# Phase 1. Ideation & Scoping

| Agent | Description | Micropayment Trigger |
|---|---|---|
| **Problem Framer Agent** | Converts vague queries into formal research questions / hypotheses. Uses domain taxonomy + prior works. | When a valid, scoped problem statement is generated. |
| **Feasibility Analyst Agent** | Checks novelty & feasibility of research idea using citation databases and prior art. | When feasibility score + summary report delivered. |
| **Goal Planner Agent** | Creates task graph outlining subtasks, dependencies, and evaluation criteria. | When plan validated by consensus agents. |

# Phase 2. Knowledge Retrieval

| Agent | Description | Micropayment Trigger |
|---|---|---|
| **Literature Miner Agent** | Searches across ArXiv, PubMed, Semantic Scholar, etc. | For each relevant paper summary retrieved. |
| **Relevance Ranker Agent** | Scores literature relevance & diversity (avoiding echo chambers). | For every ranked corpus submission. |
| **Knowledge Extractor Agent** | Extracts structured knowledge (claims, datasets, methods, findings). | For every verified structured entry. |

*(You can use decentralized storage like IPFS/Filecoin to store retrieved docs and share access tokens for micropayment verifications.)*

# Phase 3. Experimentation / Simulation

| Agent | Description | Micropayment Trigger |
|---|---|---|
| **Hypothesis Designer Agent** | Generates testable hypotheses and corresponding metrics. | When peer agents validate test structure. |
| **Data Scientist Agent** | Runs simulations, models, or statistical tests. | When experiment result hashes are uploaded + verified. |
| **Verification Agent** | Reproduces experiments for reproducibility. | For each verification report. |

## Phase 4. Interpretation & Synthesis

| Agent | Description | Micropayment Trigger |
|---|---|---|
| **Result Interpreter Agent** | Summarizes insights, limitations, and future work. | When synthesis matches verification consensus. |
| **Bias Auditor Agent** | Detects methodological or data bias. | For each bias report delivered. |
| **Ethics & Compliance Agent** | Checks for plagiarism, IRB violations, citation integrity. | When compliance score validated. |

## Phase 5. Publication & Reputation Layer

| Agent | Description | Micropayment Trigger |
|---|---|---|
| **Research Synthesizer Agent** | Writes coherent papers or reports from results. | For each completed draft section. |
| **Peer Review Agent** | Reviews and critiques submissions. | When review passes consensus checks. |
| **Reputation Oracle Agent** | Tracks agent reliability over time; maintains score & payment multiplier. | Continuously updated after every task. |

# 3. Coordination Agents (Cross-Phase)

| Agent | Description |
|---|---|
| **Coordinator / Scheduler Agent** | Allocates subtasks to qualified agents using bidding or reputation-weighted assignment. |
| Validator | Validate agent output at each step |
| Executioner | Execute agent action at each step |
| **Negotiator** | Manages agent search/scout, ranking, and bidding for agent selection |