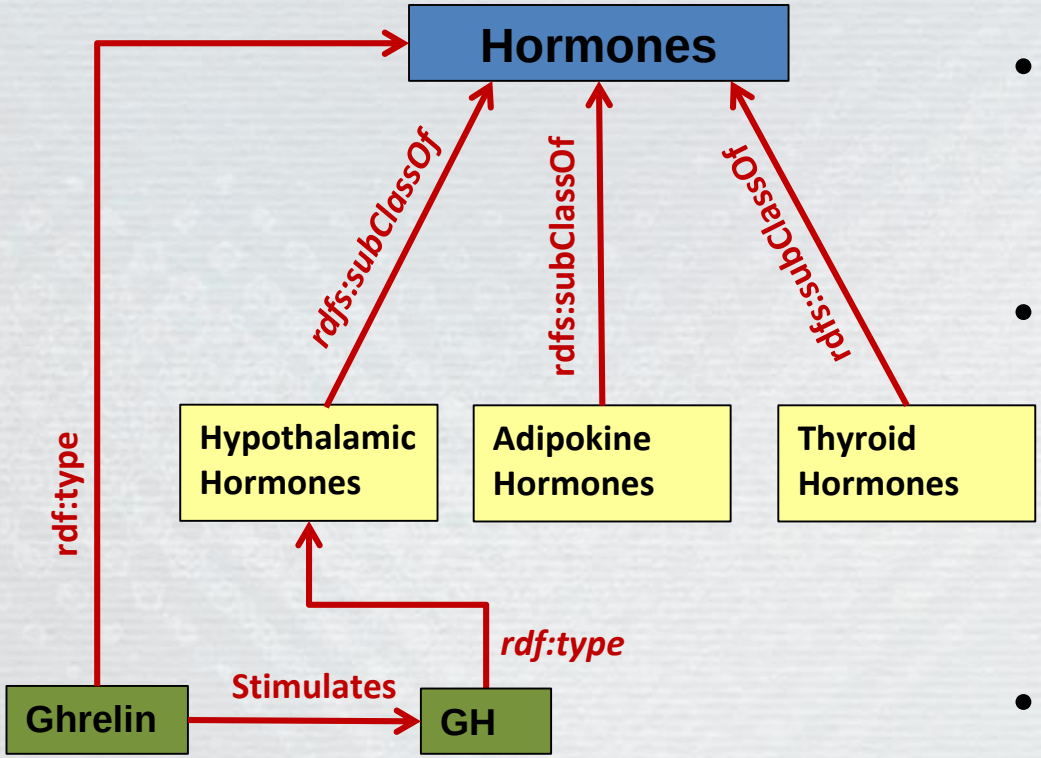
Laboratoire d'Informatique de Grenoble

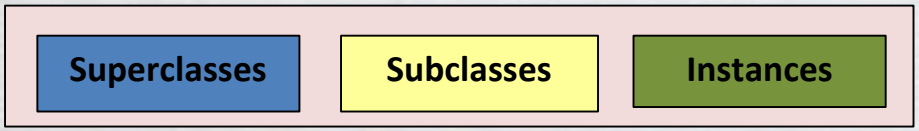
SLIDE
ScaLable Information Discovery and Exploitation

Axes de recherche SLIDE

- **Acquisition et enrichissement de données**
  - Préparation Big Data
  - Liage de données du Web sémantique
  - Acquisition intelligente par le Crowdsourcing
- **Fouille et traitement de données à grande échelle**
  - Recherche avancée de motifs fréquents
  - Algorithmes de jointure distribuée
  - Social media and health analytics
- **Approches d'exploration des informations**
  - Interrogation et vérification de données en présence d'ontologies
  - Exploration interactive de données

Ontology-based Query Answering





- a uniform setting to query and reason on data and knowledge
- Data model based on RDF statement
  - <Ghrelin, Stimulates, GH>
  - <GH, rdf:type, Hypothalamic Hormones>
  - <Hypothalamic Hormones, rdfs:subClassOf Hormones>
- Rules to define constraints and enrich the KB
  - <GH, rdf:type, Hormones> : inferred triple
- Declarative query language SPARQL

My Corporis Fabrica

joint work with Olivier Palombi (LJK/Inria/Ladaf)

