A-061: ChemoOnto, an ontology to qualify the course of chemotherapies

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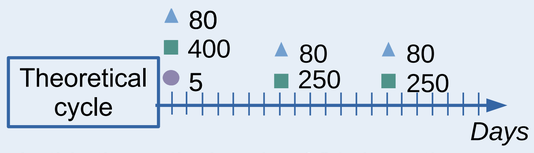
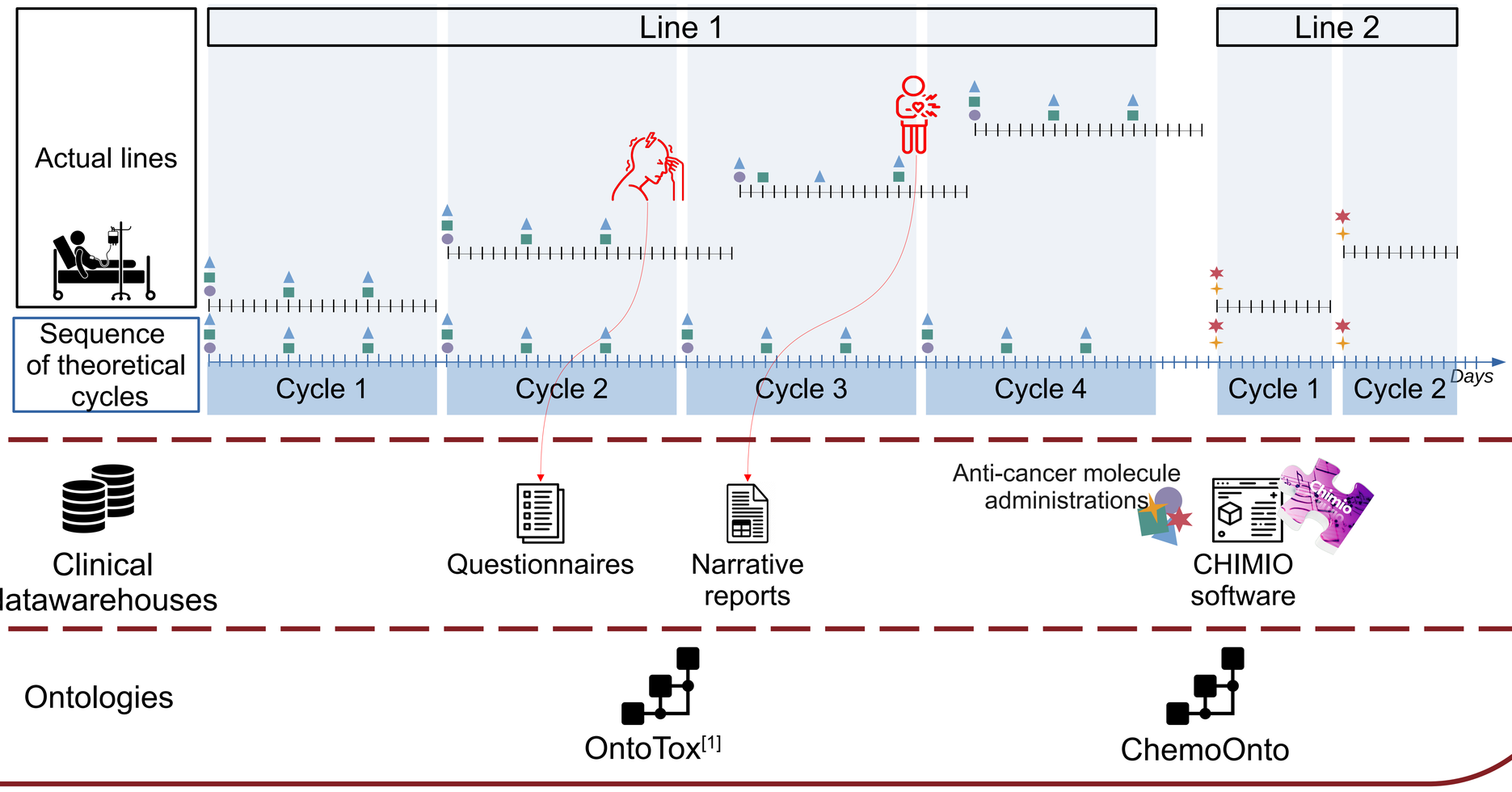
CONTEXT

