AIKIUM Inc.

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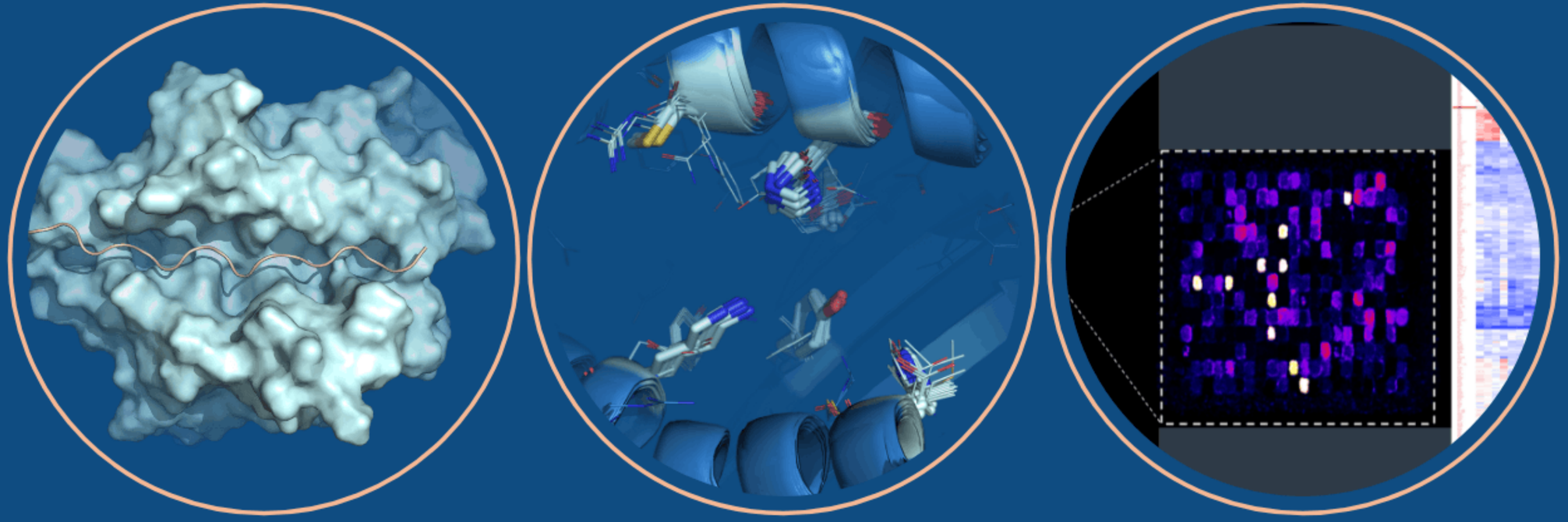
aikium.com

The SeqR™ Protein Therapeutics Company



Unlocking Membrane Protein Targets Beyond the Reach of Antibodies

The Challenge: Antibodies Miss ~50% of Therapeutically Relevant Epitopes

No existing approach for binding to intrinsically disordered regions

90% of antibody targets are conformational but 50% of the proteome is disordered

Antibodies require structured epitopes, so limited applicability to disordered regions.

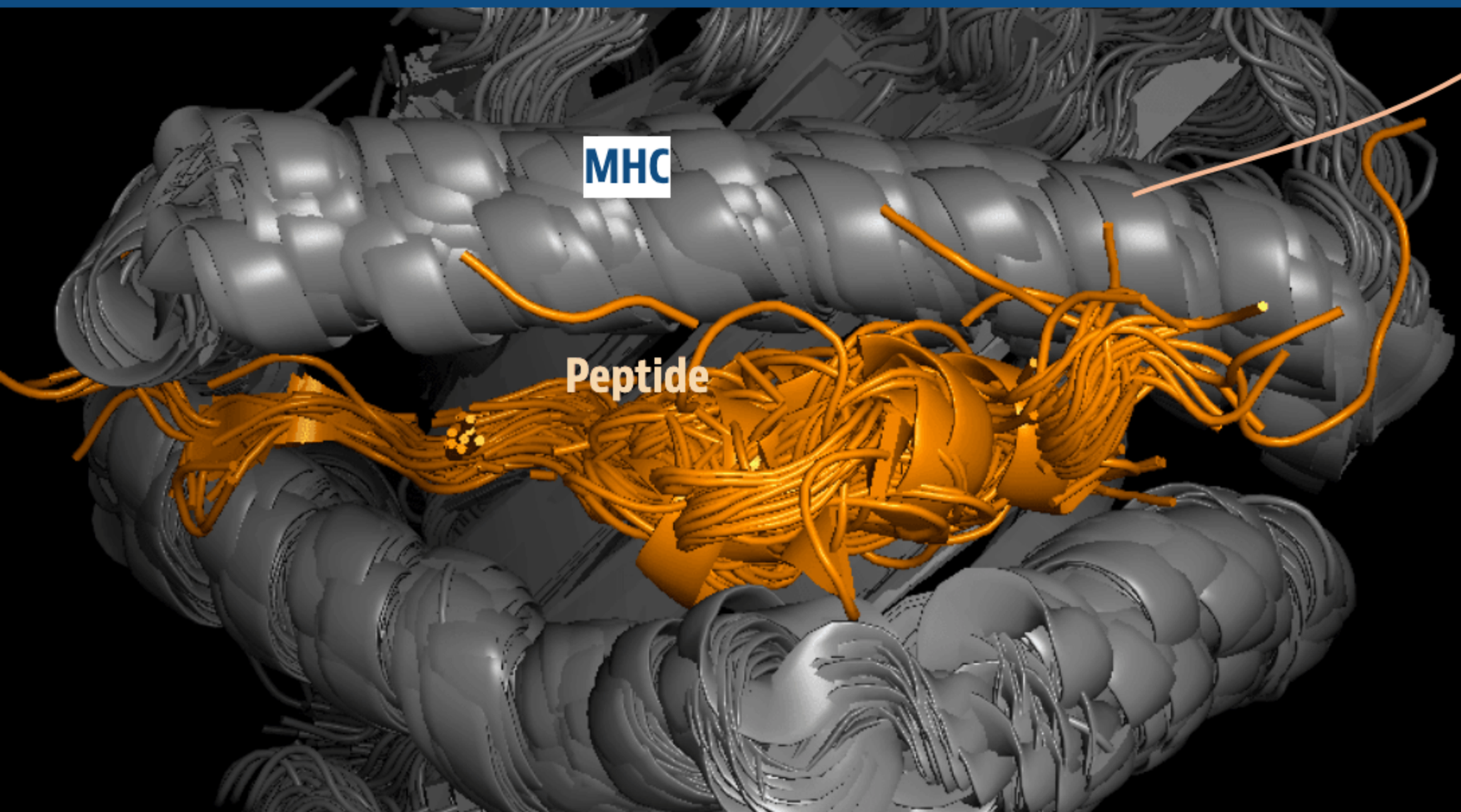
Current AI models struggle with disordered regions, further restricting antibody design.

