

MII Erweiterungsmodul Mikrobiologie

Informationsmodell

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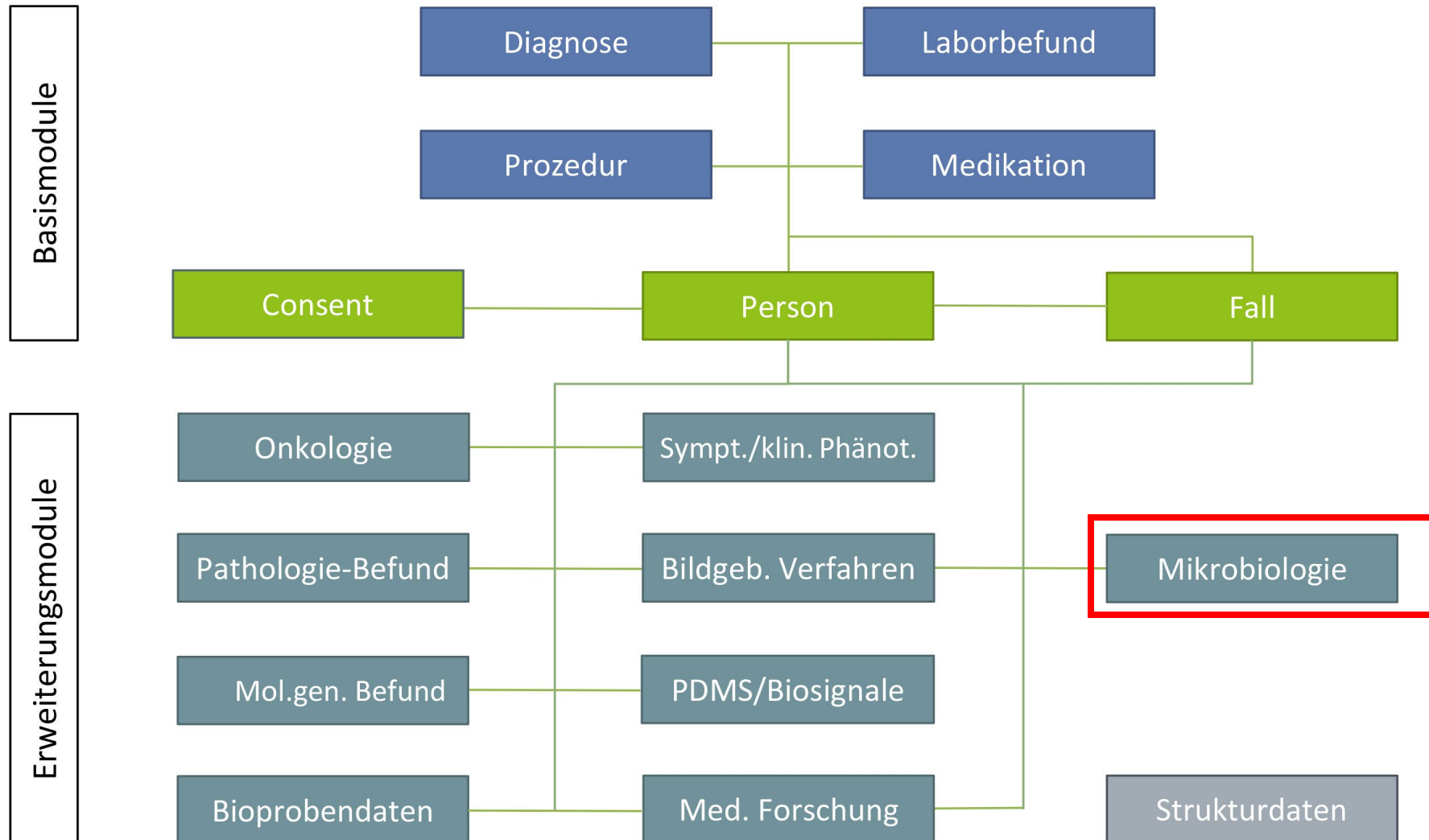
Baier, Claas
Boeker, Martin
Buckow, Karoline
Drenkhahn, Cora
Gebel, Benjamin
Hinske, Ludwig Christian
Klepka, Franziska
Rinaldi, Eugenia
Saleh, Kutaiba
Tönnies, Hauke
Von Loewenich, Frederike
Zautke, Alexander

Ansprechpartnerin für MII Modul Mikrobiologie

Berlin Institute of Health @Charité
Core Unit Digital Medicine and Interoperability

