EVOptima AI

Predictive Intelligence for EV Optimization

Turning Experimental Data into High-Quality EV Outcomes

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Chadaporn Attakitbancha
No. 6878303430

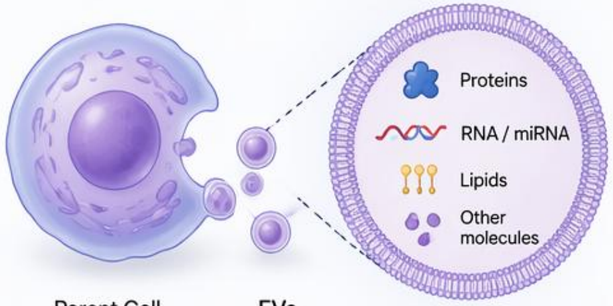
Healthcare Innovation and Entrepreneurship
3000747

Extracellular vesicles (EVs)

Powerful therapeutic messenger but difficult to optimize

1. What are EVs?

- Extracellular Vesicles (EVs) are nano-sized particles released by cells.
- They carry proteins, RNA, lipids, and other bioactive molecules.
- Key mediators of cell-to-cell communication.



Small size.
Big impact.

2. Why EVs Matter

EVs are emerging as a cell-free platform for next-generation therapeutics.

Anti-inflammatory
Modulate immune response and reduce inflammation

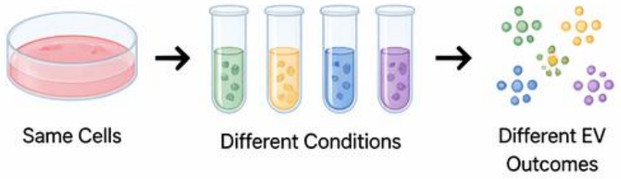
Regenerative Medicine
Promote tissue repair, angiogenesis, and healing

Mitochondrial Support
Improve mitochondrial function and cellular energy

EVs can replicate many benefits of cell therapy – without using live cells.

3. The Core Challenge

EV function is **highly dependent** on production conditions.



- High variability in EV yield and function
- Multiplex data (e.g., cytokines) is complex and hard to interpret
- No clear way to determine the best condition

Optimization is not intuitive – it is data-intensive and decision-limited.

EV optimization is the key to unlocking their full therapeutic potential.

Applications › Osteoarthritis · Lung Injury · Cardiovascular Disease · Neurodegenerative Disease · ... and more

The problems

EVOptima AI

Small changes in conditions lead to unpredictable outcomes — making optimization inefficient and costly.

Current EV Production is Inefficient

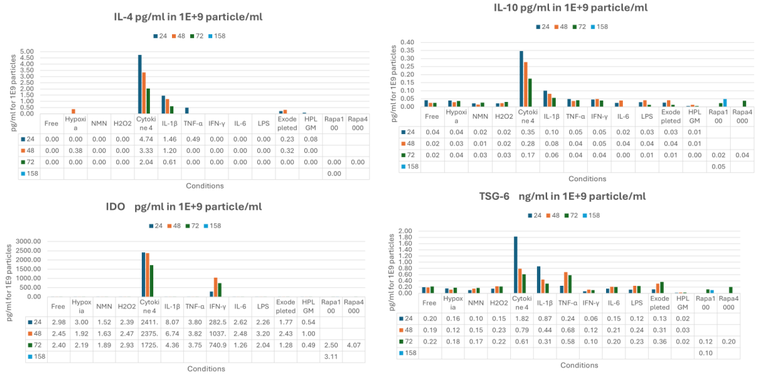
- 🔁 Trial-and-error experimentation
- ❌ “Too many experiments, not enough direction”
- 💸 “High cost, time-consuming, low reproducibility”
- ⚠️ “Difficult to interpret complex data”