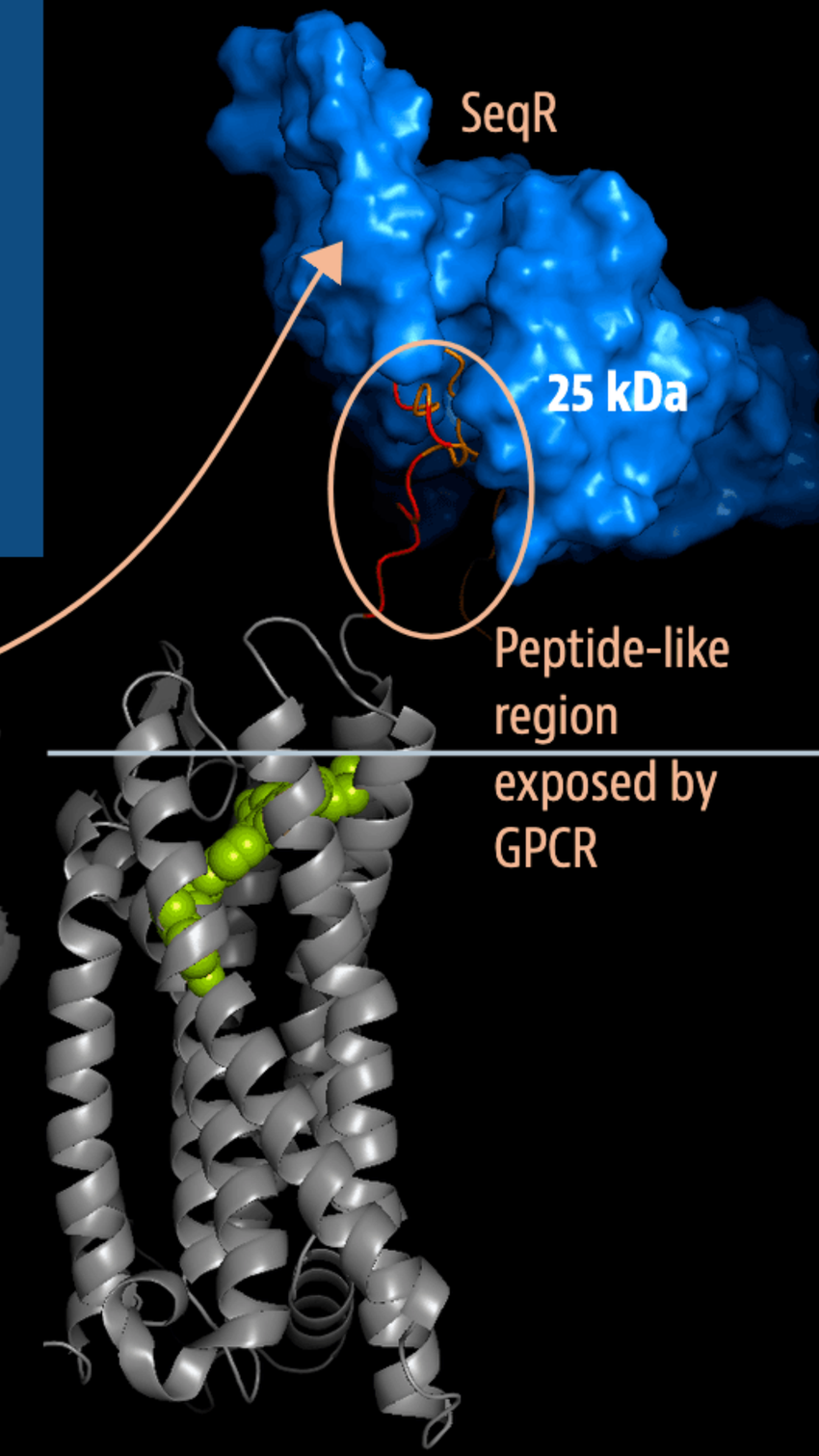
Zeng et al., Antibodies, 2023.

Solution could unlock dermatology targets with disordered regions like **GPCRs** & **ion channels**

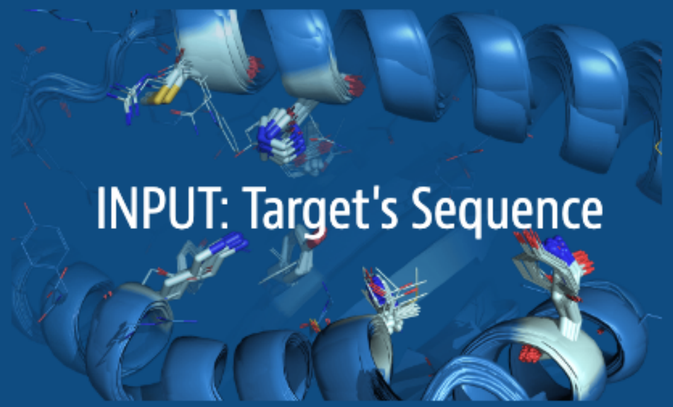
Aikium has engineered the peptide binding platform-domain of MHCs into a programmable disorder-binding scaffold — the **SeqR**

First application to the intrinsically disordered N-terminal tails of G Protein Coupled Receptors (GPCRs)

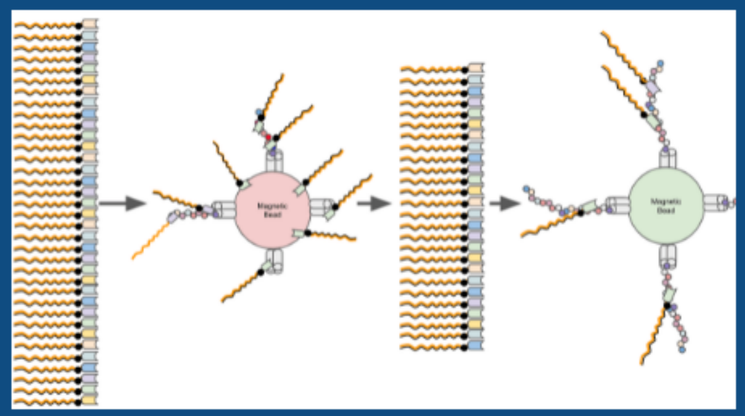




Aikium employs deep learning driven **trillion** protein screening to rapidly identify potent selective binders to targets beyond traditional antibodies



