**CLO design pattern** (In current CLO)

* cell line cell, derive from cell line cell

{cell line cell} and (derive from some {cell line cell})

Example: HeLa derived cell line cell (<http://purl.obolibrary.org/obo/CLO_0000168>)

{cell line cell} and (derive from cell line some {cell line cell})

Example: H1-neuron (<http://purl.obolibrary.org/obo/CLO_0037299>)

{cell line cell} and (is\_specified\_output\_of some

({'cell line cell transfection'} /{'cell line cell modification'} and

(has\_specified\_input some {cell line cell}))

Example: MCF10A-Er-Src cell (<http://purl.obolibrary.org/obo/CLO_0037240>)

Note: known how new cell line cell derived

* cell line cell, derive from cell

{cell line cell} and (derive from some {cell})

Example: immortal leukocyte cell line cell (<http://purl.obolibrary.org/obo/CLO_0000102>)

{cell line cell} and (derive from cell some {cell})

Example: CS28iALS-C9n2 cell (<http://purl.obolibrary.org/obo/CLO_0037528>)

* cell line cell, derive from anatomical entity

{cell line cell} and (derive from some {anatomical entity})

Example: NB-100 cell (<http://purl.obolibrary.org/obo/CLO_0007944>)

{cell line cell} and (derive from some (part of some {anatomical entity}))

Example: immortal uterus-derived cell line cell (<http://purl.obolibrary.org/obo/CLO_0000264>)

{cell line cell} and (derive from anatomic part {anatomical entity})

Example: BIHi001-A cell (<http://purl.obolibrary.org/obo/CLO_0037337>)

* cell line cell, derive from organism

{cell line cell} and (derive from some ({cell} and

(part of some ({anatomical entity} and

(part of some {organism}))))

Example: PI.1 Ut cell (<http://purl.obolibrary.org/obo/CLO_0008443>)

{cell line cell} and (derive from some ({cell} and

(part of some {organism})))

Example: NIT-2 cell (<http://purl.obolibrary.org/obo/CLO_0008176>)

{cell line cell} and (derive from some ({anatomical entity} and

(part of some {organism})))

Example: SW10 cell (<http://purl.obolibrary.org/obo/CLO_0009207>)

{cell line cell} and (derive from some

(part of some {organism}))

Example: immortal Canis lung-derived cell line cell (<http://purl.obolibrary.org/obo/CLO_0009789>)

{cell line cell} derive from organism {organism}

Example: BIHi001-A cell (<http://purl.obolibrary.org/obo/CLO_0037337>)

Note: organism could be selectively maintained organism (e.g. strain), male organism

* cell line cell, derive from organism having disease

{cell line cell} and (derive from some ({cell} and

(part of some {organism} and

(has disease some {disease}))))

Example: 143 B cell (<http://purl.obolibrary.org/obo/CLO_0001084>)

Example: 143B cell (<http://purl.obolibrary.org/obo/CLO_0001088>)

(two terms may refer to same cell line cell)

{cell line cell} and (derives from patient having disease some {disease})

Example: 143B cell (<http://purl.obolibrary.org/obo/CLO_0001088>)

Example: KY821 cell (<http://purl.obolibrary.org/obo/CLO_0009844>)

Question: how is it different from disease model?

* cell line cell, derive from organism at embryo stage

{cell line cell} and (derives from some ({cell} and

(part of some {organism} and

(existence starts during some {embryo stage}))))

Example: SK-PN-DW cell (<http://purl.obolibrary.org/obo/CLO_0009064>)

{cell line cell} and (derives from some ({cell} and

(part of some {embryo} and

(part of some {organism}))))

Example: MB-03C4 cell (<http://purl.obolibrary.org/obo/CLO_0007550>)

Notes:

1. The ‘organism’ in two expressions refer to different organism instances.
2. embryo = 'multicellular organism' and ('existence starts with' some 'embryo stage') and ('existence ends with' some 'embryo stage')

**Notes: CLO contains many more specific ‘derives from’ relations**

|  |  |  |
| --- | --- | --- |
| CLO:0037226 | cell line cell derived from (not used) | |
| CLO:0037227 | cell line cell derived from anatomical part (not used) | |
| CLO:0037229 | cell line cell derived from organism (not used) | |
| CLO:0037208 | derived from anatomic part | |
| CLO:0037209 | derived from cell | |
| CLO:0037210 | derived from cell line | |
| CLO:0037376 | derived from cell with isogenic modification of gene (not used) | | |
| CLO:0037377 | derived from cell with knockin gene (not used) | |
| CLO:0037375 | derived from cell with knockout gene (not used) | |
| CLO:0037378 | derived from cell with transgenic modification (not used) | |
| CLO:0037207 | | derived from organism | |
| CLO:0000015 | | derives from patient having disease | |

The relations are not used in the CLO with grey background.

The relations do not have domain and range (some indicated in the text)

* cell line cell, is disease model for disease

{cell line cell} and (is disease model for some {disease})

Example: GM14350 cell (<http://purl.obolibrary.org/obo/CLO_0031162>)

* cell line cell, is in cell line repository cell line repository

{cell line cell} and (is in cell line repository value {organization instance})

Example: RCB2532 cell (<http://purl.obolibrary.org/obo/CLO_0050809>)

* cell line cell, is specified input of cell line cell culturing

{cell line cell} and (is\_specified\_input\_of some {cell line cell culturing})

Example: S1E4 cell (<http://purl.obolibrary.org/obo/CLO_0008921>)

* cell line cell, capable of biological process

{cell line cell} and (capable of some {biological process})

Example: stem cell line cell (<http://purl.obolibrary.org/obo/CLO_0037224>)

**CL design pattern**

Cell, part of anatomical entity

{[cell](http://purl.obolibrary.org/obo/CL_0000000)} and ([part of](http://purl.obolibrary.org/obo/BFO_0000050) some {[anatomical\_entity](http://purl.obolibrary.org/obo/UBERON_0001062)})

Cell, taxon specific

{[cell](http://purl.obolibrary.org/obo/CL_0000000)} and ([in taxon](http://purl.obolibrary.org/obo/RO_0002162) some {[taxon](http://purl.obolibrary.org/obo/NCBITaxon_1)})

Cell, bearer of quality

{[cell](http://purl.obolibrary.org/obo/CL_0000000)} and ([bearer of](http://purl.obolibrary.org/obo/RO_0000053) some {[quality](http://purl.obolibrary.org/obo/PATO_0000001)})

Cell, capable of biological process

{[cell](http://purl.obolibrary.org/obo/CL_0000000)} and ([capable of](http://purl.obolibrary.org/obo/RO_0002215) some {[biological\_process](http://purl.obolibrary.org/obo/GO_0008150)})