field are then excluded.

```
https://api.elsevier.com/content/embase/article?sort=entrydate&httpaccept=application/daas-xml&query=['acetylsalicylic acid' AND 'drug potentiation'] NOT 'breast cancer'&APIKey=[YourAPIKey]
```

The same search for records that include certain terms while excluding others, but with a wildcard. Records should include 'acetylsalicylic acid' and any relevant version of 'poten' (e.g., potentiation, potential, potent) but exclude the term 'breast cancer'.

```
https://api.elsevier.com/content/embase/article?sort=entrydate&httpaccept=application/daas-xml&query=['acetylsalicylic acid' AND 'poten*'] NOT 'breast cancer'&APIKey=[YourAPIKey]
```

This request uses the code `de`, which designates the fields for drug index terms and disease index terms. The search retrieves records that include the exact terms 'breast disease' and 'infant' in those fields.

```
https://api.elsevier.com/content/embase/article?sort=entrydate&httpaccept=application/daas-xml&query='breast disease'/de AND 'infant'/de&APIKey=[YourAPIKey]
```

A search for records where 'breast disease' and its narrower terms appear in any field (`exp` provides exploded terms) and the term 'infant' appears in the fields for drug and disease index terms.

```
https://api.elsevier.com/content/embase/article?sort=entrydate&httpaccept=application/daas-xml&query='breast disease'/exp AND 'infant'/de&APIKey=[YourAPIKey]
```

A search for records where 'abdominal pain' or its narrower terms are indexed as side effects of tamoxifen. `dd_ae` and `dm_si` are the subheadings for adverse drug reaction and side effect.

```
https://api.elsevier.com/content/embase/article?sort=entrydate&httpaccept=application/daas-xml&query='tamoxifen'/dd_ae AND 'abdominal pain'/exp/dm_si&APIKey=[YourAPIKey]
```

A search for certican/'adverse drug reaction'/neutropenia will retrieve records where neutropenia was reported as an adverse drug reaction of certican (triple linking). The triples are included in the API response. See the elements <drgterm>, <link>, <sublink> in the provided example of data included in `enhancement` (page 24).

4. Response

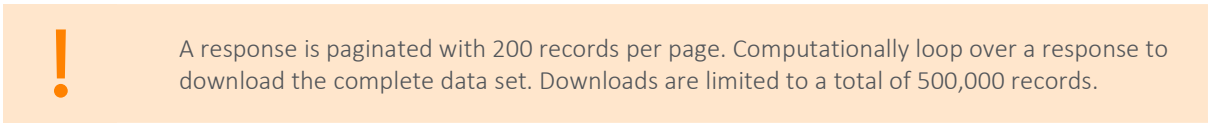
The response to a request is returned in XML or JSON format and consists of a list of records that match the query parameters of the request.

The EMBASE API should not be used for large-volume data downloads as these cause stability and performance issues. To grant all users equal opportunities to query the EMBASE API, response downloads are limited to a total of 500,000 records.

Responses are paginated, and a maximum of 200 records per page can be retrieved at a time. Use `start` and `count` to loop through a response and retrieve all records. For example, the following request delivers records 200 to 399 of the response.

```
https://api.elsevier.com/content/embase/article?start=200&count=200&httpaccept=application/daas-xml&query=diabetes&APIKey=[YourAPIKey]
```

A programmed limit prevents the pagination value in `start` to exceed a total of 500,000 records. Alternatively, single requests can be apportioned by publication year, for example, to generate several smaller data sets for download. Retrieval of large data sets is more efficient with the full-content EMBASE flat file offering.



Each response is also returned with a standardized message about the status of the request.

Response Messages

HTTP Status Code	Reason	HTTP Status Code	Reason
400	Invalid information	200	OK
401	Unauthorized	405	Invalid HTTP method
403	Forbidden	406	Invalid mime type
404	Not Found	429	Quota exceeded
		500	Generic error

4.1. Structure of a response

A response from a request consists of a list of literature records in EMBASE relevant to the parameters of a search and retrieval, wrapped in the element bibdataset. Each record of the list is contained in an element bibrecord, wrapped in the parent element item, which contains details about the processing of the record in Elsevier databases. Each record includes bibliographic, non-bibliographic, abstract and indexing information organized into 4 broad child elements:

item-info	Contains the **non-bibliographic information about a record**, such as date of creation, identifiers, and copyright information.
head	Encompasses the **abstract and indexing information** of the record, including authors and affiliations, type of document, language, source, keywords and indexing terms.
tail	Includes a single child element that lists the **number of bibliographic records** listed in the document of the record. The full bibliography (references cited) of the document in a record is not provided. This element is excluded for records without a bibliography.
explosions	A structured listing of **index terms exploded** to include parent terms according to EMTREE hierarchies.

4.2. Record information in item-info

The child elements of item-info provide information about the copyright, history and, in the case of a non-Elsevier origin (e.g., MEDLINE), the external source (external-source) of a record. Also included are record and document identifiers, like the digital object identifier or DOI (itemidlist), and the Elsevier database collection(s) to which the record belongs.

Example of information included in item-info

```
<bibrecord>
  <item-info>
    <copyright type="Elsevier">Copyright 2023 Elsevier B.V., All rights reserved.</copyright>
    <itemidlist>
      <ce:doi>10.1038/s41467-023-35928-z</ce:doi>
      <itemid idtype="PUI">2021042841</itemid>
      <itemid idtype="CAR-ID">945431235</itemid>
      <itemid idtype="MEDL">36639383</itemid>
      <itemid idtype="COLLECTIONS">/opt/embase/workarea/embase_fabrication/fabrication/current/daily/20
230120194536_00000/embasecom_new_20230119_20014_670_1.zip</itemid>
      <itemid idtype="COLLECTIONS">/opt/embase/workarea/embase_fabrication/fabrication/current/daily/20
230426194537_00000/embasecom_out_full_20230425_16934_957_1.zip</itemid>
      <itemid idtype="ASSOCIATEDPUI">640029246</itemid>
    </itemidlist>
    <history>
      <date-created year="2023" month="04" day="25"/>
      <date-aip-loaded year="2023" month="01" day="20"/>
```

```
      <date-loaded year="2023" month="01" day="20"/>
      <date-loaded year="2023" month="04" day="26"/>
      <record-updated-date year="2023" month="01" day="20"/>
      <record-updated-date year="2023" month="04" day="26"/>
    </history>
    <dbcollection>EMBASE</dbcollection>
    <dbcollection>MEDLINE</dbcollection>
    <external-source>MEDLINE</external-source>
  </item-info>
```

