

- ▶ top-level stuff (continuants, occurrents, processes, events, stages, timepoints)
- ▶ theory of timepoints
- ▶ instance level relationships (part, participates_in, temporal relations)
- ▶ reference process
- ▶ type level relationships

- ▶ parthood between occurrents
- ▶ temporally restricted parthood between continuants
- ▶ develops_from
- ▶ temporal relationships between occurents
- ▶ temporal relationships between continuants and occurrents

Do all NB7-1 neuroblasts begin to exist in embryonic stage 8?

```
all_begin_to_exist_during(Neuroblast_NB7_1,Embryonic_stage_8).
```

```
x = Neuroblast_NB7_1
y = Embryonic_stage_8
( (is_a(x, Continuant) & is_a(y, Occurrent)) ->
  (all_begin_to_exist_during(x,y)
    <-> all x1 all t
      (I1t(x, x1, t)
        -> exists y1
          ( I(y, y1)
            & refoccurrent(x1) = refoccurrent(y1)
            & befsim(alpha(y1), alpha(x1))
            & befsim(alpha(x1), omega(y1)))))))).
```

Theorem

$\text{all_begin_to_exist_during}(x,y) \ \& \ \text{begins_during}(y,z) \rightarrow$
 $\text{all_begin_to_exist_during}(x,z)$

Flybase

$\text{all_begin_to_exist_during}(\text{Neuroblast_NB7_1}, \text{Neuroblast_delam.}_phase_S1).$
 $\text{begins_during}(\text{Neuroblast_delam.}_phase_S1, \text{Embryonic_stage_8}).$

Conclusion

$\text{all_begin_to_exist_during}(\text{Neuroblast_NB7_1}, \text{Embryonic_stage_8}).$