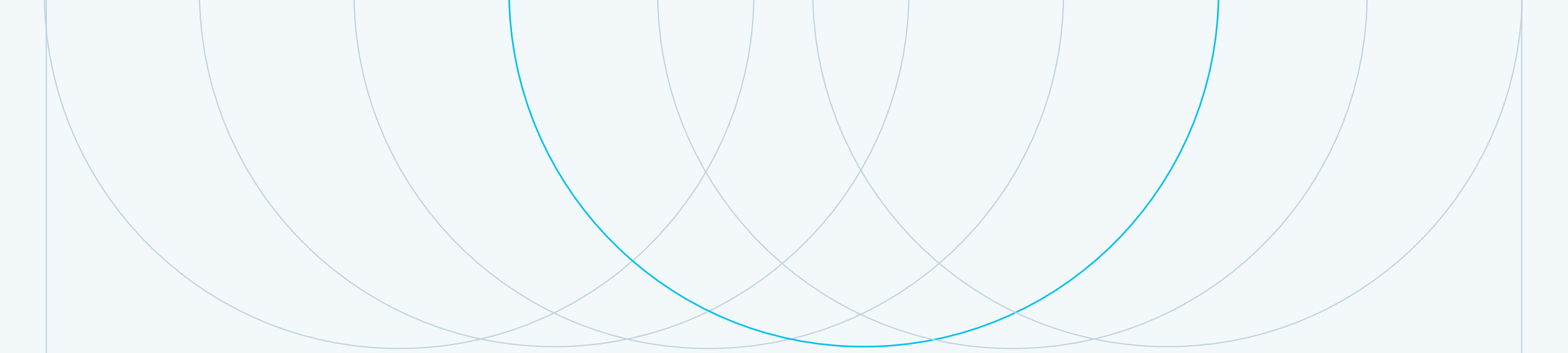




Sleuth

Biopharma **insights** others miss



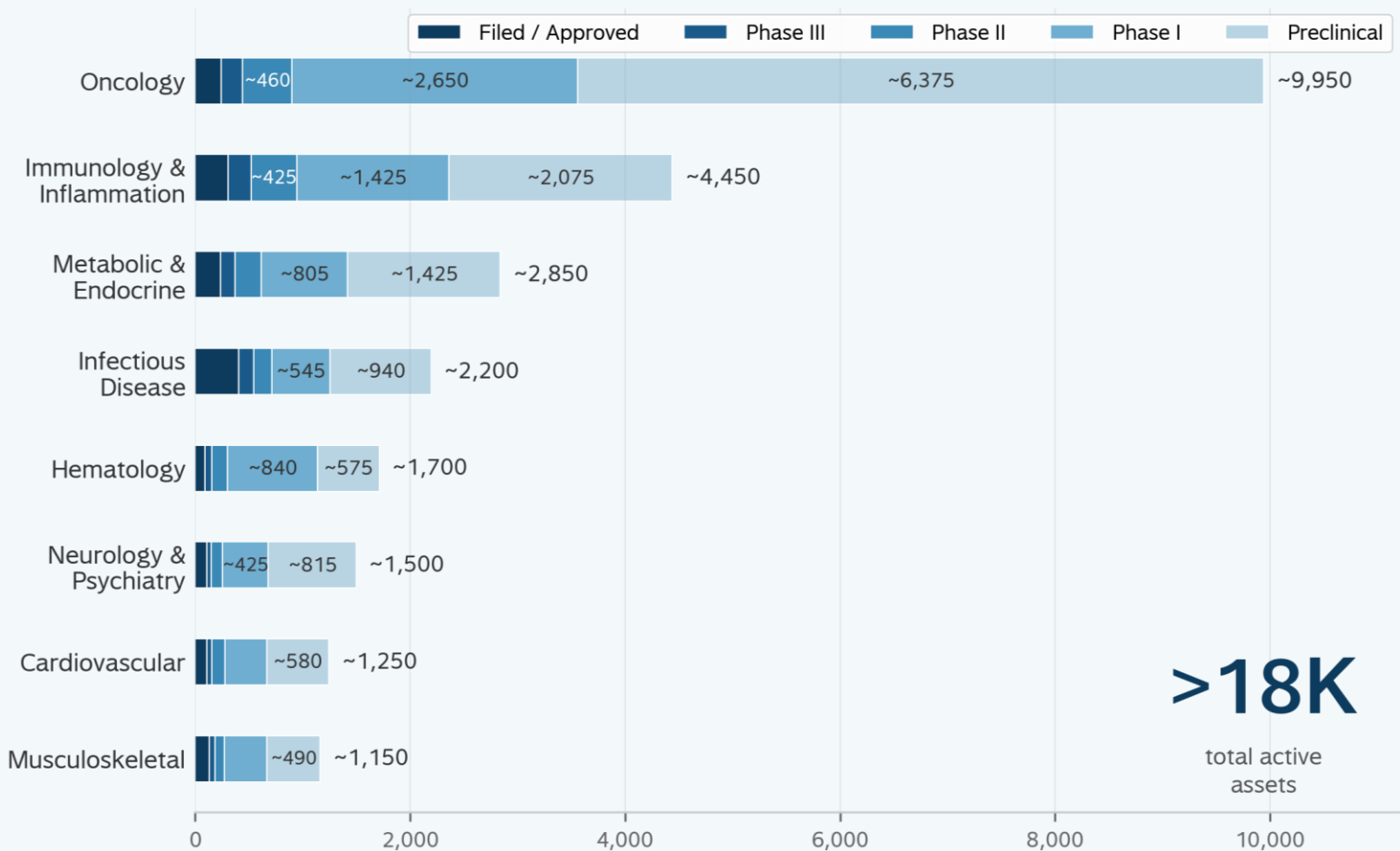
China Pipeline Overview



Policy-driven scale built an >18K-asset competitive landscape

Oncology dominates, but seven additional therapeutic areas each exceed 1,000 programs

