

JATS2RDF (v1.2): a mapping of JATS metadata to RDF

This work:

- Source document:* Mapping from the Journal Publishing Tag Set of ANSI/NISO Z39.96-2012, JATS: Journal Article Tag Suite (version 1.0), published 22 August 2012, that has public URL http://www.niso.org/apps/group_public/document.php?document_id=8975
- URL:* URL of this mapping document: <http://purl.org/spar/jats2rdf>
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- License:* Distributed under a Creative Commons CC-By Attribution License (<http://creativecommons.org/licenses/by/3.0/>).
- Described in:* Peroni S, Lapeyre DA and Shotton D (2012). From Markup to Linked Data: Mapping NISO JATS v1.0 to RDF using the SPAR (Semantic Publishing and Referencing) Ontologies. A paper for the 2012 JATS Conference, Washington DC, USA, 16-17 October 2012 (<http://jats.nlm.nih.gov/jats-con/>). Preprint available at <http://purl.org/spar/jats2rdf/mapping-paper>.

Revision history:

- This version:* v1.2, Revised by Silvio Peroni 19 October 2012, and by David Shotton 7 November 2012, with URL typo for the XSLT corrected 04/12/2012.
- Previous versions:* v1.1, Revised by Silvio Peroni and David Shotton 08 October 2012.
v1.0, Revised by Silvio Peroni 14 September 2012.
v0.8.5, Revised by Silvio Peroni 13 September 2012.
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v0.5, Revised by David Shotton 14 August 2012.
v0.4, revised by David Shotton 24 July 2012.
v0.3, revised by Silvio Peroni 23 July 2012.
v0.2, revised by David Shotton 20 July 2012.
- Original version:* v0.1, created by Silvio Peroni and David Shotton, 13 July 2012.

XSLT:

An XSLT Transform to automate the creation of RDF metadata from a JATS-marked up document is available from <http://purl.org/spar/jats2rdf/xslt>.

Application exemplars:

An RDF metadata file describing the NISO JATS Version 1.0 XML example (<http://purl.org/spar/jats2rdf/example>) has been created using this JATS2RDF mapping, and is available from: <http://purl.org/spar/jats2rdf/example/rdf>

A similar RDF metadata file for the paper by Peroni S, Lapeyre DA and Shotton D (2012) describing this mapping document, referred to above, has also been created using this mapping, and is available from: <http://purl.org/spar/jats2rdf/mapping-paper/rdf>

Introduction

The purpose of this mapping document, of metadata entities from the Journal Publishing Tag Set of ANSI/NISO Z39.96-2012, JATS: Journal Article Tag Suite (version 1.0) to RDF using ontology terms, is to enable JATS metadata in XML to be mapped automatically to RDF using an XSLT Transform, and to be published in RDF as Open Linked Data, enabling these metadata to be understood programmatically and integrated automatically with similar data from elsewhere.

In this mapping, terms from FRAPO, the Funding, Research Administration and Projects Ontology (<http://purl.org/ceif/frapo/>), and from the following SPAR (Semantic Publishing and Referencing) Ontologies (<http://purl.org/spar/>) are frequently used:

BiRO, Bibliographic Reference Ontology (<http://purl.org/spar/ biro>)

CiTO, Citation Typing Ontology (<http://purl.org/spar/ cito>)

DataCite Ontology (<http://purl.org/spar/ datacite>)

FaBiO, FRBR-aligned Bibliographic Ontology (<http://purl.org/spar/ fabio>)

DEO, Discourse Elements Ontology (<http://purl.org/spar/ deo>)

PRO, Publishing Roles Ontology (<http://purl.org/spar/ pro>)

PSO, Publishing Status Ontology (<http://purl.org/spar/ pso>)

PWO, Publishing Workflow Ontology (<http://purl.org/spar/ pwo>)

SCORO, Scholarly Contributions and Roles Ontology (<http://purl.org/spar/ scoro>)

as are terms from the other ontologies listed in Table 1.

These are supplemented by terms from Dublin Core, FOAF (Friend of a Friend Vocabulary), PRISM (Publishing Requirements for Industry Standard Metadata) and FRBR (Functional Requirements for Bibliographic Records).

Table 1: Ontology namespace declarations

<i>Abbreviation</i>	<i>Ontology Name</i>	<i>URI</i>
<i>Default prefix</i>	A fictional namespace for examples	http://www.example.org/resource/
biro	BiRO, the Bibliographic Reference Ontology	http://purl.org/spar/biro/
cito	CiTO, the Citation Typing Ontology	http://purl.org/spar/cito/
co	The Collections Ontology	http://purl.org/co/
datacite	The DataCite Ontology	http://purl.org/spar/datacite/
dc	Dublin Core Metadata Elements v1.1	http://purl.org/dc/elements/1.1/
dcterms	Dublin Core Metadata Initiative Metadata	http://purl.org/dc/terms/
deo	The Discourse Elements Ontology	http://purl.org/spar/deo/
dqm	The Data Quality Management Vocabulary	http://purl.org/dqm-vocabulary/v1/dqm#
fabio	FaBiO, the FRBR-aligned Bibliographic Ontology	http://purl.org/spar/fabio/
foaf	FOAF, the Friend of a Friend Vocabulary	http://xmlns.com/foaf/0.1/
frapo	FRAPO, the Funders, Research Administration and Projects Ontology	http://purl.org/erif/frapo/
frbr	FRBR, Functional Requirements for Bibliographic Records	http://purl.org/vocab/frbr/core#
literal	The Literal Reification Pattern	http://www.essepuntato.it/2010/06/literalreification/
mediatypes	Linked Data URIs for MIME Media Types	http://purl.org/NET/mediatypes/
prism	PRISM, Publishing Requirements for Industry Standard Metadata	http://prismstandard.org/namespaces/basic/2.0/
pro	PRO, the Publishing Roles Ontology	http://purl.org/spar/pro/
prov	The Provenance Ontology	http://www.w3.org/ns/prov#
pso	PSO, the Publishing Status Ontology	http://purl.org/spar/pso/
pwo	PWO, the Publishing Workflow Ontology	http://purl.org/spar/pwo/
rdf	RDF namespace	http://www.w3.org/1999/02/22-rdf-syntax-ns#
rdfs	RDF Schema	http://www.w3.org/2000/01/rdf-schema#
scoro	SCORO, the Scholarly Contributions and Roles Ontology	http://purl.org/spar/scoro/
skos	SKOS, a Simple Knowledge Organization System	http://www.w3.org/2004/02/skos/core#
swanrel	The SWAN Discourse Relationships Ontology	http://purl.org/swan/2.0/discourse-relationships/
swc	The Semantic Web Conference Ontology	http://data.semanticweb.org/ns/swc/ontology#
swrc	Semantic Web Research Community Ontology	http://swrc.ontoware.org/ontology#
trait	OntoMedia Trait Representation	http://contextus.net/ontology/ontomedia/ext/common/trait#
tvc	The Time-indexed Value in Context Pattern	http://www.essepuntato.it/2012/04/tvc/
vcard	Representing vCard Objects in RDF	http://www.w3.org/2006/vcard/ns#
xsd	XML Schema Definition	http://www.w3.org/2001/XMLSchema#

JATS reference

In this document, the abbreviation "JATS" refers to the Journal Publishing Tag Set of ANSI/NISO Z39.96-2012, JATS: Journal Article Tag Suite (version 1.0):

Mulberry Technologies, Inc. (2012). Journal Publishing Tag Library. ANSI/NISO JATS Version 1.0 May 2012. Sponsored by the National Center for Biotechnology Information (NCBI) and the National Library of Medicine (NLM). <http://jats.nlm.nih.gov/publishing/>

National Information Standards Organization (2012). JATS: Journal Article Tag Suite. ANSI/NISO Z39.96-2012, Approved August 9, 2012 by the American National Standards Institute. <http://jats.niso.org/>

Note that the following mappings are made on the assumption that any document bearing JATS markup is in electronic (digital) format.