4.3. Abstract and indexing information in head

The element head encompasses the bulk of information contained in an EMBASE record, including the citation information and the deep and extensive indexing of a document. This information is organized into the following child elements:

citation-info	Encompasses descriptive information about the document in a record, such as language, document type, and keywords provided by authors.
citation-title	Lists the original title of the document in a record and any translations.
author-group	Provides information about the authors of the document in a record, organized by author affiliation (ie., one or more authors that share a common affiliation). Authors publishing under one name (e.g., consortia, collaborations) are also included in this element, as the name of the collaboration plus the names of individual members.
correspondence	Gives details of the corresponding author(s) on the document in a record.
abstracts	Provides the original and any other abstracts or translations of the abstract generated for the document in a record.
source	Includes all details about the source of the document in a record, be it a book, a conference, a journal, a report or other. This element includes ISSN, volume, issue, and article number for reference, as well as publication date, publisher name and country.
enhancement	Contains a wealth of additional indexing or classification added to a record, such as controlled subject index terms organized by term type, tradenames included in the document and manufacturers of devices and drugs mentioned in the document. Also includes EMTREE terms describing the context in which index terms describe the content of the document.

Example of data included in citation-info and citation-title

```
<head>
  <citation-info>
    <citation-type code="cp"/>
    <citation-language xml:lang="en"/>
    <abstract-language xml:lang="en"/>
    <author-keywords>
      <author-keyword>Bovine</author-keyword>
      <author-keyword>Dendritic cells</author-keyword>
      <author-keyword>Interferon-alpha</author-keyword>
      <author-keyword>Interferon-gamma</author-keyword>
      <author-keyword>Monocytes</author-keyword>
      <author-keyword>Toll-like receptor 9</author-keyword>
    </author-keywords>
  </citation-info>
  <citation-title>
    <titletext xml:lang="en" original="y">Bovine toll-like receptor 9: A comparative analysis of molecular structur
e, function and expression</titletext>
  </citation-title> >
```

Example of data included in author-group and correspondence

```
<author-group>
  <author seq="18">
    <ce:initials>L.C.</ce:initials>
    <ce:indexed-name>Guimaraes L.C.</ce:indexed-name>
    <ce:surname>Guimarães</ce:surname>
    <ce:given-name>Lays Cordeiro</ce:given-name>
  </author>
  <author seq="20">
    <ce:initials>P.P.G.</ce:initials>
    <ce:indexed-name>Guimaraes P.P.G.</ce:indexed-name>
    <ce:surname>Guimarães</ce:surname>
    <ce:given-name>Pedro Pires Goulart</ce:given-name>
  </author>
  <affiliation country="bra">
    <organization>Department of Physiology and Biophysics, Institute of Biological Sciences, Universidade Feder
al de Minas Gerais</organization>
    <address-part>MG</address-part>
    <city>Belo Horizonte</city>
  </affiliation>
</author-group>
<correspondence>
  <person>
    <ce:initials>T.M.L.</ce:initials>
    <ce:indexed-name>Souza T.M.L.</ce:indexed-name>
    <ce:surname>Souza</ce:surname>
    <ce:given-name>Thiago Moreno L.</ce:given-name>
  </person>
  <affiliation country="bra">
```

```
    <organization>Laboratório de Imunofarmacologia, Oswaldo Cruz Institute, Fundação Oswaldo Cruz (Fiocruz)</organization>
    <address-part>RJ</address-part>
    <city>Rio de Janeiro</city>
  </affiliation>
  <ce:e-address>thiago.moreno@fiocruz.br</ce:e-address>
</correspondence>
```

Example of data included in abstracts

```
<abstracts>
  <abstract xml:lang="en" original="y">
  <publishercopyright>© 2023, The Author(s).</publishercopyright>
  <ce:para>Orally available antivirals against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are necessary because of the continuous circulation of new variants that challenge immunized individuals. Because severe COVID-19 is a virus-triggered immune and inflammatory dysfunction, molecules endowed with both anti viral and anti-inflammatory activity are highly desirable. We identified here that kinetin (MB-905) inhibits the in vitro replication of SARS-CoV-2 in human hepatic and pulmonary cell lines. On infected monocytes, MB-905 red uced virus replication, IL-6 and TNFα levels. MB-905 is converted into its triphosphate nucleotide to inhibit viral RNA synthesis and induce error-prone virus replication. Coinhibition of SARS-CoV-2 exonuclease, a proofreading enzyme that corrects erroneously incorporated nucleotides during viral RNA replication, potentiated the inhibit ory effect of MB-905. MB-905 shows good oral absorption, its metabolites are stable, achieving long-lasting plas ma and lung concentrations, and this drug is not mutagenic nor cardiotoxic in acute and chronic treatments. SARS-CoV-2-infected hACE-mice and hamsters treated with MB-905 show decreased viral replication, lung necro sis, hemorrhage and inflammation. Because kinetin is clinically investigated for a rare genetic disease at regimen s beyond the predicted concentrations of antiviral/anti-inflammatory inhibition, our investigation suggests the opportunity for the rapid clinical development of a new antiviral substance for the treatment of COVID-19.</ce: para>
  </abstract>
</abstracts>
```

Example of data included in source

```
<source type="j" country="gbr">
  <sourcetitle>Nature Communications</sourcetitle>
  <sourcetitle-abbrev>Nat. Commun.</sourcetitle-abbrev>
  <issn type="electronic">20411723</issn>
  <volisspag>
    <voliss volume="14" issue="1"/>
  </volisspag>
  <article-number>199</article-number>
  <publicationyear first="2023"/>
  <publicationdate>
    <year>2023</year>
    <month>12</month>
    <day>01</day>
  </publicationdate>
```

```
  <website>
    <ce:e-address>https://www.nature.com/ncomms/</ce:e-address>
  </website>
  <publisher>
    <publishername>Nature Research</publishername>
  </publisher>
</source>
```