Leitung: Prof. Sylvia Thun

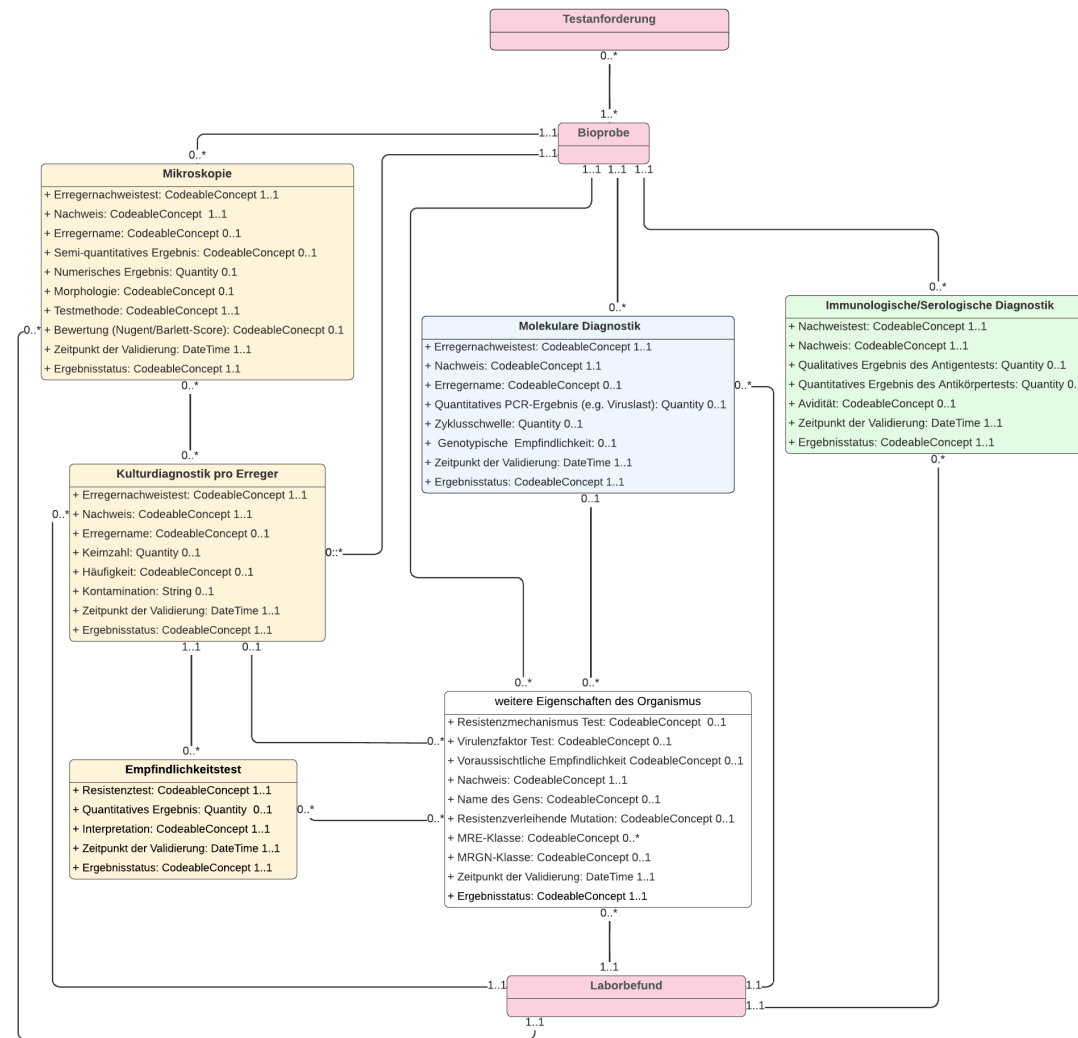
Modul Mikrobiologie und Kerndatensatz



Beschreibung des Moduls

Eigenschaften des Mikroorgansimus

- Kultur und Mikroskopie
- Molekulare Diagnostik
- Immunologie/Serologie
- Weitere Eigenschaften



Nach den Empfehlungen des MII-Steuerungskomitees wurden die Informationen mit dem **FHIR**-Standard unter Verwendung internationaler Terminologien wie **SNOMED CT** und **LOINC** strukturiert.

In deutschen Laboratorien werden häufig standortspezifische ValueSets. Dieses Modell zielt darauf ab, die Kodierungen mit internationalen Systemen wie zu vereinheitlichen.

LOINC wurde hauptsächlich zur Beschreibung der Tests verwendet
SNOMED liefert Codes zur Beschreibung von nominalen und ordinalen Ergebnissen

Die numerischen Ergebnisse müssen in **UCUM**-Einheiten angegeben werden

- **ART DECOR**- Data model
- **FHIR Resources**- Information elements
- **SearchLOINC**-Terminologie
- **SNOMED CT Browser**- Terminologie
- **CSIRO Snapper** – Value Sets
- **FORGE und SIMPLIFIER** -Profilen und Implementation Guide

FHIR Logical Model



Relevante FHIR-Observationselemente für den Nachweis des Organismus

Observation.code - Organismus Nachweis Test (**LOINC** wenn möglich)

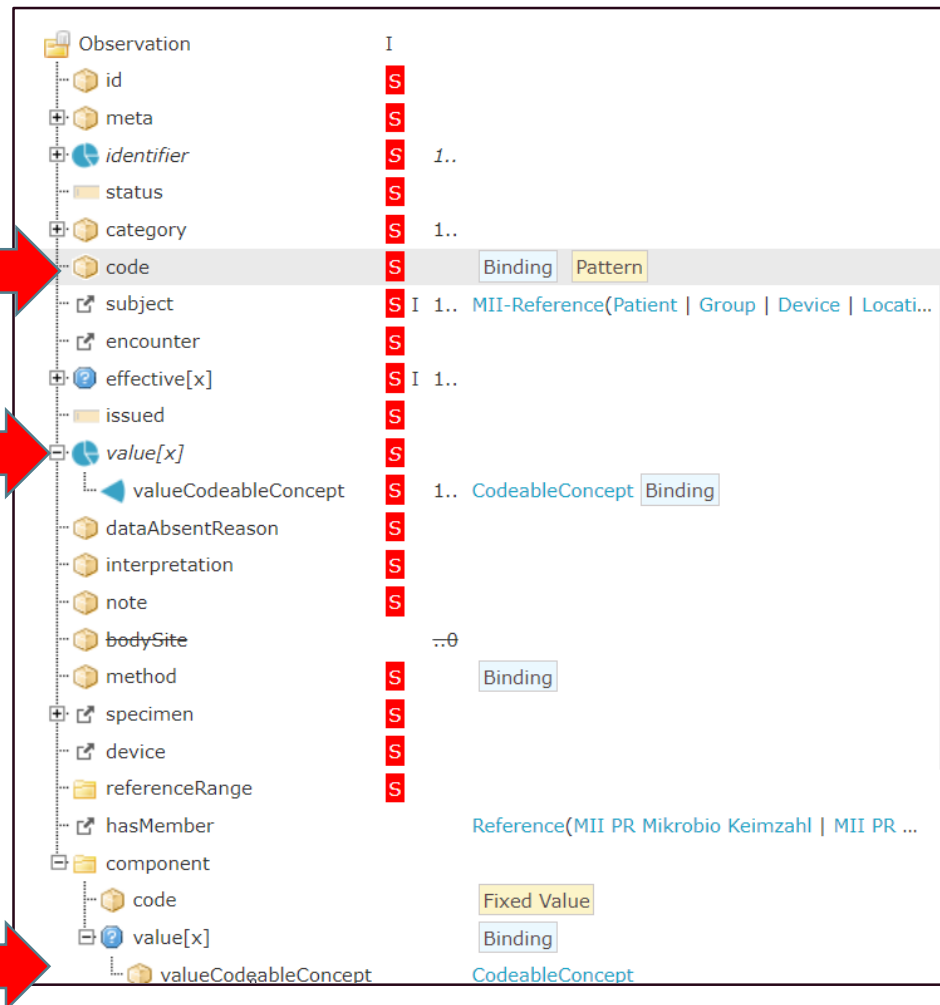
Observation.value – detected/not detected /inconclusive oder positive/weakly positiv/neegative/inconclusive (**SNOMED**)