Active Chinese assets by therapeutic area and phase



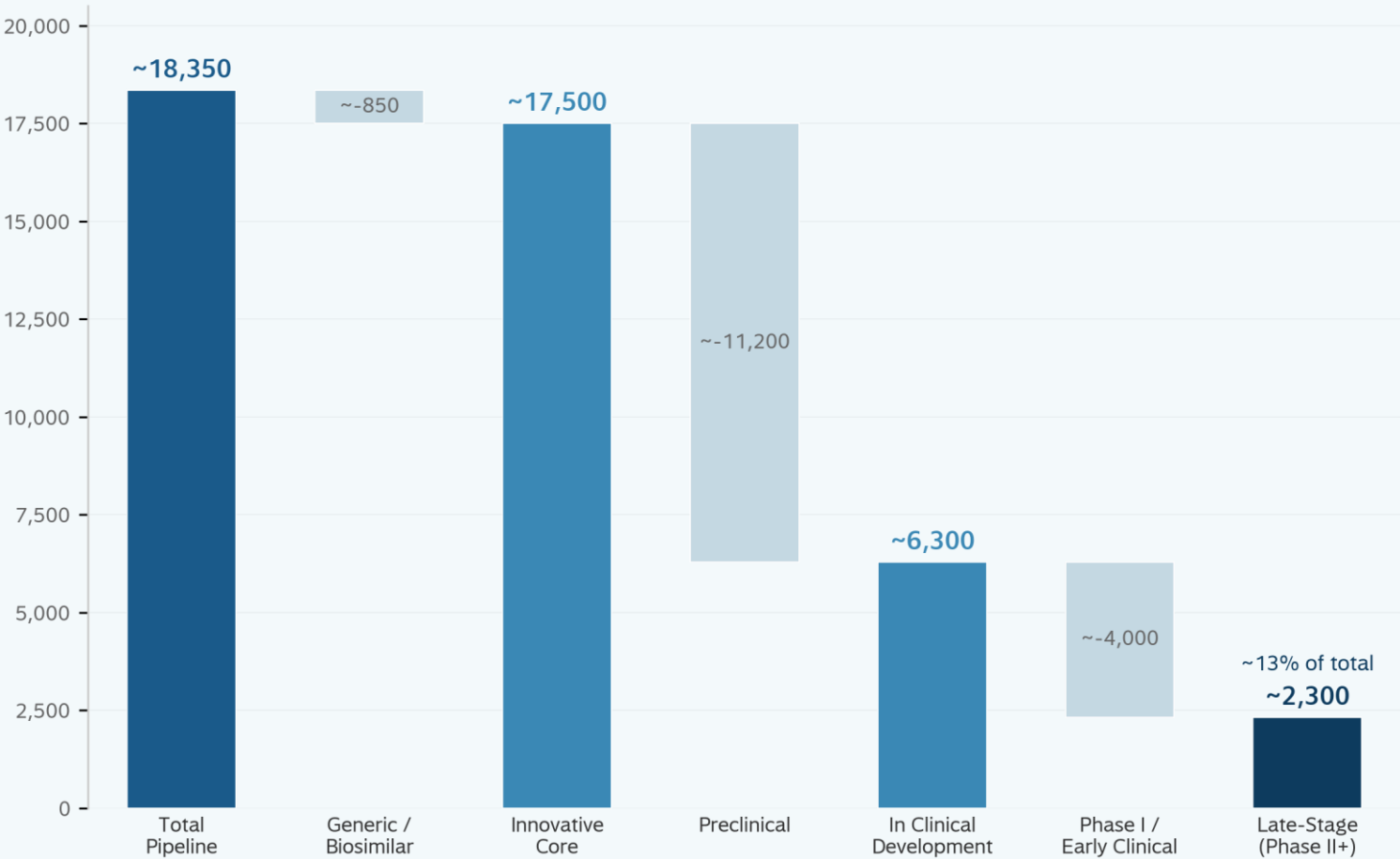
- Oncology's ~9,950 assets create the densest originator landscape globally, driven by NMPA reforms rewarding high-unmet-need indications.
- Post-2015 reforms catalyzed the pipeline explosion, producing ~2,300 innovative IND applications accepted in 2023 alone.
- Only ~510 assets have reached Phase III, signaling a large wave of mid-stage readouts rather than near-term commercial pressure.
- Seven non-oncology areas each exceed 1,000 programs, meaning Western teams in autoimmune, metabolic, or hematology will encounter China-originated competitors.



~18,350 assets collapse to ~2,300 in late-stage development

I&I overtakes oncology in late-stage, signaling where near-term licensing pressure will concentrate