Example of a chemotherapy regimen given to ENT cancer patients:

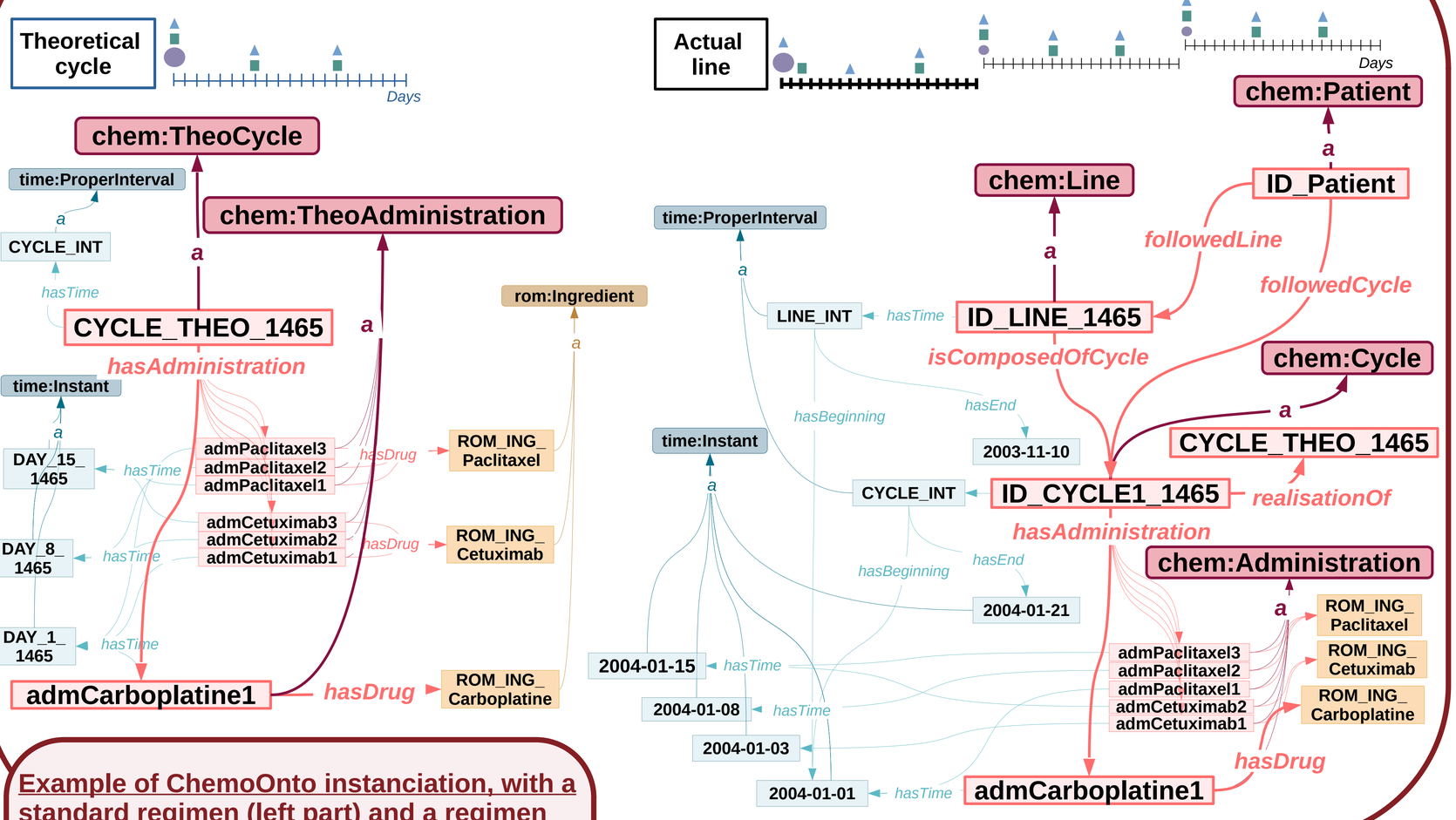


In this theoretical cycle of 21 days, the following molecules are administrated :