Validated through interviews with EV researchers

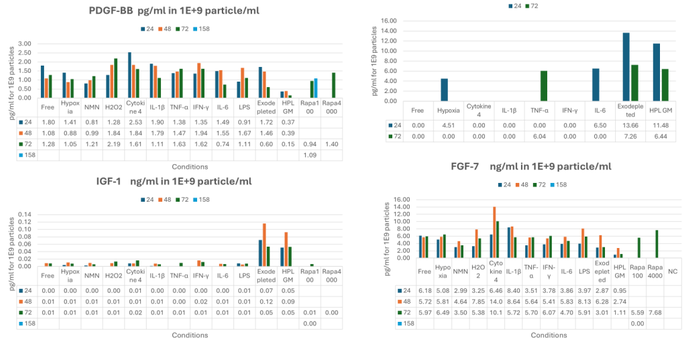
Final Conc (Mean-pg/ml)

Conditions	hours	Angiopoietin-1	BDNF	EGF	FGF-2	HGF	IDO	IFN-γ	IL-1β	IL-4	IL-10	LIF	PDGF-BB	SDF-1 alpha	TNF-α	VEGF-A
Free	24	546.69	372.86	5.55	115.29	10429.97	40.17	22.37	29.16	0	0.55	514.19	24.28	874.52	18.7	329.12
	48	563.83	480	6.65	64.29	19193.29	47.66	25.54	44.64	0	0.48	468.31	21.13	987.04	18.85	740.12
	72	499.29	302.94	6.68	38.67	12895.48	50.43	25.58	52.39	0	0.51	544.46	26.91	813.59	18.65	1221.11
Hypoxia	24	447.14	454.01	4.38	272.81	21419.96	39.6	24.92	39.05	0	0.51	534.07	18.54	1056.79	15	590.34
	48	372.57	504.05	6.26	163.3	21419.96	43.47	25.22	56.97	8.53	0.64	465.89	19.87	1045.8	23.72	3270.17
	72	295.04	368.18	5.98	71.13	17752.09	42.05	26.09	42.51	0	0.71	387.29	20.18	743.84	22.04	9248.21
NMN	24	626.93	300.88	5.12	63.46	19743.56	35.49	24.03	24.38	0	0.5	466.09	18.9	1004.77	15.17	360.54
	48	668.62	371.41	5.47	67.2	18269.24	38.73	23.04	46.31	0	0.34	466.86	23.46	930.98	17.23	847.91
	72	661.8	449.76	8.13	45.92	15639.19	59.06	30.83	68.55	0	0.79	587.66	37.7	931.56	21.85	1484.5
H2O2	24	682.66	323.92	4.72	71.7	19024.97	38.11	21.26	25.27	0	0.35	415.96	20.36	894.72	15.22	324.93
	48	686.63	341.32	4.81	82.86	18534.98	39.43	27.2	47.98	0	0.37	474.73	29.39	827.89	19.02	733.71
	72	627.1	491.6	6.74	46.68	15641.6	56.45	28.71	55.41	0	0.59	593.1	42.17	924.11	21.47	1357.52
Cytokine 4	24	317.29	262.04	21.68	73.19	21419.96	15290.95	364.68	7023.31	30.08	2.2	879.4	16.07	528.43	3554.43	7365.5
	48	153.36	78.74	14.78	66.53	21419.96	15392.2	198.13	7023.31	21.59	1.8	714.21	11.9	205.21	627.16	12688.9
	72	141.27	60.95	15.57	66.7	17555.19	15392.2	214.13	7023.31	18.23	1.56	651.58	14.32	178.57	505.96	17779.2
IL-1β	24	668.39	437.74	10.8	36.28	21419.96	90.1	47.81	7023.31	16.3	1.12	763.03	21.15	844.63	30.97	1342.34
	48	484.77	274.14	9.72	68.54	10679.99	75.24	39.31	7023.31	13.35	0.91	596.18	19.94	603.36	31.51	2296.64
	72	432.15	165.89	9.55	39.56	9643.94	70.51	36.05	7023.31	9.78	0.91	511.62	17.94	601.23	30.39	2988.16
TNF-α	24	502.6	476.37	16.63	64.22	21419.96	59.72	27.46	130.06	7.62	0.75	734.91	21.64	681.09	17513.41	453.6