FaBiO and BiRO classes

The FaBiO and BiRO ontology classes are structured according to the FRBR model of Works, Expressions, Manifestations and Items. In this mapping document, mappings are always made to the Expression that bears the JATS markup. The mappings statements in this document *presume* the following RDF relationships between this Expression (:textual-entity, representing the article) and its corresponding Work (:conceptual-work), Manifestation (:digital-embodiment) and Item (:digital-item)

```
:textual-entity
  a fabio:Expression ;
  frbr:realizationOf :conceptual-work ;
  frbr:embodiment :digital-embodiment ;
  fabio:hasRepresentation :digital-item .
```

These relationships are specified in the first mapping statement in Table 2, that for JATS <article>, and are then presumed to exist, rather than being explicitly re-stated every time they apply.

Note further that we have chosen to use the term ":textual-entity" rather than ":this-article" to specify the document to which the JATS markup is applied, because the JATS definition of "article" is so broad that it includes things that are *not* articles:

" **<article>** This element can be used to describe not only typical journal articles (research articles) but also much of the non-article content within a journal."

This and other mapping decisions are explained in the paper:

Peroni S, Lapeyre DA and Shotton D (2012). From Markup to Linked Data: Mapping NISO JATS v1.0 to RDF using the SPAR (Semantic Publishing and Referencing) Ontologies. A paper for the *2012 JATS Conference*, Washington DC, USA, 16-17 October 2012 (<http://jats.nlm.nih.gov/jats-con/>).
Preprint available at <http://purl.org/spar/jats2rdf/mapping-paper>.

In the following tables, the mapping for each <element> is followed by mappings for @attributes appropriate for that <element>. The exemplar RDF usage statements are given in Turtle notation (<http://www.w3.org/TeamSubmission/turtle/>), and represent the mapping of those elements of the XML statements shown in **bold type**.

Table 2: JATS metadata for the elements <article> and <sub-article>

Element/attribute name	XML example	RDF translation
article	<article xml:lang="en"> ... </article>	:textual-entity a fabio:Expression ; frbr:realizationOf :conceptual-work ; frbr:embodiment :digital-embodiment ; fabio:hasRepresentation :digital-item ; dcterms:language [a dcterms:LinguisticSystem ; dcterms:description "en"^^dcterms:RFC5646] .
@article-type ("abstract")	<article article-type="abstract"> ... </article>	:textual-entity a fabio:Abstract ; frbr:summarizationOf [a fabio:Expression] .
@article-type ("addendum")	<article article-type="addendum"> ... </article>	:textual-entity a fabio:Addendum .
@article-type ("announcement")	<article article-type="announcement"> ... </article>	:conceptual-work a fabio:Announcement .
@article-type ("article-commentary")	<article article-type="article-commentary"> ... </article>	:textual-entity a fabio:Comment ; cito:discusses [a fabio:Article] .
@article-type ("book-review")	<article article-type="book-review"> ... </article>	:textual-entity a fabio:BookReview ; cito:reviews [a fabio:Book] .
@article-type ("books-received")	<article article-type="books-received"> ... </article>	:conceptual-work a fabio:NotificationOfReceipt ; swanrel:relatesTo [a fabio:Book] .
@article-type ("brief-report")	<article article-type="brief-report"> ... </article>	:textual-entity a fabio:BriefReport .
@article-type ("calendar")	<article article-type="calendar"> ... </article>	:conceptual-work a fabio:TimeTable .
@article-type ("case-report")	<article article-type="case-report"> ... </article>	:textual-entity a fabio:ReportDocument . :conceptual-work a fabio:CaseReport .
@article-type ("collection")	<article article-type="collection"> ... </article>	:textual-entity a foaf:ExpressionCollection .
@article-type ("correction")	<article article-type="correction"> ... </article>	:conceptual-work a fabio:Correction .
@article-type ("discussion")	<article article-type="discussion"> ... </article>	:conceptual-work a fabio:Opinion .
@article-type ("dissertation")	<article article-type="dissertation"> ... </article>	:textual-entity a fabio:Thesis .
@article-type ("editorial")	<article article-type="editorial"> ... </article>	:textual-entity a fabio:Editorial .

	</article>	
@article-type (“in-brief”)	<article article-type=“in-brief” > ... </article>	:textual-entity a fabio:InBrief ; frbr:partOf :periodical-issue ; frbr:summarizationOf [a fabio:Article ; frbr:partOf :periodical-issue] . :periodical-issue a fabio:PeriodicalIssue .
@article-type (“introduction”)	<article article-type=“introduction” > ... </article>	:conceptual-work a deo:Introduction .
@article-type (“letter”)	<article article-type=“letter” > ... </article>	:textual-entity a fabio:Letter .
@article-type (“meeting-report”)	<article article-type=“meeting-report” > ... </article>	:textual-entity a fabio:ReportDocument . :conceptual-work a fabio:MeetingReport .
@article-type (“news”)	<article article-type=“news” > ... </article>	:textual-entity a fabio:NewsItem .
@article-type (“obituary”)	<article article-type=“obituary” > ... </article>	:conceptual-work a fabio:Obituary .
@article-type (“oration”)	<article article-type=“oration” > ... </article>	:textual-entity a fabio:Oration .
@article-type (“partial-retraction”)	<article article-type=“partial-retraction” > ... </article>	:textual-entity cito:retracts [frbr:partOf [a owl:Thing]] . :conceptual-work a fabio:Retraction .
@article-type (“product-review”)	<article article-type=“product-review” > ... </article>	:textual-entity cito:reviews [a owl:Thing] . :conceptual-work a fabio:ProductReview .
@article-type (“rapid-communication”)	<article article-type=“rapid-communication” > ... </article>	:textual-entity a fabio:RapidCommunication .
@article-type (“reply”)	<article article-type=“reply” > ... </article>	:textual-entity cito:repliesTo [a frbr:Endeavour] . :conceptual-work a fabio:Reply .
@article-type (“reprint”)	<article article-type=“reprint” > ... </article>	:digital-embodiment frbr:reproductionOf [a fabio:Manifestation] .
@article-type (“research-article”)	<article article-type=“research-article” > ... </article>	:textual-entity a fabio:Article . :conceptual-work a fabio:ResearchPaper .
@article-type (“retraction”)	<article article-type=“retraction” > ... </article>	:textual-entity cito:retracts [a owl:Thing] . :conceptual-work a fabio:Retraction .
@article-type (“review-article”)	<article article-type=“review-article” > ... </article>	:textual-entity a fabio:ReviewArticle ; cito:reviews [a owl:Thing] .
@article-type (“translation”)	<article article-type=“translation” > ... </article>	:textual-entity frbr:translationOf [a fabio:Expression] .

sub-article	<pre> <article> ... <sub-article xml:lang="it"> ... </sub-article> ... </article> </pre>	<pre> :sub-textual-entity a fabio:Expression ; frbr:partOf :textual-entity ; frbr:realizationOf :sub-conceptual-work ; frbr:embodiment :digital-embodiment ; fabio:hasRepresentation :digital-item ; dcterms:language [a dcterms:LinguisticSystem ; dcterms:description "it"^^dcterms:RFC5646] . :sub-conceptual-work frbr:partOf :conceptual-work . </pre>
<p>Note: The same attribute mappings apply to <sub-article> as to <article>, using <i>:sub-textual-entity</i> and <i>:sub-conceptual-work</i> instead of <i>:textual-entity</i> and <i>:conceptual-work</i> respectively.</p>		