Example of data included in enhancement (abridged response [...])

```
<enhancement status="002" type="8">
  <descriptorgroup>
    <descriptors controlled="y" type="DRG">
      <descriptor>
        <mainterm candidate="true">6 furfurylamino 9 (tetrahydropyran 2 yl) 9h purine</mainterm>
        <drgterm>6 furfurylamino 9 (tetrahydropyran 2 yl) 9h purine</drgterm>
        <link>
          <linkterm>drug analysis</linkterm>
        </link>
        <link>
          <linkterm>drug combination</linkterm>
          <sublink>
            <sublinkterm>daclatasvir</sublinkterm>
          </sublink>
          <sublink>
            <sublinkterm>dolutegravir</sublinkterm>
          </sublink>
          <sublink>
            <sublinkterm>ombitasvir</sublinkterm>
          </sublink>
          <sublink>
            <sublinkterm>pibrentasvir</sublinkterm>
          </sublink>
          <sublink>
            <sublinkterm>raltegravir</sublinkterm>
          </sublink>
        </link>
        <link>
          <linkterm>drug development</linkterm>
        </link>
        <link>
          <linkterm>drug interaction</linkterm>
          <sublink>
            <sublinkterm>dolutegravir</sublinkterm>
          </sublink>
        </link>
        <link>
          <linkterm>intravenous drug administration</linkterm>
        </link>
        <link>
          <linkterm>oral drug administration</linkterm>
```

```
        </link>
        <link>
          <linkterm>pharmacokinetics</linkterm>
        </link>
        <link>
          <linkterm>pharmacology</linkterm>
        </link>
        <weight>a</weight>
      </descriptor>
      <descriptor>
      [...]
      </descriptor>
    </descriptors>
    <descriptors controlled="y" type="MED">
      <descriptor>
        <mainterm>animal cell</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>animal experiment</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>animal model</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>article</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>bronchoalveolar lavage fluid</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>Calu-3 cell line</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>cardiotoxicity</mainterm>
        <disterm>cardiotoxicity</disterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
        <mainterm>controlled study</mainterm>
        <weight>b</weight>
      </descriptor>
      <descriptor>
      [...]
      </descriptor>
    </descriptors>
  </descriptorgroup>
  <classificationgroup>
    <classifications type="EMCLASS">
```

```
      <classification>
        <classification-code>30</classification-code>
      </classification>
      <classification>
        <classification-code>37</classification-code>
      </classification>
      <classification>
        <classification-code>4</classification-code>
      </classification>
    </classifications>
  </classificationgroup>
  <tradenamegroup>
    <tradenames type="TNM">
      <trademanuitem>
        <tradename>mb 905</tradename>
      </trademanuitem>
    </tradenames>
  </tradenamegroup>
  <chemicalgroup>
    <chemicals source="esbd">
      <chemical>
        <chemical-name>adenine phosphoribosyltransferase</chemical-name>
        <cas-registry-number>9027-80-9</cas-registry-number>
        <enzyme-commission-number>EC 2.4.2.7</enzyme-commission-number>
      </chemical>
      <chemical>
        <chemical-name>daclatasvir</chemical-name>
        <cas-registry-number>1009119-64-5</cas-registry-number>
        <cas-registry-number>1009119-65-6</cas-registry-number>
      </chemical>
      <chemical>
        <chemical-name>dolutegravir</chemical-name>
        <cas-registry-number>1051375-16-6</cas-registry-number>
        <cas-registry-number>1051375-19-9</cas-registry-number>
        <cas-registry-number>1172581-47-3</cas-registry-number>
        <cas-registry-number>1229006-39-6</cas-registry-number>
      </chemical>
      <chemical>
        <chemical-name>exonuclease</chemical-name>
        <cas-registry-number>37228-74-3</cas-registry-number>
      </chemical>
      <chemical>
        <chemical-name>kinetin</chemical-name>
        <cas-registry-number>525-79-1</cas-registry-number>
      </chemical>
      <chemical>
        [...]
      </chemical>
    </chemicals>
  </chemicalgroup>
</enhancement>
```

4.4. Exploded index terms

Exploding index terms provides a comprehensive list of the controlled parent subject terms for each subject index term assigned to a record, wrapped within the element explosions. The subject index term is included in the child element mainterm and is grouped with its parent terms, each contained in a child element ancestor.

Example of data included in explosions (abridged response […])

```
<explosions>
  <explosion>
    <ancestors>
      <ancestor>6 furfurylamino 9 (tetrahydropyran 2 yl) 9h purine</ancestor>
    </ancestors>
    <drgterm>6 furfurylamino 9 (tetrahydropyran 2 yl) 9h purine</drgterm>
    <link>
      <linkterm>drug analysis</linkterm>
    </link>
    <link>
      <linkterm>drug combination</linkterm>
      <sublink>
        <sublinkterm>daclatasvir</sublinkterm>
      </sublink>
      <sublink>
        <sublinkterm>dolutegravir</sublinkterm>
      </sublink>
      <sublink>
        <sublinkterm>ombitasvir</sublinkterm>
      </sublink>
      <sublink>
        <sublinkterm>pibrentasvir</sublinkterm>
      </sublink>
      <sublink>
        <sublinkterm>raltegravir</sublinkterm>
      </sublink>
    </link>
    <link>
      <linkterm>drug development</linkterm>
    </link>
    <link>
      <linkterm>drug interaction</linkterm>
      <sublink>
        <sublinkterm>dolutegravir</sublinkterm>
      </sublink>
    </link>
    <link>
      <linkterm>intravenous drug administration</linkterm>
    </link>
    <link>
      <linkterm>oral drug administration</linkterm>
    </link>
```

```
    <link>
      <linkterm>pharmacokinetics</linkterm>
    </link>
    <link>
      <linkterm>pharmacology</linkterm>
    </link>
    <mainterm candidate="true">6 furfurylamino 9 (tetrahydropyran 2 yl) 9h purine</mainterm>
    <weight>a</weight>
  </explosion>
  <explosion>
    <ancestors>
      <ancestor>adenine phosphoribosyltransferase</ancestor>
      <ancestor>chemicals and drugs</ancestor>
      <ancestor>enzyme</ancestor>
      <ancestor>glycosyltransferase</ancestor>
      <ancestor>natural products and their synthetic derivatives</ancestor>
      <ancestor>peptides and proteins</ancestor>
      <ancestor>transferase</ancestor>
    </ancestors>
    <drgterm>adenine phosphoribosyltransferase</drgterm>
    <link>
      <linkterm>endogenous compound</linkterm>
    </link>
    <mainterm>adenine phosphoribosyltransferase</mainterm>
    <weight>b</weight>
  </explosion>
  <explosion>
  [...]
  </explosion>
  <explosion>
    <ancestors>
      <ancestor>distribution parameters</ancestor>
      <ancestor>parameters</ancestor>
      <ancestor>pharmacokinetic parameters</ancestor>
      <ancestor>pharmacological parameters</ancestor>
      <ancestor>procedures, parameters and devices</ancestor>
      <ancestor>volume of distribution</ancestor>
    </ancestors>
    <mainterm>volume of distribution</mainterm>
    <weight>b</weight>
  </explosion>
</explosions>
```