Observation.method- Weitere Angabe zu Methode (**SNOMED**)

Observation.component –Name des Mikroorganismus (**SNOMED**)

Observation.component – Numerische Ergebnisse (e.g. Cycle Threshold, Viruslast)

Observation.component- Scores (e.g. Nugent, Barlett)



Observation.code: (LOINC)

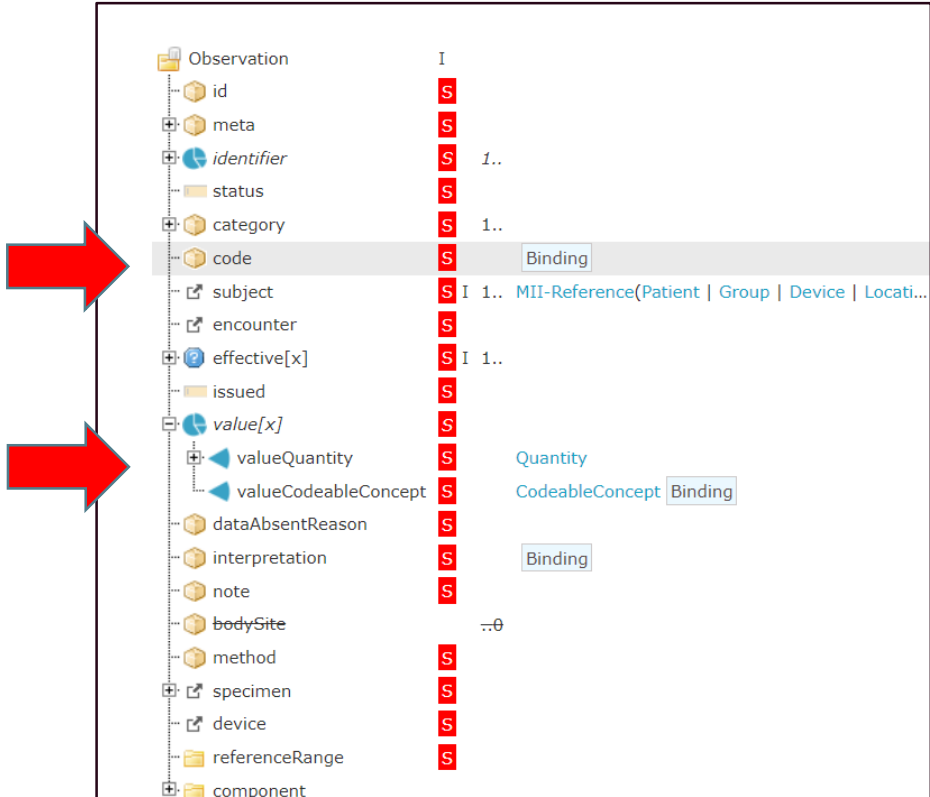
11475-1 Microorganism identified in Specimen by Culture

Observation.value: (SNOMED)

260373001	Detected (qualifier value)
260415000	Not detected (qualifier value)
419984006	Inconclusive (qualifier value)

Observation.component.value: (SNOMED)

409822003 |Domain Bacteria (organism)|
 414561005 |Kingdom Fungi (organism)|
 417396000 |Kingdom Protozoa (organism)|
 243565002 |Slime mold (organism)|
 84676004 |Prion (organism)|
 49872002 |Virus (organism)|



Observation.code: (LOINC)

49223-1 Colony count [# /volume] in Unspecified specimen by Visual count

564-5 Colony count [#] in Unspecified specimen by Visual count

38436-2 Colony count [# / mass] in Unspecified specimen by Visual count

20774-6 Colony count [Units/volume] in Unspecified specimen by Visual count

Observation.valueCodeableConcept: (SNOMED)

260347006

Present + out of ++++ (qualifier value)

260348001

Present ++ out of ++++ (qualifier value)