Table 3: JATS metadata for the element <article-meta>

Element/attribute name	XML example	RDF translation
article-id	<article-meta> <article-id>XXX</article-id> </article-meta>	:textual-entity dcterms:identifier "XXX" .
@pub-id-type (“art-access-id”)	<article-id pub-id-type="art-access-id"> XXX</article-id>	:textual-entity datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent ; rdfs:label "An archive"]] .
@pub-id-type (“arxiv”)	<article-id pub-id-type="arxiv"> XXX</article-id>	:textual-entity fabio:hasArXivId "XXX" .
@pub-id-type (“coden”)	<article-id pub-id-type="coden"> XXX</article-id>	:textual-entity fabio:hasCODEN "XXX" .
@pub-id-type (“doi”)	<article-id pub-id-type="doi"> XXX</article-id>	:textual-entity prism:doi "XXX" .
@pub-id-type (“doaj”)	<article-id pub-id-type="doaj"> XXX</article-id>	:textual-entity datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent ; rdfs:label "DOAJ"]] .
@pub-id-type (“isbn”)	<article-id pub-id-type="isbn"> XXX</article-id>	:textual-entity frbr:embodiment [a fabio:Manifestation ; prism:isbn "XXX"] . or :textual-entity frbr:partOf [a fabio:Expression ; frbr:embodiment [a fabio:Manifestation ; prism:isbn "XXX"]] .
@pub-id-type (“manuscript”)	<article-id pub-id-type="manuscript"> XXX</article-id>	:textual-entity datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX"] .
@pub-id-type (“medline”)	<article-id pub-id-type="medline"> XXX</article-id>	:textual-entity fabio:hasPubMedId "XXX" .
@pub-id-type (“other”)	<article-id pub-id-type="other"> XXX</article-id>	:textual-entity dcterms:identifier "XXX" .
@pub-id-type (“pii”)	<article-id pub-id-type="pii"> XXX</article-id>	:textual-entity fabio:hasPII "XXX" . # See footnote ¹
@pub-id-type (“pmcid”)	<article-id pub-id-type="pmcid"> XXX</article-id>	:textual-entity fabio:hasPubMedCentralId "XXX" .
@pub-id-type (“pmid”)	<article-id pub-id-type="pmid"> XXX</article-id>	:textual-entity fabio:hasPubMedId "XXX" .
@pub-id-type	<article-id pub-id-type="publisher-id">	:textual-entity datacite:hasIdentifier [a datacite:Identifier ;

¹ The PPI identifies an item such as a chapter within a serial or book, which has the same expression whether it appears in a hardback or a paperback version of the book, despite the fact that these will have different ISBNs.

(“publisher-id”)	XXX</article-id>	datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue “XXX” ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label “A Publisher”]] .
@pub-id-type (“sici”)	<article-id pub-id-type=“sici”> XXX</article-id>	:textual-entity fabio:hasSICI “XXX” .
@pub-id-type (“std-designation”)	<article-id pub-id-type=“std-designation”> XXX</article-id>	:conceptual-work a fabio:TechnicalStandard ; fabio:hasStandardNumber “XXX” .
article-categories	<article-meta> ... <article-categories> <subj-group> <subject>XXX</subject> <subj-group> <subject>YYY</subject> </subj-group> </article-categories> ... </article-meta>	:textual-entity fabio:hasSubjectTerm :term1 , :term2 . :term1 a fabio:SubjectTerm ; rdfs:label “XXX” ; skos:narrower :term2 . :term2 a fabio:SubjectTerm ; rdfs:label “YYY” .
article-title	<article-meta> ... <title-group> <article-title>XXX</article- title> </title-group> ... </article-meta>	:textual-entity dcterms:title “XXX”@en .
subtitle	<article-meta> ... <title-group> ... <subtitle>XXX</subtitle> </title-group> ... </article-meta>	:textual-entity fabio:hasSubtitle “XXX”@en .
trans-title	<article-meta> ... <title-group> ... <trans-title-group @xml:lang=“it”> <trans-title>XXX</trans-title> </trans-title-group> </title-group> ... </article-meta>	:textual-entity fabio:hasTranslatedTitle “XXX”@it .
alt-title	<article-meta> ... <title-group> ... <alt-title>XXX</alt-title> </title-group> ... </article-meta>	:textual-entity prism:alternateTitle “XXX” .
pub-date	<article-meta> ... <title-group> ... <pub-date> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date> </title-group> ... </article-meta>	:conceptual-work dcterms:date “YYYY-MM-DD”^^xsd:date . or :textual-entity dcterms:date “YYYY-MM-DD”^^xsd:date . or :digital-embodiment dcterms:date “YYYY-MM-DD”^^xsd:date . # See footnote ²
@date-type	<pub-date date-type=“accepted”> <day>DD</day>	:conceptual-work frbr:realization [a fabio:Expression ;

² Here, and also for <date>, the alternatives are valid, since <pub-date> can be applied to so many different things in different contexts.

("accepted")	<month>MM</month> <year>YYYY</year> </pub-date>	dcterms:dateAccepted YYYY-MM-DD^^xsd:date] .
@date-type ("corrected")	<pub-date date-type="corrected"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work fabio:hasCorrectionDate "YYYY-MM-DD"^^xsd:date ; frbr:realization [a fabio:Expression ; frbr:revision [a fabio:Expression ; dcterms:created "YYYY-MM-DD"^^xsd:date]] . # See footnote ³
@date-type ("preprint")	<pub-date date-type="preprint"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity a fabio:Preprint ; fabio:hasDistributionDate "YYYY-MM-DD"^^xsd:date .
@date-type ("retracted")	<pub-date date-type="retracted"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity fabio:hasRetractionDate "YYYY-MM-DD"^^xsd:date . # See footnote ⁴
@date-type ("received")	<pub-date date-type="received"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work frbr:realization [a fabio:Expression ; fabio:hasDateReceived "YYYY-MM-DD"^^xsd:date] .
@date-type ("rev-recd")	<pub-date date-type="rev-recd"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work frbr:realization [a fabio:Expression ; frbr:revision [a fabio:Expression ; fabio:hasDateReceived "YYYY-MM-DD"^^xsd:date]] . # See footnote ³
@date-type ("rev-request")	<pub-date date-type="rev-request"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work fabio:hasRevisionRequestDate "YYYY-MM-DD"^^xsd:date .
@date-type ("pub")	<pub-date date-type="pub"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [prism:publicationDate "YYYY-MM-DD"^^xsd:date] . # See footnote ⁵
@publication-format ("print")	<pub-date publication-format="print"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:PrintObject ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
@publication-format ("electronic")	<pub-date publication-format="electronic"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:DigitalManifestation ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
@publication-format ("ebook")	<pub-date publication-format="ebook"> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity a fabio:Book ; frbr:embodiment [a fabio:DigitalManifestation ; dcterms:date "YYYY-MM-DD"^^xsd:date] .

³ The FRBR Work layer is the only one that may change during time, from the first draft to the final published version or subsequently corrected version. The individual Expression at each stage is a static document that does not change, while every revision of a past Work realization results in a new Expression. For this reason, the statement defining the date on which a correction is made to the content of the document applies specifically to the Work that underlies the particular document bearing the JATS markup (in our mapping, the entity *:conceptual-work*). This also applies to @date-type ("ecorrected") and @date-type "pcorrected".

⁴ Retractions apply to published Expressions (here *:textual-entity*) or their Manifestations. You cannot retract a Work.

⁵ It is the Manifestation's publication date that is critical, since print and electronic Manifestations of the same Expression can have different publication dates.

@publication-format ("video")	<pub-date publication-format="video" <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work a fabio:MovingImage ; fabio:hasManifestation [a fabio:Manifestation ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
@publication-format ("audio")	<pub-date publication-format="audio" <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work a fabio:SoundRecording ; fabio:hasManifestation [a fabio:Manifestation ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
@publication-format ("online")	<pub-date publication-format="online" <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:DigitalManifestation ; frbr:exemplar [a fabio:ComputerFile ; fabio:isStoredOn fabio:internet] ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
@publication-format ("web")	<pub-date publication-format="web" <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:DigitalManifestation ; frbr:exemplar [a fabio:ComputerFile ; fabio:isStoredOn fabio:web] ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
@publication-format ("XXX")	<pub-date publication-format="XXX" <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:Manifestation ; dcterms:format [a dcterms:MediaTypeOrExtent ; rdfs:label "XXX"] ; dcterms:date "YYYY-MM-DD"^^xsd:date] .
season	<pub-date> <season>SSS</season> <year>YYYY</year> </pub-date>	:textual-entitiy literal:hasLiteral [a dcterms:date ; fabio:hasSeason "SSS" ; literal:hasLiteralValue "YYYY"^^xsd:gYear] .
@calendar	<pub-date calendar="XXX" > <year>YYYY</year> </pub-date>	:textual-entity literal:hasLiteral [a dcterms:date ; literal:hasLiteralValue "YYYY"^^xsd:gYear ; fabio:usesCalendar "XXX"] .
@pub-type ("epub")	<pub-date pub-type="epub" > <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:DigitalManifestation ; prism:publicationDate "YYYY-MM-DD"^^xsd:date] .
@pub-type ("ppub")	<pub-date pub-type="ppub" > <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:PrintObject ; prism:publicationDate "YYYY-MM-DD"^^xsd:date] .
@pub-type ("epub-ppub")	<pub-date pub-type="epub-ppub" > <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:DigitalManifestation ; prism:publicationDate "YYYY-MM-DD"^^xsd:date] , [a fabio:PrintObject ; prism:publicationDate "YYYY-MM-DD"^^xsd:date] .
@pub-type ("eprint")	<pub-date pub-type="eprint" > <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work frbr:realization [a fabio:Preprint ; frbr:embodiment [a fabio:DigitalManifestation ; fabio:hasDistributionDate "YYYY-MM-DD"^^xsd:date]] .
@pub-type ("ppreprint")	<pub-date pub-type="ppreprint" > <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work frbr:realization [a fabio:Preprint ; frbr:embodiment [a fabio:PrintObject ; fabio:hasDistributionDate "YYYY-MM-DD"^^xsd:date]] .
@pub-type ("ecorrected")	<pub-date pub-type="ecorrected" <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work fabio:hasCorrectionDate "YYYY-MM-DD"^^xsd:date ; frbr:realization [a fabio:Expression ; frbr:revision [a fabio:Expression ; dcterms:created "YYYY-MM-DD"^^xsd:date ; frbr:embodiment [a fabio:DigitalManifestation]]] .