Chinese pipeline filtered to ~2,300 late-stage innovative assets



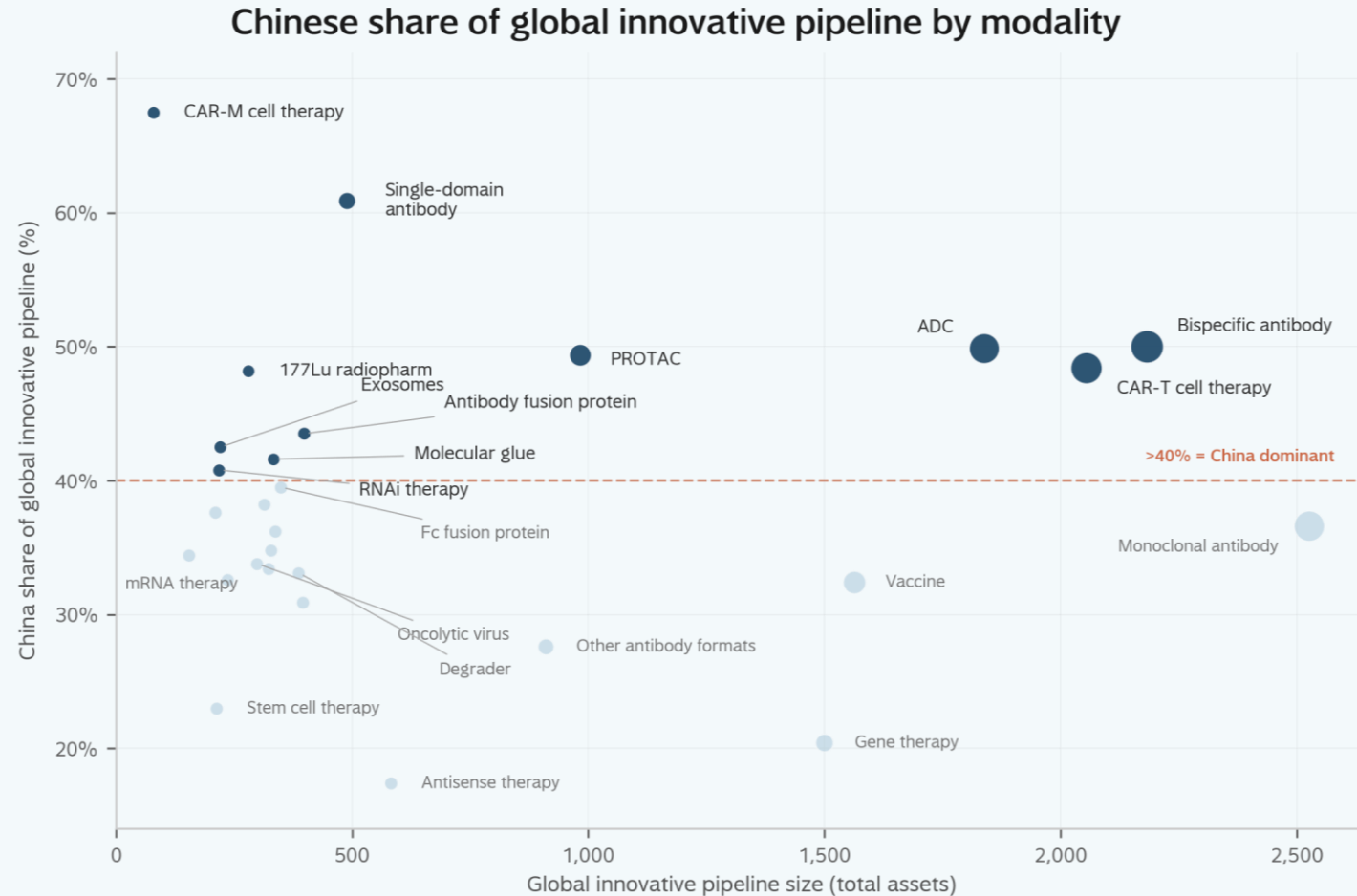
Late-stage innovative assets by therapeutic area (top 8 by volume)

- ~830 Immunology & Inflammation
- ~785 Oncology
- ~665 Infectious Disease
- ~455 Metabolic & Endocrine
- ~325 Other / Unclassified
- ~250 Cardiovascular
- ~245 Hematology
- ~215 Neurology & Psychiatry



China originates roughly half of global innovation in 11 modalities

China holds roughly half the pipeline in the largest modalities and over 60% in smaller, specialized ones



- Bispecifics, ADCs, CAR-T, and PROTACs define the battleground: ~50% China share in global pools of ~1,000 or more assets each.
- Niche platforms above 60% share represent near-monopoly originator positions, but their small global pools (roughly 80 to 500 assets) mean limited licensing targets for Western buyers seeking volume.
- Many structural drivers underpin this concentration, rooted in translational throughput rather than discovery, with each modality exploiting a distinct ecosystem advantage.
- Gene therapy at ~20% and antisense at ~15% represent genuine white space where China's structural advantages have not translated.

China's structural advantages stop at CNS, rare disease, and legacy platforms

Five of seven example white-space targets are CNS receptors requiring Western trial infrastructure

Chinese white space: modalities, targets, and TAs with low global share

Dimension	Name	China Assets	Global Assets	China Share	Structural Gap
Modality	Antisense therapy	~100	~580	~17%	Oligonucleotide chemistry expertise concentrated in Western hubs
	Gene therapy	~305	~1,500	~20%	Long development timelines and complex viral vector manufacturing
	Stem cell therapy	~50	~215	~23%	Regulatory complexity and limited standardized manufacturing
Target	Adrenergic receptor	~35	~350	~10%	CNS target requiring Western trial design and long endpoint trials
	Histamine receptor	~20	~225	~10%	Legacy CNS small-molecule space with established Western IP
	COX	~30	~275	~11%	Mature NSAID class with limited remaining innovation runway
	HIV-1	~45	~305	~14%	Requires global trial networks and Western regulatory pathways
	AChR	~45	~295	~16%	Neuromuscular and CNS targets with complex endpoint requirements
	5-HT receptor	~50	~305	~16%	Psychiatry targets requiring long placebo-controlled outcome trials
	Opioid receptor	~40	~215	~19%	Pain and addiction space dominated by US regulatory dynamics
TA	Rare Disease	~125	~825	~15%	Small patient pools require orphan drug expertise and global access
	Neurology & Psychiatry	~1,375	~7,100	~19%	Long trials, subjective endpoints, limited fast-enrollment advantage