5. Description of elements included in a response

		Parent	Contains code/tag	Contains data	Brief description
1	**bibdataset**				Top-level wrapper element of Elsevier Abstract and Indexing DTD.
2	**item**	1			Top-level wrapper element.
3	**ait:process-info**	2			Contains information relevant to the processing of the record, organized into child elements ait:date-delivered, ait:date-sort, and ait:status.
	ait:date-delivered	3		•	Date given in the attributes *year*, *month*, and *day*, on which a record was processed for delivery. For internal purposes only.
	ait:date-sort	3		•	The date (given in the attributes *year*, *month*, and *day*) of a record used for sorting. Data in publicationdate are standardized in format by day, month and year using predefined input rules so that documents with unstructured dates of publication can also be sorted.
	ait:status	3	•		A multi-attribute element that indicates the status of a record as an item in EMBASE. The attribute *type* is set to "core" to indicate that the item is a full bibliographic record. The attribute *state* may be "new" to indicate that the item has been delivered to EMBASE for the first time, "update" to indicate that it replaces a previously delivered item, or "delete" to indicate that a previously delivered item should be deleted. The attribute *stage* indicates an uncorrected document in the record ("S100"), a corrected document ("S200") or a published document ("S300"). The default value is "S300".
4	**bibrecord**	2			Top-level element containing all information of a record, organized into child elements item-info, head, and tail.
5	**item-info**	4			Includes the non-bibliographic information of a record, organized into child elements copyright for copyright information, itemidlist for identifiers, history for record history, dbcollection for codes of database collections, and external-source for the case that a record comes from a third-party source (e.g., MEDLINE)
	copyright	5		•	Contains the copyright notice from Elsevier B.V. (with year of most recent update to include the record) and/or a third party (e.g., Medline). Origin of the copyright notices is given in the attribute *type*.
6	**itemidlist**	5			Includes known identifiers for the document of a record, such as Publisher Item Identifier (pii) and Digital Object Identifer (doi). Each identifier is contained it a dedicated child element.
	ce:pii	6		•	Contains the publisher item identifier (PII) of the document in a record.
	ce:doi	6		•	Contains the digital object identifier (DOI) of the document in the record. Empty for documents of a print-only journal.
	itemid	6		•	Contains other identifiers. The nature of the identifier is given in the attribute *idtype*, and can be: idtype=PUI: a unique EMBASE identification number assigned to a record idtype=ABSN: the abstract number if the document in a record is a conference abstract idtype=CAR-ID: an internal Elsevier CAR ID number that uniquely identifies each record created in Elsevier systems

		Parent	Contains code/tag	Contains data	Brief description
					idtype=EMBASE: a record accession number that is specific to EMBASE. This identifier is no longer in use idtype=EMBACK: a record accession number that is specific to EMBASE Classic. This identifier is no longer in use idtype=MEDL: the Medline PubMed Unique Identifier (PMID) of the document in a record idtype=COLLECTIONS: a code related to the Elsevier collections infrastructure used for internal processing purposes idtype=ASSOCIATEDPUI: In the event that a MEDLINE record is accessioned before an EMBASE record is created, the MEDLINE record is assigned an associated EMBASE identification number contained in this element. Once the EMBASE record is created, it is assigned a new EMBASE identification number (PUI) that is found in the element itemid with the attribute *idtype*=PUI, but the associated PUI is retained.
7	**history**	5			Provides the date on which a fully indexed record was delivered (date-created) and/or loaded/updated (date-loaded; date-aip-loaded; record-updated-date) into EMBASE. Each child element structures the date into attributes *year*, *month*, and *day*.
	date-aip-loaded	7		•	Provides the date on which an automatically indexed record (e.g., article in press) is loaded into EMBASE. Besides conference abstracts and preprints, all automatically indexed records are subsequently indexed manually and loaded again into EMBASE.
	date-created	7		•	Provides the date on which a fully indexed (automatically and manually) record was delivered to EMBASE.
	date-loaded	7		•	Provides the date on which a fully indexed (automatically and manually) record is loaded into EMBASE.
	record-updated-date	7		•	A multi-value date field that captures the history of the record, listing each date when an update is made to the record.
	dbcollection	5		•	Contains the Elsevier database collection(s) to which a record belongs. such as EMBASE Classic, EMBASE French, MEDLINE, MEDLINE Classic, and preprints. A record can belong to 1 or more collections.
	external-source	5		•	Includes additional information about the external (non-Elsevier) origin of a record.
8	**head**	4			Contains the abstract and indexing information of a record, organized into the child elements abstracts, author-group, citation-info, citation-title, correspondence, enhancement, and source.
9	**citation-info**	8			Provides the descriptive information of the document in a record, organized into the child elements abstract-language, author-keywords, citation-language, citation-type.
	citation-type	9		•	Identifies the type of document in a record: article (ar), conference abstract (cb), conference paper (cp), conference review (cr), data paper (dp), editorial (ed), erratum (er), letter (le), note (no), review (re), short survey (sh).
	citation-language	9	•		Provides the language of the original document in a record. In cases where a document is published in parallel in other languages, up to three languages may be provided.
	abstract-language	9	•		Provides the language of the abstracts or summaries published in the original document. Up to three languages are captured.
10	**author-keywords**	9			Contains the uncontrolled keywords assigned by the author(s) to the document in a record. These may be in the original language or translated.