		# See footnote ³
@pub-type (“pcorrected”)	<pub-date pub-type=“pcorrected”> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:conceptual-work fabio:hasCorrectionDate “YYYY-MM-DD”^^xsd:date ; frbr:realization [a fabio:Expression ; frbr:revision [a fabio:Expression ; dcterms:created “YYYY-MM-DD”^^xsd:date ; frbr:embodiment [a fabio:PrintObject]]] . # See footnote ³
@pub-type (“eretracted”)	<pub-date pub-type=“eretracted”> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:DigitalManifestation ; fabio:hasRetractionDate “YYYY-MM-DD”^^xsd:date] . # See footnote ⁴
@pub-type (“pretracted”)	<pub-date pub-type=“pretracted”> <day>DD</day> <month>MM</month> <year>YYYY</year> </pub-date>	:textual-entity frbr:embodiment [a fabio:PrintObject ; fabio:hasRetractionDate “YYYY-MM-DD”^^xsd:date] . # See footnote ⁴
issue	<article-meta> ... <issue>XXX</issue> ... </article-meta>	:textual-entity frbr:partOf :periodical-issue . :periodical-issue a fabio:PeriodicalIssue ; frbr:realizationOf :conceptual-papers-collection ; prism:issueIdentifier “XXX” . :conceptual-papers-collection a fabio:WorkCollection .
issue-id	<article-meta> ... <issue-id>XXX</issue-id> ... </article-meta>	:periodical-issue prism:issueIdentifier “XXX” . See footnote ⁶
issue-title	<article-meta> ... <issue-title>XXX</issue-title> ... </article-meta>	:periodical-issue dcterms:title “XXX”@en .
issue-sponsor	<article-meta> ... <issue-sponsor>XXX</issue-sponsor> ... </article-meta>	:conceptual-papers-collection frapo:isFundedBy [a foaf:Agent ; foaf:name “XXX”] .
issue-part	<article-meta> ... <issue-part>XXX</issue-part> ... </article-meta>	:periodical-issue prism:section “XXX” .
@seq	<issue seq=“XXX”> ... </issue>	:periodical-issue fabio:hasSequenceIdentifier “XXX” .
volume	<article-meta> ... <volume>XXX</volume> ... </article-meta>	:periodical-issue frbr:partOf :periodical-volume . :periodical-volume a fabio:PeriodicalVolume ; frbr:partOf fabio:Periodical ; prism:volume “XXX” .
volume-id	<article-meta> ... <volume-id>XXX</volume-id> ... </article-meta>	:periodical-volume prism:volume “XXX” . # See footnote ⁷
volume-series	<article-meta> ... <volume-series>XXX</volume-series> ... </article-meta>	:periodical-volume fabio:hasSequenceIdentifier “XXX” .

⁶ The previously defined statement “:textual-entity frbr:partOf :periodical-issue .” is assumed here and subsequently.

⁷ The previously defined statement “:periodical-issue frbr:partOf :periodical-volume.” is assumed here and subsequently.

	</article-meta>	
isbn	<article-meta> ... <isbn>XXX</isbn> ... </article-meta>	:textual-entity frbr:partOf :periodical-issue . :periodical-issue frbr:embodiment [a fabio:Manifestation ; prism:isbn "XXX"] . or :textual-entity frbr:partOf :periodical-volume . :periodical-volume frbr:embodiment [a fabio:Manifestation ; prism:isbn "XXX"] . # See footnote ⁸
supplement	<article-meta> ... <supplement>XXX</supplement> ... </article-meta>	:textual-entity a fabio:Supplement ; dcterms:description "XXX" .
fpage lpage page-range	<article-meta> ... <fpage>XXX</fpage> <lpage>WWW</lpage> <page-range> XXX-YYY, ZZZ-WWW </page-range> ... </article-meta>	:textual-entity frbr:embodiment [a fabio:Manifestation ; prism:startingPage "XXX" ; prism:endingPage "WWW" ; prism:pageRange "XXX-YYY, ZZZ-WWW"] .
elocation-id	<article-meta> ... <elocation-id>XXX</elocation-id> ... </article-meta>	:textual-entity frbr:embodiment [a fabio:Manifestation ; fabio:hasDigitalArticleIdentifier "XXX"] .
product	<article-meta> ... <product>...</product> ... </article-meta>	:textual-entity cito:discusses :this-product . :this-product a owl:Thing .
@product-type ("book")	<product product-type="book"> ... </product>	:this-product a fabio:Book . # See footnote ⁹
@product-type ("software")	<product product-type="software"> ... </product>	:this-product a fabio:ComputerProgram .
@product-type ("article")	<product product-type="article"> ... </product>	:this-product a fabio:Article .
@product-type ("issue")	<product product-type="issue"> ... </product>	:this-product a fabio:PeriodicalIssue .
@product-type ("website")	<product product-type="website"> ... </product>	:this-product a fabio:WebSite .
@product-type ("film")	<product product-type="film"> ... </product>	:this-product a fabio:Film .
@product-type ("XXX")	<product product-type="XXX"> ... </product>	:this-product a [a owl:Class ; rdfs:label "XXX"] .
supplementary-material	<article-meta> ... <supplementary-material> ... </supplementary-material> ...	:textual-entity cito:citesASRelated supplementary-information. :supplementary-information a fabio:SupplementaryInformation .

⁸ Here, the alternatives are valid, since the mapping depends on the subject entity to which the ISBN relates.

⁹ The previously defined statement ":textual-entity cito:discusses :this-product ." is assumed here and subsequently.

	</article-meta>	
@mimetype <i>and</i> @mime-subtype	<supplementary-material mimetype="XXX" mime-subtype="YYY" ... </supplementary-material>	:supplementary-information frbr:embodiment [a fabio:DigitalManifestation ; dcterms:format mediatypes:XXX/YYY] .
date	<article-meta> ... <history> <date> ... </date> </history> ... </article-meta>	:conceptual-work dcterms:date "YYYY-MM-DD"^^xsd:date . or :textual-entity dcterms:date "YYYY-MM-DD"^^xsd:date . or :digital-embodiment dcterms:date "YYYY-MM-DD"^^xsd:date . # See footnote ¹⁰
Note: <date> can take the @date-type attribute. The mappings for @date-type are as shown above for <pub-date>.		
copyright-statement	<article-meta> ... <permissions> <copyright-statement> ... XXX ... </copyright-statement> </permissions> ... </article-meta>	:textual-entity dcterms:rights "XXX" .
copyright-year	<article-meta> ... <permissions> <copyright-year> XXXX </copyright-year> </permissions> ... </article-meta>	:textual-entity fabio:hasCopyrightYear "XXXX"^^xsd:gYear .
copyright-holder	<article-meta> ... <permissions> <copyright-holder> XXX </copyright-holder> </permissions> ... </article-meta>	:copyright-agent a foaf:Agent ; foaf:name "XXX" ; pro:holdsRoleInTime [pro:withRole pro:copyright-owner ; pro:relatesToDocument :textual-entity] .
license	<article-meta> ... <permissions> <license xlink:href="YYY"> ... XXX ... </license> </permissions> ... </article-meta>	:textual-entity dcterms:license <YYY> .
kwd	<article-meta> ... <kwd>XXX</kwd> ... </article-meta>	:textual-entity prism:keyword "XXX" .
award-group	<article-meta> ... <award-group> ... </award-group> ... </article-meta>	:textual-entity frapo:isOutputOf :investigation . :investigation a frapo:Investigation .
funding-source	<award-group> <funding-source country="YYY"> XXX </funding-source> </award-group>	:funding-agent a foaf:Agent ; foaf:name "XXX" ; frapo:country "YYY" ; frapo:funds :investigation .

