

ROH Ontology Classes, Object Properties and Data Type Properties

1. Ontologies used	1
2. Concepts modelled	2
2.1. vivo:AcademicDegree	2
2.2. roh:Accreditation	2
2.3. rohes:Account	3
2.4. roh:Activity	3
2.5. foaf:Agent	4
2.6. skos:Concept	4
2.7. roh:CurriculumVitae	5
2.8. roh:Expense	5
2.9. gn:Feature	5
2.10. roh:Funding, roh:FundingAmount, roh:FundingProgram & roh:FundingSource	6
2.11. roh:Infrastructure	6
2.12. roh:Metric	6
2.13. vivo:Project	7
2.14. vivo:Relationship	7
2.15. roh:ResearchObject	8
2.16. obo-bfo:Role	10
2.17. obo-ero:Service	10
2.18. rohes:Tax	11
2.19. obo-bfo:TemporalRegion	11

1. Ontologies used

Prefix	Ontology name	Ontology namespace	Ontology website
bibo	Bibliographic Ontology	http://purl.org/roh/mirror/bibo#	http://bibliontology.com/
cito	CITO, the Citation Typing Ontology	http://purl.org/spar/cito#	https://sparontologies.github.io/cito/current/cito.html
foaf	FOAF: Friend of a Friend Ontology	http://purl.org/roh/mirror/foaf#	http://xmlns.com/foaf/spec/
gn	GeoNames Ontology	http://purl.org/roh/mirror/geonames#	http://www.geonames.org/ontology/documentation.html
obo-bfo	OBO Foundry, Basic Formal Ontology	http://purl.org/roh/mirror/obo/bfo#	http://www.obofoundry.org/ontology/bfo.html
obo-ero	OBO Foundry, eagle-i Research Resource Ontology (ERO)	http://purl.org/roh/mirror/obo/ero#	https://open.library.utoronto.ca/wiki/display/eaglei/Ontology
obo-iao	OBO Foundry, Information Artifact Ontology	http://purl.org/roh/mirror/obo/iao#	https://github.com/information-artifact-ontology/IAO/
obo-ro	OBO Foundry, Relations Ontology	http://purl.org/roh/mirror/obo/ro#	http://www.obofoundry.org/ontology/ro.html
owl	OWL Web Ontology Language	http://www.w3.org/2002/07/owl#	https://www.w3.org/TR/owl-features/
rdf	The RDF Concepts Vocabulary (RDF)	http://www.w3.org/1999/02/22-rdf-syntax-ns#	https://www.w3.org/TR/rdf-concepts/

rdfs	RDF Schema 1.1	http://www.w3.org/2000/01/rdf-schema#	https://www.w3.org/TR/rdf-schema/
roh	Red de Ontologías Hércules / Hercules Network of Ontologies	http://purl.org/roh#	https://github.com/HerculesCRUE/GnossDeustoOnto/tree/master/Documentation
rohes	Red de Ontologías Hércules / Hercules Network of Ontologies, Spanish specialization	http://purl.org/rohes#	https://github.com/HerculesCRUE/GnossDeustoOnto/tree/master/Documentation
rohum	Red de Ontologías Hércules / Hercules Network of Ontologies – University of Murcia Specialization	http://purl.org/rohum#	https://github.com/HerculesCRUE/GnossDeustoOnto/tree/master/Documentation
skos	SKOS Simple Knowledge Organization System	http://www.w3.org/2004/02/skos/core#	https://www.w3.org/TR/2008/WD-skos-reference-20080829/skos.html
uneskos	SKOS UNESCO Thesaurus	http://purl.org/umu/uneskos#	https://skos.um.es/unescothes/downloads.php
vcard	vCard Ontology - for describing People and Organizations	http://purl.org/roh/mirror/vcard#	https://www.w3.org/TR/vcard-rdf/
vivo	VIVO core ontology	http://purl.org/roh/mirror/vivo#	https://wiki.lyrasis.org/display/VIVO/The+core+ontology+and+its+annotations

2. Concepts modelled

2.1. vivo:AcademicDegree

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
vivo	AcademicDegree				vivo	abbreviation	rdfs:Literal	
					roh	title	xsd:string	

