

Diagram File Format revision 0.7.6 (2010-05-13)

1. Abstract of specification changes

- a) MoleculeRoleOntology became a single attribute from multiple attributes.

2. Representation on the file

(1) Representation of the document element and the version information

This format is expressed in XML. Its document element is the "inoh" element.

The "inoh" element has an attribute which expresses the version of the file format and its attribute value format should be "yy/mm/dd".

The value of this version is 10/05/13.

```
<inoh FormatVersion="10/05/13">
```

(2) Types of objects

There are three kind of objects: diagram, node and edge.

Note: Diagram is a special type of an "event node" (Type attribute of the node element is Diagram).

(3) Representation of attributes of each object

Each object has three attributes described below.

i) System attributes

```
<attributeList Name="System">  
  <attribute Name="DisplayName" Value="Diagram1" />  
  <attribute Name="Comment" Value="" />  
</attributeList>
```

ii) Editorial attributes

```
<attributeList Name="Editing">  
  <attribute Name="Author" Value="" />  
  <attribute Name="AuthorMailAdd" Value="" />  
  <attribute Name="Version" Value="" />  
  <attribute Name="Date" Value="2006-01-06 11:42:39.682" />  
</attributeList>
```

iii) Biological attributes (The attribute names differ depending on the types of objects.)

```
<attributeList Name="Biological">
  <attribute Name="MoleculeRoleOntology" Value="IMR_xxxxxx:Term name" />
  <attribute Name="Organism" Value="Canonical" />
  <attribute Name="LocationOntology" Value="ILC:xxxx Term name" /> --- (A)
  <attribute Name="LocationOntology" Value="ILC:xxxx Term name" /> --- (B)
  <attribute Name="Evidence">
    <sub-attribute Name="Type" Value="Generic" />
    <sub-attribute Name="Target" Value="" />
    <sub-attribute Name="Evidence Code" Value="IEX" />
    <sub-attribute Name="Citation" Value="PubMed:xxxxxx" />
    <sub-attribute Name="Comment" Value="" />
  </attribute>
</attributeList>
```

Note: In the case of attributes which can be multiple, multiple definitions are used like (A) and (B) shown in the figure above.

(4) Representation of node and edge

Nodes and Edges are expressed by enumerating the “node” element and the “edge” element (These elements are enumerated on the same hierarchy level in XML

```
<inoh>
  <node> </node>
  <node> </node>
  <node> </node>
  <edge> </edge>
  <edge> </edge>
  <edge> </edge>
</inoh>
```

format.)

(5) Representation of object hierarchy

The hierarchy of objects are expressed by dedicated pointer elements.

There are link information of “up” and “down” which expresses upper and lower levels in the hierarchy

Up link: The parent node is expressed by the “parentNodePtr” element.

(There is not multiple inheritance, thus the number of parent node is 0 or 1)

Down link: A child node is expressed by the “childNodesPtr” element.

Down link: A child edge is expressed by the “childEdgePtr” element.

Note) Child edge includes all edges which are connected to the child node.

Therefore the source node and/or the target node may not be the child node or descendant node of this node. In the example below, GID=“GlobalID” is just an example. The actual attribute value is not “GlobalID”.

```

<hierarchy>
  <parentNodePtr GID="GlobalID" LID="LocalID" />
  <childNodesPtr GID="GlobalID" LID="LocalID" />
  <childEdgePtr GID="GlobalID" LID="LocalID" />
</hierarchy>

```

(6) Representation of source and target of edge

This is expressed by the “source” and the “target” element under the “edge” element.

```

<edge GID="GlobalID" LID="LocalID" MatID="MatID" PreMatID="PreMatID" Type="type" >
  ...
  <source GID="GlobalID" LID="LocalID" />
  <target GID="GlobalID" LID="LocalID" />
  ...
</edge>

```

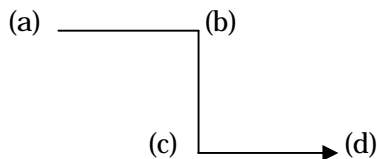
(7) Representation of bended edges

This is expressed by the “bend” element under the “graphics” element.

```

<bend>
  <point XPoint="" YPoint="" /> ... (a)
  <point XPoint="" YPoint="" /> ... (b)
  <point XPoint="" YPoint="" /> ... (c)
  <point XPoint="" YPoint="" /> ... (d)
</bend>

```



(8) Representation of non-center end point of edge

The end point which is not center of node is expressed by the “sourcePoint”, and the “targetPoint” element under the “graphics” element.

There is no “sourcePoint” element if the end point of source is the center of node.

There is no “targetPoint” element if the end point of target is the center of node.