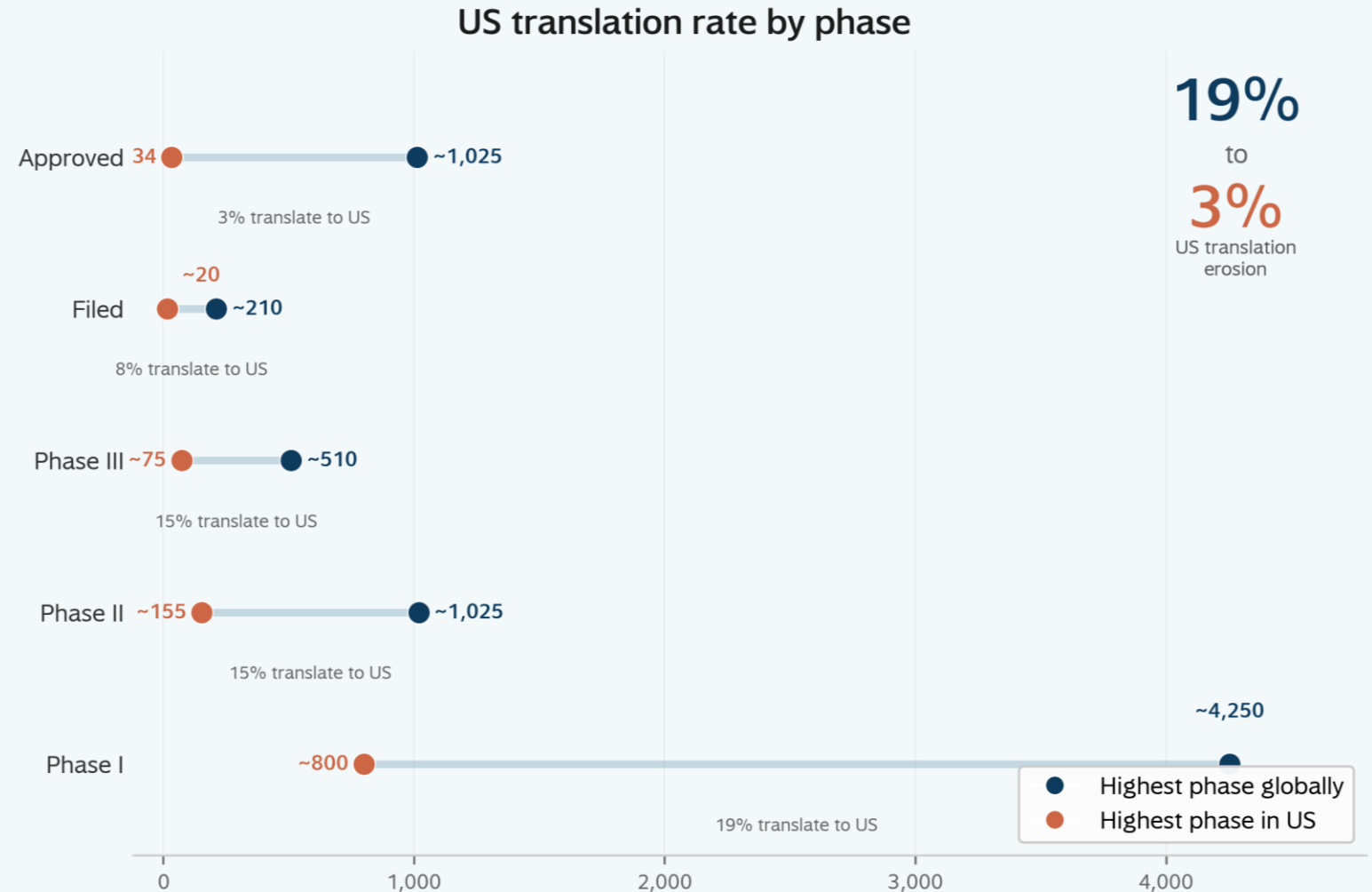
- 5 of 7 example white-space targets are central nervous system receptors, where long trials and subjective endpoints negate fast-enrollment advantages.
- Rare disease at ~15% and neurology at ~20% confirm the pattern at the TA level, while gene therapy and antisense represent modality white space.
- The common thread is development complexity that China's manufacturing and enrollment advantages cannot shortcut.

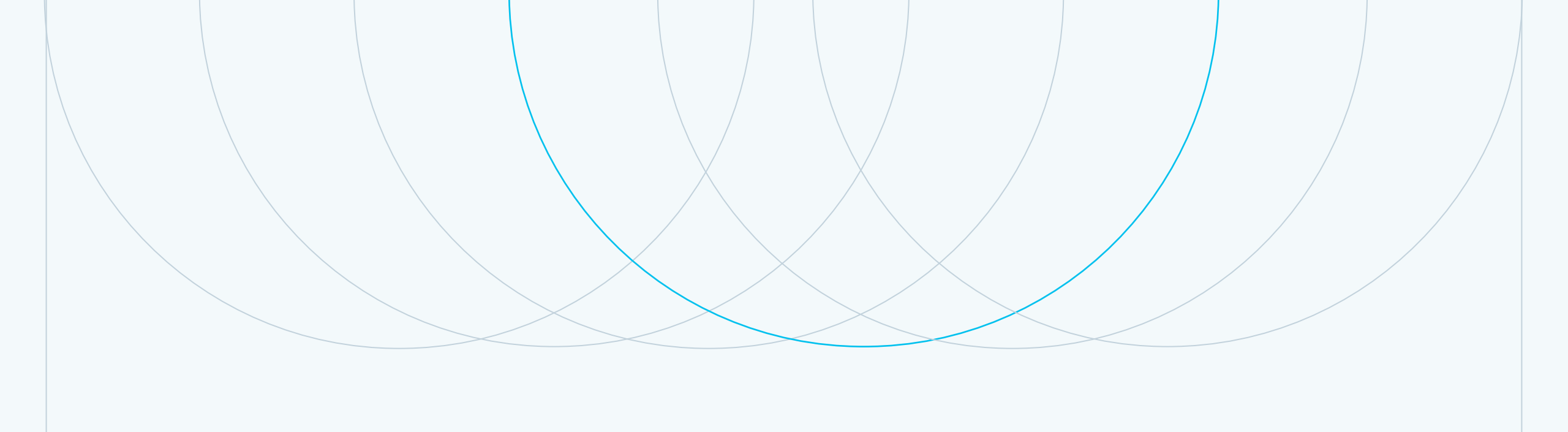


~1 in 5 Chinese assets have US presence, but only ~1 in 30 reach US approval

The translation rate erodes from ~19% at Phase I to ~3% at approval as barriers compound

- ~39% of the barriers that suppress US translation are tied to BIOSECURE-style policy risk, raising this as a vendor and supply chain problem.
- In practice, that means longer diligence timelines, costly vendor switches and CMC rework, and sponsors holding off on US/EU filings until their contractor stack is clean.
- The sharpest drop is Phase III to Approved, where the rate falls from 15% to 3% as CMC readiness and evidence acceptance become hard gates rather than friction.
- The key question is whether the 19% US footprint at Phase I can survive into later stages, or whether these barriers make the erosion inevitable.