		Parent	Contains code/tag	Contains data	Brief description
	author-keyword	10		•	Contains a single uncontrolled keyword assigned by the author(s) to the document in a record.
11	**citation-title**	8			Contains the original and every translation of the title of a document in a record, organized into child element titletext.
	titletext	11	•	•	Contains the title of the document in a record, original or translated. The attribute *lang* provides a code for the language of the recorded document title. The attribute *original* is set to "y" if that language is the original language used in the document of a record.
12	**author-group**	8			Contains information about the author(s) of the document in a record, grouped by affiliation. Information is provided in the child elements author, collaboration, and affiliation.
13	**author**	12			Contains personal information about an author of the document in a record, organized into the child elements ce:initials, ce:indexed-name, ce:degrees, ce:surname, ce:given-name, ce:suffix, ce:e-address. The attribute *seq* contains a sequential numbering indicating the order of authors in the document of a record.
	ce:initials	13, 17, 25		•	Provides the initials of an author or contributor, as part of their name.
	ce:indexed-name	13, 14, 17		•	Contains a sortable variant of an author's name or a collaboration name. In the case of an author, the entry consists of the concatenated values of the elements surname and initials, with all special characters removed.
	ce:degrees	13, 17, 25		•	An optional element that provides any degrees listed for an author or contributor.
	ce:surname	13, 17, 25		•	Provides the family name of an author or contributor. Names that cannot be easily parsed into given name, initials and surname (e.g., Chinese names) are contained completely in this element.
	ce:given-name	13, 17, 25		•	Provides the forename(s) or first name(s) of an author or contributor.
	ce:suffix	13, 17		•	An optional element containing any suffix to the name of an author, such as junior, senior, III, etc.

		Parent	Contains code/tag	Contains data	Brief description
	ce:e-address	13, 16, 23, 26		•	Provides one or more electronic addresses of an author, a corresponding person, or a publisher. Depending on the case, this may be an e-mail address or a website URL.
14	**collaboration**	12			Contains within the child element ce:indexed-name a sortable variant of the designation of a group of authors that present themselves under a common name. Treated as an author in author-group, so it includes the attribute *seq*.
	text	14		•	Contains the name of the collaboration as it appears in the document.
15	**affiliation**	12, 16, 24, 26			Contains details about the affiliation of an author group, corresponding person, contributor, or publisher, like name and/or address. Includes the child elements ce:text, organization, address-part, city-group, city, state, postal-code. A 3-letter code in the attribute *country* indicates the country of the affiliation.
	ce:text	15		•	An optional container element for text used for an *unstructured* address of an affiliation. Empty if the affiliation has a structured address.
	address-part	15		•	For the structured address of an affiliation, contains a street or P.O. box.
	city-group	15, 30		•	An optional container element for city and postal code information of an affiliation or of the venue for a conference.
	city	15, 30		•	Contains a city name for the structured address of an affiliation or for the venue of a conference.
	state	15		•	Provides the name of the state in the structured address of an author group's affiliation.
	postal-code	15		•	An optional element containing the postal code of the structured address of an affiliation.
	organization	15		•	Provides the name of the organization for an affiliation, which can include institution, department, or other.
16	**correspondence**	8			Contains details about the corresponding author of the document in a record, organized into child elements person, affiliation, ce:e-address.
17	**person**	16		•	Provides the name and personal details of the corresponding author, organized into child elements ce:initials, ce:indexed-name, ce:degrees, ce:surname, ce:given-name, ce:suffix
18	**abstracts**	8			Contains one or more abstracts of the document, the original author summary and any possible translations or other alternatives.

		Parent	Contains code/tag	Contains data	Brief description
19	**abstract**	18	•		Each abstract of the document in a record is listed in abstract, with information in child elements ce:para, and publishercopyright. The attribute *lang* indicates the language of the abstract, and the attribute *original* is set to "y" when the text is the original abstract. The attribute *perspective* indicates if the abstract was auto-translated.
	ce:para	19		•	The abstract of the document in a record may consist of one or more paragraphs. Each is contained in this child element ce:para.
	publishercopyright	19		•	Provides the copyright statement of the publisher for the document in a record.
20	**source**	8			Contains information about the source of the document in a record, organized into child elements sourcetitle, sourcetitle-abbrev, issuetitle, issn, isbn, codencode, volisspag, article-number, publicationyear, publicationdate, website, contributor-group, publisher, additional-srcinfo, and bib-text. The element has two attributes: *type* assigns a code to indicate the type of source as journal (j), book series (k) or trade journal (d). *country* provides the 3-letter code of the country where the source is published.
	sourcetitle	20		•	Contains the full title of the source (e.g., journal, book, conference proceeding, report) for the document in a record.
	sourcetitle-abbrev	20		•	Contains the abbreviated title of the source for the document in a record.
	issuetitle	20		•	Provides the name of the issue in which the document of a record appears. Issues of journals, books, conference proceedings or reports occasionally have their own title.
	issn	20		•	Provides one or more international standard serial numbers (ISSN) of the source for the document in a record. The attribute type indicates the *type* pf ISSN (e.g., print, electronic)
	isbn	20		•	Provides one or more 10-digit or 13-digit International Standard Book Number (ISBN) assigned to the source of the document in a record. Note: 10-digit ISBN were discontinued at the end of 2006. The attribute *length* indicates if the ISBN is 10 or 13 digits. The attribute *level* indicates the level of the ISBN assigned to the source of the document in a record, such as a book set or an individual book volume. Unique 13-digit ISBN are assigned to each format of a source. Thus, 13-digit ISBN include the attribute *type* to indicate format, such as hardback or paperback.
	codencode	20		•	Provides the CODEN code that Chemical Abstracts Service (CAS) uses to uniquely identify the source of the document in a record.
21	**volisspag**	20			Contains details about the volume, issue and pages of a source where the document of a record appears. Includes child elements voliss, supplement, pagerange, pages, pagecount.
	voliss	21		•	Provides the volume and issue of the source in which the document of a record was published in the respective attributes *volume* and *issue*.
	supplement	21		•	Indicates that the document of a record is located in a supplement issue. May include supplement number.
	pagerange	21		•	If pages of a source are numeric, provides the page on which the document of a record begins in attribute *first* and ends in attribute *last*.
	pages	21		•	An optional element used to provide page information when the first and last pages are not completely numeric.
	pagecount	21		•	Provides the number of pages in the document of a record, when relevant for the document type, such as a book.

