Input

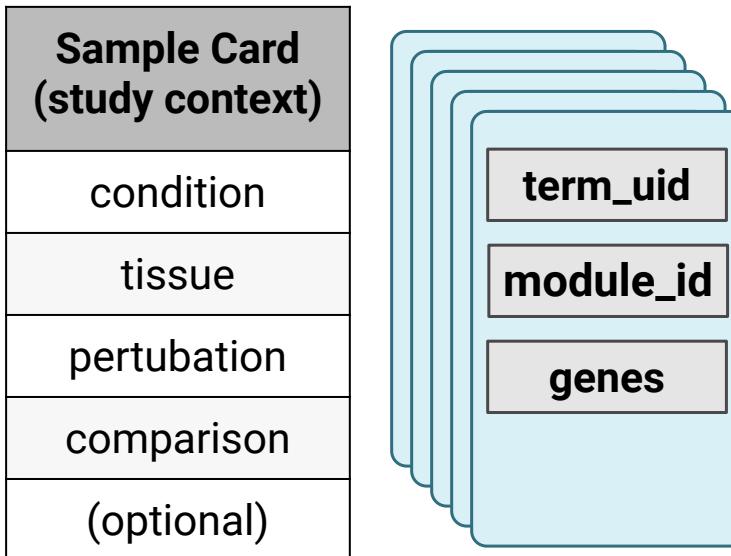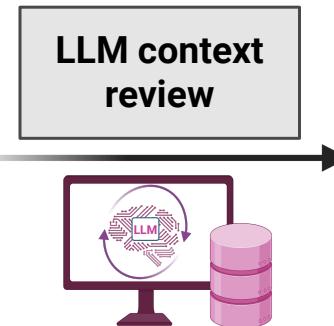| Sample Card (study context) |
| --- |
| condition |
| tissue |
| pertubation |
| comparison |
| (optional) |

term_uid
module_id
genes

LLM context review

LLM context relevance review (context validity gate)

```
{
  context_status: PASS,
  context_review_mode: llm,
  context_gate_mode: hard,
  ctx_id_effective: HNSC|tumor|genotype|TP53_mut_vs_TP53_wt,
  evidence_ref: {
    term_uid: fgsea_msigdb_H_entrez:HALLMARK_P53_PATHWAY,
    module_id: Maf269dcd4575,
    gene_set_hash: 73cbba12ef1c,
  }
}
```

**LLM schema-bound claim proposal
(typed selection; tool-owned evidence identity)**

```
{
  claim_id: c_402f11698cfb,
  entity: HALLMARK_P53_PATHWAY,
  direction: up,
  evidence_ref: {
    term_uid: fgsea_msigdb_H_entrez:HALLMARK_P53_PATHWAY,
    module_id: Maf269dcd4575,
    gene_set_hash: "73cbba12ef1c,
  }
}
```

Typed JSON claim

LLM claim proposal

Audit gates

- Evidence link (ID+hash)
- Stability/ Support
- Context validity
- Stress / Contradiction

Decision-grade report

PASS
- stable
- context-specific

ABSTAIN
- unstable
- context-nonspecific

FAIL
- contradiction
- evidence drift

audit log