LEVL – AI Nutraceutical Development Platform for Anti-Aging

Company Description:
LEVL is an AI longevity startup targeting the biology of aging to create novel nutraceutical formulations and personalized protocols to help people live longer, healthier lives.

By leveraging the tools of AI drug discovery to identify synergistic combinations of naturally derived ingredients, certain formulations are emerging that rival the potency of comparable pharmaceuticals without the side effects and regulatory timelines of traditional drug development. Our first Patented formulation using this process mimics fasting-induced cellular rejuvenation without the need for caloric restriction, and in our testing is comparable to the leading anti-aging pharmaceutical, Rapamycin.

We are commercializing these breakthroughs under the LIFESPAN+ brand to deliver foundational cellular support, tackling the root causes of age-related decline while providing immediate functional benefits of Energy, Sleep, Focus, Calm, etc.

Our companion app dynamically optimizes personalized longevity protocols based on users' biomarkers and qualitative feedback, effectively slowing their pace of aging.

Students will directly contribute to developing our open-source longevity knowledge graph, powered by the frontier of aging research and anonymized user data, to democratize anti-aging research in pursuit of LEVL's ultimate mission: Achieve Longevity Escape Velocity, and eliminate age-related disease.

Preferred Team Size: 3-5

Location: Remote - With virtual access to the team throughout the entire program

Project Summary

Objective
Develop the MVP version of **LEVL's AI Synergy Discovery Engine**, a modular platform that helps researchers uncover, compare, and explain novel compound combinations that target the hallmarks of aging and functional health outcomes (e.g., energy, sleep, cognition).
 This MVP must:

1. Deliver a usable researcher-facing UI.
2. Provide a synergy-scoring engine.
3. Include a working NLP pipeline to extract structured synergy evidence from scientific literature.
4. Be compatible with a "researcher copilot"—students will expose an interface to a state-of-the-art frontier model that can: answer interactive questions about the knowledge base, and surface additional insights or unexplored compound/pathway

relationships on demand.

Core Deliverable – *Functional Synergy Explorer v0.1*

Compound + Combo Search UI	Query by compounds, combinations, functional outcomes, hallmarks, or pathways (e.g., AMPK, mTOR).
Effect-Size Scoring & Ranking	0-99 scores for Hallmark impact, Functional benefit, Pathway activation; show synergy score, dosing, mechanisms, and source links.
Ranking & Exploration Tools	Sort by any score, explore top combos, compare individual ingredients.
Structured Literature Ingestion (NLP)	Pipeline extracts synergy-relevant claims (e.g., "compound X boosts autophagy via AMPK") and effect sizes from papers; modular for future libraries.
Export & Bookmark	Save top candidates for further testing or formulation work.
Modular Scoring Equation Engine	Python module hot-swappable by LEVL researchers; updates auto-propagate through scores and rankings.
App Integration	Ingest structured efficacy data from the LEVL Protocols App (user outcomes & biomarkers) to create a closed feedback loop.
Researcher Copilot Interface	Embed chat / prompt panel backed by a frontier LLM for Q&A and exploratory reasoning over the KG.

Longevity Knowledge Graph Compatibility – Enhancements to implement

These improvements will ensure seamless integration between the Synergy Explorer and the broader LEVL Longevity KG.

- **Pathway activation flags** for every ingredient (up- or down-regulated) to support synergy discovery and pulsed-dosing optimization.
- **Bulk ingestion** of PDFs/PMCID articles with automatic assignment of a standardized effect-size variable.
- **Automated web-scraping of open-source literature sites** to populate the KG without manual download/upload steps.
- **Quality & weight scoring** for each paper based on journal tier and citation count.

Scientific Relevance

By rapidly surfacing safe, multi-compound regimens that intervene on biological drivers of aging, the LEVL platform can shorten discovery cycles from years to weeks and democratize access to evidence-based longevity therapeutics. Students will work with LEVL PhD chemists to design the initial effect-size scoring function—considering hallmark relevance (GenAge, CellAge, Reactome), bioactivity strength, evidence confidence (human > animal > in-vitro), and multi-pathway synergy.

Stretch Goals (time permitting)

- Integrate pharmaceutical compounds, and (or) if time permits, non-nutraceutical modalities (sauna, fasting, etc.).
- Add network visualizations of compound–pathway links (Cytoscape.js, KEGG, Gephi).
- Train a prototype ML model to predict synergy likelihood from structure + mechanism embeddings.

Desired Skill Set

This project is a great fit for students who enjoy connecting scientific ideas with real-world applications and are excited by the intersection of longevity, AI, and product design.

We're looking for:

- Strong problem-solving and communication skills
- Interest in biology, health optimization, or scientific discovery
- Enthusiasm for working with emerging AI tools and knowledge graphs
- Willingness to learn new tools as needed—whether that's building an interface, parsing scientific papers, or reasoning over structured data

Familiarity with Python, graph data structures (e.g., Neo4j), or large language models is a plus—but not required. If you're curious, collaborative, and enjoy designing clean, modular systems that make science actionable, you'll thrive in this role.

Student Benefits:

1. Gain hands-on experience with frontier models, scientific literature parsing, knowledge graph construction, and health optimization. Gain experience with startup-style product thinking and stakeholder collaboration.
2. Enjoy creative freedom to design and solve open-ended, high-impact problems that push the frontiers of human life extension.
3. Each team will ship an independent, modular contribution with clear ownership and a path to public demo or open-source release.
4. Top-performing students may be invited to continue working with LEVL or be referred to partner startups in the healthtech and AI space.

5. Complimentary LIFESPAN+ products to improve sleep, boost energy & focus, and mitigate the effects of stress.

IP Rights:
Students will be asked to sign a proprietary information and intellectual property assignment agreement. Intellectual property rights to all code, data, and documentation will be retained by LEVL, Inc.

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