	48	631.49	550.37	17.17	69.57	14898.22	63.05	31.78	307.27	0	0.61	680.02	24.3	910.84	7348.65	1168.14
	72	802.97	442.31	14.08	0	10172.38	65.26	32.23	297.39	0	0.71	652.34	28.25	709.61	3882.25	1669.82
IFN-γ	24	674.72	183.6	3.11	38.27	16469.44	3571.02	751.26	12.59	0	0.58	305.48	17.06	733.5	11.59	289.44
	48	1101.06	247.21	4.05	56.28	16399.49	13089.34	1721.44	23.47	0	0.61	289.98	24.44	894.16	18.04	585.52
	72	1567.2	261.34	4.92	35.18	13385.21	14226.09	1745.38	25.28	0	0.74	143.63	31.15	925.66	17.88	791.07
IL-6	24	500.73	411.99	5.69	26.96	19484.36	45.03	24.97	33.14	0	0.42	541.38	25.54	859.7	20.44	1230.72
	48	723.15	434.4	6.32	61.47	17552.13	40.44	24.63	38.72	0	0.65	464.64	25.22	1065.65	17.15	806.14
	72	561.52	283.4	4.18	106.05	16699.77	35.15	17.68	25.44	0	0	438.61	20.84	898.27	15.91	314.79
LPS	24	471.85	264.14	4.04	71.95	21419.96	37.71	21.14	25.25	0	0.48	501.6	15.23	920.01	13.86	323.31
	48	721.2	388.58	5.48	49.88	18669.45	44.14	25.59	45.28	0	0.56	508.6	22.98	956.1	18.95	752.2
	72	518.22	529.97	5.65	23.93	16854.07	46.2	23.36	39.57	0	0.29	532.2	25.18	1030.47	17.05	1264.52
Exosome depleted HPL GM	24	3276.56	507.96	34.93	0	5083.67	53.34	26.81	20.75	6.83	0.8	552.04	51.99	1068.22	17.83	893.21
	48	4216.63	659.59	21.93	0	4245.12	55.2	28.58	29.93	7.2	0.93	551.14	33.26	1236.63	20.99	1690.4
	72	2906.2	707.47	17.93	0	4571.24	53.38	26.38	40.86	0	0.53	551.89	25.05	1221.72	16.91	2175.75
HPL GM	24	4855.17	691.41	36.93	0	5014.02	66.59	32.27	35.32	9.71	0.68	582.23	45.17	1180.44	24.45	1565.41
	48	4041.18	598.6	21.4	0	5403.16	60.73	31.04	51.1	0	0.73	564.91	23.62	1176.17	23.77	2159.53
	72	2972.98	600.04	17.63	0	5102.18	61.16	28.83	123.35	0	0.6	442.51	18.62	1085.15	21.5	2821.05
Rapa100 nM	72	293.61	133.89	6.56	24.94	8485.23	47.51	26.55	29.74	0	0.74	456.89	16.56	170.97	22.22	3212.74
Rapa 4000 nM	168	338.01	311.72	5.67	18.5	15861.12	47.45	22.87	27.22	0	0.42	517.66	17.95	481.92	19.36	1371.76
NC	72	470.7	275.62	8.08	42.04	14173.19	61.31	27.18	35.25	0	0.58	613.2	21.16	230.21	24.09	1357.27
	0	0	1.34	0	8.16	0	0	0	1.41	0	0	0	0	10.01	1.07	1.51