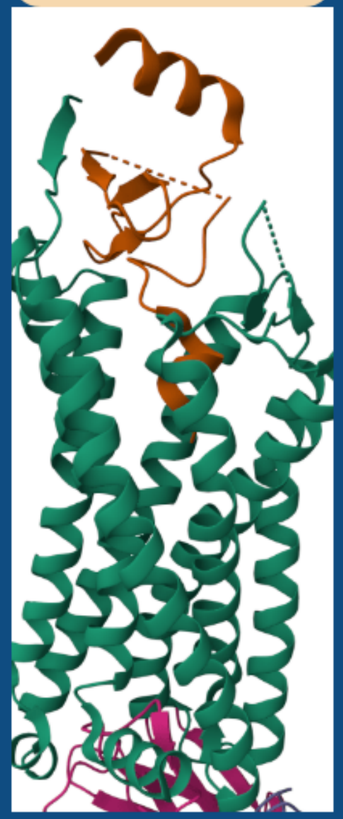
Deep Learning



Yotta Display

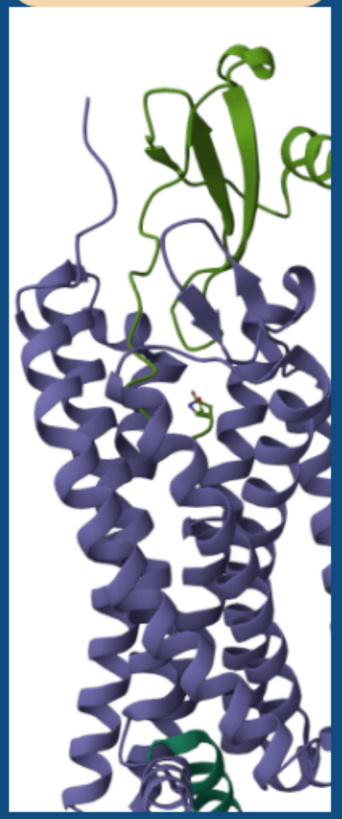
Aikium's "**SeqR**" protein binds sequence epitope on target's disordered region

First-in-Class



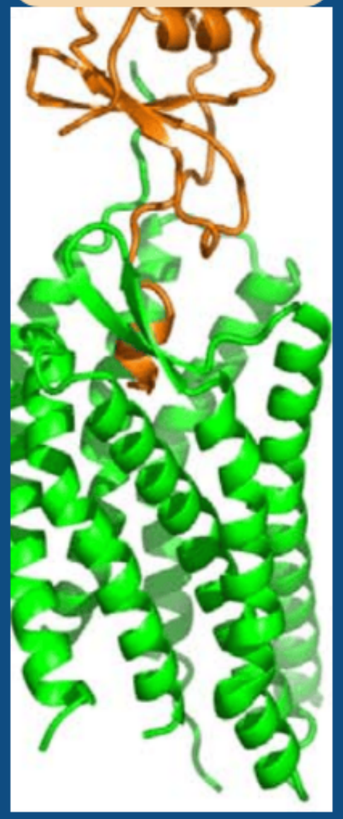
GPCR-1

First-in-Class



GPCR-2

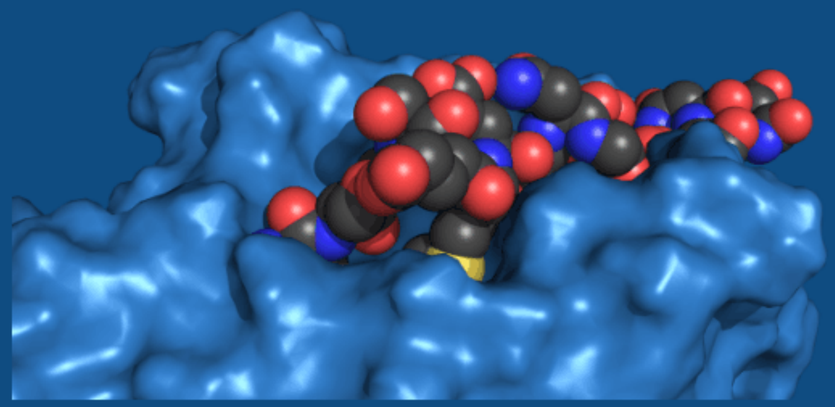
Best-in-Class



GPCR-3

Target specific screening libraries to be Yotta-displayed are designed by Aikium's proprietary deep learning platform

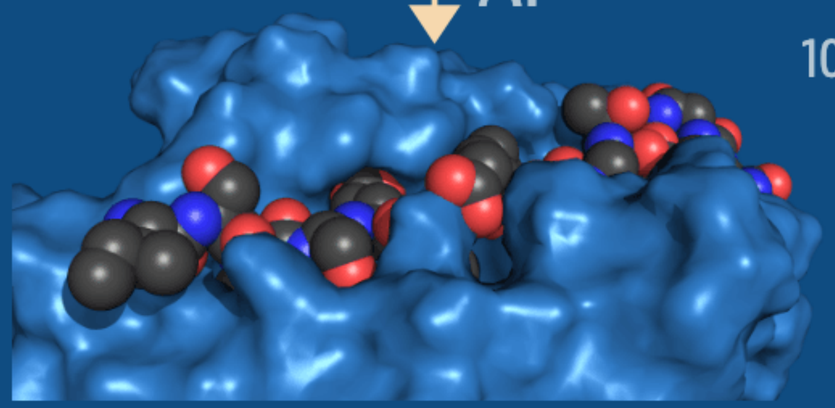
Proprietary generative AI models, genetic algorithms, bioinformatics, MD simulation