260349009

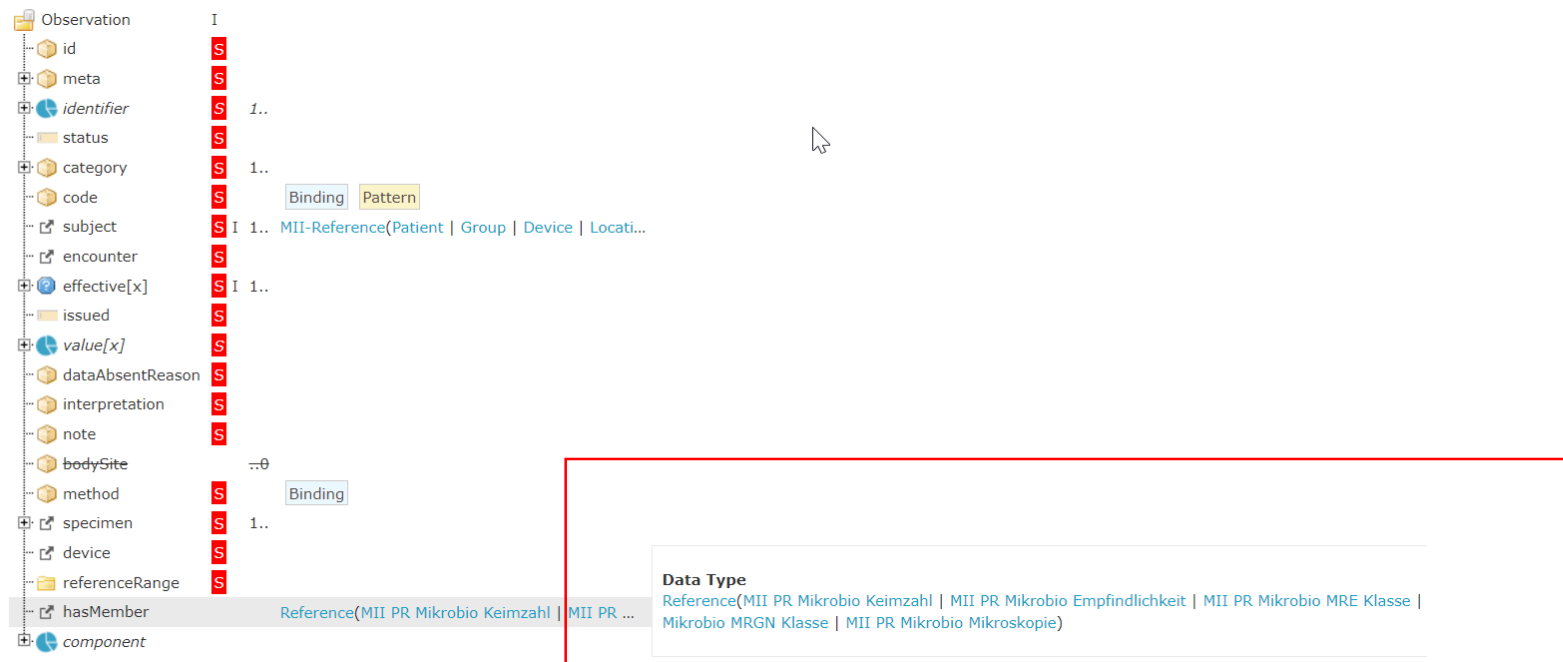
Present +++ out of ++++ (qualifier value)

260350009

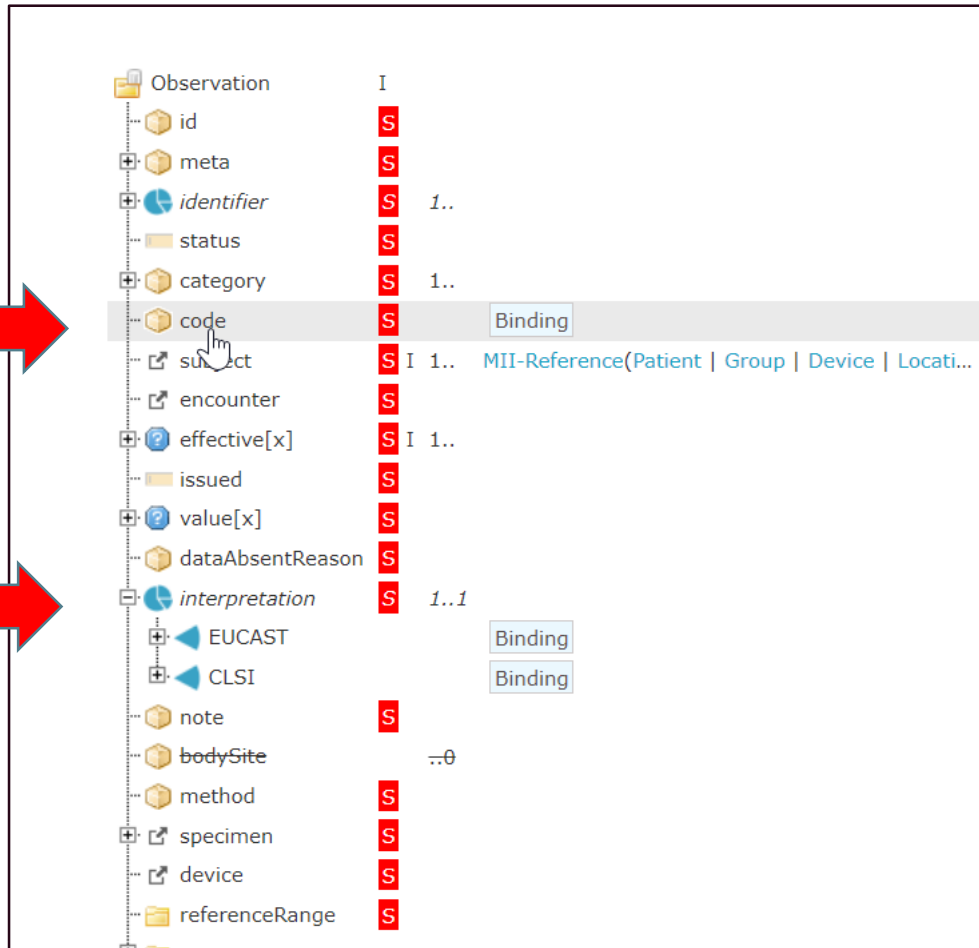
Present ++++ out of ++++ (qualifier value)