Reduce inflammation



Promote cell proliferation, improve mitochondrial function, and prevent cell death



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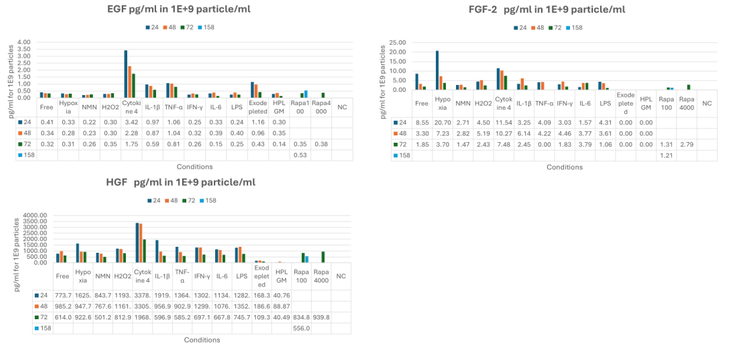


The solution

EVOptima AI

EVOptima AI: We Turn Biological Data into Clear Decisions

EVOptima AI

Input
(culture conditions and EV functional data)

Engine
(Predictive logic/ model)

Output
(ranked conditions + risk flags)

🤖 AI analyzes experimental parameters
📊 Predicts EV functional quality
⭐ Translates data → **actionable recommendations**
⚠ Flags high-risk conditions

Reduce trial-and-error, accelerate EV optimization, and improve reproducibility

The solution

EVOptima AI

EVOptima AI: We Turn Biological Data into Clear Decisions

Data Sources

- Internal datasets: Controlled experimental data from in-house EV studies
- Academic collaborations: Partnerships with EV-focused laboratories in Thailand and ASEAN
- Industry partnerships: Biotech and CDMO companies Public databases: EV-related datasets (e.g., Vesiclepedia, EVAtlas)

Collaboration Model

- Academic labs contribute data in exchange for platform access
- Biotech partners gain improved process efficiency and predictive insights
- Future clinical collaborators provide outcome-linked datasets

Continuous Learning Loop

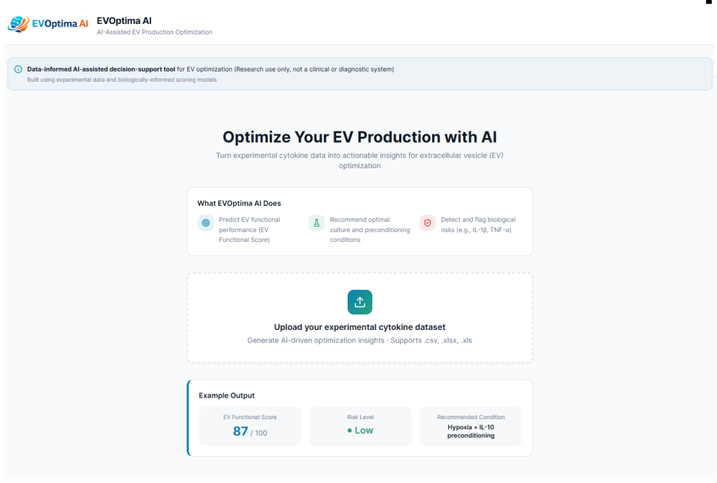
User Input → AI Prediction → Experimental Validation → Data Re-upload → Model Refinement

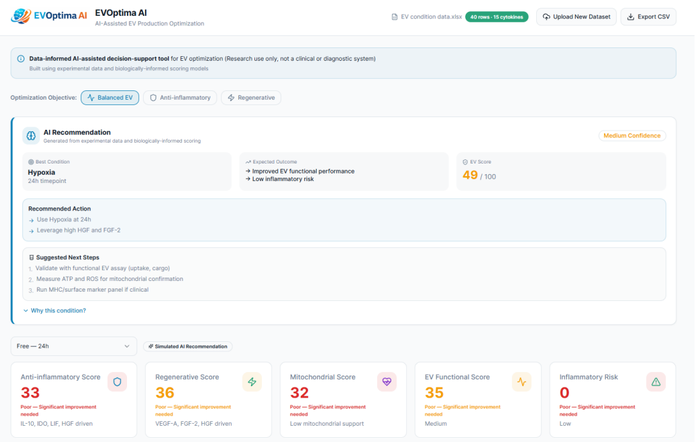
Reduce trial-and-error, accelerate EV optimization, and improve reproducibility