(9) Representation of auto layout information(compound node, edge)

This is expressed by the “layout” element under compound node element and the “edge” element.

i) compound node

```

<layout>
  <attribute Name="TYPE" Value="NODE" />
  <attribute Name="AUTO_LAYOUT" Value="GLOBAL" />
  <attribute Name="LAYOUTER" Value="INHERIT" />
  <attribute Name="ORIENTATION" Value="INHERIT" />
  <attribute Name="EDGE_ROUTING" Value="SIMPLE" />
</layout>

```

ii) edge

```
<layout>
  <attribute Name="TYPE" Value="EDGE" />
  <attribute Name="AUTO_LAYOUT" Value="ON" />
  <attribute Name="DIRECTION" Value="USE_DIRECTION" />
  <attribute Name="ROUTING" Value="INHERIT" />
  <attribute Name="TYPE_OF_EDGE" Value="USE_DEFAULT" />
</layout>
```

(10) Closed compound node

Closed compound node has the "Close" attribute of the "graphics" element.
Compound node is closed if Close="true".

(11) Representation of uncut label text and label position

In the case of node label, the text of label of "Process" node is not cut and label position is not in the node but under the node.

To implement this feature, the "NoCutLabelText" attribute and the "LabelPosition" attribute of the "graphics" element were added.

The label text is not cut if NoCutLabelText="true".

The label is placed under the node if LabelPosition="S".

(12) Representation of the reduced view

The reduced view state of a diagram is expressed by the "reduced" element.

The reduced element is placed under the "inoh" element. The children of the reduced element are the node element and the edge element.

There may be no reduced element.

To reduce the file size, there are limited attributes of the system attribute, display information by the graphics element and hierarchy information by the hierarchy element in the node element and edge element under the reduced element.

There are no editorial attributes, biological attributes and auto layout information.

```
<reduced>
  <node>
  ...
  <edge>
  ...
</reduced>
```

(13) Others

This format does not handle Japanese language.

2. Sample (The details of attribute group of node, edge are omitted)

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<inoh FormatVersion="10/05/13">
```

```
<node LID="id325988654" Type="Diagram" GID="" MatID="" PreMatID="">
```

```

<attributeGroup #attribute descriptions>
  <attributeList Name="System">
    <attribute Name="DisplayName" Value="Diagram1" />
    <attribute Name="Comment" Value="" />
  </attributeList>
  <attributeList Name="Editing">
    <attribute Name="Author" Value="" />
    <attribute Name="AuthorMailAdd" Value="" />
    <attribute Name="Version" Value="" />
    <attribute Name="Date" Value="2006-01-06 11:42:39.682" />
  </attributeList>
  <attributeList Name="Biological" />
</attributeGroup>

```

```
<graphics/>
```

```

<layout #auto layout descriptions>
  <attribute Name="TYPE" Value="DIAGRAM" />
  <attribute Name="AUTO_LAYOUT" Value="GLOBAL" />
  <attribute Name="LAYOUTER" Value="HIERARCHICAL_BASED" />
  <attribute Name="ORIENTATION" Value="AUTO_ORIENTATION" />
  <attribute Name="EDGE_ROUTING" Value="SIMPLE" />
</layout>

```

```
<hierarchy>
```

```
  <childNodePtr GID="" LID="id484808271" />
```

```
</hierarchy>
```

```
</node>
```

```
<node Type="EventCompound" LID="id484808271" GID="" MatID="" PreMatID="">
```

```

<attributeGroup #attribute descriptions>
  <attributeList Name="System">
    <attribute Name="DisplayName" Value="Event1" />
    <attribute Name="Comment" Value="" />
  </attributeList>
  <attributeList Name="Editing">
    <attribute Name="Author" Value="" />
    <attribute Name="AuthorMailAdd" Value="" />
    <attribute Name="Version" Value="" />
    <attribute Name="Date" Value="2006-01-06 11:42:39.682" />
  </attributeList>
  <attributeList Name="Biological">
    <attribute Name="EventOntology" Value="IEV:xxxxx Term name" />
    <attribute Name="Organism" Value="Canonical" />
    <attribute Name="LocationOntology" Value="ILC:xxxx Term name" />
  </attributeList>
</attributeGroup>

```

Diagram node

Event node(Compound node)

continued on next page

