FONDO EUROPEO DE DESARROLLO REGIONAL (FEDER)

Una manera de hacer Europa

ROH Ontology Classes, Object Properties and DataType Properties

1. Abstract

The aim of this document is to provide a bird's eye view on the entities modelled within ROH. The document includes an overview in tabular form for each of the core entities of the network of ontologies ROH, giving details on the object and data properties supported by each of them. This document is meant to be useful when instances of ROH want to be created, since it clearly explains what entity types a given entity type relates with through an object property and what data properties are supported by a given entity type, including details about its associated object types.

This document should be read as a complement to the ROH Tutorial document which describes more verbosely the purpose of the core entities of ROH and their relationships with other entities in the ontology.

2. Ontologies used

The following table lists all ontologies created, i.e. those starting by namespace prefix roh, and those reused in the design of ROH. Notice that ROH network of ontologies is divided into 3 main parts.

- The generic ontology, named ROH, contains the most important entities and properties to model information in the academic domain. It contains the most important part of the network of ontologies. It covers the academic domain, being agnostic to the country or the research organization whose information wants to be modelled with.
- ROHES is a specialization of ROH for the Spanish science and research domain. It includes some additional entities which are only used in the Spanish science and research domain, e.g. rohes:Sexenio or rohes:ProfesorTitularDeEscuelaUniversitaria.
- Finally, ROHUM is a specialization to cater with the special modelling needs of University of Murcia. More concretely, a wide range of entities to support the accounting system and be able to model expense types are included, e.g. rohum:ArrendamientosYCanones or rohum:InversionNueva.

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.catalyst.harvard.edu/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

3. Concepts modelled

3.1. 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	

3.2. 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	CatedraticoUniversidad							
		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								

Prefix	Class			Prefix	Object property	Range Class	Prefix	Datatype Property	Range Datatype	Range values
roh	ResearchAccreditation									
	rohes	Sexenio		vivo	dateTimeInterval	vivo:DateTimeInterval				

3.3.   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						
			…							

3.4.   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							

3.5.　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:Infastructure				
				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	roh	issues	roh:Accreditation				
		roh	FundingOrganization	roh	**promotes**	roh:FundingProgram or roh:FundingSource				
				roh	funds	roh:Funding				
		roh	ResearchGroup				roh	excellenceLabel	xsd:boolean	
		vivo	University	roh	**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	
							vivo	**scopusId**		
							rohes	secondFamilyName	xsd:string	

3.6.　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

					roh	knowledgeAreaOf					
skos	**Concept**										
	roh	**KnowledgeArea**									
		roh	UNESCOKnowledgeArea								
		rohes	FECYTKnowledgeArea								
	roh	**ProjectClassification**									
		roh	European								
		roh	International								
		roh	National								
		rohes	PlanEstatal2017-2020								
		roh	Own								
		roh	Regional								
	roh	**HRClassification**									
		roh	TrainingStaffPlacement								
		roh	TechnicalSupportStaffGrant								
		roh	Mobility								
		roh	PostDocContract								
		roh	PostDocGrant								
		roh	PostDocContinuityGrant								
		roh	PreDocContract								
		roh	PreDocGrant								
		roh	PreDocGrantContract								
		roh	ResearchStartGrant								

3.7.   roh:CurriculumVitae

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	CurriculumVitae		roh	CVOf	foaf:Person	roh	cites	xsd:string	
						roh	factorH	xsd:string	
						roh	summary	xsd:string	

3.8.   roh:Expense

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	Expense			roh	spentBy		roh	currency	xsd:string	
				vivo	dateTimeValue	vivo:DateTimeValue	vivo	description	xsd:string	
							roh	monetaryAmoung	xsd:float	
							roh	title	xsd:string	
	roh	PersonExpense					roh	expenseModality		
	roh	ProjectExpense								
	roh	ResearchObjectExpense								
		rohum	GastosCorrientesBienesYServicios							
			rohum	ArrendamientosYCanones						
			rohum	IndemizacionesServicio						
			rohum	MaterialSuministrosOtros						

Prefix	Class									
		roh um	ReparacionesMantenimientoConservación							
		rohum	InversionesReales							