- **Description of anatomic objects, constraints, functions and 3D aspects**

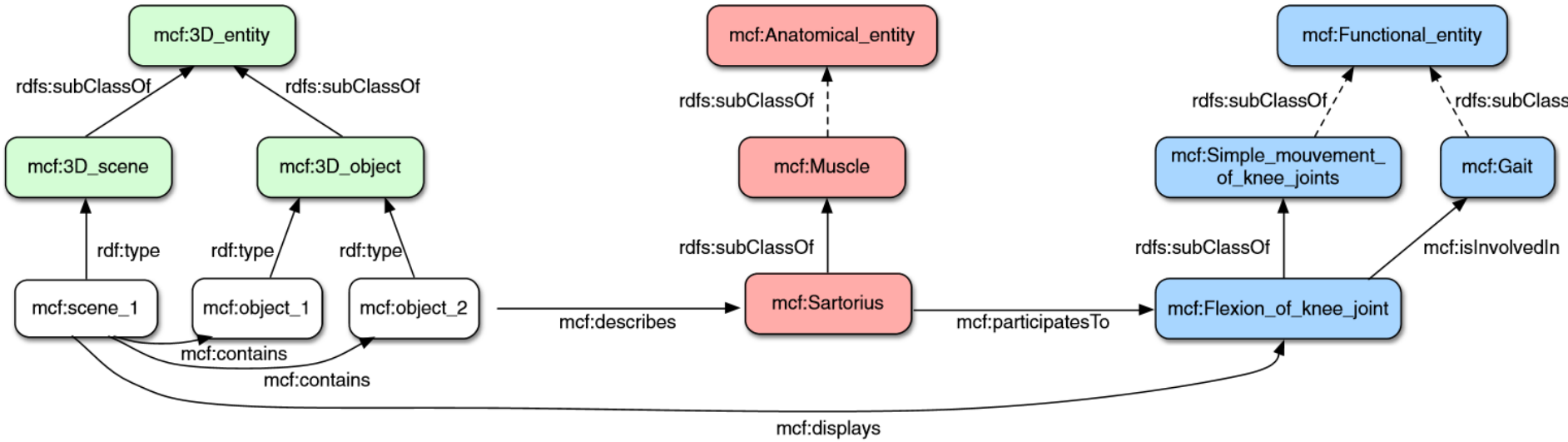
« 3Dmodel1 describes the Sartorius which is a Muscle that participates to the Flexion of the Knee »

- **Reasoning and Declarative Querying capabilities on knowledge**

« Which 3D objects refer to muscles that participate to the Flexion of Knee ? »

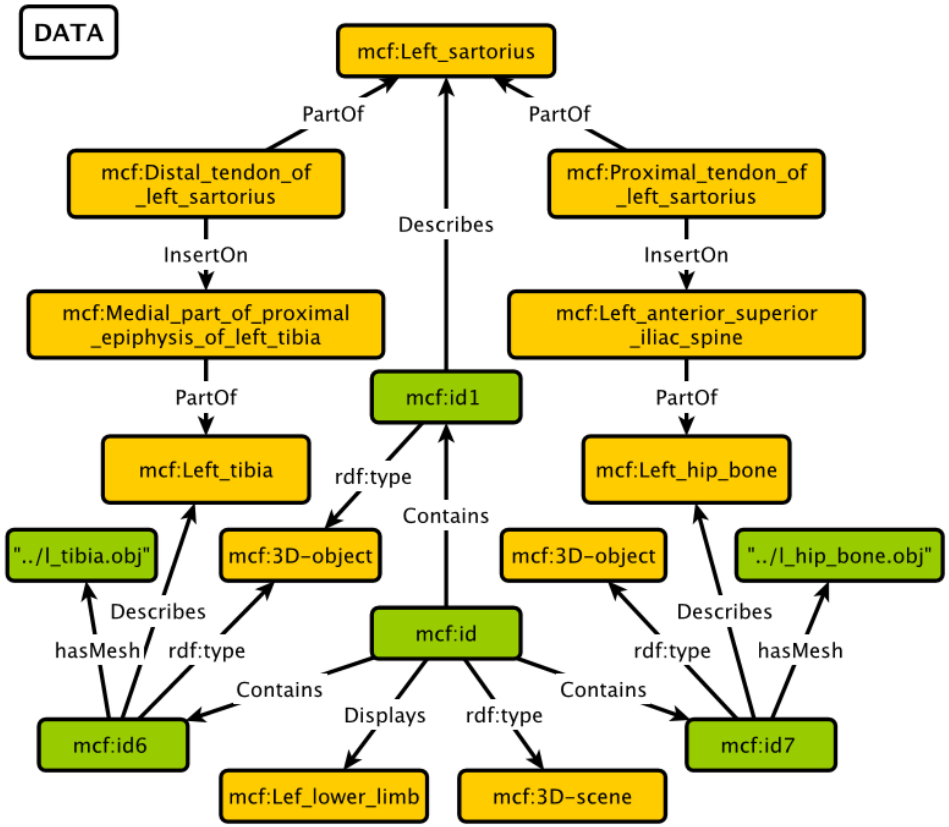
- **Evolutive and Efficient tool for knowledge driven 3D anatomic models in real time**