¹⁰ Here, as for <pub-date>, the alternatives are valid, since <date> can be applied to so many different things in different contexts.

award-id	<award-group> <award-id> XXX </award-id> </award-group>	:funding-agent frapo:awards :award . :award a frapo:Grant ; frapo:hasGrantNumber "XXX" frapo:funds :investigation .
principal-award-recipient	<award-group> <principal-award-recipient> XXX </principal-award-recipient> </award-group>	:funding-recipient-agent a foaf:Agent ; foaf:name "XXX" ; pro:holdsRoleInTime [pro:withRole scoro:funding-recipient ; pro:relatesToEntity :investigation] .
principal-investigator	<award-group> <principal-investigator> XXX </principal-investigator> </award-group>	:principal-investigator a foaf:Agent ; foaf:name "XXX" pro:holdsRoleInTime [pro:withRole scoro:principal-investigator ; pro:relatesToEntity :investigation] .
conference	<article-meta> ... <conference> ... </conference> ... </article-meta>	:textual-entity a fabio:ConferencePaper . :conceptual-work swc:relatedToEvent :conference . :conference a swc:ConferenceEvent .
conf-date	<conference> <conf-date>XXX</conf-date> </conference>	:conference swrc:date "XXX" .
conf-name	<conference> ... <conf-name>XXX</conf-name> </conference>	:conference swrc:eventTitle "XXX" .
conf-acronym	<conference> ... <conf-acronym>XXX</conf-acronym> </conference>	:conference frapo:hasAcronym "XXX".
conf-num	<conference> ... <conf-num>XXX</conf-num> </conference>	:conference swrc:number "XXX" .
conf-loc	<conference> ... <conf-loc>XXX</conf-loc> </conference>	:conference swrc:location "XXX" .
conf-sponsor	<conference> ... <conf-sponsor>XXX</conf-sponsor> </conference>	:conference swc:hasSponsorship [a swc:Sponsorship ; swc:isProvidedBy [a foaf:Organization ; foaf:name "XXX"]] .
conf-theme	<conference> ... <conf-theme>... XXX ...</conf-theme> </conference>	:conference dcterms:description "XXX" .
related-article	<article-meta> ... <related-article> ... </related-article> ... </article-meta>	:textual-entity frbr:relatedEndeavour :related-textual-entity . :related-textual-entity a fabio:Article .
@id	<related-article id="XXX"> ... </related-article>	:related-textual-entity dcterms:identifier "XXX" .
related-object	<article-meta> ... <related-object> ... </related-object> ... </article-meta>	:textual-entity frbr:relatedEndeavour :related-object . :related-object a frbr:Expression .
@object-id	<related-object object-id="XXX"> ... </related-object>	:related-object dcterms:identifier "XXX" .
@object-id-type	<related-object object-id="XXX" object-id-type="doi"> ... </related-object>	:related-object prism:doi "XXX" .

("doi")	</related-object>	
self-uri	<pre> <article-meta> ... <self-uri xlink:href="XXX"> "YY" </self-uri> ... </article-meta> </pre>	<pre> :textual-entity frbr:arrangement [a fabio:Expression ; dqm:hasURI "XXX"^^xsd:anyURI ; dcterms:description "YYY"] . </pre>

Table 4: JATS metadata for the element <journal-meta>

Element/attribute name	XML example	RDF translation
journal-meta	<pre><article> <front> <journal-meta> ... </journal- meta> ... </front> ... </article></pre>	<pre>:textual-entity frbr:partOf :journal . :journal a fabio:Journal ; frbr:realizationOf [a fabio:WorkCollection] .</pre>
journal-id	<pre><journal-meta> <journal-id xml:lang="en">XXX</journal-id> ... </journal-meta></pre>	<pre>:journal dcterms:identifier "XXX"@en .</pre>
@journal-id-type ("YYY")	<pre><journal-id journal-id-type="YYY"> XXX</journal-id></pre>	<pre>:journal datacite:hasIdentifier [a datacite:Identifier ; literal:hasLiteralValue "XXX" ; datacite:usesIdentifierScheme [a datacite:IdentifierScheme ; rdfs:label "YYY"]] . or :journal datacite:hasIdentifier [a datacite:Identifier ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; dcterms:description "Identifier scheme authority" ; rdfs:label "YYY"]] . # see footnote ¹¹</pre>
@journal-id-type ("archive")	<pre><journal-id journal-id-type="archive"> XXX</journal-id></pre>	<pre>:journal datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label "An archive"]] .</pre>
@journal-id-type ("aggregator")	<pre><journal-id journal-id-type="aggregator"> XXX</journal-id></pre>	<pre>:journal datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label "An aggregator"]] .</pre>
@journal-id-type ("doaj")	<pre><journal-id journal-id-type="doaj"> XXX</journal-id></pre>	<pre>:journal datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label "DOAJ"]] .</pre>
@journal-id-type ("doi")	<pre><journal-id journal-id-type="doi"> XXX</journal-id></pre>	<pre>:journal prism:doi "XXX" .</pre>
@journal-id-type ("index")	<pre><journal-id journal-id-type="index"> XXX</journal-id></pre>	<pre>:journal datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label "An indexing service"]] .</pre>

¹¹ These alternatives are valid, since this element can be used either to identify an identifier scheme, or to identify the organization or authority responsible for that identifier scheme.

@journal-id-type (“issn”)	<journal-id journal-id-type=“issn” XXX</journal-id>	:journal prism:issn “XXX” .
@journal-id-type (“nlm-ta”)	<journal-id journal-id-type=“nlm-ta” XXX</journal-id>	:journal literal:hasLiteral [a fabio:hasShortTitle ; literal:hasLiteralValue “XXX” ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label “PubMed”]] .
@journal-id-type (“pmc”)	<journal-id journal-id-type=“pmc” XXX</journal-id>	:journal literal:hasLiteral [a fabio:hasShortTitle ; literal:hasLiteralValue “XXX” ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label “PubMed Central”]] .
@journal-id-type (“publisher-id”)	<journal-id journal-id-type=“publisher-id” XXX</journal-id>	:journal datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:local-resource-identifier-scheme ; literal:hasLiteralValue “XXX” ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; rdfs:label “A Publisher”]] .
journal-title	<journal-meta> ... <journal-title-group> <journal-title @xml:lang=“en”> XXX</journal-title> </journal-title-group> ... </journal-meta>	:journal dcterms:title “XXX”@en .
journal-subtitle	<journal-meta> ... <journal-title-group> <journal-subtitle @xml:lang=“en”> XXX</journal-subtitle> </journal-title-group> ... </journal-meta>	:journal fabio:hasSubtitle “XXX”@en .
trans-title	<journal-meta> ... <journal-title-group> <trans-title-group @xml:lang=“it”> <trans-title>XXX</trans-title> </trans-title-group> </journal-title-group> ... </journal-meta>	:journal fabio:hasTranslatedTitle “XXX”@it .
trans-subtitle	<journal-meta> ... <journal-title-group> <trans-title-group @xml:lang=“it”> ... <trans-subtitle> XXX</trans-subtitle> </trans-title-group> </journal-title-group> ... </journal-meta>	:journal fabio:hasTranslatedSubtitle “XXX”@it .
abbrev-journal- title	<journal-meta> ... <journal-title-group> <abbrev-journal-title @xml:lang=“en”> XXX</abbrev-journal-title> </journal-title-group> ... </journal-meta>	:journal fabio:hasShortTitle “XXX”@en .
abbrev-type (“YYY”)	<abbrev-journal-title abbrev-type=“YYY” XXX </abbrev-journal-title>	:journal literal:hasLiteral [a fabio:hasShortTitle ; literal:hasLiteralValue “XXX” ; prov:wasAttributedTo [a prov:Agent ; rdfs:label “YYY”]] .