Observation.hasMember

Das FHIR Element hasMember wurde verwendet, um die Verbindung zwischen der Erkennung und anderen verwandten Informationen aufrechtzuerhalten und Keimzahl, Empfindlichkeit Anfälligkeit, MRGN-Klassifizierung, MRE-Typ



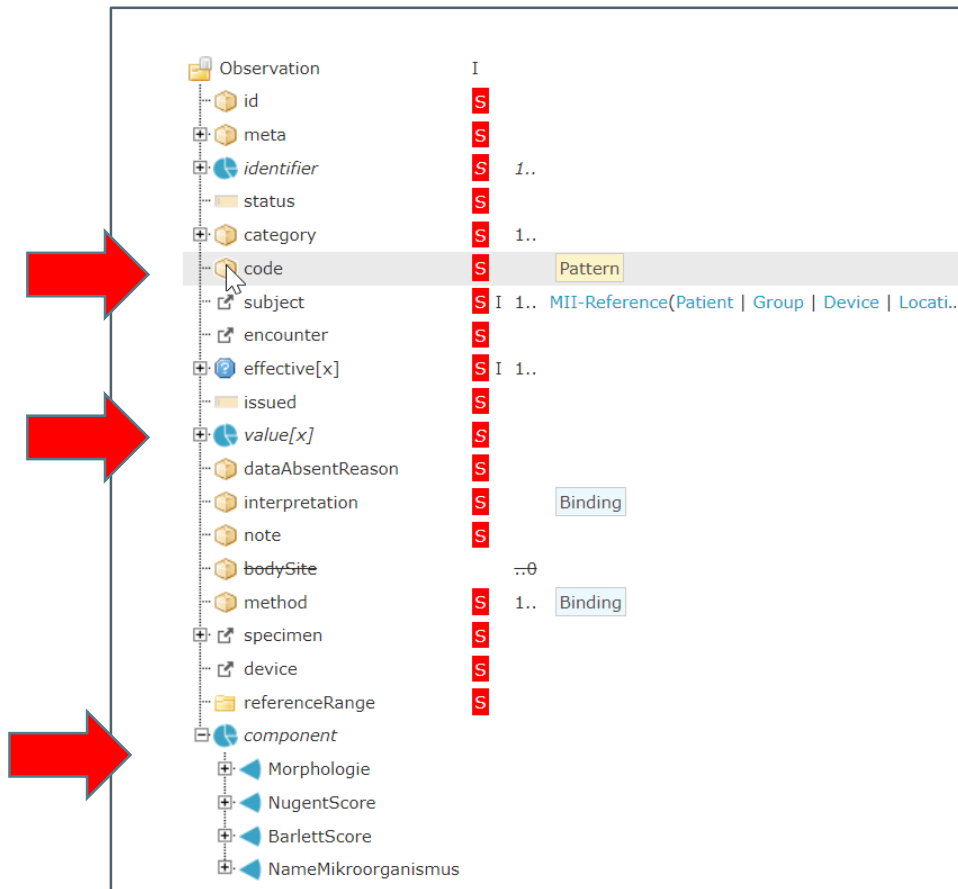
Empfindlichkeit



Observation.code: (LOINC)
ValueSet

Observation.interpretation: (EUCAST 2019)

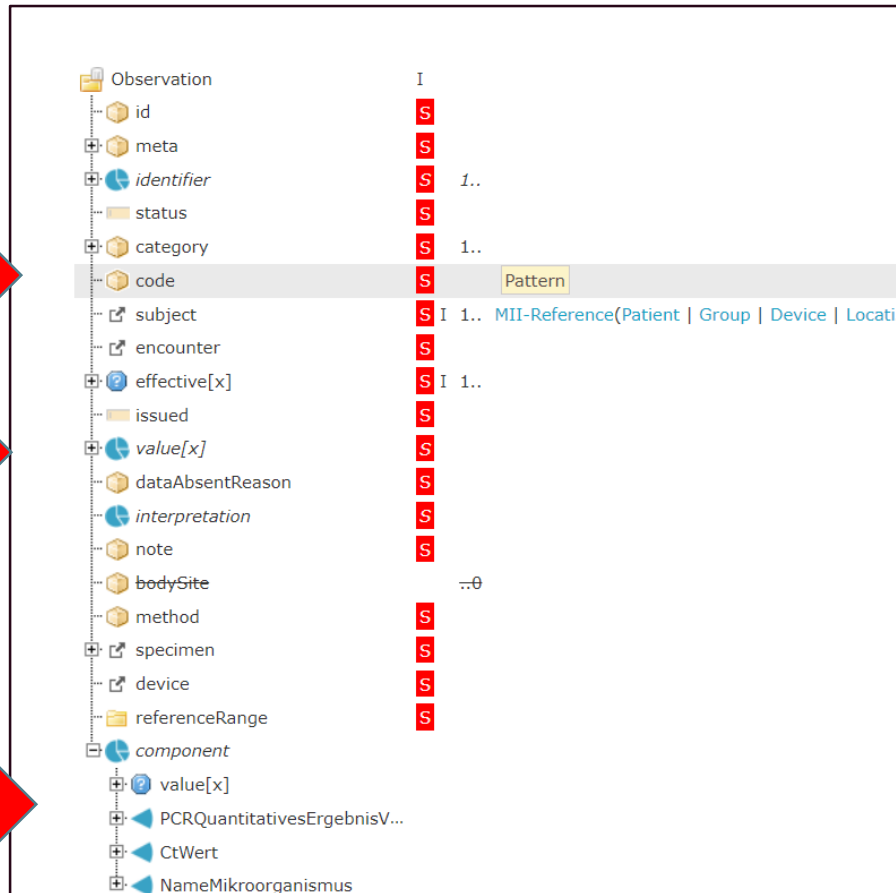
S Susceptible, standard dosing regimen
I Susceptible, increased exposure
R Resistant