Ontology (extract)



IF⟨ ?x rdf:type mcf:3D-object ⟩AND⟨ ?x mcf:Describes ?y ⟩
AND⟨ ?y rdfs:subClassOf mcf:Bone ⟩
THEN⟨ ?x mcf:hasColour ‘yellow’ ⟩ (R12)

Ontology-based Query Answering (illustration)



Corresponding triples :

⟨ mcf:Distal_tendon_of_left_sartorius mcf:PartOf mcf:Left sartorius ⟩
⟨ mcf:Distal_tendon_of_left_sartorius mcf:InsertOn mcf:Medial_part_of_proximal_epiphysis_of_left_tibia ⟩
⟨ mcf:Proximal_tendon_of_left_sartorius mcf:PartOf mcf:Left sartorius ⟩
⟨ mcf:Proximal_tendon_of_left_sartorius mcf:InsertOn mcf:Left_anterior_superior_iliac_spine ⟩
⟨ mcf:Medial_part_of_proximal_epiphysis_of_left_tibia mcf:PartOf mcf:Left_tibia ⟩
⟨ mcf:Left_anterior_superior_iliac_spine mcf:PartOf mcf:Left_hip_bone ⟩

⟨ mcf:id rdf:type mcf:3D-scene ⟩ ⟨ mcf:id mcf:Displays mcf:Left_lower_limb ⟩
⟨ mcf:id1 rdf:type mcf:3D-object ⟩ ⟨ mcf:id6 rdf:type mcf:3D-object ⟩ ⟨ mcf:id7 rdf:type mcf:3D-object ⟩
⟨ mcf:id mcf:Contains mcf:id1 ⟩ ⟨ mcf:id mcf:Contains mcf:id6 ⟩ ⟨ mcf:id mcf:Contains mcf:id7 ⟩

⟨ mcf:id1 mcf:Describes mcf:Left_sartorius ⟩ ⟨ mcf:id1 mcf:hasMesh ¨"..\geometries\l sartorius.obj"⟩
⟨ mcf:id6 mcf:Describes mcf:Left_tibia ⟩ ⟨ mcf:id6 mcf:hasMesh ¨"..\geometries\l_tibia.obj"⟩
⟨ mcf:id7 mcf:Describes mcf:Left_semimembranosus ⟩ ⟨ mcf:id7 mcf:hasMesh ¨"..\geometries\l_hip_bone.obj"⟩

QUERY

Query in English :

May I see, in the curent 3D scene, the bones on which the left sartorius muscle is inserted ?

Query in SPARQL

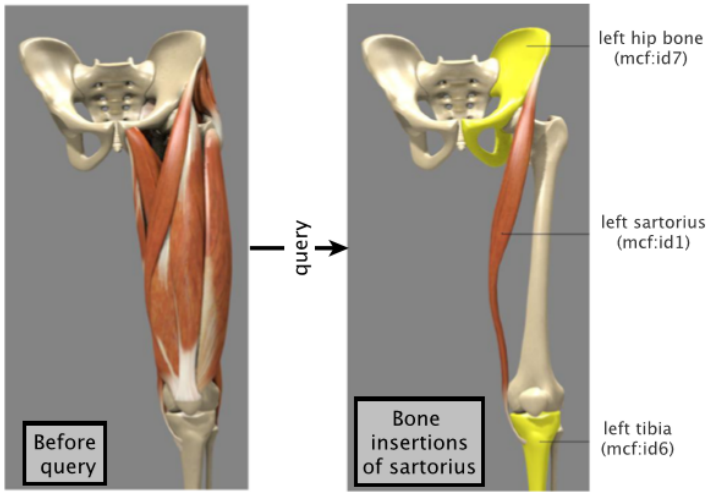
```
PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX mcf:<http://www.mycorporisfabrica.org/ontology/mcf.owl#>

select ?bone ?individual ?mesh
where {?s mcf:PartOf mcf:Left_sartorius.
?s mcf:InsertOn ?z.
?z mcf:PartOf ?bone.
?individual rdfs:Describes ?bone.
?scene mcf:Contains ?individual.
?individual rdf:type mcf:3D-object.
?individual mcf:hasMesh ?mesh }
```

