Deep learning approaches for improving CHO cell antibody production



Leo Chi U Seak CEO and Lead Scientist Genenet Technology Limited

#bioProcessUK





GENENET

AI Bioproduction methods

Leo Chi U Seak, PhD Co-cofounder and CEO

Genenet Technology (UK) Limited http://genenet.co/ info@genenet.co Raising: £2.4 millions [SEIS/EIS] Tax Deductions Available 10+ Clients/Collaborators & 2 InnovateUK Project



Cancer Statistics



In UK, there are average 6500 new diagnosis of cancer before 30, and 375,000 new cases per year

Massive demand will need to be fulfilled and we need to improve the current production system



Bioproduction and Pain Point

Available Innovative treatments: **Antibody therapies** and **gene therapy**, are emerging for cancer patients



Cell dead significant increase the downstream purification cost OR **DESTROY THE PRODUCTION.**

Labour intensive & High costs of production and purification.

Current cell lines for bio-manufacturing cannot adapt to different stress circumstances



Our solution use neural networks and synthetic biology technology to increase antibody production



Al-driven multi-omics analysis

improve yield and resist cell stress

AI-Powered Cell Line

Revolutionized smart cell line



Value Proposition

We de-risk the bioproduction process, improve the yield and reduce the financial burden.

Genenet Technology Smart Cell lines





Reduces risk





Secured Grant Application

EUREKA GlobalStars digital industrial collaborations



鬠 CPI

- Maximising bioproduction in CHO cell by interdisciplinary engineering and Al
- AI bioreactor culturing predict algorithm
- Engineer A) stress sensing & B) Bioproduction improvement genetic circuits and establish stable cell lines with upscale bioreactor test.



Technology 1



PCA-based CNN for metabolite-embedded biomarker searching



Successfully identified some biomarkers that improved yield of trastuzumab and lowered lactate even in transient transfection

Filing a Patent + Owning 2 more background tech patents



Technology 2

Gene networks to mimic neural network



Improvement of yield and viability (vector editing approach)



Business partners/network







Roadmap to success

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2022-23 CPI £35K ERDF SPRINT Award RTO/£13.4K Catapult Geant Award (MD Catapult)

2022-23

Get selected for the SBC Lab Hotel Program and be among the final 10 startups in the SBC Catalyser Program

2023

Among the final 20 startups in the Santander X UK Award

2021-22

Cambridge Impulse program, BIA PULSE program, UK IP Audit and Access award & InnovateUK Edge Program

2022-2024 InnovateUK EUREKA Project (~£1M R&D grant)

2024

CGT Catapult AAV bioproduction Project Collaboration 2nd Innovate UK Grant **Now Seeking Funding for** <u>R&D and marketing</u>



Business Model

SALES & SERVICES Bioinformatics

GENENE[®]

Non-exclusive licensing

Pharma / CRO / Biotech / Academia

PLATFORMS

Exclusive licensing Subscription model

> UPFRONT FEES + ROYALTIES

Annual License ranging from

£100k - £1 million

Price determined by scales of the required improvement. Genenet Technology is required to cover additional model options.



Leading in the competition

	GENENET TECHNOLOGY	SENTI BIO	ASIMOV	Merck	Lonza
Market	Bioproduction	Cell and gene therapies	Next- generation therapeutics	Cell line + others	Cell line + others
Genetic circuits	✓ artificial neural network based	✓ Logic gate based	✓ Logic gate based	X	X
Machine learning & Al	✓	X		~	~
First round funding	Raising 3M USD	USD 53M (2018)	4.7M USD Seed funding	USD 80M (2022)	Venture Round: EUR 2M (2017)
Status	Private	IPO in 2022 Q2.		Private	Private

Genetic Circuit

Cell Engineering



Thank you for your attention

We are looking for

Investment, Collaborations &

New team members

Leo Chi U Seak Researcher and innovator



Scan to add my Linkedin

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