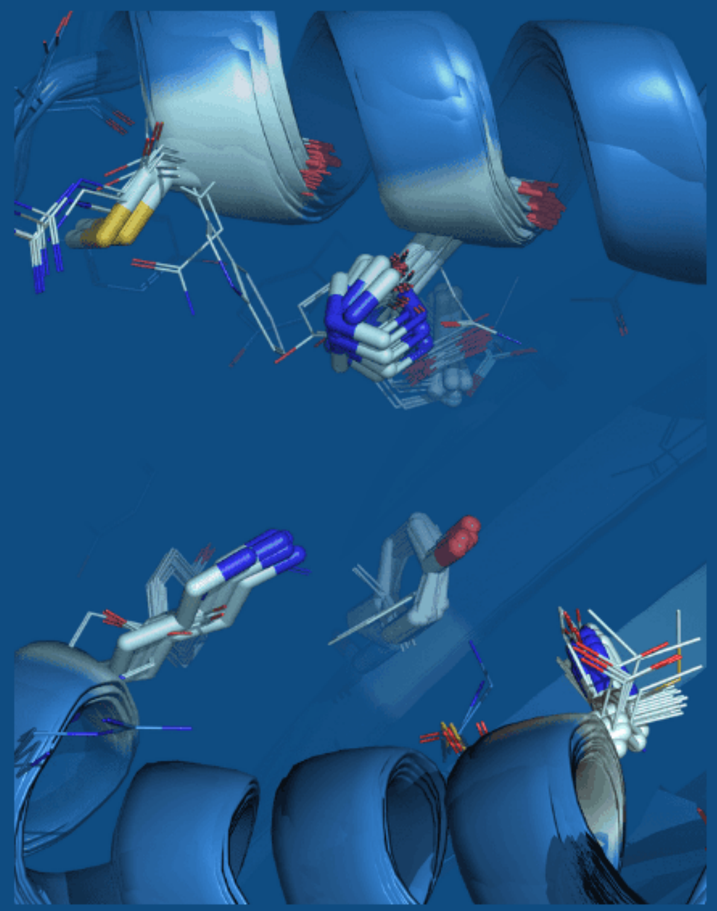
Target epitope

Binder surface to be optimized

AI



10 **million** times



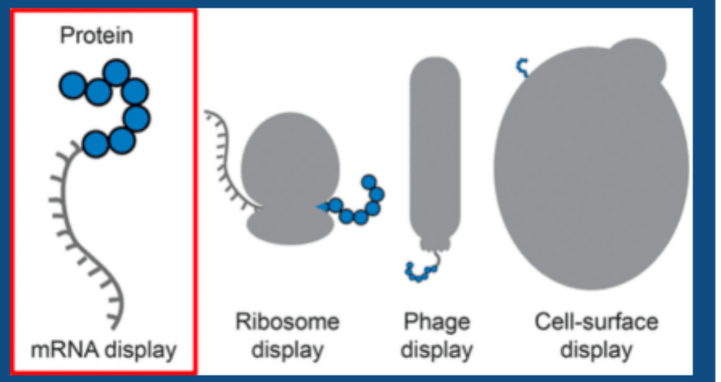
AI uncovers trillions of possible mutation combinations on the binder

Trillion Scale RNA-Encoded-Protein Display Library

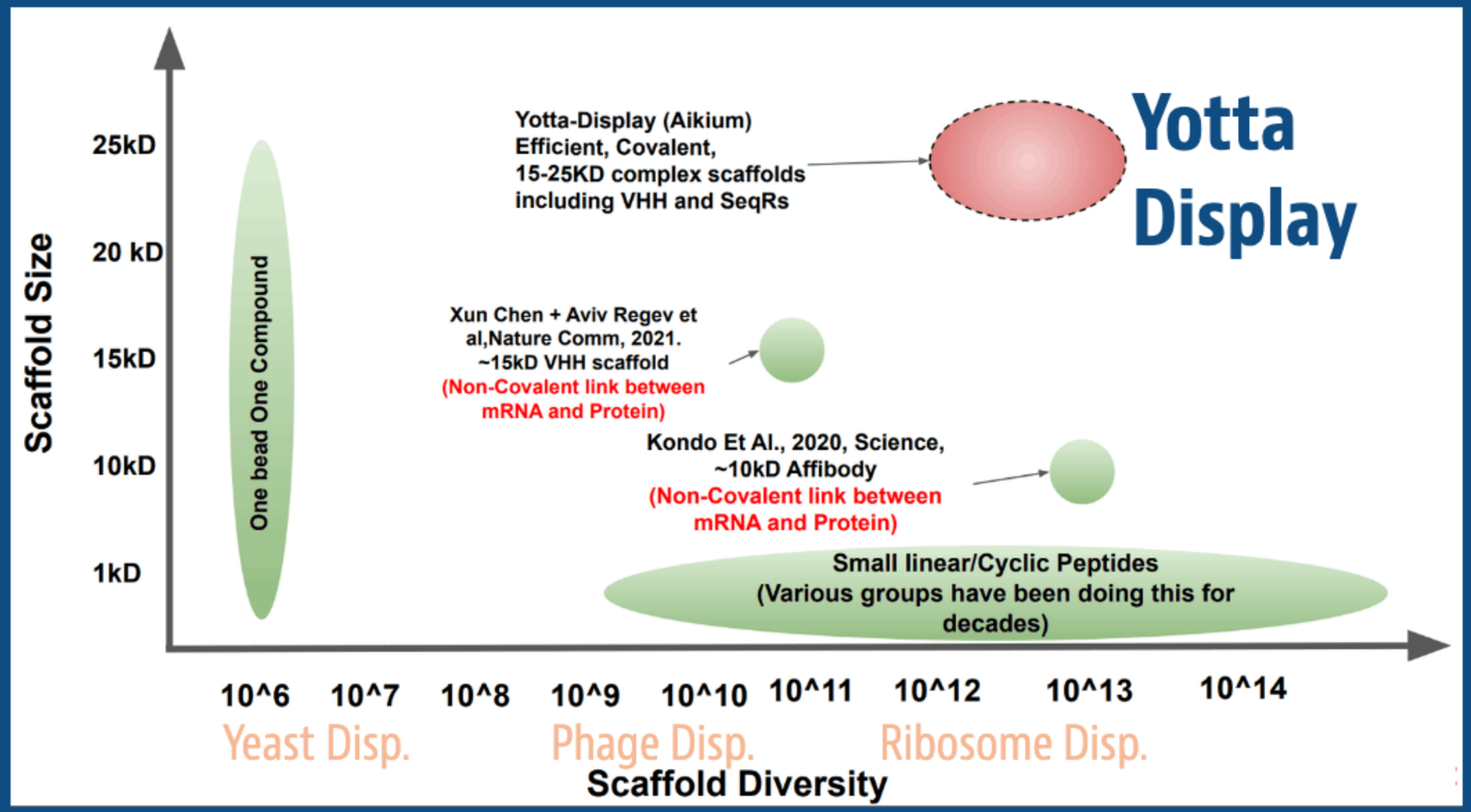
Each computational run modifies the binding interface differently to make it bind the target