issn	<journal-meta> ... <issn>XXX</issn> ... </journal-meta>	:journal prism:issn "XXX" .
issnl	<journal-meta> ... <issn-l>XXX</issn-l> ... </journal-meta>	:journal fabio:hasIssnL "XXX" .
isbn	<journal-meta> ... <isbn>XXX</isbn> ... </journal-meta>	:periodical-issue a fabio:PeriodicalIssue ; frbr:part :textual-entity ; frbr:partOf :journal ; frbr:embodiment [a fabio:Manifestation ; prism:isbn "XXX"] . or :periodical-volume a fabio:PeriodicalVolume ; frbr:part :textual-entity ; frbr:partOf :journal ; frbr:embodiment [a fabio:Manifestation ; prism:isbn "XXX"] . # See footnote ¹²
publisher	<journal-meta> ... <publisher>...</publisher> ... </journal-meta>	:journal dcterms:publisher :this-publisher . :this-publisher a foaf:Organization .
publisher-name	<publisher> <publisher-name>XXX</publisher-name> </publisher>	:this-publisher foaf:name "XXX" . # See footnote ¹³
publisher-loc	<publisher> ... <publisher-loc>XXX</publisher-loc> </publisher>	:this-publisher tvcc:hasValueInTime [a tvcc:ValueInTime ; tvcc:withValue [a vcard:VCard ; vcard:addr [a vcard:Address ; vcard:locality "XXX"]] ; tvcc:withinContext :journal] .

¹² Here, the alternatives are valid, since the mapping depends on the subject entity to which the ISBN relates.

¹³ The previously defined statement ":journal dcterms:publisher :this-publisher ." is assumed here and subsequently.

Table 5: JATS metadata for the element <contrib>.

Element/attribute name	XML example	RDF translation
contrib	<article> ... <contrib>...</contrib> ... </article>	:conceptual-work dcterms:contributor :this-agent . :this-agent a foaf:Agent . # See footnote ¹⁴
@contrib-type (“author”)	<contrib contrib-type=“author”> ... </contrib>	:conceptual-work dcterms:creator :this-agent . :this-agent pro:holdsRoleInTime [pro:withRole pro:author ; pro:relatesToDocument :conceptual-work] .
@contrib-type (“XXX”)	<contrib contrib-type=“XXX”> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole [a pro:Role ; rdfs:label “XXX”] ; pro:relatesToDocument :conceptual-work] . # See footnote ¹⁵
@corresp (“yes”)	<contrib corresp=“yes”> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole scoro:corresponding-author ; pro:relatesToDocument :textual-entity] .
@deceased (“yes”)	<contrib deceased=“yes”> ... </contrib>	:this-agent a trait:Dead .
@equal-contrib (“yes”)	<!-- Agent 1 --> <contrib equal-contrib=“yes”> ... </contrib> ... <!-- Agent 2 --> <contrib equal-contrib=“yes”> ... </contrib>	:this-agent-1 scoro:makesContribution [a scoro:ContributionSituation ; scoro:hasContributionContext :conceptual-work ; scoro:isEqualToContributionSituation _contribution-2] . _contribution-2 a scoro:ContributionSituation ; scoro:hasContributionContext :conceptual-work . :this-agent-2 scoro:makesContribution _contribution-2 .
@equal-contrib (“no”)	<contrib equal-contrib=“no”> ... </contrib>	:this-agent scoro:makesContribution [a scoro:ContributionSituation ; scoro:hasContributionContext :conceptual-work] .
contrib-id	<contrib> <contrib-id>XXX</contrib-id> ... </contrib>	:this-agent dcterms:identifier “XXX” .
@contrib-id-type (“ORCID”)	<contrib-id contrib-id-type=“ORCID”> XXX</contrib-id>	:this-agent datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:orcid; literal:hasLiteralValue “XXX”] .
@contrib-id-type (“JST”)	<contrib-id contrib-id-type=“JST”> XXX</contrib-id>	:this-agent datacite:hasIdentifier [a datacite:Identifier ; datacite:usesIdentifierScheme datacite:jst; literal:hasLiteralValue “XXX”] .
@contrib-id-type (“YYY”)	<contrib-id contrib-id-type=“YYY”> XXX</contrib-id>	:this-agent datacite:hasIdentifier [a datacite:Identifier ; literal:hasLiteralValue “XXX” ; datacite:usesIdentifierScheme [a datacite:IdentifierScheme ; rdfs:label “YYY”]] .

¹⁴ In JATS <contrib> is specified as a container element for information about a single person. However, <collab>, referring to a group of people, is permitted within <contrib>, as well as within <contrib-group>, enabling, for example, an organization or a consortium of people to be named as a single author in an article's author list. So, rather than use *foaf:Person* as the object of the mapping here, we make a more generic mapping to *foaf:Agent*, which has sub-classes *foaf:Person*, *foaf:Group* and *foaf:Organization*.

¹⁵ The previously-defined statement “:conceptual-work dcterms:creator :this-agent .” is assumed here and subsequently.

		<p>or</p> <pre>:this-agent datacite:hasIdentifier [a datacite:Identifier ; literal:hasLiteralValue "XXX" ; prov:wasAttributedTo [a prov:Agent , foaf:Organization ; dterms:description "Identifier scheme authority" ; rdfs:label "YYY"]] .</pre> <p># see footnote ¹⁶</p>
anonymous	<contrib><anonymous /></contrib>	:this-agent foaf:name "Anonymous" .
collab	<contrib> <collab @xml:lang="en">XXX</collab> </contrib>	:this-agent a foaf:Group ; foaf:name "XXX"@en .
collab-alternatives	<contrib> <collab-alternatives> <collab @xml:lang="en"> XXX</collab> <collab @xml:lang="it"> QQQ</collab> </collab-alternatives> </contrib>	:this-agent a foaf:Group ; foaf:name "XXX"@en , "QQQ"@it .
@collab-type (“assignee”)	<collab collab-type="assignee"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole scor:patent-holder ; pro:relatesToDocument :conceptual-work] .
@collab-type (“authors”)	<collab collab-type="authors"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole pro:author ; pro:relatesToDocument :conceptual-work] .
@collab-type (“editors”)	<collab collab-type="editors"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole pro:editor ; pro:relatesToDocument :textual-entity] .
@collab-type (“compilers”)	<collab collab-type="compilers"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole pro:compiler ; pro:relatesToDocument :conceptual-work] .
@collab-type (“guest-editors”)	<collab collab-type="guest-editors"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole pro:guest-editor ; pro:relatesToDocument :textual-entity] .
@collab-type (“inventors”)	<collab collab-type="inventors"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole scor:inventor ; pro:relatesToDocument :conceptual-work] .
@collab-type (“translators”)	<collab collab-type="translators"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole pro:translator ; pro:relatesToDocument :textual-entity] .
@collab-type (“YYY”)	<collab collab-type="YYY"> ... </collab >	:this-agent pro:holdsRoleInTime [pro:withRole [a pro:Role ; rdfs:label "YYY"] ; pro:relatesToDocument :conceptual-work] .
name <i>and</i> string-name	<contrib> ... <name> ... </name> ... </contrib> or <contrib> ... <string-name> ... </string-name> ... </contrib>	:this-agent a foaf:Person .