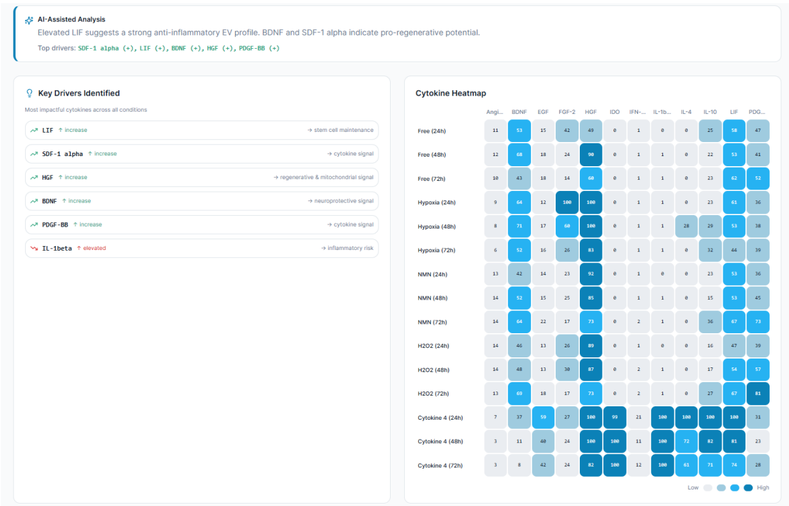
The solution

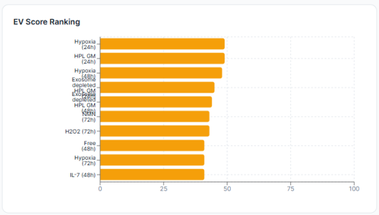
EVOptima AI

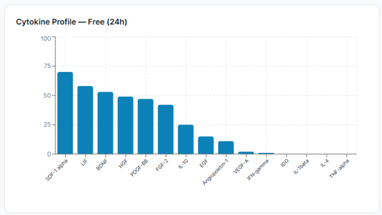
https://ev-boost-insight.lovable.app

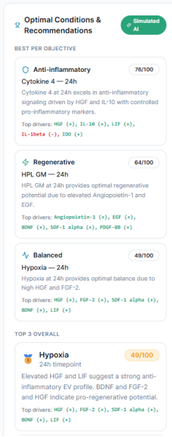


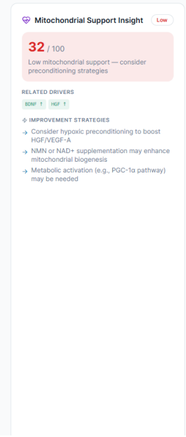