		Parent	Contains code/tag	Contains data	Brief description
	article-number	20		•	Provides the item number assigned to the document by the publisher.
	publicationyear	20		•	Provides the year of publication as reported in the document of a record. The attribute *first* provides the year of first appearance (e.g., e-publication). The attribute *last* is used when, for example, final distribution occurs in another year.
22	**publicationdate**	20			Specifies a more complete date of publication as reported in the document of a record, either in child elements year, month, and day, or in child element datetext.
	year	22		•	Indicates the year of publication.
	month	22		•	Indicates the month of publication.
	day	22		•	Indicates the day of publication.
	datetext	22		•	Provides the unstructured publication date (e.g., Spring 2002) of the document in a record.
23	**website**	20			Contains information about the website where the document in a record is published, either a URL or an electronic mail address in the child element ce:e-address.
24	**contributor-group**	20			Contains information on one or more contributors to the source of a document in a record, organized into child elements contributor and affiliation. Contributors are mainly editors.
25	**contributor**	24			Contains details about a contributor to the source of a document in a record, organized into child elements ce:initials, ce:degrees, ce:surname, and ce:given-name. The attribute *role* indicates the function of a contributor (mainly editors for book series) and the attribute *seq* contains a concatenation of the contributor's surname and initials.
26	**publisher**	20			Contains information about the publisher of the document in a record; at least the publishername and optionally the address either in the child element publisheraddress or affiliation. If available, an email address is provided in the child element ce:e-address.
	publishername	26		•	Lists the name of the publisher of the document in a record.
	publisheraddress	26		•	Optionally provides the unstructured address of the publisher of the document in a record. A structured address is provided in the element affiliation.
27	**additional-srcinfo**	20			Provides details on any additional source information, such as the name and date of a conference that generated the document in a record.
28	**conferenceinfo**	27			If the source of a document in a record is associated with a conference, this element provides details in child element confevent.
29	**confevent**	28			Contains information about a conference event, organized into child elements confname, conflocation, confdate, and confcode.
	confname	29		•	Provides the name of a conference associated with the source of the document in a record.
30	**conflocation**	29			Provides the venue and address of a conference associated with the source of the document in a record, structured into child elements venue, city-group, city. The attribute *country* provides the 3-letter code for the country of a conference event.
	venue	30		•	Lists the name of the hotel, center, or other place where a conference event is held.

		Parent	Contains code/tag	Contains data	Brief description
31	**confdate**	29			Provides the begin and end dates of a conference associated with the source of the document in a record.
	startdate	31		•	Lists the year, month, and day of the start of a conference event as corresponding attributes.
	enddate	31		•	Lists the year, month, and day of the end of a conference event as corresponding attributes.
	confcode	29	•		Contains a unique code assigned by Elsevier to a conference associated with the source of the document in a record.
	bib-text	20		•	Optional element used when bibliographic information about a source is unstructured.
32	**enhancement**	8			Contains additional indexing or classification of a record. Includes child elements descriptorgroup, classificationgroup, manufacturergroup, tradenamegroup, sequencebanks, chemicalgroup. The attribute *status* provides a 3-digit code that indicates the indexing status of a record as either intermediate (001) or final (002). The attribute *type* indicates the type of indexing performed; 17 for automatic indexing and 8 for manual indexing. In EMBASE, after automatic indexing generates a record of intermediate status, it is taken to final status by manual indexing.
33	**descriptorgroup**	32			Contains a list of subject index terms describing the contents of the document in the record. The subject index terms may be controlled by a thesaurus or uncontrolled and are grouped into the child element descriptors by type (e.g., controlled drug terms, controlled medical terms).
34	**descriptors**	33			Contains a set of subject index terms of a specific type, each in the child element descriptor, that describe the contents of the document in a record. The attribute *controlled* is set to "y" if the subject index terms included in a descriptors element are controlled. The attribute *type* contains the type of subject index terms and can be either MDV (controlled medical device terms), DRG (controlled drug terms) or MED (controlled medical terms).
35	**descriptor**	34			Contains one subject index term of a specific type describing the contents of the document in a record. Expanded information about the subject index term is provided in child elements devterm, disterm, drgterm, mainterm, weight, link.
	devterm	35, 51		•	Provides a controlled medical device term as defined by EMTREE.
	disterm	35, 51		•	Provides a controlled disease term as defined by EMTREE.
	drgterm	35, 51		•	Provides a controlled drug term as defined by EMTREE.
	mainterm	35, 51		•	Contains a principle subject index term assigned to the document in a record. Context about how the "main term" is used in the document is provided in child element link. The attribute *candidate* is set to "true" when the subject index term in mainterm is controlled but still a candidate term.

		Parent	Contains code/tag	Contains data	Brief description
	weight	35, 51	•		Designates the subject index term in mainterm as a major term (weight = a) or a minor term (weight = b).
36	**link**	35, 51			Contains the child elements linkterm and sublink with EMTREE terms used to describe the context in which the subject index term in mainterm is used. They are concept modifiers.
	linkterm	36		•	Provides an EMTREE term used to describe the context in which the subject index term in mainterm is used when assigned to the document in a record.
37	**sublink**	36			Contains the child element sublinkterm with an EMTREE term that further qualifies the context in which the subject index term in mainterm is used. The term is subordinate to the EMTREE term in linkterm.
	sublinkterm	37		•	Provides an EMTREE term subordinate to the term in linkterm.
38	**classificationgroup**	32			Provides information on content categories to which a document in a record is assigned. These are assigned according to the EMBASE section headings (see Appendix).
39	**classifications**	38			Contains one or more child elements classification with content categories of a specific type to which a document in a record is assigned. The *type* is indicated in the corresponding attribute.
40	**classification**	39			Contains the child element classification-code which provides the numerical code of a content category assigned to the document in a record based on the EMBASE section headings.
	classification-code	40	•		Provides the numerical code of a category in the EMBASE section headings (see Appendix) to which a document in a record is assigned.
41	**manufacturergroup**	32			Contains information about one or more manufacturers mentioned in the document of a record, listed in child element manufacturers.
42	**manufacturers**	41			Lists details about one or more manufacturers of a specific type mentioned in the document of a record, each in child element manufacturer. The type is provided in the attribute *type* and can be either MNF for drug manufacturers or MNV for device manufacturers.
	manufacturer	42, 45		•	Provides the name of a manufacturer mentioned in the document of a record according to a controlled list. The country of the manufacturer is indicated in the attribute *country*.
43	**tradenamegroup**	32			Contains information on tradenames mentioned in the document of a record, organized in the child element tradenames.
44	**tradenames**	43			Lists one or more tradenames of a specific type mentioned in the document of a record, each in child element trademanuitem. The attribute *type* provides a 3-letter code that indicates the type of tradenames listed: TNM for a drug tradename or TNV for a device tradename.
45	**trademanuitem**	44			Provides details about a tradename, and optionally its manufacturer, organized into child elements tradename, and manufacturer.
	tradename	45		•	Provides the tradename for a drug, device that is mentioned in the document of a record. The trademark symbol is not used.
46	**sequencebanks**	32			Contains information about one or more nucleotide or amino acid sequences defined or mentioned in the document of a record, organized into child element sequencebank.