¹⁶ These alternatives are valid, since this element can be used either to identify an identifier scheme, or to identify the organization or authority responsible for that identifier scheme.

surname	<pre><contrib> ... <name> <surname>XXX</surname> </name> ... </contrib></pre>	:this-agent a foaf:Person ; foaf:familyName "XXX" .
given-names	<pre><contrib> ... <name> <given-names>PPP QQQ</given- names> </name> ... </contrib></pre>	:this-agent a foaf:Person ; foaf:givenName "PPP QQQ" .
@initials	<pre><name> <surname initials="X"> XXX</surname> <given-names initials="PQ"> PPP QQQ</given-names> </name></pre>	:this-agent a foaf:Person ; foaf:familyName "XXX" ; foaf:givenName "PPP QQQ" ; frapo:familyNameInitial "X" ; frapo:givenNameInitial "PQ" .
prefix	<pre><name> ... <prefix>XXX</prefix> </name></pre>	:this-agent a foaf:Person ; foaf:title "XXX" .
suffix	<pre><name> ... <suffix>XXX</suffix> </name></pre>	:this-agent a foaf:Person ; frapo:hasNameSuffix "XXX" .
name-alternatives	<pre><contrib> ... <name-alternatives> <name> <surname xml:lang="en"> DDD</surname> </name> <name> <surname xml:lang="gr"> ΔΔΔ</surname> </name> </name-alternatives> ... </contrib></pre>	:this-agent a foaf:Person ; foaf:familyName "DDD"@en , "ΔΔΔ"@gr .
degrees	<pre><contrib> ... <degrees>XXX</degrees> ... </contrib></pre>	:this-agent frapo:hasDegreeSuffix "XXX" .
address	<pre><contrib> ... <address> ... </address> ... </contrib></pre>	:this-agent tv:hasValueInTime [a tv:ValueInTime ; tv:withValue :this-agent-contact-info ; tv:withinContext :conceptual-work] . :this-agent-contact-info a vcard:VCard .
addr-line (child of address and aff)	<pre><address> <addr-line>XXX</addr-line> <addr-line>YYY</addr-line> <addr-line>ZZZ</addr-line> </address> or <aff> <addr-line>XXX</addr-line> <addr-line>YYY</addr-line> <addr-line>ZZZ</addr-line> </aff></pre>	:this-agent-contact-info vcard:address [a vcard:Address ; vcard:label "XXX YYY ZZZ"] .
country (child of address and aff)	<pre><address> <country>XXX</country> </address> or <aff> <country>XXX</country> </aff></pre>	:this-agent-contact-info vcard:address [a vcard:Address ; vcard:country-name "XXX"] .
fax	<pre><address> <fax>XXX</fax> </address></pre>	:this-agent-contact-info vcard:tel [a vcard:Fax ;

(child of address and aff)	<pre>or <aff> <fax>XXX</fax> </aff></pre>	<pre>literal:hasLiteralValue "XXX"] .</pre>
institution (child of address and aff)	<pre><address> <institution>XXX</institution> </address> or <aff> <institution>XXX</institution> </aff></pre>	<pre>:this-agent-contact-info vcard:org [a vcard:Organization ; vcard:organization-name "XXX"] .</pre>
phone (child of address and aff)	<pre><address> <phone>XXX</phone> </address> or <aff> <phone>XXX</phone> </aff></pre>	<pre>:this-agent-contact-info vcard:tel [a vcard:Tel ; literal:hasLiteralValue "XXX"] .</pre>
email (child of address and aff)	<pre><address> <email>XXX</email> </address> or <aff> <email>XXX</email> </aff></pre>	<pre>:this-agent-contact-info vcard:email <XXX> .</pre>
ext-link (child of address and aff)	<pre><address> <ext-link>XXX</ext-link> </address> or</pre>	<pre>:this-agent-contact-info dcterms:relation <XXX> .</pre>
uri (child of address and aff)	<pre><address> <uri>XXX</uri> </address> or <aff> <uri>XXX</uri> </aff></pre>	<pre>:this-agent-contact-info dqm:hasURI "XXX"^^xsd:anyURI .</pre>
aff	<pre><contrib> ... <aff> ... </aff> ... </contrib> and <contrib> ... <xref ref-type="aff" rid="affid" /> ... </contrib> <aff id="affid"> ... </aff></pre>	<pre>:this-agent pro:holdsRoleInTime [pro:withRole scor:affiliate ; pro:relatesToOrganization :this-organization ; pro:relatesToDocument :conceptual-work] . :this-organization a foaf:Organization ; tv:hasValueInTime [a tv:ValueInTime ; tv:withValue :this-agent-contact-info ; tv:withinContext :conceptual-work] . :this-agent-contact-info a vcard:VCard .</pre>
author-comment	<pre><contrib> ... <author-comment> ... XXX ... </author-comment> ... </contrib></pre>	<pre>:this-agent pro:holdsRoleInTime [pro:withRole pro:author ; pro:relatesToDocument :conceptual-work ; datacite:hasDescription :author-comment] . :author-comment a fabio:Comment ; frbr:partOf :textual-entity ; dcterms:creator :this-agent ; dcterms:description "XXX" .</pre>
bio	<pre><contrib> ... <bio> ... XXX ... </bio> ... </contrib></pre>	<pre>:textual-biography frbr:realizationOf [a fabio:Biography ; frbr:subject [a foaf:Person]] ; frbr:partOf :textual-entity ; dcterms:description "XXX" .</pre>
email (child of contrib)	<pre><contrib> <email>XXX</email> </contrib></pre>	<pre>:this-agent foaf:mbox <XXX> .</pre>

uri (child of contrib)	<contrib> ... <uri>XXX</uri> ... </contrib>	:this-agent dgm:hasURI "XXX"^^xsd:anyURI .
on-behalf-of	<contrib> ... <on-behalf-of>XXX</on-behalf-of> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole scor:agent ; pro:relatesToDocument :textual-entity ; pro:relatesToOrganization [a foaf:Organization ; foaf:name "XXX"]] .
role (editor-in-chief)	<contrib> ... <role>editor-in-chief</role> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole pro:editor-in-chief ; pro:relatesToDocument :textual-entity] .
role (chief scientist)	<contrib> ... <role>chief scientist</role> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole scor:chief-scientist ; pro:relatesToDocument :conceptual-work] .
role (photographer)	<contrib> ... <role>photographer</role> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole scor:photographer ; pro:relatesToDocument :conceptual-work] .
role (research associate)	<contrib> ... <role>research associate</role> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole scor:postdoctoral-researcher ; pro:relatesToDocument :conceptual-work] .
role (XXX)	<contrib> ... <role>XXX</role> ... </contrib>	:this-agent pro:holdsRoleInTime [pro:withRole [a pro:Role ; rdfs:label "XXX"] ; pro:relatesToDocument :conceptual-work] .

Table 6: JATS metadata for the element <ref-list>

Note that the mappings for a large number of elements – e.g. <article-title>, <collab>, <pub-date> – and for their attributes have already been handled in previous tables.

Element/attribute name	XML example	RDF translation
ref-list	<code><ref-list> ... </ref-list></code>	<code>:textual-entity frbr:part :ref-list .</code> <code>:ref-list a biro:ReferenceList .</code>
ref	<code><ref-list></code> <code> <ref id="XXX"> ... </ref></code> <code> <ref id="YYY"> ... </ref></code> <code> ...</code> <code></ref-list></code>	<code>:ref-list co:item :iref-XXX .</code> <code>:iref-XXX a co:ListItem ;</code> <code> co:itemContent :ref-XXX ;</code> <code> co:nextItem :iref-YYY ;</code> <code> co:index "1" .</code> <code>:iref-YYY a co:ListItem ;</code> <code> co:itemContent :ref-YYY ;</code> <code> co:nextItem :iref-ZZZ ;</code> <code> co:index "2" .</code> <code>:ref-XXX a biro:BibliographicReference .</code> <code>:ref-YYY a biro:BibliographicReference .</code> <code># (etc. until list is complete)</code>
element-citation <i>and</i> mixed-citation	<code><ref id="XXX"></code> <code> <element-citation></code> <code> ...</code> <code> </element-citation></code> <code></ref></code> <i>and</i> <code><ref id="XXX"></code> <code> <mixed-citation></code> <code> ...</code> <code> </mixed-citation></code> <code></ref></code>	<code>:ref-XXX a biro:BibliographicReference ;</code> <code> biro:references :textual-entity-XXX .</code> <code>:textual-entity cito:cites :textual-entity-XXX .</code> <code>:textual-entity-XXX a fabio:Expression ;</code> <code> frbr:realizationOf :conceptual-work-XXX .</code> <code># See footnote ¹⁷</code>
@publication-type ("book")	<code><element-citation</code> <code> publication-type="book"</code> <code> ...</code> <code></element-citation></code> <i>and</i> <code><mixed-citation</code> <code> publication-type="book"</code> <code> ...</code> <code></mixed-citation></code>	<code>:textual-entity-XXX a fabio:Book .</code> <code># See footnote ¹⁸</code>
@publication-type ("letter")	<code><element-citation</code> <code> publication-type="letter"</code> <code> ...</code> <code></element-citation></code> <i>and</i> <code><mixed-citation</code> <code> publication-type="letter"</code> <code> ...</code> <code></mixed-citation></code>	<code>:textual-entity-XXX a fabio:Letter .</code>
@publication-type ("journal")	<code><element-citation</code> <code> publication-type="journal"</code> <code> ...</code> <code></element-citation></code> <i>and</i> <code><mixed-citation</code> <code> publication-type="journal"</code> <code> ...</code> <code></mixed-citation></code>	<code>:textual-entity-XXX a fabio:JournalArticle .</code>