```

<graphics XPoint="270.5" YPoint="313.0" Width="187.0"
  Height="98.0" Font="DialogInput" FontSize="12"/>
  continued from previous page
  Event node(Compound node)
  #auto layout descriptions
  <layout>
    <attribute Name="TYPE" Value="NODE" />
    <attribute Name="AUTO_LAYOUT" Value="GLOBAL" />
    <attribute Name="LAYOUTER" Value="INHERIT" />
    <attribute Name="ORIENTATION" Value="INHERIT" />
    <attribute Name="EDGE_ROUTING" Value="SIMPLE" />
  </layout>
  <hierarchy>
    <childNodesPtr GID="" LID="id11353895" />
    <childEdgePtr GID="" LID="id1344064253" />
    <childNodesPtr GID="" LID="id1832150531" />
    <parentNodePtr GID="" LID="id325988654" />
  </hierarchy>
</node>
<node Type="Protein" LID="id11353895" GID="" MatID="" PreMatID="">
  #attribute descriptions
  <attributeGroup>
    <attributeList Name="System">
      <attribute Name="DisplayName" Value="Protein1" />
      <attribute Name="Comment" Value="" />
    </attributeList>
    <attributeList Name="Editing">
      <attribute Name="Author" Value="" />
      <attribute Name="AuthorMailAdd" Value="" />
      <attribute Name="Version" Value="" />
      <attribute Name="Date" Value="2006-01-06 11:42:39.682" />
    </attributeList>
    <attributeList Name="Biological">
      <attribute Name="MoleculeRoleOntology" Value="IMR_xxxxxx:Term name" />
      <attribute Name="Organism" Value="Canonical" />
      <attribute Name="LocationOntology" Value="ILC:xxxx Term name" />
      <attribute Name="LocationOntology" Value="ILC:xxxx Term name" />
      <attribute Name="Evidence">
        <sub-attribute Name="Type" Value="Generic" />
        <sub-attribute Name="Target" Value="" />
        <sub-attribute Name="Evidence Code" Value="IEX" />
        <sub-attribute Name="Citation" Value="PubMed:xxxxxx" />
        <sub-attribute Name="Comment" Value="" />
      </attribute>
    </attributeList>
  </attributeGroup>
  <graphics XPoint="217.0" YPoint="318.0" Width="32.0"
    Height="32.0" Font="DialogInput" FontSize="12"/>
  <hierarchy>
    <parentNodePtr GID="" LID="id484808271" />
  </hierarchy>
  Protein node 1
  Continued on next page

```

</node>

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<node Type="Protein" LID="id1832150531" GID="" MatID="" PreMatID="">

```

<attributeGroup>
  <attributeList Name="System">
    <attribute Name="DisplayName" Value="Protein2"/>
    <attribute Name="Comment" Value="" />
  </attributeList>
  <attributeList Name="Editing">
    <attribute Name="Author" Value="" />
    <attribute Name="AuthorMailAdd" Value="" />
    <attribute Name="Version" Value="" />
    <attribute Name="Date" Value="2006-01-06 11:42:39.682" />
  </attributeList>
  <attributeList Name="Biological">
    <attribute Name="MoleculeRoleOntology" Value="IMR_xxxxxx:Term name" />
    <attribute Name="Organism" Value="Canonical" />
    <attribute Name="SequenceFeature">
      <sub-attribute Name="AttributeSetNumber" Value="1" />
      <sub-attribute Name="Type" Value="phosphorylated" />
      <sub-attribute Name="Position" Value="" />
      <sub-attribute Name="Site" Value="Ser" />
      <sub-attribute Name="Status" Value="greater than" />
      <sub-attribute Name="Description" Value="COOH-terminal" />
    </attribute>
    <attribute Name="LocationOntology" Value="ILC:xxxx Term name" />
    <attribute Name="Evidence">
      <sub-attribute Name="Type" Value="SequenceFeature" />
      <sub-attribute Name="Target" Value="1" />
      <sub-attribute Name="Evidence Code" Value="AS" />
      <sub-attribute Name="Citation" Value="PubMed:xxxxx" />
      <sub-attribute Name="Comment" Value="" />
    </attribute>
  </attributeList>
</attributeGroup>

```

#attribute descriptions

Protein node 2

<graphics XPoint="314.0" YPoint="318.0" Width="32.0" Height="32.0" Font="DialogInput" FontSize="12" />

<hierarchy>
 <parentNodePtr GID="" LID="id484808271" />
</hierarchy>

</node>

<edge Type="Connected" LID="id1344064253" GID="" MatID="" PreMatID="">

```

<attributeGroup>
  <attributeList Name="System">
    <attribute Name="DisplayName" Value="Connected" />
    <attribute Name="Comment" Value="" />
  </attributeList>

```

#attribute descriptions

edge

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```
<attributeList Name="Editing">                                     #attribute descriptions
  <attribute Name="Author" Value="" />
  <attribute Name="AuthorMailAdd" Value="" />
  <attribute Name="Version" Value="" />
  <attribute Name="Date" Value="2006-01-06 11:42:39.682" />
</attributeList>
<attributeList Name="Biological" />
</attributeGroup>
<graphics Font="DialogInput" FontSize="12">
  <bend>
    <point XPoint="257.0" YPoint="293.0" />
    <point XPoint="265.0" YPoint="321.0" />
  </bend>
</graphics>
<layout>                                                         #auto layout descriptions
  <attribute Name="TYPE" Value="EDGE" />
  <attribute Name="AUTO_LAYOUT" Value="ON" />
  <attribute Name="DIRECTION" Value="USE_DIRECTION" />
  <attribute Name="ROUTING" Value="INHERIT" />
  <attribute Name="TYPE_OF_EDGE" Value="USE_DEFAULT" />
</layout>
<source GID="" LID="id11353895" />
<target GID="" LID="id1832150531" />
</edge>
</inh>
```

edge