		Parent	Contains code/tag	Contains data	Brief description
47	**sequencebank**	46			Contains the accession numbers of one or more nucleotide or amino acid sequences defined or mentioned in the document of a record. All accession numbers listed in one sequencebank element come from one sequence bank. The attribute *name* provides the name of the sequence bank.
	sequence-number	47		•	Provides the accession number of individual nucleotide or amino acid sequences from a specific sequence bank that are mentioned in the document of a record.
48	**chemicalgroup**	32			Contains information on chemicals mentioned in the document of a record. Sets of chemicals are organized into child element chemicals according to the source of the information.
49	**chemicals**	48			Contains a list of child element chemical, each containing the association of a chemical name with one or more CAS registry numbers. The source of that information is common to the list and provided in the attribute *source* as either "nlm" for the National Library of Medicine or "esbd" for the Elsevier Bibliographic Databases Division.
50	**chemical**	49			Contains the association of a chemical name with one or more CAS Registry Numbers and/or Enzyme Commission Number, organized into child elements chemical-name, cas-registry-number, and enzyme-commission-number.
	chemical-name	50		•	Provides the name of a chemical substance that is mentioned in the document of a record.
	cas-registry-number	50		•	Provides one CAS Registry Number for the chemical substance named in element chemical. A chemical substance may have more than one CAS Registry Number.
	enzyme-commission-number	50		•	Provides one Enzyme Commission Number (EC number) for the chemical substance named in element chemical, provided it is an enzyme. A chemical substance may have more than one Enzyme Commission Number.
51	**tail**	4			Contains in the child element bibliography the number of references in the bibliography of the document in a record.
	bibliography	51		•	Contains in the attribute *refcount* the number of references in the bibliography of the document in a record.
52	**explosions**	4			Contains information on all EMTREE parent terms for each of the index terms (mainterm, devterm, drgterm, disterm) assigned to the document of a record, grouped by index term in the child element explosion.
53	**explosion**	52			Contains information on all EMTREE parent terms for one index term assigned to the document of a record, organized into child elements ancestors, devterm, disterm, drgterm, link, mainterm, and weight.
54	**ancestors**	53			Lists each EMTREE parent term of one index term in a child element ancestor.
	ancestor	54		•	Provides one EMTREE parent term of an index term assigned to the document of a record.

6. Appendix

6.1. Classifications (EMBASE section headings)

Assigned number	Classification (EMBASE section heading)
1	Anatomy, anthropology, embryology and histology
2	Physiology
3	Endocrinology
4	Microbiology: bacteriology, mycology, parasitology and virology (includes section 47 as of 1992)
5	General pathology and pathological anatomy
6	Internal medicine
7	Pediatrics and pediatric surgery
8	Neurology and neurosurgery
9	Surgery (includes section 34 as of 1992)
10	Obstetrics and gynecology
11	Otorhinolaryngology
12	Ophthalmology
13	Dermatology and venereology
14	Radiology
15	Chest diseases, thoracic surgery and tuberculosis
16	Cancer
17	Public health, social medicine and epidemiology
18	Cardiovascular diseases and cardiovascular surgery
19	Rehabilitation and physical medicine
20	Gerontology and geriatrics
21	Developmental biology and teratology
22	Human genetics
23	Nuclear medicine
24	Anesthesiology
25	Hematology
26	Immunology, serology and transplantation
27	Biophysics, bioengineering and medical instrumentation

Assigned number	Classification (EMBASE section heading)
28	Urology and nephrology
29	Clinical and experimental biochemistry
30	Clinical and experimental pharmacology
31	Arthritis and rheumatism
32	Psychiatry
33	Orthopedic surgery
34	Plastic surgery (1974–1991. Incorporated into section 9 in 1992)
35	Occupational health and industrial medicine
36	Health policy, economics and management
37	Drug literature
38	Adverse reaction titles
39	Pharmacy (introduced in 1997)
40	Drug dependence, alcohol abuse and alcoholism
46	Environmental health and pollution control
47	Virology (1974–1991. Incorporated into section 4 in 1992)
48	Gastroenterology
49	Forensic science abstracts
50	Epilepsy abstracts
51	Leprosy and other mycobacterial diseases (1979–1988. Incorporated into section 4 in 1989)
52	Toxicology (introduced in 1983)

6.2. Special situations in pharmacovigilance

Special situation	Indexing instruction
compassionate use	Use in the case of compassionate use of a drug or an expanded access program/trial for a drug. Use when indicated as such by the author.
counterfeit drug	Use when the authors suspect or confirm a falsified drug. Use when indicated as such by the author.
disease transmission via medicinal product	Use when the authors suspect or confirm the transmission of an infectious agent via a drug or a medicinal product. Use when indicated as such by the author.
drug abuse	Use in the case of drug abuse. Drug abuse is the intentional excessive use of a drug accompanied by harmful physical or psychological effects. Use when indicated as such by the author.
drug exposure during lactation	Use when a nursing infant is exposed to a drug through breast feeding. Use when indicated as such by the author.
drug misuse	Use in the case of drug misuse. Drug misuse is the intentional and inappropriate use of a drug not in accordance with the authorized product information. Use when indicated as such by the author.
drug overdose	Use in the case of a drug overdose. Use when indicated as such by the author.
drug quality defect	Use when the authors suspect or confirm a quality defect of a drug. Use when indicated as such by the author.
aged	Use when a drug is used for elderly patients (for humans age 65 years and over)
kidney failure	Use when the drug is used by patients with kidney failure. Use when indicated as such by the author.
liver failure	Use when the drug is used by patients with liver failure. Use when indicated as such by the author.
medication error	Use in the case of a medication error, including medication errors through device malfunction. Use when indicated as such by the author.
named patient program	Use in the case of drugs used in a named-patient program. Use when indicated as such by the authors.
occupational drug exposure	Use in the case of exposure to a drug as a result of one's occupation. Use when indicated as such by the author.
off label drug use	Use in the case of off-label drug use. Off-label use is the intentional use of a drug for a medical purpose not in accordance with the authorized product information. Use when indicated as such by the author.
pediatric patient	Use when a drug is used for pediatric patients (for humans less than 18 years of age).
prenatal drug exposure	Use when the embryo or fetus is exposed to a drug through the parent. Use when indicated as such by the author.