Answer

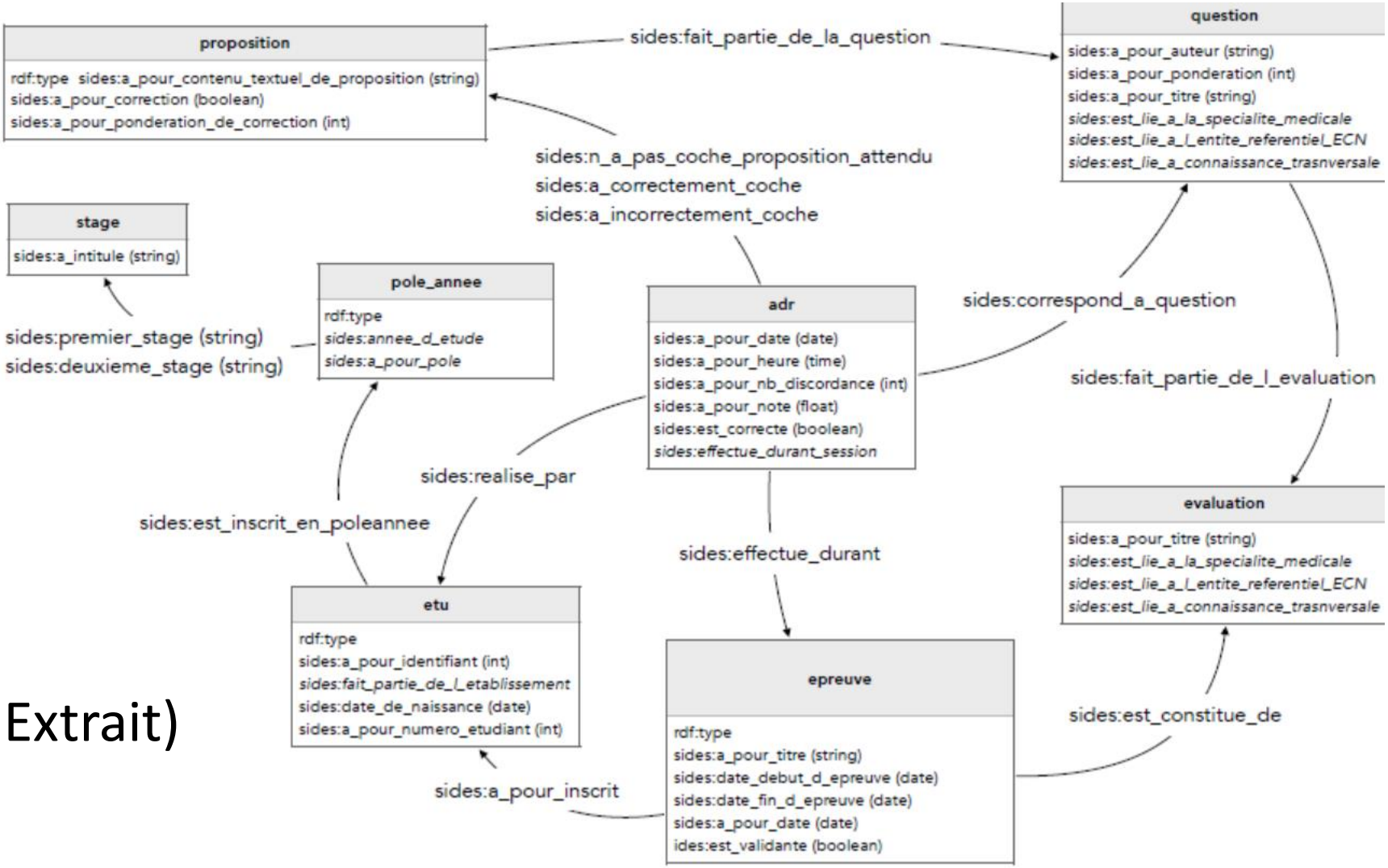
?bone	?individual	?mesh
mcf:Left_tibia	mcf:id6	../l_tibia.obj
mcf:Left_hip_bone	mcf:id7	../l_hip_bone.obj

3D view



OntoSides (aussi avec Olivier P.)

- « Preuve de Concept » de l'approche SIDES 3.0 (cf exposé/démo)
  - Embryon d'une ontologie « métier » pour décrire et requêter les activités d'entrainement d'étudiants de Grenoble sur SIDES



(Extrait)