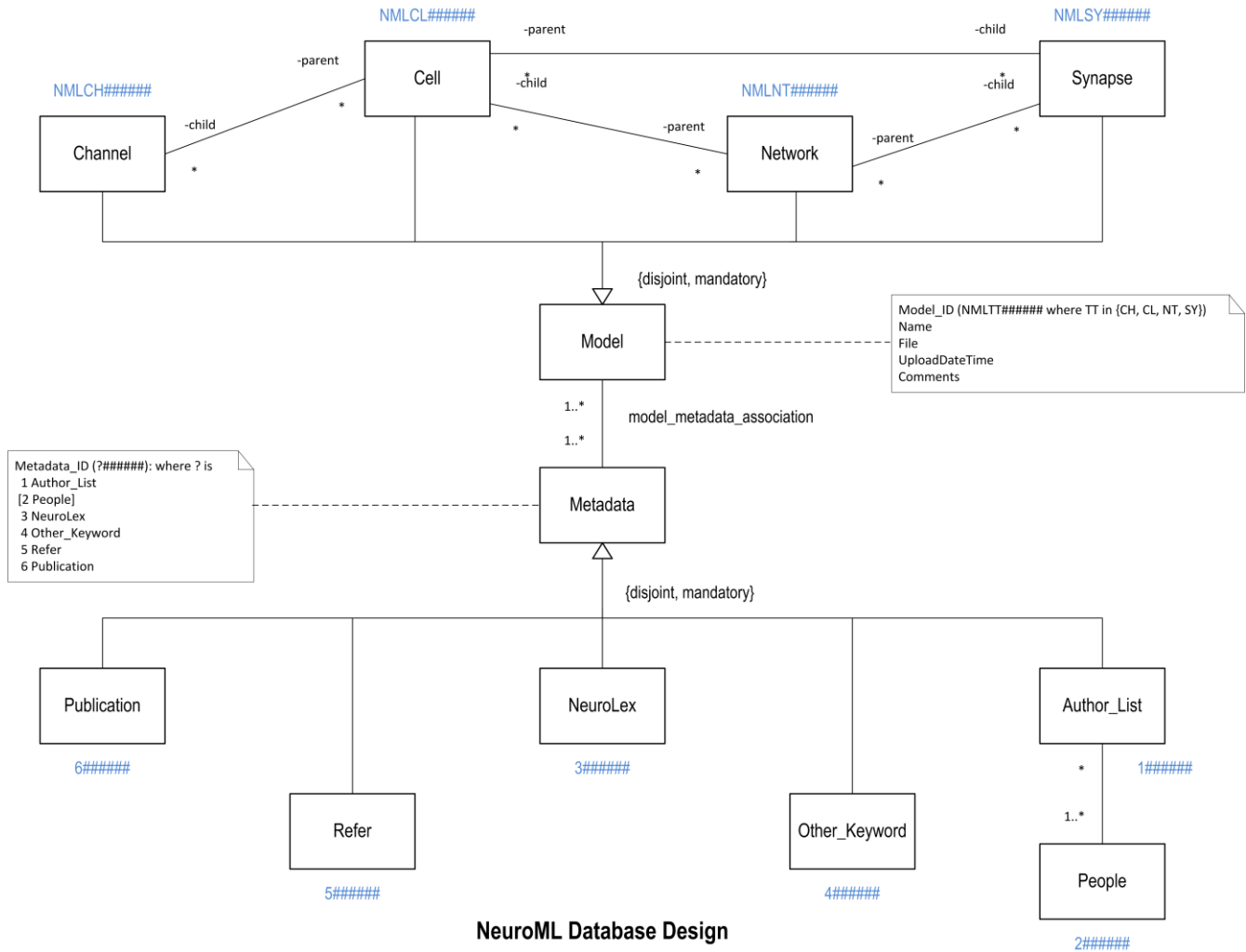# NeuroML Database Design

NeuroML Database Design

Model is a generalization of the distinct subclasses (Channels, Cell, Network, Synapse), which are mapped to tables named by the subclass, each having the following attributes: _ID, _Name, _File, Upload_Time, Comments.

- channels(Channel_ID, Channel_Name, ChannelML_File, Upload_Time, Comments)

- cells(Cell_ID, Cell_Name, MorphML_File, Upload_Time, Comments)

- networks(Network_ID, Network _Name, Network ML_File, Upload_Time, Comments)

- synapses(Synapse_ID, Synapse _Name, Synapse _File, Upload_Time, Comments)

NeuroML Database Design

The many-to-many associations representing the multiscale nature of NeuroML are mapped to tables that are named as parent-child associations (cell_channel_associations, cell_synapse_associations, network_cell_associations, network_ synapse _associations) with attributes: parent_ID, child_ID, Comments. This table for each subclass mapping approach provides inherent typing of the models and facilitates the validation of the multiscale model associations using referential integrity supported by the relational database.

A similar table for each subclass approach maps the specializations of metadata to its own table where the _ID of the specialization is a Metadata_ID in the generalization. The IDs are generated by the system in the following ranges: 1000000-AuthorList, [2000000 Person], 3000000 NeuroLex, 4000000 Other_Keyword, 5000000 Refers, 6000000 Publication. Note that Person_ID is NOT a Metadata_ID but its associated range is used to create People as authors/translators on author lists.

Constraints that should hold on the metadata:

- All models from the same publication should be associated with the same Metadata_ID for the Publication, indicating unique Pubmed_Ref.

- The AuthorList for the models from the same publication should be the same.

- A Person should be in the database once.