3.9. gn:Feature

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
gn	Feature	gn	featureClass		gn	geonamesID	rdfs:Literal	
		gn	featureCode	gn:Code	gn	countryCode	rdfs:Literal	
		gn	parentAMD1	gn:featureCode	gn	name	xsd:string	
		gn	parentAMD2	gn:featureCode	gn	population	xsd:integer	
		gn	parentAMD3	gn:featureCode				
		gn	parentAMD4	gn:featureCode				

3.10. 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	monetaryAmoung	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	
			obo-ro	hasPart	roh:FundingProgram				
roh	FundingSource		roh	promotedBy	vivo:FundingOrganization				
			roh	funds	roh:FundingProgram				

3.11. 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	

Prefix	Class	Prefix	Object property	Range Class	Prefix	Datatype Property	Range Datatype	Range values
					vivo	description	xsd:string	
vivo	Equipment				vivo	freeTextKeyword	xsd:string	
vivo	Facility	obo-ro	hasPart	roh:Facility				
obo-ero	Software	vivo	hasSubjectArea	skos:Concept				
		roh	correspondingAuthor	foaf:Person				

3.12.   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	
	rohes PhDThesisMetric				rohes	doctoradoEuropeo	xsd:boolean	
					rohes	doctoradoInternacional	xsd:boolean	
					rohes	mencionCalidad	xsd:boolean	
					rohes	premioExtraordinarioDoctorado	xsd:boolean	
	roh PublicationMetric				roh	**impactFactor**	xsd:float	
					roh	**quartile**	xsd:string	{"Q1" , "Q2" , "Q3" , "Q4"}
					roh	**ranking**	xsd:string	

3.13.   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				
		roh	**hasProjectCategorization**	roh:ProjectClassification				
		roh	**hasHRClassification**	roh:HRClassification				

3.14.   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	vivo	dateTimeInterval	vivo:DateTimeInterval				
		vivo	hasSubjectArea	skos:Concept				
		vivo	relates	vivo:AdvisorRole or vivo:AdviseeRole or foaf:Person				
		vivo	**degreeCandidacy**	vivo:AcademicDegree				
	vivo AwardedDegree	roh	**awardedBy**	vivo:University				
		vivo	relates	foaf:Person or roh:AcademicDegree				
		vivo	dateTimeValue	vivo:DateTimeValue				
	vivo Contract	roh	**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-iao:InfrormationContentEntity				
	roh PersonContract	roh	**hasHRClassification**	roh:HRClassification				
	roh ProjectContract							
	vivo Position	vivo	relates	foaf:Organization	vivo	rank	xsd:int	
		vivo	relates	foaf:Person	vivo	**hrJobTitle**		
		vivo	dateTimeInterval	vivo:DateTimeInterval				
	vivo FacultyAdministrativePosition							
	vivo FacultyPosition							
	rohes CuerpoDocente							
	rohes: CatedraticoEscuelaUniversitaria							
	rohes: CatedraticoDeUniversidad							
	rohes: ProfesorTitularDeEscuelaUniversitaria							
	rohes: ProfesorTitularDeUniversidad							
	rohes PDIContratado							
	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				

Prefix	Class			Prefix	Object property	Range Class	Prefix	Datatype Property	Range Datatype	Range values
				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				

3.15.   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	
		vivo	Abstract								
		bibo	Article					bibo	**issue**		
			bibo	AcademicArticle							
			obo-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							
		vivo	ConferencePoster								
		vivo	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				

Prefix	Prefix	Class	Prefix	Class	Prefix	Object property	Range Class	Prefix	Datatype Property	Range Datatype	Range values
					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	evaluationStatus	xsd:string	{"FINAL", "PROVISIONAL"}
			roh	Justification	vivo	relates	roh:Project				
			vivo	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									

3.16. 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							

Prefix		Class			
vivo	SupervisorRole				
vivo	TeacherRole				
vivo	ThirdPartyContractorRole				

3.17. 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							
	vivo	AnalysisService							
	roh	ExternalMemberRole							
	vivo	…							

3.18. 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							

3.19. 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	