Aikium's Yotta Display is the only platform that can experimentally screen **trillion** diversity libraries of large proteins (> 20kDa)

Continuous innovation and non-obvious optimization of mRNA display with increased mRNA-protein yield, novel linker conjugation and release biochemistry, enhanced mRNA retrieval for PCR, improved PCR amplification, and optimization of linkers, adapters, sequences & codons

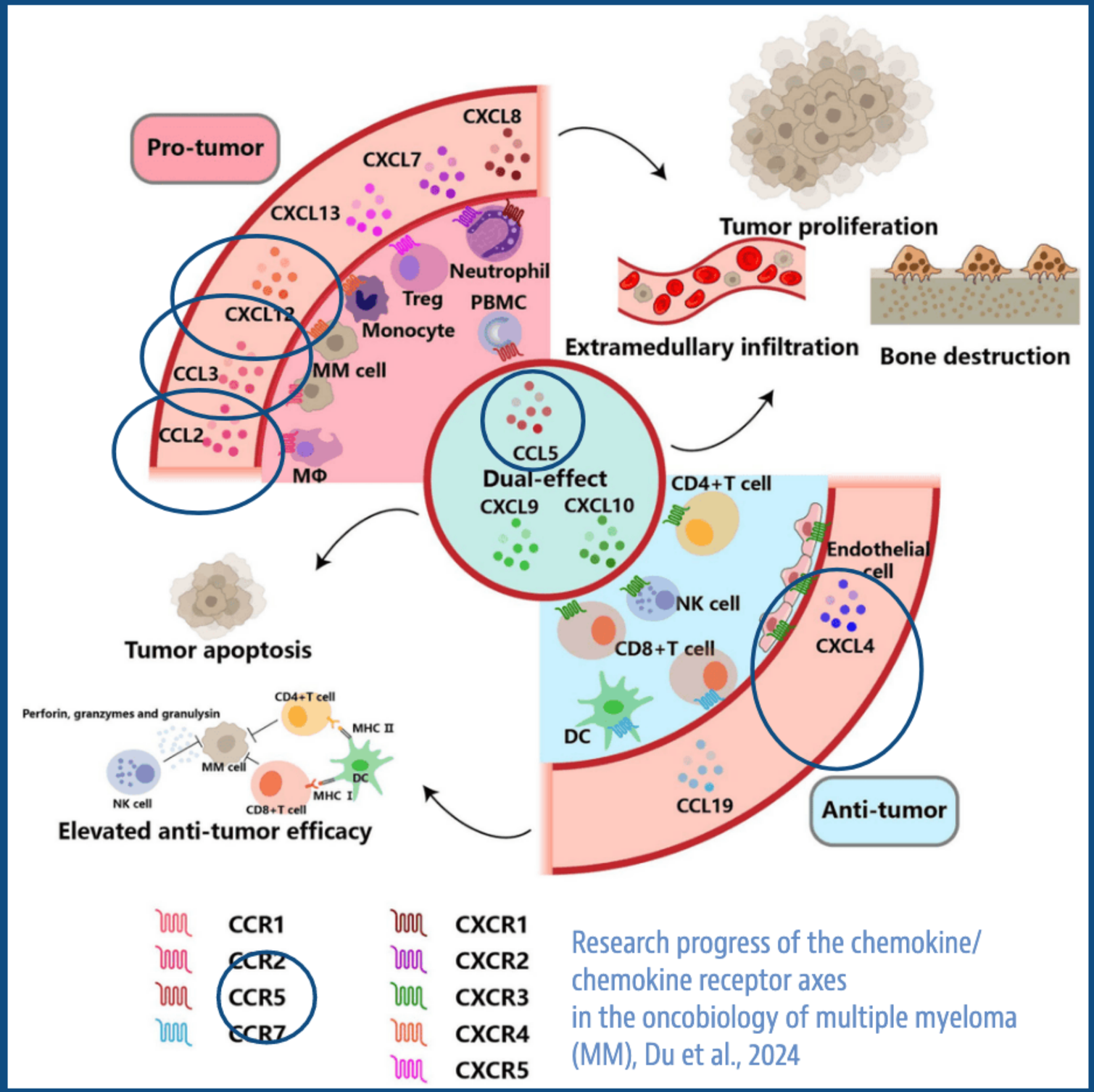


Seelig, B., mRNA display for the selection and evolution of enzymes from in vitro-translated protein libraries (2011); Newton et al., *In Vitro* Selection of Peptides and Proteins-Advantages of mRNA Display (2020); Kamalinia et al., Directing evolution of novel ligands by mRNA display (2021)