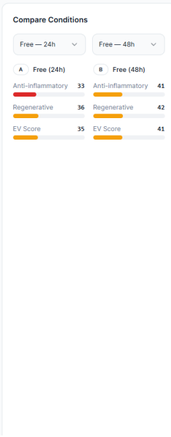


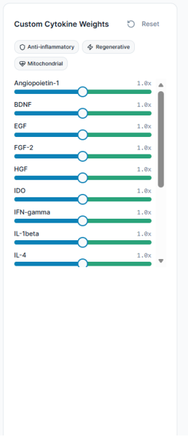










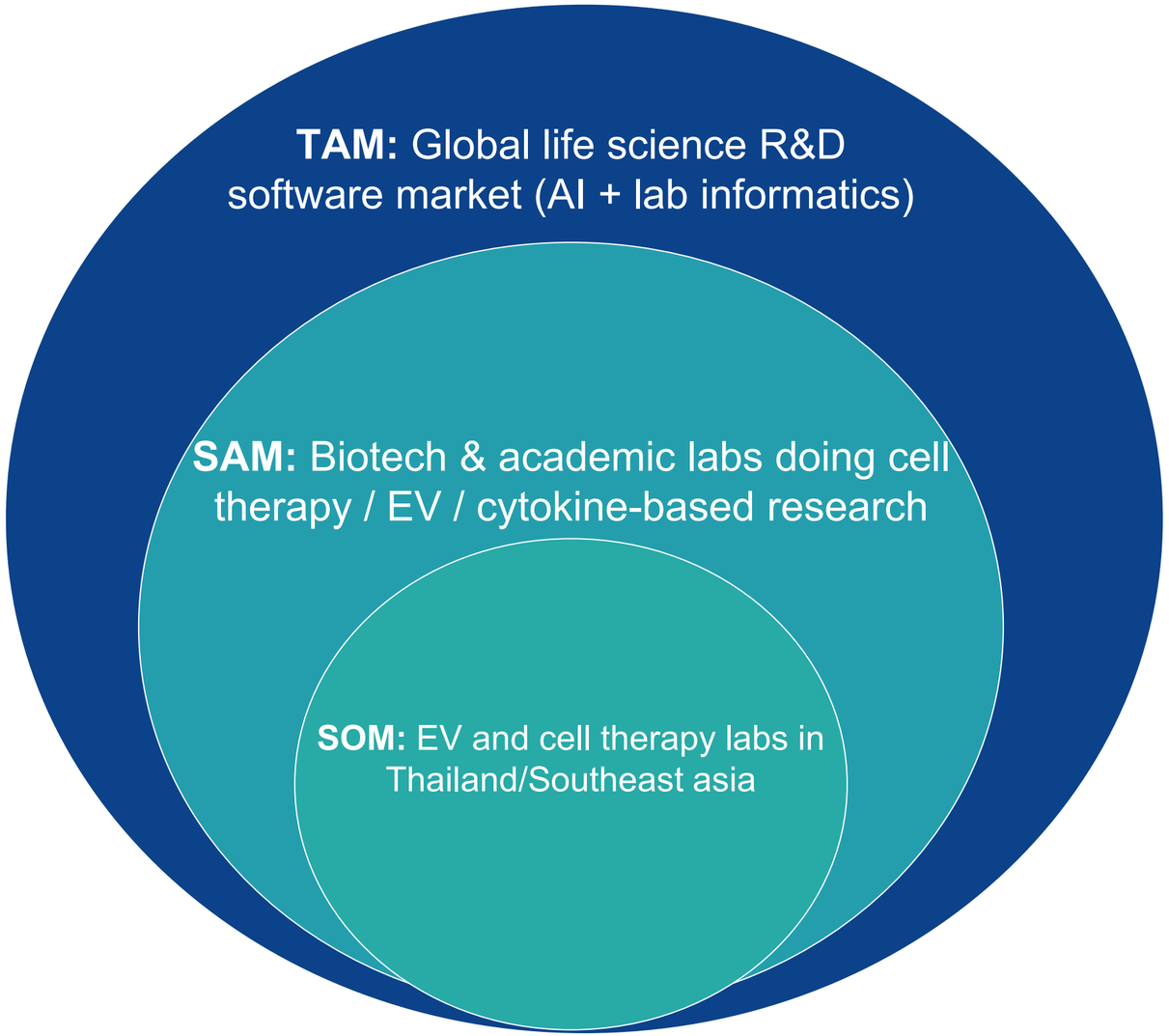


Researcher gains

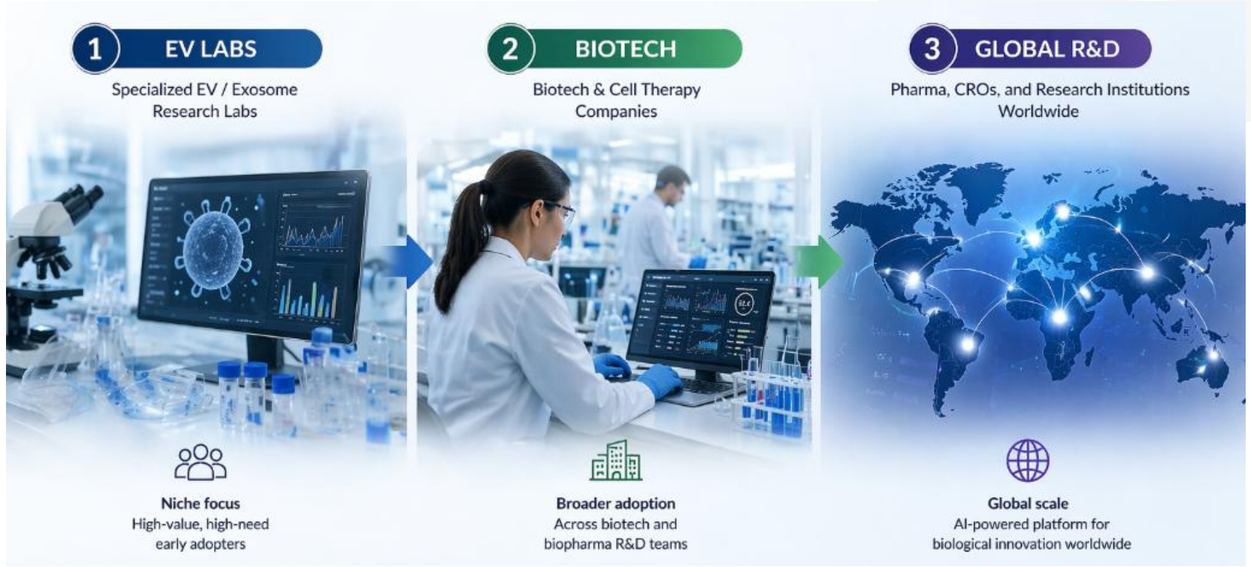
- Faster optimization
- Data-driven decisions
- Normalized data
- Translated with scientific base