- Cetuximab
  day 1 at 400 mg/m²
  day 8 and 15 at 250 mg/m²
- Carboplatine
  day 1 at 5 mg
- Placlitaxel
  day 1, 8 and 15 at 80 mg/m²



REPRESENTING COMPLEXITY

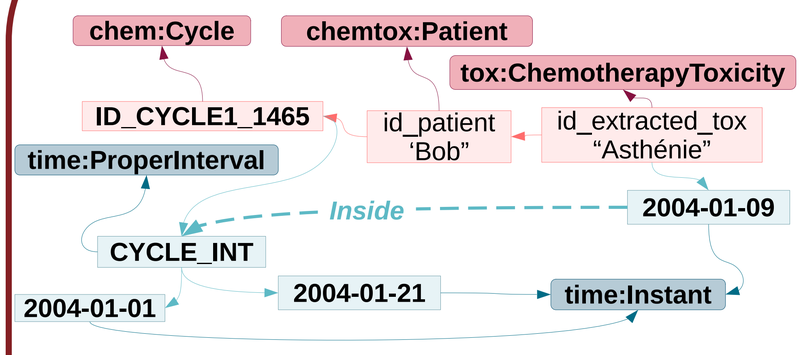


Example of ChemoOnto instanciation, with a standard regimen (left part) and a regimen actually administrated to a patient (right part)

: Classes
: Instances

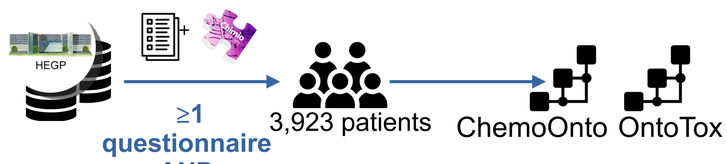
Namespaces:
time: https://www.w3.org/TR/owl-time/
rom: https://romedi.fr
chem:https://chemonto.owl

REASONING



SWRL rule :

```
chemtox:Patient(?pat),
chem:Cycle(?cycle),
tox:ChemotherapyToxicity(?tox),
time:ProperInterval(?p),
time:Instant(?i),
chem:followedCycle(?pat, ?cycle),
tox:isRelatedToPatient(?tox, ?pat),
time:hasTime(?cycle,?p),
time:hasTime(?tox,?i),
time:inXSDDateTime(?i,?di),
time:hasBeginning(?p, ?pbeg),
time:hasEnd(?p,?pend),
time:inXSDDateTime(?pbeg, ?dpbeg),
time:inXSDDateTime(?pend, ?dpend),
swrlb:lessThanOrEqual(?dpbeg, ?di),
swrlb:lessThanOrEqual(?di, ?dpend)
-> time:inside(?p,?i)
```