2.2. roh:Accreditation

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
roh	Accreditation	vivo	hasGoverningActivity	foaf:Organization	roh	title	xsd:string	
		vivo	hasSubjectArea	owl:Thing	vivo	description	xsd:string	
		roh	accreditationOf	foaf:Agent				
		roh	issuedBy	roh:AccreditationIssuer				
		vivo	dateIssued	vivo:DateTimeValue				
	roh AcademicAccreditation				roh	title	xsd:string	
	rohes AyudanteDoctor							
	rohes CatedráticoUniversidad							
	rohes ContratadoDoctor							
	rohes ProfesorUniversidadPrivada							
	rohes TitularUniversidad							
	roh Certificate				roh	title	xsd:string	
	roh Award							
	roh CourseCertificate							
	roh LanguageCertificate				roh	language	xsd:string	
					roh	listeningSkill	xsd:string	{"A1", "A2", "B1", "B2", "C1", "C2"}
					roh	readingSkill	xsd:string	{"A1", "A2", "B1", "B2", "C1", "C2"}
					roh	speakingSkill	xsd:string	{"A1", "A2", "B1", "B2", "C1", "C2"}
					roh	spokenInteractionSkill	xsd:string	{"A1", "A2", "B1", "B2", "C1", "C2"}

	roh	DegreeHomologation	vivo	relates	vivo:AwardedDegree				
	roh	License							
	roh	ResearchAccreditation							
		rohes Sexenio	vivo	dateTimeInterval	vivo:DateTimeInterval				

2.3. rohes:Account

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
rohes	Account		rohes	charges	roh:Expense				
	rohes	ActivoNoCorriente							
		rohes InmovilizacionesIntangibles							
		...							
	rohes	ComprasYGastosPorNaturaleza							
		rohes Perdidas							
		rohes ServiciosExteriores							
		...							
		rohes Suministros							
		...							

2.4. roh:Activity

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
roh	Activity		roh	participatedBy	foaf:Agent	vivo	identifier	xsd:string	
			bibo	presents	bibo:Document	roh	description	xsd:string	
			vivo	relates	roh:Expense or obo-bfo:Role	vivo	freeTextKeyword	xsd:string	
			obo-bfo	realizes	obo-bfo:Role	vivo	contactInformation	rdfs:Literal	
			vivo	hasSubjectArea	skos:Concept	roh	title	xsd:string	
			vivo	dateTimeInterval	vivo:DateTimeInterval				
			gn	locatedIn	gn:Feature				
	vivo	Competition							
	bibo	Conference				vivo	abbreviation	rdfs:Literal	
	vivo	Course	obo-ro	partOf	vivo:AcademicDegree	vivo	courseCredits	xsd:int	
						vivo	courseHours	xsd:string	
	vivo	Exhibit							
	bibo	Hearing							
	vivo	Internship							
	vivo	Interview							
	vivo	Meeting							
	bibo	Performance							
	vivo	Presentation							
	vivo	InvitedTalk							
	roh	PanelTalk							
	roh	ThesisViva							
	bibo	Workshop							

2.5. foaf:Agent

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
foaf	Agent		roh	hasContactInfo	vcard:Organization	vivo	freeTextKeyword	xsd:string	
			roh	hasAccreditation	roh:Accreditation				
			roh	hasRole	obo-bfo:Role				
			foaf	mBox	owl:Thing				
			vivo	relatedBy	vivo:Relationship				
	foaf	Organization	roh	hasKnowledgeArea	skos:Concept	vivo	identifier	xsd:string	
			vivo	affiliatedOrganization	foaf:Organization	vivo	abbreviation	rdfs:Literal	
			vivo	hasSuccessorOrganization	foaf:Organization	roh	description	xsd:string	
			vivo	hasPredecessorOrganization	foaf:Organization	roh	researchLine	xsd:string	
			obo-ro	hasPart	foaf:Organization	roh	foundationDate	xsd:string	
			roh	hasInfrastructure	roh:Infrastructure				
			foaf	homePage	foaf:Document				
			roh	participates	roh:Activity				
			roh	produces	roh:ResearchObject				
			roh	grantedBy	roh:FundingAmount				
			vivo	dateTimeInterval	vivo:DateTimeInterval				
			gn	locatedIn	gn:Feature				
		roh	AccreditationIssuer	issues	roh:Accreditation				
		roh	FundingOrganization	promotes	roh:FundingProgram or roh:FundingSource				
				funds	roh:Funding				
		roh	ResearchGroup			roh	excellenceLabel	xsd:boolean	
		vivo	University	awards	vivo:AwardedDegree				
	foaf	Person	roh	hasKnowledgeArea	skos:Concept	vivo	identifier	xsd:string	
			vivo	relates	vivo:AwardedDegree	vivo	researcherId		
			roh	spends	roh:PersonExpense	roh	birthdate	xsd:string	
			roh	hasContract	roh:PersonContract	vivo	eRACommonsId		
			roh	hasCV	roh:CurriculumVitae	roh	description	xsd:string	
			roh	hasPosition	vivo:Position	roh	firstName	xsd:string	
			roh	participates	roh:Activity	roh	gender	xsd:string	
			roh	elegibleFor	roh:Accreditation	roh	researchLine	xsd:string	
			foaf	homePage	foaf:Document	foaf	surname	xsd:string	
			foaf	image	foaf:Image	foaf	name	xsd:string	
			roh	correspondingAuthor		foaf	nickname	xsd:string	
			roh	supervisorOf	bibo:Thesis	roh	taxID	xsd:string	
						roh	title	xsd:string	
						roh	ORCID	xsd:string	
						rohes	secondFamilyName	xsd:string	