Observation.code: (SNOMED)
117259009 |Microscopy (procedure)|

Observation.value: (SNOMED)

260373001	Detected (qualifier value)
260415000	Not detected (qualifier value)
419984006	Inconclusive (qualifier value)



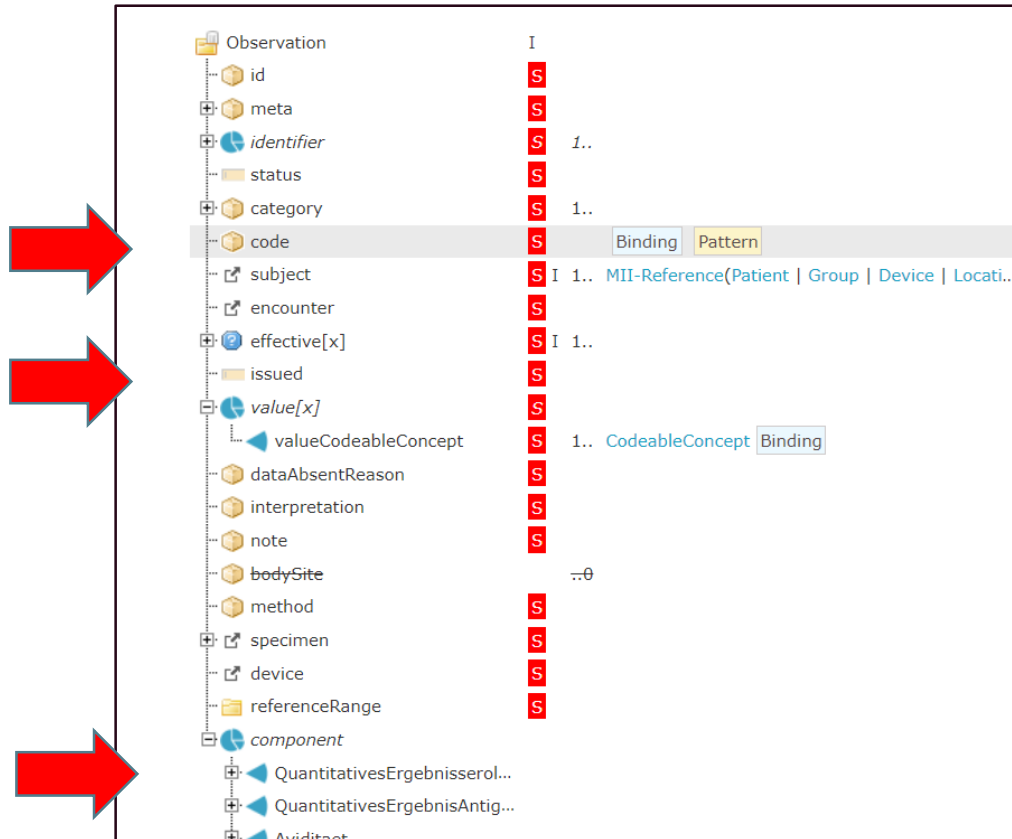
Observation.code: (LOINC)

92253-4 Microorganism identified in Isolate or Specimen by Molecular genetics method

Observation.value: (SNOMED)

10828004	Positive
260408008	Weakly positive
260385009	Negative
419984006	Inconclusive

Observation.component. valueQuantity

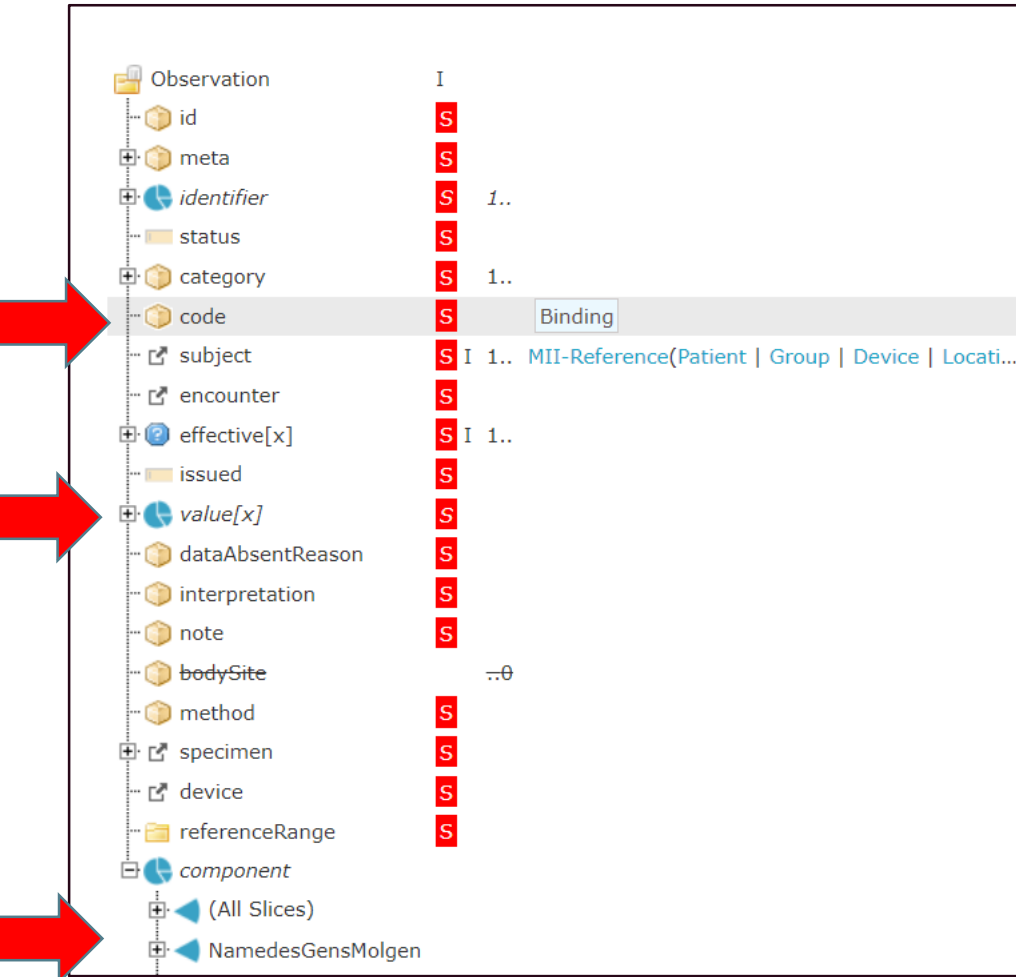


Observation.code: (SNOMED+LOINC VS)
252318005 |Immunology laboratory test (procedure)|