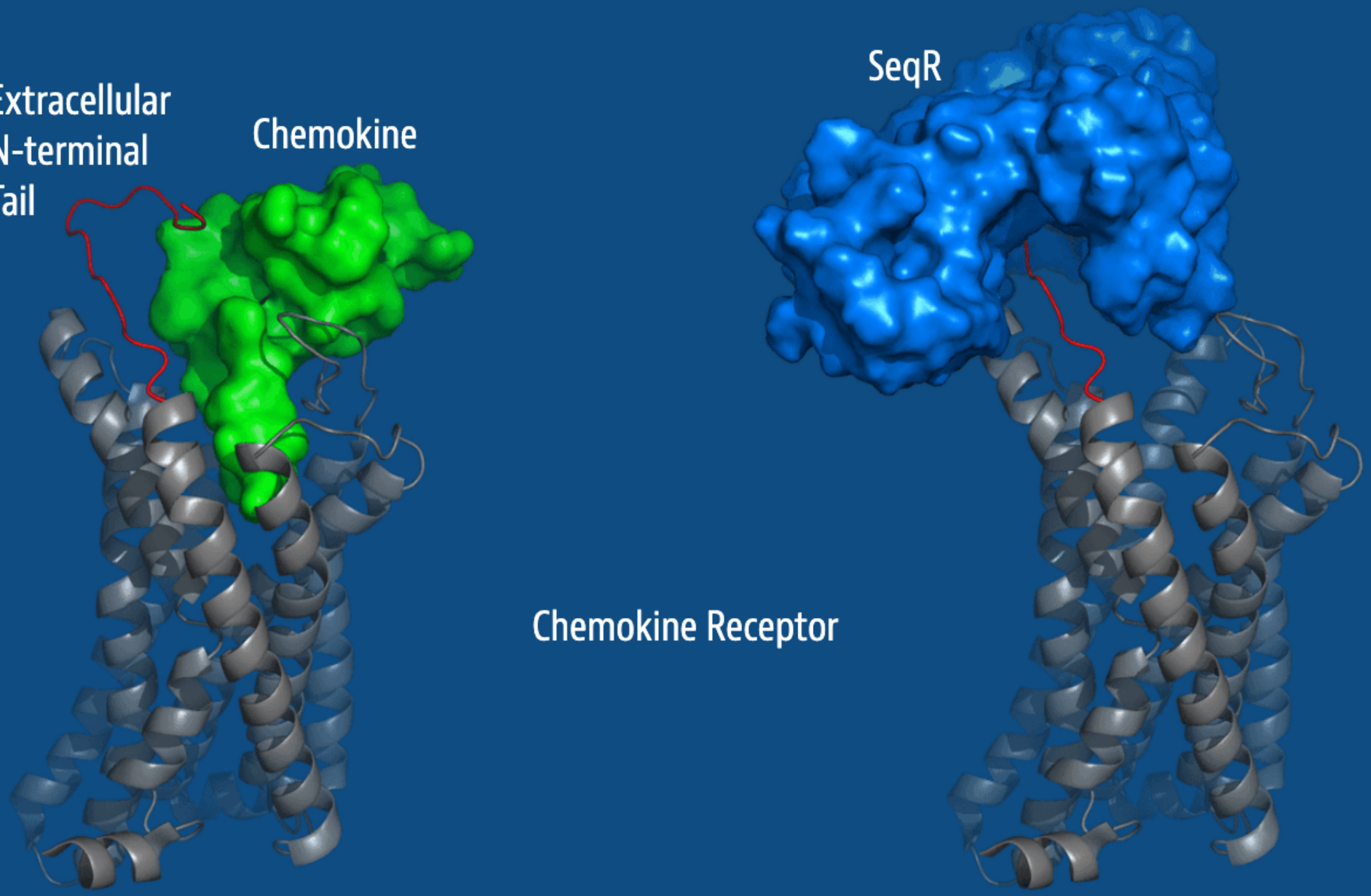
Targeting Chemokine Receptors on Immune Cells for the Treatment of Cancer, Auto-immune Diseases and Neuro-Inflammation

Aikium has developed SeqRs that target three chemokine receptors

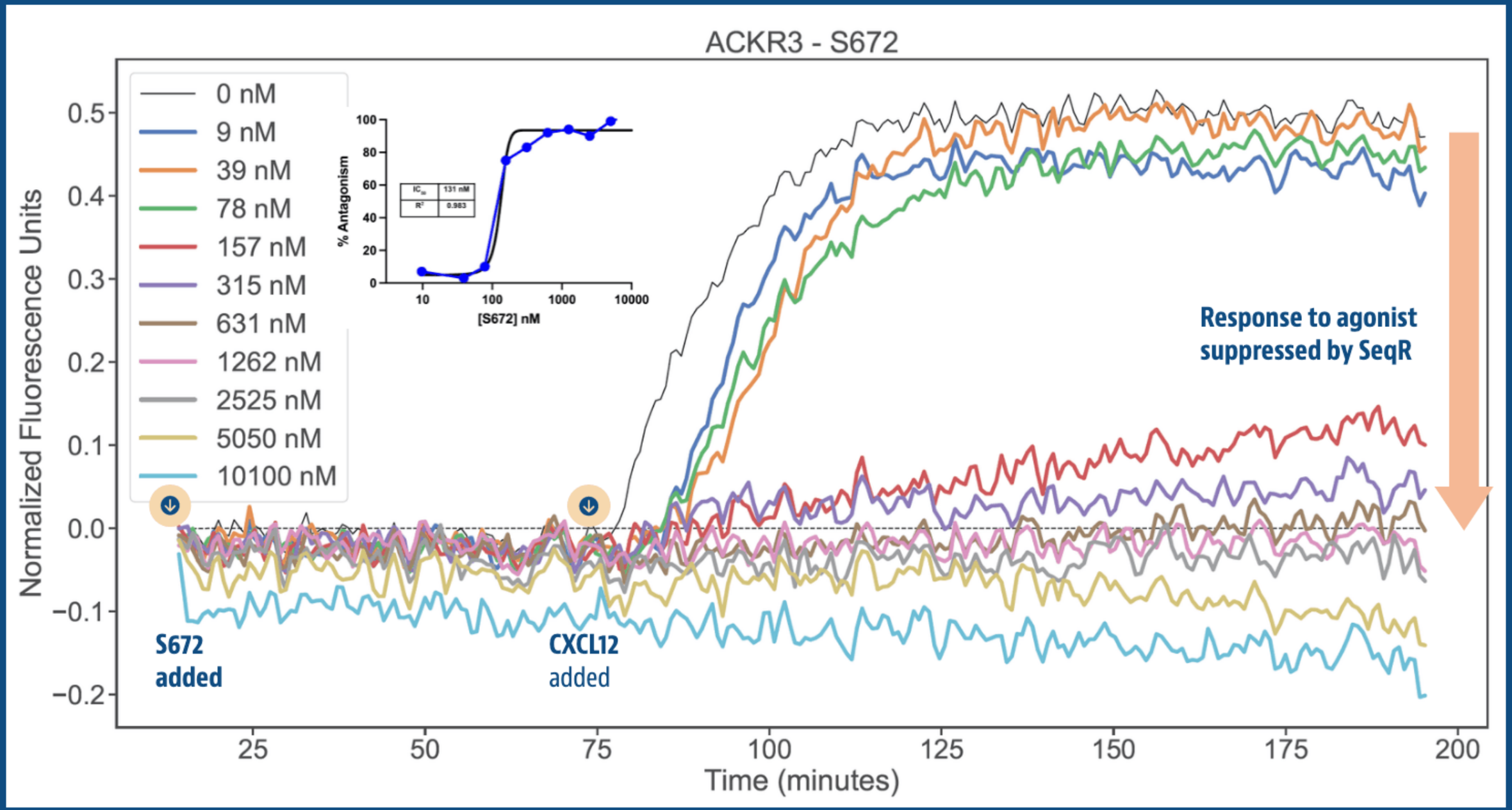


Research progress of the chemokine/ chemokine receptor axes in the oncobiology of multiple myeloma (MM), Du et al., 2024