2.6. skos:Concept

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
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		gn	parentAMD3	gn:featureCode				
		gn	parentAMD4	gn:featureCode				

2.10. roh:Funding, roh:FundingAmount, roh:FundingProgram & roh:FundingSource

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
roh	Funding		obo-ro	hasPart	roh:FundingAmount	vivo	identifier	xsd:string	
			roh	fundedBy	roh:FundingProgram	vivo	description		
			vivo	dateTimeInterval	vivo:DateTimeInterval	vivo	freeTextKeyword		
			roh	financedBy	roh:FundingSource	roh	publicFunding	xsd:boolean	
			roh	hasContract	vivo:Contract				
			roh	supports	roh:PersonContract or roh:Project				
			roh	hasKnowledgeArea	skos:Concept				
			vivo	dateTimeInterval	vivo:DateTimeInterval				
	roh	Grant							
	roh	Loan							
	roh	Outsourcing							
	roh	RefundableAdvance							
roh	FundingAmount		roh	grants	foaf:Organization	roh	currency	xsd:string	
			obo-ro	partOf	roh:Funding	roh	monetaryAmounting	xsd:float	
			vivo	dateTimeInterval	vivo:DateTimeInterval				
roh	FundingProgram		roh	promotedBy	roh:FundingSource	vivo	identifier	xsd:string	
			gn	locatedIn	gn:Feature	roh	title	xsd:string	
			vivo	dateTimeInterval	vivo:DateTimeInterval	vivo	description	xsd:string	
roh	FundingSource		roh	promotedBy	vivo:FundingOrganization				
			roh	funds	roh:FundingProgram				

2.11. roh:Infrastructure

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
roh	Infrastructure		roh	infrastructureOf	foaf:Agent	roh	title	xsd:string	
						vivo	description	xsd:string	
	roh	Equipment				vivo	freeTextKeyword	xsd:string	
	roh	Facility	obo-ro	hasPart	roh:Facility				
	roh	Software	vivo	hasSubjectArea	skos:Concept				
			roh	correspondingAuthor	foaf:Person				

2.12. roh:Metric

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
roh	Metric		roh	metricOf	roh:ResearchObject	roh	metricName	xsd:string	
	roh	DegreeMetric							

		roh	ThesisMetric				roh	cumLaude	xsd:boolean	
							roh	mark	xsd:string	
			PhDThesisMetric				rohes	doctoradoEuropeo	xsd:boolean	
							rohes	doctoradoInternacional	xsd:boolean	
							rohes	mentionCalidad	xsd:boolean	
							rohes	premioExtraordinarioDoctorado	xsd:boolean	
	roh		PublicationMetric				roh	impactFactor	xsd:float	
							roh	quartile	xsd:string	{"Q1", "Q2", "Q3", "Q4"}
							roh	ranking	xsd:string	

2.13. vivo:Project

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
vivo	Project	roh	hasKnowledgeArea	skos:Concept	vivo	identifier	xsd:string	
		vivo	relates	roh:Audit or obo-bfo:Role	vivo	abbreviation	rdfs:Literal	
		roh	hasContract	vivo:ProjectContract	vivo	description	rdfs:Literal	
		obo-ro	hasPart	vivo:Project	roh	title	xsd:string	
		vivo	participates	roh:Activity	roh	projectStatus	xsd:string	{"CLOSED", "OPEN", "PROPOSAL_SUBMITTED", "REJECTED"}
		roh	spends	roh:ProjectExpense	vivo	freeTextKeyword	xsd:string	
		roh	produces	roh:ResearchObject	roh	modality	xsd:string	
		vivo	relatedBy	roh:Dossier or roh:Justification or obo-bfo:Role	roh	foreseenJustificationDate	xsd:dateTime	
		roh	isSupportedBy	roh:Funding	roh	needsEthicalValidation	xsd:boolean	
		gn	locatedIn	gn:Feature				
		vivo	dateTimeInterval	vivo:DateTimeInterval				