¹⁷ The previously defined statement "`:ref-XXX a biro:BibliographicReference .`" is assumed here and subsequently. In addition, note that several elements (e.g. *name*) may appear within both *element-citation* and *mixed-citation* without the appropriate context that characterises their meaning (e.g. *contrib*). In these cases, additional statements are added to link `:conceptual-work-XXX` to its contributors implicitly defined by such "out-of-context" tags (e.g. `:conceptual-work-XXX dcterms:creator :agent-XXX`).

¹⁸ The previously defined statement "`:ref-XXX biro:references :textual-entity-XXX .`" is assumed here and subsequently.

	<pre> ... </mixed-citation> </pre>	
@publication-type ("patent")	<pre> <element-citation publication-type="patent"> ... </element-citation> and <mixed-citation publication-type="patent"> ... </mixed-citation> </pre>	:textual-entity-XXX a fabio:PatentDocument .
@publication-type ("report")	<pre> <element-citation publication-type="report"> ... </element-citation> and <mixed-citation publication-type="report"> ... </mixed-citation> </pre>	:textual-entity-XXX a fabio:ReportDocument .
@publication-type ("standard")	<pre> <element-citation publication-type="standard"> ... </element-citation> and <mixed-citation publication-type="standard"> ... </mixed-citation> </pre>	:conceptual-work-XXX a fabio:Specification] . # See footnote ¹⁹ and ²⁰
@publication-type ("working-paper")	<pre> <element-citation publication-type="working-paper"> ... </element-citation> and <mixed-citation publication-type="working-paper"> ... </mixed-citation> </pre>	:textual-entity-XXX a fabio:WorkingPaper .
@publication-type ("ZZZ")	<pre> <element-citation publication-type="ZZZ"> ... </element-citation> and <mixed-citation publication-type="ZZZ"> ... </mixed-citation> </pre>	:textual-entity-XXX a [a owl:Class ; rdfs:label "ZZZ" ; rdfs:subClassOf fabio:Expression] .
chapter-title	<pre> <element-citation> ... <chapter-title>XXX</chapter-title> ... </element-citation> and <mixed-citation> ... <chapter-title>XXX</chapter-title> ... </mixed-citation> </pre>	:textual-entity-XXX a fabio:BookChapter ; frbr:partOf :textual-entity-XXX-collection ; dcterms:title "XXX" . :textual-entity-XXX-collection a fabio:Book .
part-title	<pre> <element-citation> ... <part-title>XXX</part-title> ... </element-citation> and <mixed-citation> </pre>	:textual-entity-XXX dcterms:title "XXX" ; frbr:partOf :textual-entity-XXX-collection . :textual-entity-XXX-collection a fabio:Book .

¹⁹ *fabio:Specification* includes the sub-classes *fabio:TechnicalStandard*, *fabio:ReportingStandard* and *fabio:MinimalInformationStandard*, among other types of specification. These more specific classes can be used here, in place of *fabio:Specification*, if the nature of the "standard" being described by JATS is known.

²⁰ The previously defined statement ":textual-entity-XXX frbr:realizationOf :conceptual-work-XXX ." is assumed here and subsequently.

	<pre> ... <part-title>XXX</part-title> ... </mixed-citation> </pre>	
source	<pre> <element-citation> ... <source>XXX</source> ... </element-citation> and <mixed-citation> ... <source>XXX</source> ... </mixed-citation> </pre>	<pre> :textual-entity-XXX-collection dcterms:title "XXX" . </pre>
edition	<pre> <element-citation> ... <edition>XXX</edition> ... </element-citation> and <mixed-citation> ... <edition>XXX</edition> ... </mixed-citation> </pre>	<pre> :textual-entity-XXX-collection prism:edition "XXX" . </pre>
gov	<pre> <element-citation> ... <gov>XXX</gov> ... </element-citation> and <mixed-citation> ... <gov>XXX</gov> ... </mixed-citation> </pre>	<pre> :textual-entity-XXX a fabio:DocumentReport . :conceptual-work-XXX a fabio:Report . </pre>
person-group	<pre> <element-citation> ... <person-group>YYY</person-group> ... </element-citation> and <mixed-citation> ... <person-group>YYY</person-group> ... </mixed-citation> </pre>	<pre> :person-group a foaf:Group ; foaf:name "YYY" ; pro:holdsRoleInTime [a pro:RoleInTime ; pro:withRole pro:contributor ; pro:relatesToDocument :textual-entity-XXX] . </pre>
@person-group-type (“translators”)	<pre> <person-group person-group-type="translators"> YYY </person-group> </pre>	<pre> :person-group a foaf:Group ; foaf:name "YYY" ; pro:holdsRoleInTime [a pro:RoleInTime ; pro:withRole pro:translator ; pro:relatesToDocument :textual-entity-XXX] . </pre>
@ person-group-type (“XXX”)	<pre> <person-group person-group-type="XXX"> YYY </person-group> </pre>	<pre> :person-group a foaf:Group ; foaf:name "YYY" ; pro:holdsRoleInTime [a pro:RoleInTime ; pro:withRole [a pro:Role ; rdfs:label "XXX"] ; pro:relatesToDocument :textual-entity-XXX] . </pre>
etal	<pre> <element-citation> ... <etal /> ... </element-citation> and <mixed-citation> ... <etal /> ... </mixed-citation> </pre>	<pre> :textual-entity-XXX a [owl:Restriction ; owl:onProperty dcterms:creator ; owl:minCardinality "{count_specified_authors + 1}"] . </pre>
patent	<pre> <element-citation> ... <patent>YYY</patent> ... </element-citation> </pre>	<pre> :textual-entity-XXX a fabio:PatentDocument ; fabio:hasPatentNumber "YYY" . </pre>

	<pre> and <mixed-citation> ... <patent>YYY</patent> ... </mixed-citation> </pre>	
std	<pre> <element-citation> ... <std> ... </std> ... </element-citation> and <mixed-citation> ... <std> ... </std> ... </mixed-citation> </pre>	<pre> :conceptual-work-XXX a fabio:TechnicalStandard . </pre>
annotation	<pre> <element-citation> ... <annotation> XXX </annotation> ... </element-citation> and <mixed-citation> ... <annotation> XXX </annotation> ... </mixed-citation> </pre>	<pre> :ref-XXX frbr:part :annotation . :annotation a fabio:Comment ; dcterms:description "XXX" ; dcterms:references :textual-entity-XXX . </pre>
date-in-citation	<pre> <element-citation> ... <date-in-citation content-type="XXX"> "YYYY-MM-DD" </date-in-citation> ... </element-citation> and <mixed-citation> ... <date-in-citation content-type="XXX"> "YYYY-MM-DD" </date-in-citation> ... </mixed-citation> </pre>	<pre> :textual-entity-XXX literal:hasLiteral [a dcterms:date ; rdfs:label "XXX" ; literal:hasLiteralValue "YYYY-MM-DD"^^xsd:date] . </pre>
std-organization	<pre> <std> ... <std-organization> YYY </std-organization> ... </std> </pre>	<pre> :conceptual-work-XXX dcterms:creator :std-org . :std-org a foaf:Organization ; foaf:name "YYY"; pro:holdsRoleInTime [pro:withRole pro:author ; pro:relatesToDocument :conceptual-work-XXX] . </pre>