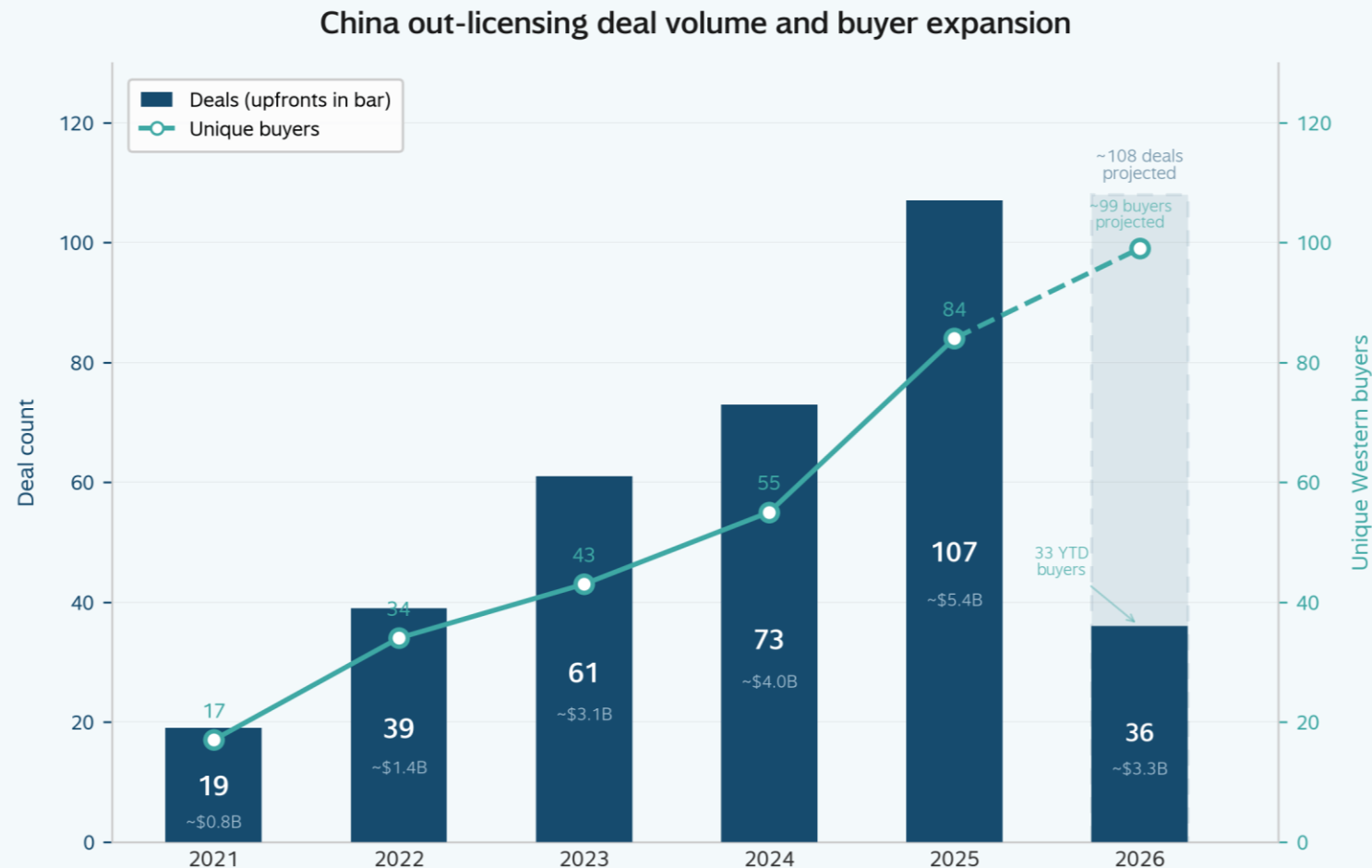
Deal Environment



China out-licensing volume grew ~5.6x from 2021 to 2025

Deal count, disclosed upfronts, and buyer pool all accelerated in parallel

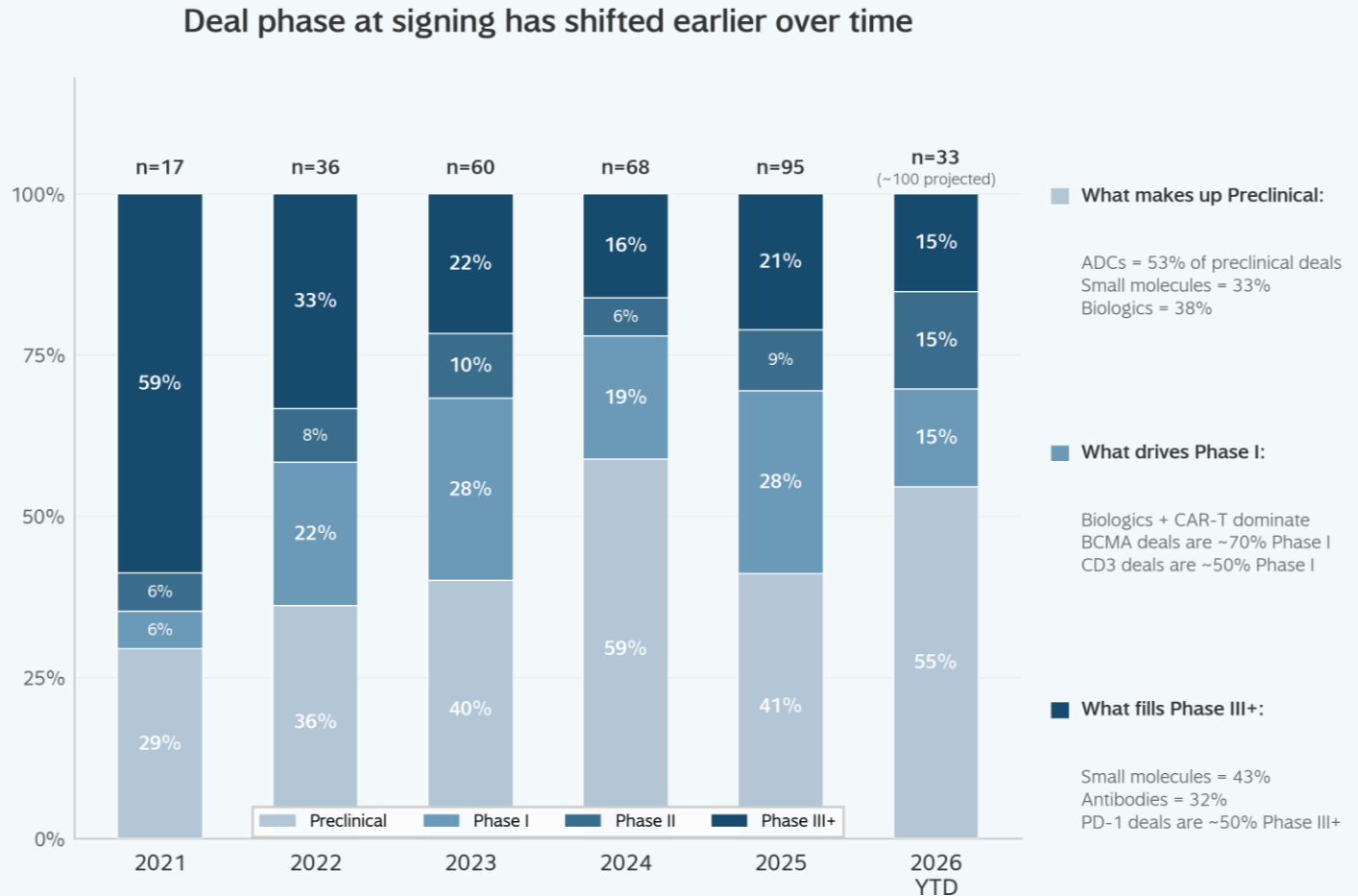
- The buyer pool grew from 17 specialty firms to 84 companies including all Top 20 Western pharma, a structural shift.
- Upfronts grew ~7x versus ~5.6x volume growth, and 2025 mega-deals reset pricing ceilings, signaling rising seller power.
- Five novel China-origin assets reached FDA approval since 2022, and 13 of 19 terminations were strategic, not scientific.
- 2026 YTD pace has not slowed, and ~51% upfront disclosure means visible capital understates actual flow.