SeqR binding to the extracellular N-terminal tail of the **chemokine receptor** could antagonize it by inhibiting chemokine binding

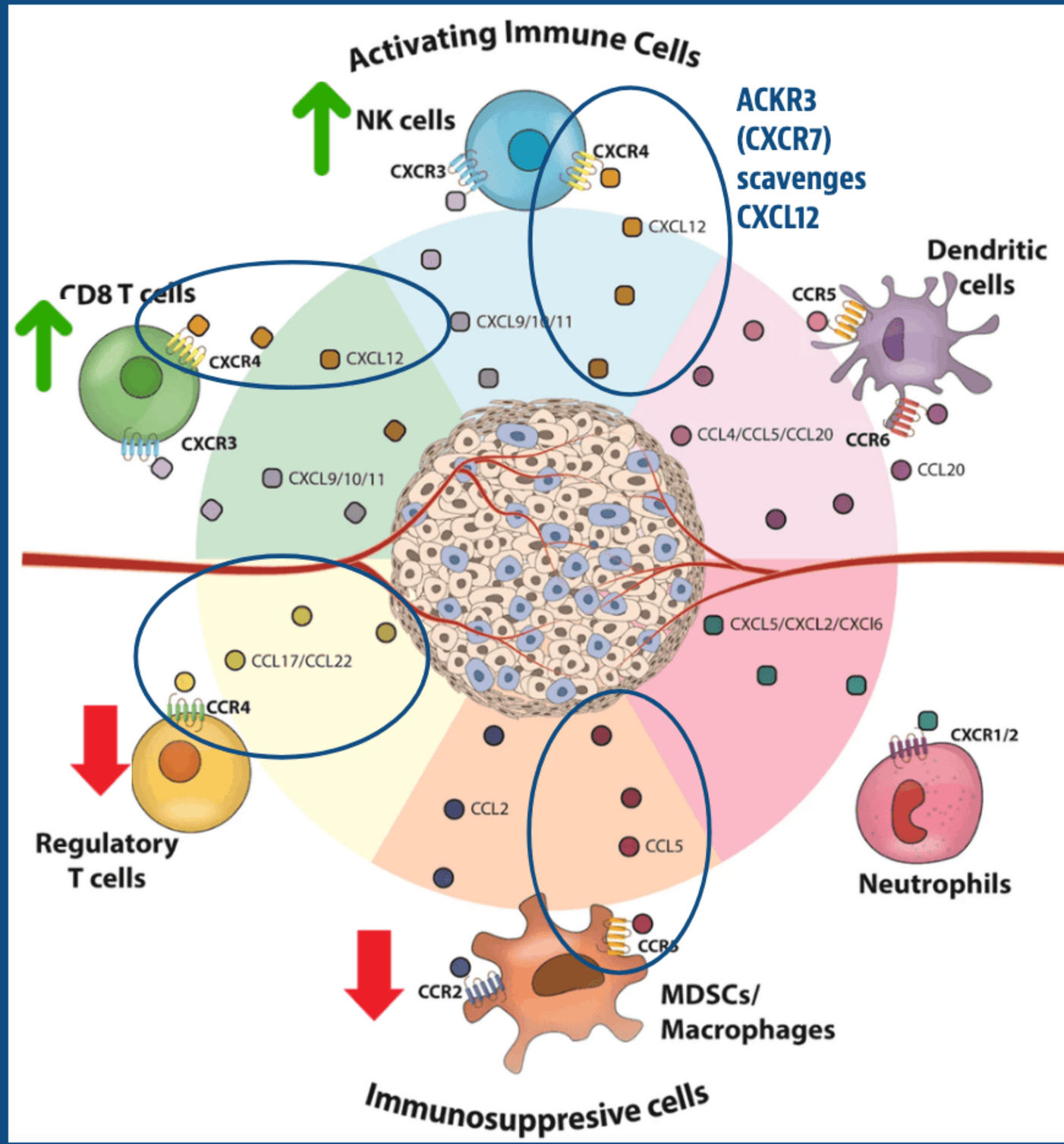


ACKR3 antagonist SeqR S672 with EC50 ~ **131 nM** found directly from very first screen of 32 SeqRs against the target, *without any optimization*



High hit rates across three chemokine receptors illustrates potential of the platform

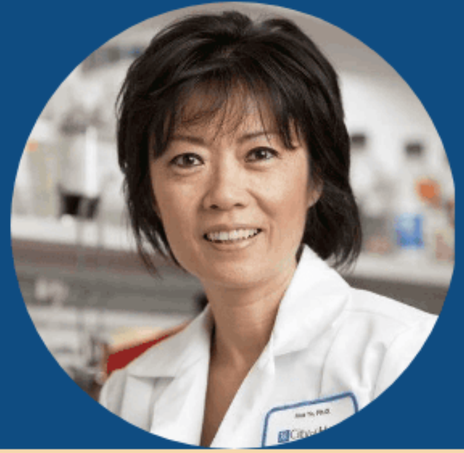
Target	SeqRs	Antagonists	Inconclusive	Agonists
ACKR3	32	28	4	0
CCR5	32	6	12	14
CCR4	32	8	6	18



Key chemokines direct migration of immune cells in solid tumors, Kohli et al., 2021

Aikium has both internal pipelines and external partnerships

Pharma partnership getting inked



Dr. Hua Yu

City of Hope

Billy and Audrey L. Wilder Prof. in Tumor Immunotherapy; Associate Chair, Dept. of Immuno-Oncology; Co-leader, Cancer Immunotherapeutics Prog.