2.14. vivo:Relationship

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
vivo	Relationship							
	vivo	AdvisingRelationship	dateTimeInterval	vivo:DateTimeInterval				
		vivo	hasSubjectArea	skos:Concept				
		vivo	relates	vivo:AdvisorRole or vivo:AdviseeRole or foaf:Person				
		vivo	degreeCandidacy	vivo:AcademicDegree				
	vivo	AwardedDegree	awardedBy	vivo:University				
		vivo	relates	foaf:Person or roh:AcademicDegree				
		vivo	dateTimeValue	vivo:DateTimeValue				
	vivo	Contract	contractOf		bibo	abstract	xsd:string	
		roh	contractSigningDate	vivo:DateTimeValue	roh	fileURI		
		vivo	assignedBy	foaf:Organization	roh	attachment	owl:Thing	
		vivo	hasSubjectArea	skos:Concept				
		vivo	relates	roh:Funding or bibo:Patent or foaf:Agent or obo-bfo:Role				

			vivo	dateTimeInterval	vivo:DateTimeInterval				
			vivo	supportedInformationResource	obo:ao:InformationContentEntity				
		roh	PersonContract						
		roh	ProjectContract						
	vivo	Position	vivo	relates	foaf:Organization	vivo	rank	xsd:int	
			vivo	relates	foaf:Person				
			vivo	dateTimeInterval	vivo:DateTimeInterval				
		vivo	FacultyAdministrativePosition						
		vivo	FacultyPosition						
			rohes	CuerpoDocente					
			rohes:	CatedraticoEscuelaUniversitaria					
			rohes:	CatedraticoDeUniversidad					
			rohes:	ProfesorTitularDeEscuelaUniversitaria					
			rohes:	ProfesorTitularDeUniversidad					
			rohes	PDICContratado					
			rohes:	Ayudante					
			rohes:	ProfesorAsociado					
			rohes:	ProfesorAyudanteDoctor					
			rohes:	ProfesorContratadoDoctor					
			rohes:	ProfesorEmerito					
			rohes:	ProfesorVisitante					
		vivo	LibrarianPosition	roh	produces	roh:DegreeThesis			
		vivo	NonAcademicPosition						
		vivo	NonFacultyAcademicPosition						
		vivo	PrimaryPosition						
		roh	ResearcherPosition						
	roh	SupervisingRelationship	vivo	dateTimeInterval	vivo:DateTimeInterval				
			roh	produces	roh:Thesis				
			vivo	relates	roh:SupervisorRole or roh:SuperviseeRole or foaf:Person				
		roh	DegreeSupervisingRelationship	roh	produces	roh:DegreeThesis			
		roh	MasterSupervisingRelationship	roh	produces	roh:MasterThesis			
		roh	PhDSupervisingRelationship	roh	produces	roh:PhDThesis			

2.15. roh:ResearchObject

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
roh	ResearchObject	roh	hasKnowledgeArea	skos:Concept				
		roh	correspondingAuthor	foaf:Person				
		roh	producedBy	roh:Project				
	bibo	Collection			bibo	oclcnum	rdfs:Literal	