The entry point for Western buyers has shifted earlier to Ph1 and preclinical

Late-stage deal volume held steady on absolute basis, while preclinical grew 8x since 2021

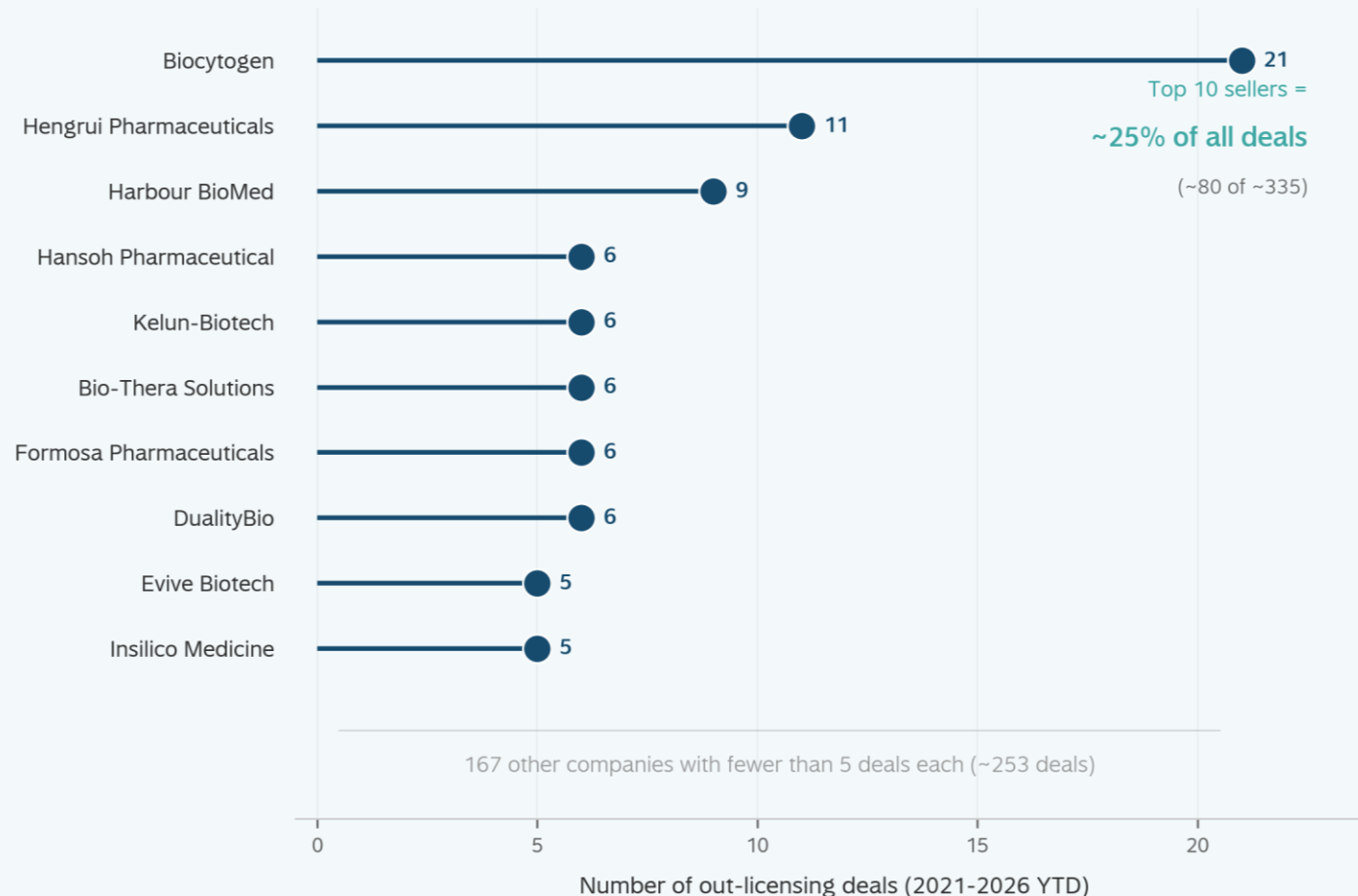
- Phase III+ doubled from 10 to 20 while preclinical grew 8x to 39, adding 78 earlier-stage deals to the total since 2021.
- BIOSECURE caution froze later-stage signings in 2024, spiking preclinical to 59%. The 2025 rebound to 41% shows the backlog cleared.
- ADCs account for 53% of preclinical deals, antibodies 25%. Buyers source early in complex modalities, late in validated ones.
- 2026 YTD reads 55% preclinical from H1 timing skew. Full-year will settle near 40-45% as later-stage deals close.