Observation.value: (SNOMED)

10828004	Positive
260408008	Weakly positive
260385009	Negative
419984006	Inconclusive

Observation.component. valueQuantity



Observation.code: (LOINC VS)
Value Set

Observation.value: (SNOMED)

260373001	Detected (qualifier value)
260415000	Not detected (qualifier value)
419984006	Inconclusive (qualifier value)

Observation.component:

<https://www.ncbi.nlm.nih.gov/pathogens/refgene/>

FHIR und terminology Bindings

- **Fixed values**
einen bestimmten Code
- **Intensional Value sets**
algorithmisch definiert
- **Extensional value sets**
explizite Liste von Codes

Value Sets in Snapper

Snapper/   <https://r4.ontoserver.csiro.au/fhir> Ontoserver  Snapper:

Find existing FHIR Resources

FHIR Code Systems 

MRE Klasse 

Untitled Code System 1 

FHIR Value Sets 

Viren 

Known-virus-quantitative 

VirusDetection 

Virus-known 

quantitativevirus 

AlleViren 

Quantitative Virus detection tests 

HIGHmed- Bakterien 

Code System*

Code System Version

Value Sets  Value Set

 Add new row  Delete selected rows  Update display text  Import codes from file (csv/tsv)  Toggle Filters

	Code	Display
	88899-0	Adenovirus [Presence] in Cornea or Conjunctiva by Organism specific culture
	88898-2	Adenovirus [Presence] in Lower respiratory specimen by Organism specific culture
	88900-6	Adenovirus [Presence] in Upper respiratory specimen by Organism specific culture
	88901-4	Adenovirus [Presence] in Stool by Organism specific culture
	88902-2	Adenovirus [Presence] in Urine by Organism specific culture
	55095-4	Adenovirus [Presence] in Specimen by Organism specific culture
	86330-8	Adenovirus B(11) DNA [Presence] in Specimen by NAA with probe detection
	86331-6	Adenovirus B(14) DNA [Presence] in Specimen by NAA with probe detection

  1 / 152   20 items per page 1 - 20 of 3031 items

SearchLOINC

LOINC Search **LOINC** Eugenia Rinaldi

LOINC Search

RESULTS 15010 DISPLAYING 200 1-200 FILTER VIEW List Card EXPORT

	Component	Property	Timing	System	Scale	Method	Class	Type	Example UCUM Units	Order/Observation	Version First Released	Version Last Changed
☐ DOC. ONTOLOGY	1											
☐ DRUG/TOX	1											
☒ EYE.SPECULAR MICROSCOPY	2											
☐ FERT	31											
☐ HEM/BC	200											
☐ MICRO	13962											
☐ PANEL.ABX BACT	2											
☐ PANEL.EYE	1											
☐ PANEL.MICRO	460											
☐ PANEL.UA	1											
☐ PATH	59											
☐ PATH.HISTO	13											
☐ SPEC	1											
☐ UA	219											
☒ Order/Observation												
☒ Property												
☒ Timing												
☒ System												
☒ Scale												
☒ Method												
☒ Panel Type												
☒ Tags												
☒ Version First Released												
☒ Version Last Changed												
☒ HL7 Attachment												
Apply												
Growth detection in Time to microorganism growth detection	Time	*	Specimen	Qn	MICRO	h	Observation	2.67	2.67			
Panel - Pus Microbiology CNAMTS panel	-	Pt	Pus	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Blood Microbiology CNAMTS panel	-	Pt	Bld	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Bronchial Microbiology CNAMTS panel	-	Pt	Bronchial	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Sputum Microbiology CNAMTS panel	-	Pt	Sputum	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Throat Microbiology CNAMTS panel	-	Pt	Thrt	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Urethra Microbiology CNAMTS panel	-	Pt	Urethra	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Urine Microbiology CNAMTS panel	-	Pt	Urine	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Cornea or Microbiology CNAMTS panel	-	Pt	Cornea/Conjunctiva	-	PANEL.MICRO		Order	2.64	2.64			
Panel - Semen Microbiology CNAMTS panel	-	Pt	Semen	-	PANEL.MICRO		Order	2.64	2.64			
Plate by Light Mold	Morph	Pt	Isolate	Nom	Microscopy.light	MICRO		Observation	2.71	2.71		
Plate by Light Yeast	Morph	Pt	Isolate	Nom	Microscopy.light	MICRO		Observation	2.71	2.71		
Identified in Arthropod identified	Prid	Pt	XXX	Nom	Micro/Micro	MICRO		1.0k	2.69			

SNOMED Browser

SNOMED CT Browser

Release: International Edition

Version: 2023-12-01

Perspective: Full

Feedback

About

SNOMED

go back to home page

Favorites

Reset

Search

Options

Filter results by Language

Filter results by Semantic Tag

Type at least 3 characters

3147 matches found in 1.368 seconds.