6.3. Unexpected outcome of drug treatment

Unexpected outcome of drug treatment	Indexing instruction
disease worsening with drug treatment	Use when the authors report disease worsening after drug therapy. The authors must make a connection between drug and the disease worsening.
lack of drug effect	Use when the authors report a lack of therapeutic efficacy of the drug.
partial drug response	Use when the authors report a partial response of the drug.
unexpected therapeutic effect	Use when the authors report an unexpected therapeutic drug effect.

6.4. Differences between the current response structure and that prior to October 2023

Parent element	Previous structure	New structure
bibdataset	bibrecord was the immediate child element of bibataset, containing all information of a record.	The wrapper element item was added between bibdataset and bibrecord. It provides information about the processing of the record it contains.
item-info	Contained the elements date-sort with record date information for sorting, and kind with an internally defined parameter to indicate if an article was in press or regular.	The elements date-sort and kind have been removed. ait:date-sort under ait:process-info in the wrapper element item contains the sortable date.
copyright	Included the child elements cprtext containing the copyright text, and cprtype, indicating the origin of the copyright notice (Elsevier or other).	Content of the elements cprtext and cprtype were incorporated into copyright. cprtype is now the attribute *type.*
itemidlist	Each identifier for the document included in the record was listed in a corresponding child element like doi, lui, pii, etc.	Some identifiers retain their own element (e.g., ce:doi, ce:pii). Others are listed in the child element itemid, whit the attribute *idtype* indicating the nature of each identifier.
head	Included the elements authorlist and grantlist after enhancement.	The elements authorlist and grantlist have been removed. Author information is provided in author-group.
author-keywords	Keywords assigned by the author were grouped by language into the element author-list-keywords, which included elements to indicate original language and other languages.	All keywords from authors are listed separately in the child element author-keyword.
citation-title	The child element titletext included the elements language, translated, and ttltext to provide information about the language of the document title and whether it was original or translated.	The information about language are now provided in the attributes *lang* and *original* included in titletext.
author	Each author in an author-group included an affiliation, as well as elements containing author identifiers (e.g., orcid, author-id) and their sequential order in the document (seq)	Authors are organized into author-group by affiliation, and affiliation is now a child element of author-group. The element author has the attribute *seq*, and no longer includes identifiers. Inoperative elements (e.g., aggregatedAuthorId) were removed.
affiliation	Included the child elements afftext and affiliation-instance-id.	afftext is now ce:text; affiliation-instance-id was removed.

Parent element	Previous structure	New structure
collaboration	The element included member names and inoperative elements (e.g., collabidx, et-al).	Inoperative elements were removed. Collaboration only includes the name of a collaboration as an author-group.
correspondence	The child element person with details of the corresponding author, included the element persidx with a sortable variant of the author's name.	persidx has been removed.
abstract	Included child elements original, translated, abstract-language, and perspective.	The information of these elements have been incorporated into the attributes *lang*, *original*, and *perspective* within abstract.
source	Included sourcetype to categorize the source as a journal, book series or other; and sourcecountry to provide the country where the source is published.	The information of these elements have been incorporated into the attributes *type* and *country* within source.
	Provided the ISSN of a source in element issn, with information organized into child elements issnr and issntype.	The ISSN is provided directly in element issn, with the attribute *type* indicating if print or electronic source.
	Listed 10-digit and 13-digit ISBN in separate child elements isbn10 and isbn13.	Lists all ISBN in the child element isbn. The attribute *length* indicates the number of digits, *level* indiciates the level of the ISBN assigned to the source, and *type* indicates if hardback or paperback.
	Conference information was provided directly under source, in the child element conferenceinfo.	Conference information is now organized under the child element additional-srcinfo.
publicationdate	If necessary, an unstructured publication date is provided in the child element pubdatetext.	The name of the pubdatetext element has changed to datetext.
website	The URL and general email of the website where the document was published were included in child elements url and email.	Website information is included as a URL or email in the child element ce:e-address.
publisher	If available, an email for the publisher was included in the child element email.	If available, an email for the publisher is included in the child element ce:e-address.
confevent	Provided a country code in child element clcountry under conflocation. The child elements enddate and startdate provided the dates of the conference.	The country of a conference event is provided in the attribute country within conflocation. enddate and startdate are now child elements of confdate.
contributor-group	Included the child element et-al. The element contributor included the elements role, and ctrbidx.	et-al and ctrbidx have been removed. The role of a contributor is provided in the attribute *role* within contributor.

Parent element	Previous structure	New structure
enhancement	Included child elements enhancement-status and enhancement-type.	Information from these elements is now in attributes *status* and *type*.
descriptors	Included the child elements descriptor-type amd controlled to indicated the type of the subject index term and if it is controlled.	Information from these elements is now in the attributes *controlled* and *type* within descriptors.
descriptor	Included the child element candidate to indicate if the term in mainterm is still a candidate term.	Information from this element is now in the attribute *candidate* within mainterm.
classifications	Provided numeric codes of content categories to which a document is assigned in the child element clsemclass.	A new structure provides the codes in the sub-element classification-code contained in the child element classification.
manufacturers	Listed a group of manufacturers organized into elements manufacturername, noncountry, and country within the element manufacturer. Indicated the type of manufacturers in the element manufacturer-type.	Manufacturer type is now in the attribute *type* within manufacturers. manufacturer includes the name directly, with an attribute to indicate *country*. noncountry was removed.
tradenames	Included the child element tradename-type with a code to indicate if the tradename was a drug or device.	The information in this element is now in the attribute *type* within tradenames.
sequencebank	The name of the sequence bank was provided in the child element sqbname.	The information in this element is now in the attribute *name* within sequencebank.
sequence-number	Sequence accession numbers were provided in the child element sqnr.	The child element was removed and the accession number is contained in sequence-number.
chemicals	The source of information in the child element chemical was included in the element chemical-source.	The attribute *source* within chemicals now indicates the information source.
bibliography	The number of references in the document was included in child element refcount.	*refcount* is now an attribute of bibliography.

The following elements have been excluded in the new structure:

authorlist, author-id, autidx, author-instance-id, aggregatedAuthorId, grantlist, grant, grant-acronym, grant-agency, grant-agency-id, grant-id, hasabstract, hascasnr, hasdevicemanufacturer, hasdevicetradename, hasdrugtradename, hasmsn, idxs, agidx, dgidx, dmnidx, dsidx, dtridx, dvidx, gnidx, mnfidx, stidx, tnmidx, kind, affiliation-instance-id, uniqueAuthorId, orcid, collabidx, member-name, et-al, persidx, ctrbidx, noncountry, wordcount.