China's out-licensing market is fragmented across ~177 sellers

~177 unique sellers with the top 10 accounting for just ~25% of activity

Top China out-licensing sellers by deal count



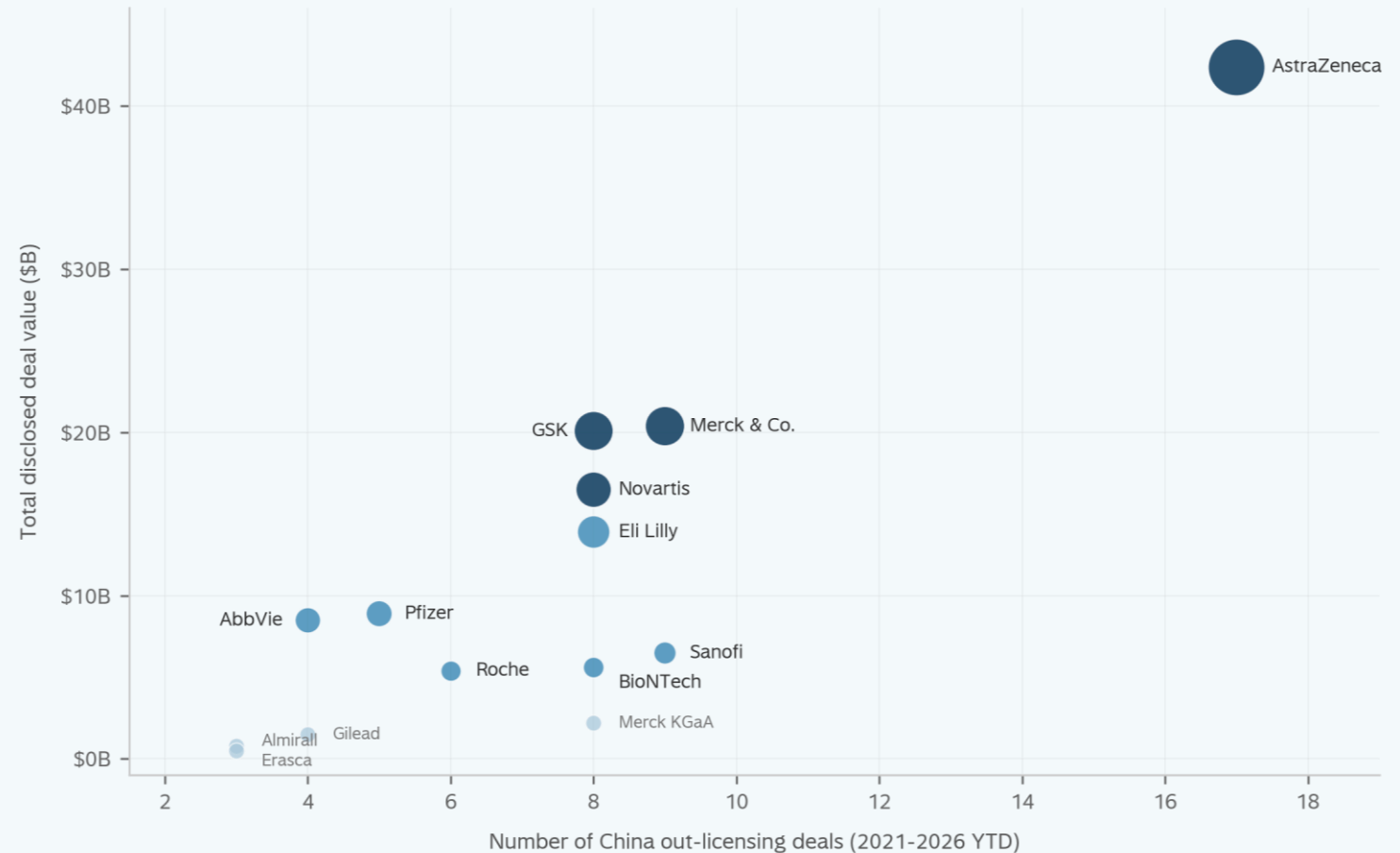
- ~177 unique sellers with the top 10 representing ~25% of deals signals a fragmented, broad-access ecosystem rather than a gatekeeper market.
- Five companies tied at 6 deals each with no clear second tier suggests the seller landscape is flat beyond a single outlier, not pyramidal.
- Only ~21% of deals occur between repeat seller-buyer pairs; this is a deal-by-deal bazaar where prior relationships do not guarantee future access.
- Western BD teams should source opportunistically across the full ecosystem rather than building narrow bilateral pipelines with a few repeat partners.

AstraZeneca leads China deal activity while 4 pharma giants cluster at \$14 to 20B

~335 out-licensing deals since 2021 reveal concentrated Western buying patterns

- AstraZeneca dominates with 17 deals totaling ~\$42B, built on repeat bilateral buying and embedded China infrastructure. Soriot has committed \$15B through 2030, calling China "a fundamental part of our R&D network."
- "GSK, Merck, Novartis, and Eli Lilly cluster at 8 to 9 deals and \$14 to 20B each. All four CEOs now frame China as global pipeline feedstock, not just a commercial market."
- Preclinical assets account for 39% of deals and oncology drives 50%, with ADCs and cell therapy as the most frequently licensed modalities.
- Most executive statements frame these deals as global pipeline plays, not China-commercial ones.

