1 Namespaces

Table 1: Namespaces and their prefixes used in the ontology.

Namespace prefix	Namespace
bo	http://www.bacillondex.org#
so	http://purl.org/obo/owl/SO#
go	http://purl.org/obo/owl/GO#
sbol	http://sbols.org/sbol.owl#
bods	http://www.bacillondex.org/cv#
boet	http://www.bacillondex.org/evidenceType#
owl	http://www.w3.org/2002/07/owl#
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
rdfs	http://www.w3.org/2000/01/rdf-schema#
xsd	http://www.w3.org/2001/XMLSchema#

2 Class Definitions

```
Class: NegativelyRegulatedOperator
   Annotations:
      rdfs:label "Negatively regulated operator",
      rdfs:comment "Operator site for a repressor"
   EquivalentTo:
      Operator
         and (NA some rdf:PlainLiteral)
         and (regulationType value "Negative")
       SubClassOf:
          Operator

Class: PositivelyRegulatedOperator
   Annotations:
      rdfs:label "Positively regulated operator",
      rdfs:comment "Operator site for an activator"
   EquivalentTo:
      Operator
         and (NA some rdf:PlainLiteral)
         and (regulationType value "Positive")
      SubClassOf:
         Operator
```

Figure 1: The class definitions for operator classification in the Manchester OWL syntax. Operators with known sequences are classified according to their regulation type restrictions.

```
Class: InduciblePromoter
   Annotations:
      rdfs:label "Inducible promoter",
      rdfs:comment "Promoter with an activator site"
   EquivalentTo:
      Promoter
         and (hasPart exactly 1 Operator)
         and (hasPart exactly 1 PositivelyRegulatedOperator)
      SubClassOf:
         Promoter
```

Figure 2: The inducible promoter class definition. Promoters with one operator for an activator are classified as `InduciblePromoter`s.

```
Class: RepressiblePromoter
   Annotations:
      rdfs:label "Repressible promoter",
      rdfs:comment "Promoter with a repressor site"
   EquivalentTo:
      Promoter
         and (hasPart exactly 1 NegativelyRegulatedOperator)
         and (hasPart exactly 1 Operator)
      SubClassOf:
         Promoter
```

Figure 3: The repressible promoter class definition. Promoters with one operator for a repressor are classified as `RepressiblePromoter`s.

```
Promoter
   and (hasPart exactly 2 Operator)
   and (hasPart exactly 2 PositivelyRegulatedOperator)
```

Figure 4: The OWL expression for the `InduciblePromoterWith2Operators` class which is used to classify promoters with two activator sites only.

```
Promoter
   and (hasPart exactly 2 Operator)
   and (hasPart exactly 2 NegativelyRegulatedOperator)
```

Figure 5: The OWL expression for the `RepressiblePromoterWith2Operators` class which is used to classify promoters with two repressor sites only.

```
Promoter
   and (hasPart exactly 2 Operator)
   and (hasPart exactly 1 NegativelyRegulatedOperator)
   and (hasPart exactly 1 PositivelyRegulatedOperator)
```

Figure 6: The OWL expression to classify promoters with one activator and one repressor site.

```
Class: ANDGatePromoter
    SubClassOf:
        InduciblePromoterWith2Operators

Class: ORGatePromoter
    SubClassOf:
        InduciblePromoterWith2Operators

Class: NORGatePromoter
    SubClassOf:
        RepressiblePromoterWith2Operators

Class: NANDGatePromoter
     SubClassOf:
        RepressiblePromoterWith2Operators

Class: ANDNGatePromoter
     SubClassOf:
        RepressibleInduciblePromoterWith2Operators
```

Figure 7: Two-input logic gate promoter definitions.

```
Class: ConstitutivePromoter
    Annotations:
        rdfs:comment "Constitutive Promoter",
        rdfs:label "Constitutive Promoter"
    SubClassOf:
        Promoter

Class: ConstitutiveSigAPromoter
    Annotations:
        rdfs:comment "Constitutive SigA Promoter",
        rdfs:label "Constitutive SigA Promoter"
    EquivalentTo:
        SigAPromoter
         and (not (hasPart some Operator))
    SubClassOf:
        SigAPromoter,
        ConstitutivePromoter
```

Figure 8: Constitutive promoter definitions in SyBiOnt. Constitutive SigA promoters are SigA promoters that do not include any operator binding sites.

```
CDS and
   (encodes some (Protein and
   (bindsTo some PositivelyRegulatedOperator)))
```

Figure 9: The OWL expression for the `ActivatorEncodingCDS` defined class. A CDS that encodes for a protein binding to at least one activator site is classified as `ActivatorEncodingCDS`.

```
CDS and
   (encodes some (Protein and
   (bindsTo some NegativelyRegulatedOperator)))
```

Figure 10: The OWL expression for the `RepressorEncodingCDS` defined class. A CDS that encodes for a protein binding to at least one repressor site is classified as `RepressorEncodingCDS`.

```
CDS and (encodes some (Protein
     and (hasFunction some go:GO_0000155)))
```

Figure 11: The OWL expression for the `KinaseEncodingCDS` defined class. A CDS that encodes for a protein that has function `go:GO_0000155` is classified as `KinaseEncodingCDS`.

```
CDS and (encodes some (Protein
     and (hasFunction some go:GO_0000156)))
```

Figure 12: The OWL expression for the `ResponseRegulatorEncodingCDS` defined class. A CDS that encodes for a protein that has function `go:GO_0000156` is classified as `ResponseRegulatorEncodingCDS`.