Target: Transcription Factor

Dr. Florent Ginhoux

Gustave Roussy

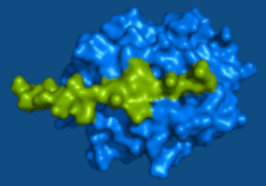
Singapore Immunology Network (SIgN), A*STAR; EMBO Young Investigator; Shanghai Immunology Inst.; Web of Science Highly Cited Researcher

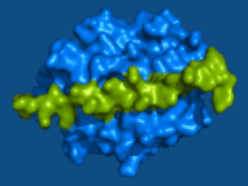
Target: Chemokine Receptor

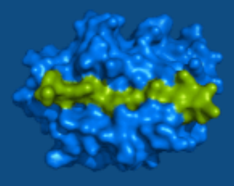
PIPELINE

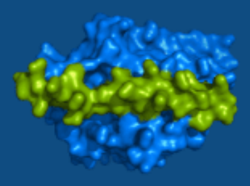
Target	Indication	Program	Most Advanced Molecule	Computational Screen	mRNA Display	Hits with Cellular Activity		Hit-to-Lead Optimization	in vitro Lead Optimization	in vivo Pharmacology	Development Candidate Nomination
						Weak	Strong				
ACKR3	Advanced cancers, Multiple Sclerosis	In-house	SeqR672								
CCR5	Advanced cancers	In-house	SeqR792								
CCR4	Advanced cancers, Atopic dermatitis	In-house	SeqR648								
Transcription factor	Immuno-oncology	City of Hope Partnership									
Chemokine receptor	Immuno-oncology	Gustave Roussy Partnership									
CysLTR2	Uveal Melanoma, Chronic pruritus	In-house	SeqR177								

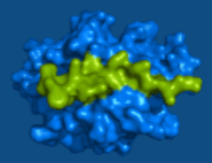
Digital assets have been generated to the entire chemokine receptor class

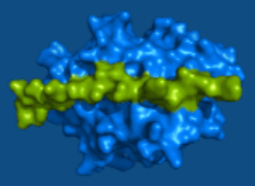

CCR3


CCR6


CCR9


CXCR6


ACKR2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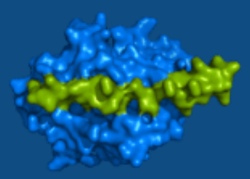
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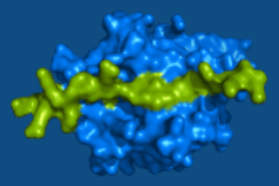
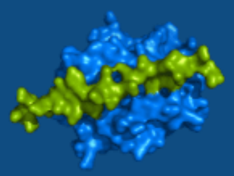
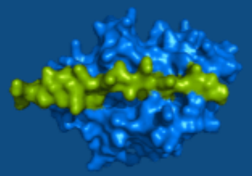
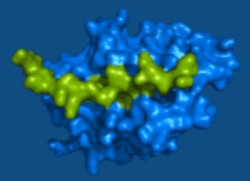
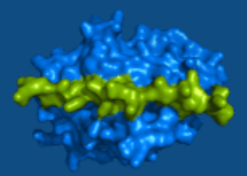

CXCR3(A)


ACKR4


CCR1


XCR1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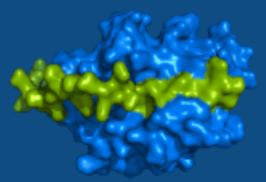
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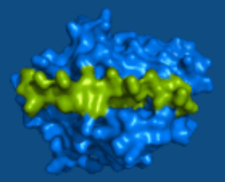
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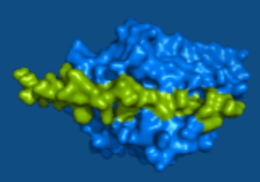
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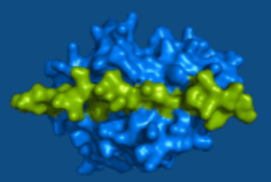
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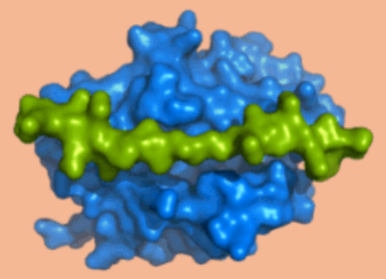
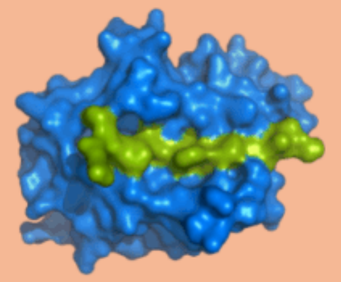

Kv 1.6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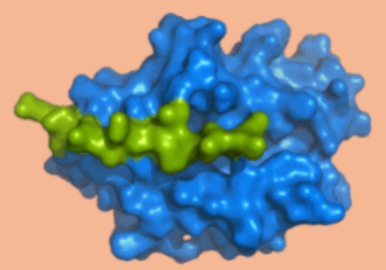
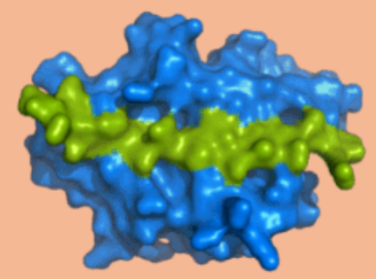

V1bR


C5aR1

...and several GPCRs, ion channels, transporters and other targets with disordered loops, tails or domains

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10xGenomics, Illumina

Protein Sciences

Elena

Valitor

GPCRs

Wijnand

City of Hope, Univ. of Copenhagen

Deep Learning

Jigar

Wadhwani AI, CrowdAI, IBM

*"Aikium is one of the hottest **AI / biotech** companies in existence",* STIFEL Report, April'24

SAB

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CEO, Caliber Bio

Dr. Nicolas Gaudenzio

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Dr. Nina Bhardwaj

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Prof. Tracy Handel

UC San Diego

Dr. Mark Lebwohl

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Dr. George Church

Harvard, MIT, Wyss

Dr. Larry Stern

U Mass Med School

Dr. Kevin Yang

Microsoft

AIKIUM Inc. Is Seeking Partnerships with Pharma and Academia on Elusive Targets with Immediate Clinical Translation Potential

Dr. Shankar Shastry

VP, Head of Protein Sciences

10X Genomics, GenapSys, National Cancer Institute, UC Santa Cruz, PSU

Dr. Eswar Iyer

CEO, Head of Synthetic Biology

10X Genomics, George Church Lab, Harvard, Wyss, George Mason, BITS

Dr. Venkatesh Mysore

CTO, Head of Artificial Intelligence

NVIDIA, Atomwise, D. E. Shaw Research, NYU, Wisc-Mad, IIT