Virus	Virus (organism)
K virus	Kilham polyomavirus (organism)
B virus	Cercopithecine herpesvirus 1 (organism)
JC virus	John Cunningham virus (organism)
Virus Ag	Antigen of virus (substance)
ME virus	Murine encephalomyelitis virus (organism)
RT virus	RT parvovirus (organism)
CV virus	Cache Valley virus (organism)
BK virus	BK polyomavirus (organism)
Rat virus	Kilham rat virus (organism)
RKV virus	Rabbit kidney vacuolating virus (organism)
PPR virus	Peste-des-petits-ruminants virus (organism)
Ife virus	Ife virus (organism)
H-1 virus	H-1 virus (organism)
EMC virus	Encephalomyocarditis virus (organism)
Una virus	Una virus (organism)
DNA virus	Deoxyribonucleic acid virus (organism)

Concept Details

Expression Constraint Queries

Concept Details

Summary

Details

Diagram

Expression

Refsets

Members

History

References

Stated

Inferred

Parents

Virus (organism)

SCTID: 49872002

49872002 | Virus (organism) |

en Virus (organism)

en Virus

Children (42)

Animal virus (organism)

Antimicrobial resistant virus (organism)

Araguari virus (organism)

Aride virus (organism)

Asdravirus (organism)

Bacterial virus (organism)

Bacterial, insect, plant and/or other virus (organism)

Common specific viruses (organism)

Deoxyribonucleic acid virus (organism)

Erve virus (organism)

Hawaii virus (organism)

Hepatitis D virus (organism)

Human virus (organism)

Insect virus (organism)

Johnson Atoll virus (organism)

Jos virus (organism)

javascript:void(0);

ED International

User Guide

Contact Us

12:16

Datenelemente in ART DECOR

 **MI Core Data Set - Datasets**

ProjectDatasetsScenariosTerminologyTemplatesIssues Login

Concepts MI Dataset

Datasets





- Diagnostic - Microbiology
 - Identification
 - Status
 - Time of report
 - Microbiological culture
 - Bioprobe
 - Micoorganism detection test**
 - ID
 - Status
 - Name of the microorganism
 - Detection result
 - Culture method
 - Time of validation
 - Commentary
 - Colony count
 - Determinatio of resistance
- Microscopy
- Molecular diagnostics
- Further properties of the organism
- Immunology and serology

Micoorganism detection test 

Id	mid-dataelement-2464	Version	2022-01-27 13:47:09						
Status	 Draft	Version Label							
Description	Test for the detection of a pathogen by means of culture								
Comment									
Terminology Association	<table><thead><tr><th>Code</th><th>Display Name</th><th>Codesystem</th></tr></thead><tbody><tr><td>11475-1</td><td>Microorganism identified in Unspecified specimen by Culture</td><td>Logical Observation Identifier Names and Codes</td></tr></tbody></table>	Code	Display Name	Codesystem	11475-1	Microorganism identified in Unspecified specimen by Culture	Logical Observation Identifier Names and Codes		
Code	Display Name	Codesystem							
11475-1	Microorganism identified in Unspecified specimen by Culture	Logical Observation Identifier Names and Codes							

Value

Type	Code
------	------

Usage (0)

History (8)

[Introduction](#)
[Resources](#)
[Guides](#)
[Team](#)
[Log](#)
[Dependencies](#)
[Packages](#)

Resources

Profiles	13
ValueSets	25
CodeSystems	1
CapabilityStatements	1
LogicalModels	2
Texts	76
Images	19
Layouts	5
PackageManifests	1

 Canonical claims

This project contains canonicals that conflict with another package or project.

<https://www.medizininforma...>

Claimed

Medizininformatik Initiative - Kerndatensatz - Modul Mikrobiologie

Übersicht

Das vorliegende Projekt beschreibt die FHIR-Spezifikation des Erweiterungsmoduls 'Mikrobiologie', welches einen Teil des Kerndatensatzes der Medizininformatik-Initiative darstellt. Die hier veröffentlichten FHIR-Profil und ImplemenationGuides dienen als zentrale und verbindliche Spezifikation für die syntaktische und semantische Kodierung der Modulinhalte.

Status

Alle veröffentlichten FHIR-Artefakte innerhalb des Projektes verfügen über einen Status, durch welchen der jeweilige Reifegrad abgeleitet werden kann. Profile mit dem Status 'Draft' wurden noch nicht ballotiert und können noch diversen und substantiellen Änderungen unterliegen. Verpflichtende und ballotierte Ergebnisse sind unter dem Tab 'Packages' zu finden.

Medical Informatics Initiative - Core Data Set - Microbiology Module



This project describes the FHIR specification of the extension module 'Microbiology', which is part of the core data set of the Medical Informatics Initiative. The FHIR profiles and implementation guides published here

Herausforderungen

- Sehr spezifisches und kompliziertes Fachgebiet
- Bedarf an Feedback von Fachleuten bei der Modellierung
- Unterschiedliche Verfahren in verschiedenen Labors
- ValueSets erstellen
- Fehlende Codes in Standardterminologien

- Die FHIR-Profile zur Abbildung der Inhalte des Erweiterungsmoduls Diagnostik Mikrobiologie haben die HL7-Ballotierung durchlaufen.
- Alle Kommentare wurden überprüft und innerhalb des KDS-Team diskutiert.
- Fehler und Ungenauigkeiten wurden korrigiert
- Diskussion mit MII Modul Labor
- Diskussion mit RKI und MIO42

Die Zusammenarbeit auf europäischer Ebene fortzusetzen, um ein europäisches Datenmodell für die Mikrobiologie auf der Grundlage von MII Modul Mikrobiologie zu erstellen.

(z.B. X-eHealth, x-Share...)

weitere Informationen

Rinaldi, E., Drenkhahn, C., Gebel, B. *et al.* Towards interoperability in infection control: a standard data model for microbiology. *Sci Data* **10**, 654 (2023).

<https://doi.org/10.1038/s41597-023-02560-x>

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