		roh	Dossier	vivo	relates	roh:ProjectContract or bibo:Report or roh:Project	vivo	identifier	xsd:string	
				vivo	dateTimeInterval	vivo:DateTimeInterval	roh	title		
							vivo	description		
		bibo	Periodical	vivo	publisher	foaf:Organization	bibo	eissn	rdfs:Literal	
							bibo	issn	rdfs:Literal	
			bibo Journal	vivo	dateIssued	vivo:DateTimeValue	vivo	abbreviation	rdfs:Literal	
			bibo Magazine							
		bibo	Document	vivo	publishedIn	bibo:Collection or bibo:Book	bibo	doi	xsd:string	
				bibo	authorList	rdf:Seq	bibo	abstract	xsd:string	
				vivo	dateIssued	vivo:DateTimeValue	bibo	pageStart		
				bibo	editorList	rdf:Seq	bibo	pageEnd		
							bibo	volume	rdfs:Literal	
		bibo	Abstract							
		bibo	Article				bibo	doi		
							bibo	issue		
							bibo	pageStart		
							bibo	pageEnd		
			bibo AcademicArticle							
			roh-iao: JournalArticle	roh	hasMetric	roh:PublicationMetric				
		vivo	ConferencePaper	bibo	presentedAt	bibo:Conference				
			roh: WorkshopPaper							
		vivo	EditorialArticle							
		bibo	Book	vivo	publisher	foaf:Organization	bibo	edition	rdfs:Literal	
							bibo	isbn	rdfs:Literal	
							vivo	placeOfPublication	rdfs:Literal	
							bibo	iccn	rdfs:Literal	
			bibo Proceedings							
		bibo	ConferencePoster							
		bibo	Dataset	cito	isCitedAsDataSourceBy	foaf:Document				
		bibo	DocumentPart	vivo	publisher	foaf:Organization	vivo	placeOfPublication	rdfs:Literal	
			bibo BookSection							
			bibo: Chapter							
		bibo	Patent	vivo	publisher	foaf:Organization	vivo	identifier	xsd:string	
				gn	locatedIn	gn:Feature	roh	modality	xsd:string	
				vivo	dateIssued	vivo:DateTimeValue				
				roh	ownerOrganization	foaf:Organization				
		bibo	Report	vivo	distributor	foaf:Organization	roh	status	xsd:string	{"ACCEPTED", "REJECTED"}
				vivo	publisher	foaf:Organization				
			roh EthicalReport							
			roh: EthicalAudit							
			roh: EthicalValidation							
			roh EvaluationSummary							
			roh Justification	vivo	relates	roh:Project				
			roh ResearchProposal	vivo	relates	roh:Justification or roh:ProjectContract or roh:Project or roh:ResearchProposal				
		bibo	Thesis				vivo	abbreviation	rdfs:Literal	

							vivo	placeOfPublication	rdfs:Literal	
			roh	DegreeThesis						
			roh	MasterThesis						
			roh	PhDThesis						
		bibo	Webpage							

2.16. obo-bfo:Role

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
obo-bfo	Role	vivo	dateTimeInterval	vivo:DateTimeInterval	roh	dedication	xsd:string	{"PARTIAL", "TOTAL"}
		roh	inheresIn	foaf:Agent	vivo	description	xsd:string	
		vivo	relatedBy	roh:Project or vivo:Relationship				
		roh	hasKnowledgeArea	skos:Concept				
		obo-bfo	realizedIn	roh:Activity				
		roh	roleOf	foaf:Agent				
	vivo		AdministratorRole					
	vivo		AdviseeRole					
	vivo		AdvisorRole					
	vivo		AttendeeRole					
	vivo		AuditeeRole					
	vivo		AuditorRole					
	vivo		EditorRole					
	vivo		EducatorRole					
	vivo		EmployeeRole					
	vivo		ExternalMemberRole					
	vivo		FundingRole					
	vivo		LeaderRole					
	vivo		MemberRole					
	vivo		OrganizerRole					
	vivo		PresenterRole					
	vivo		ResearcherRole					
	vivo		ReviewerRole					
	vivo		StudentRole					
	vivo		SuperviseeRole					
	vivo		SupervisorRole					
	vivo		TeacherRole					
	vivo		ThirdPartyContractorRole					

2.17. obo-ero:Service

Prefix	Class	Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
obo-ero	Service	roh	isProvidedBy	foaf:Organization	vivo	identifier	xsd:string	
					roh	title	xsd:string	
					vivo	description	xsd:string	
	vivo		AccessService					

vvo	AnalysisService							
roh	ExternalMemberRole							
vivo	...							

2.18. rohes:Tax

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
rohes	Tax					rohes	rate	xsd:float	
	rohes	IVA							
	rohes	IRPF							
	rohes	IRNR							

2.19. obo-bfo:TemporalRegion

Prefix	Class		Prefix	Object property (bold indicates explicit Domain, otherwise a Restriction)	Range Class	Prefix	Datatype Property (bold indicates explicit domain; otherwise a restriction)	Range Datatype (if typed)	Range values
obo-bfo	TemporalRegion								
	obo-bfo	OneDimensionalTemporalRegion							
	vivo	DateTimeInterval	vivo	start	vivo:DateTimeValue				
			vivo	end	vivo:DateTimeValue				
	obo-bfo	ZeroDimensionTemporalRegion							
	vivo	DateTimeValue				vivo	dateTime	xsd:dateTime	