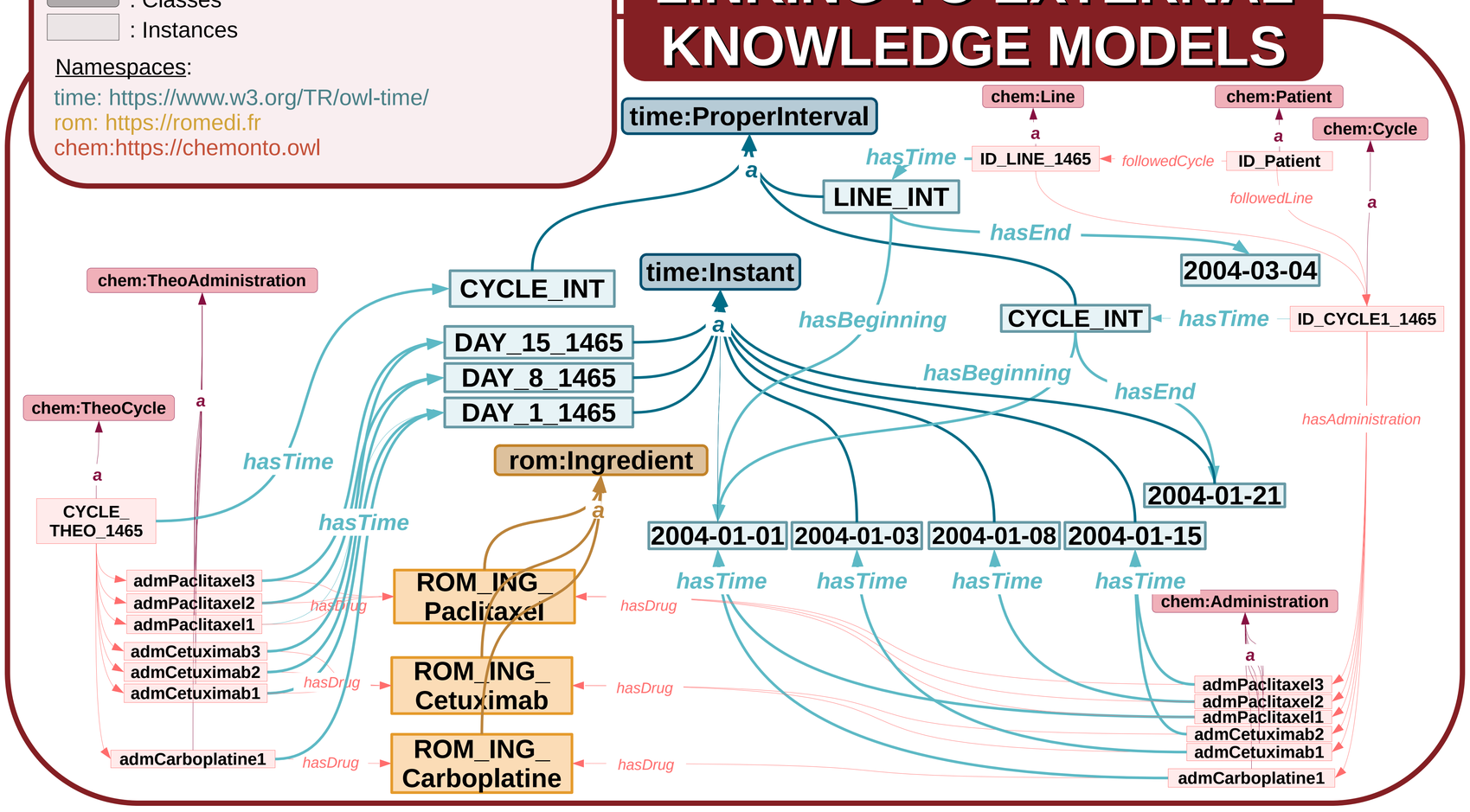


ChemoOnto Classes representing actual treatment	#instances
Administration	487,325
Cycle	62,343
Line	11,197

OntoTox Classes	#instances
Chemotherapy Toxicity	980,105
Toxicity evaluated as absent	759,622
Toxicity evaluated with its severity	220,483

time:inside object property	#instances
Toxicity instant indentified within a cycle interval	825,202
Toxicity evaluated as absent instant indentified within a cycle interval	633,766
Toxicity evaluated with its severity instant indentified within a cycle interval	191,436

LINKING TO EXTERNAL KNOWLEDGE MODELS



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https://github.com/TeamHeka/ChemoOnto

[1] Rogier, A., Coulet, A., & Rance, B. (2021, October). Using an ontological representation of chemotherapy toxicities for guiding information extraction and integration from EHRs. In Medinfo 2021-18th World Congress on Medical and Health Informatics