Market Opportunity

EVOptima AI



Target Customers



Business Model

EVOptima AI

Built for B2B Scientific Workflows

Hybrid Software as a Service(SaaS) + usage-based model
Platform Access: $30/month
Usage: $10 per dataset analysis
Enterprise: project-based / custom

Traction/Validation

EVOptima AI

Built and Ready for Validation

What we have achieved

Interviewed 2 EV researchers

Validated key pain points in EV optimization.

Identified key pain

Trial-and-error experimentation and data complexity.

Built MVP platform (live demo)

AI-driven recommendations and visual analytics.

Next steps

Pilot with real research labs

Test the platform in real experimental workflows.

Collect feedback + experimental validation

Refine the model and validate performance with real data.

Competitive Advantage

EVOptima AI

Specification	EVOptima AI	Existing Software (e.g., Benchling, Dotmatics ,and JMP)	Traditional Workflow
EV-specific modeling	Yes	No	No
Multi-parameter optimization	AI-driven	Statistical only	Manual
Biological interpretation	Yes	No	No
Experimental conditions tested	~5	~10–15	~20
Iteration time	~1 week	~1–2 weeks	~2 weeks
Personnel required	1 researcher	1–2 researchers	>2 researchers

What Makes Us Different

- Not generic AI — biology-aware system
- Uses real experimental outcomes, not assumptions
- Built specifically for EV workflows

Competitive Advantage

EVOptima AI

Without EVOptima AI (Baseline)

- ~20 experimental conditions
- 2 researchers × 2 weeks
- ≈ 160 labor hours
- Cost:
  - Labor ≈ $3,000
  - Reagents ≈ $5,000
  - → **Total ≈ $8,000 per cycle**

With EVOptima AI

- ~5 optimized conditions
- 1 researcher × 1 week
- ≈ 40 labor hours
- Cost:
  - Labor ≈ $1,000
  - Reagents ≈ $1,500
  - → **Total ≈ $2,500 per cycle**

Economic Benefit

- **Labor reduction:** ~75%
- **Time reduction:** ~50%
- **Cost reduction:** ~70%
- **Higher success probability:** Fewer failed iterations

Net saving ≈ **$5,500 per optimization cycle**

Marketing

EVOptima AI

Built and Ready for Validation

Go-To-Market
- Start: EV labs (pilot)
- Channel: conferences (ISEV, ISCT)
- Strategy: data-driven validation
- Expand: biotech partnerships

Financial

EVOptima AI

PRICING MODEL

Platform Access
$30 / month
Access to platform & core features

Usage
$10 / analysis
Pay per dataset analysis

Enterprise
Custom
Project-based / custom solutions

REVENUE PROJECTION (USD)

Assumption: ~5 analyses / lab / month
Average revenue per lab ≈ $80/month

KEY HIGHLIGHTS

Hybrid Revenue Model
Subscription + usage-based aligned with lab workflow

Scalable Growth
More labs and more experiments drive revenue growth

High Scalability
Software platform with low marginal cost

Revenue scales with both users and experimental activity.

Vision

EVOptima AI

From Optimization Tool to Global Data Platform

Today:
Optimize EV production

Future:
- Learn from global experimental data
- Improve predictive capability
- Standardize EV manufacturing

Clinical Translation Potential

EVOptima AI

THANK YOU

FOR YOUR ATTENTION

23 Apr 2026