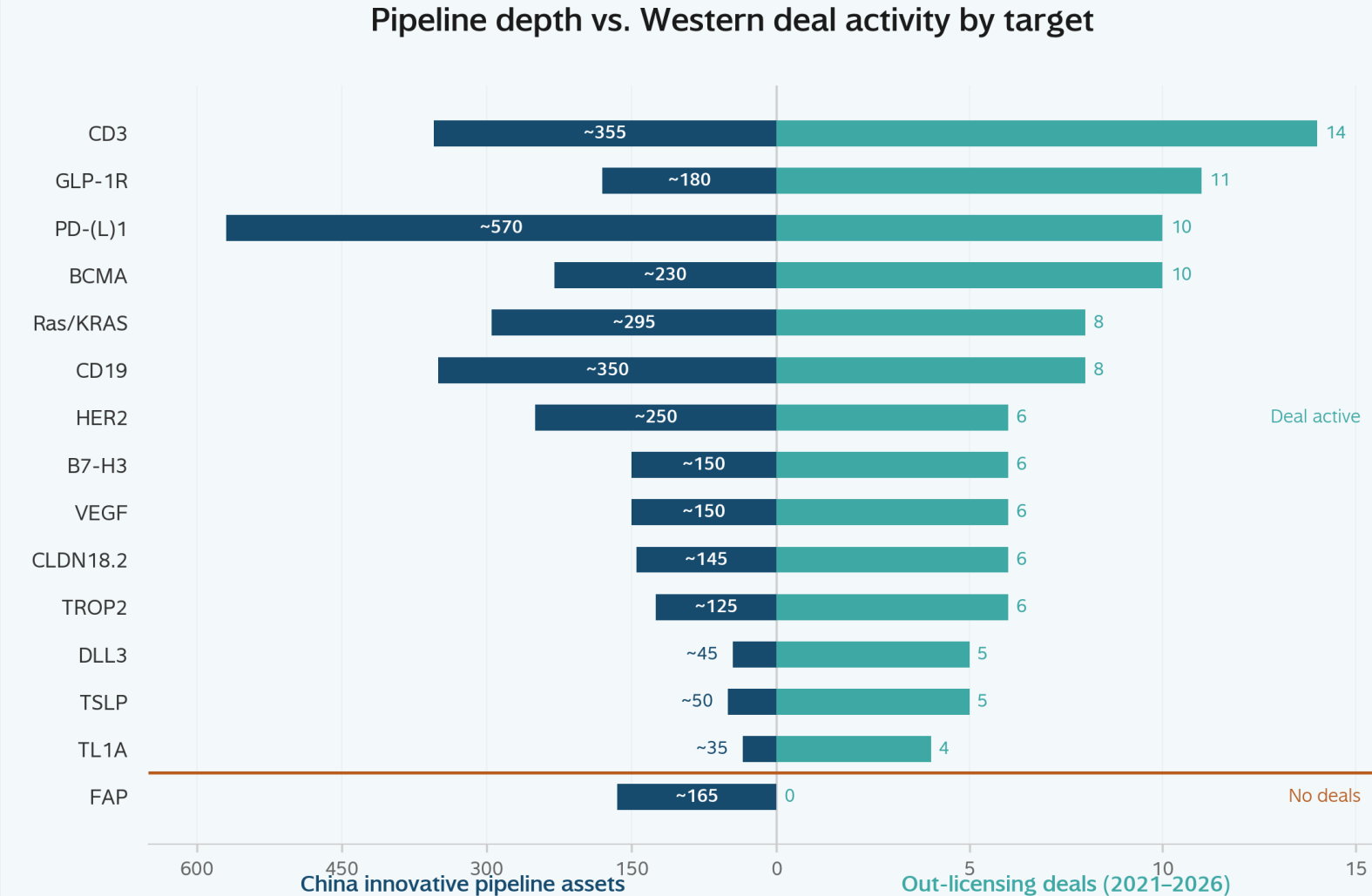
Western licensees by deal count and total disclosed value

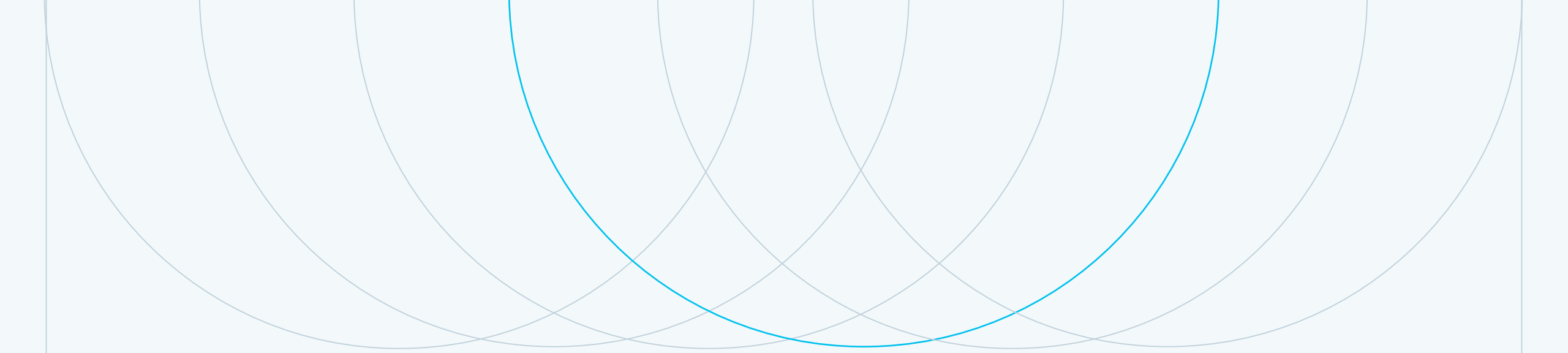


GLP-1R and TSLP punch above their pipeline weight in deals

Pipeline depth does not predict Western deal interest for every target

- GLP-1R attracts ~11 deals from a pipeline of only ~180 assets, the strongest deal-to-pipeline ratio among top targets.
- Ras/KRAS and FAP carry ~460 assets with limited or no deal activity, but Western pipelines (320 and 139 ex-China assets) suggest self-sufficiency rather than structural barriers.
- DLL3, TSLP, and TL1A each carry fewer than ~50 pipeline assets but draw 4 to 5 deals, signaling buyer conviction in select targets where Western pipelines are thinner.
- PD-(L)1 shows deepest pipeline (~570 assets), but most are novel combinations, not monotherapies, explaining why deal interest lags.



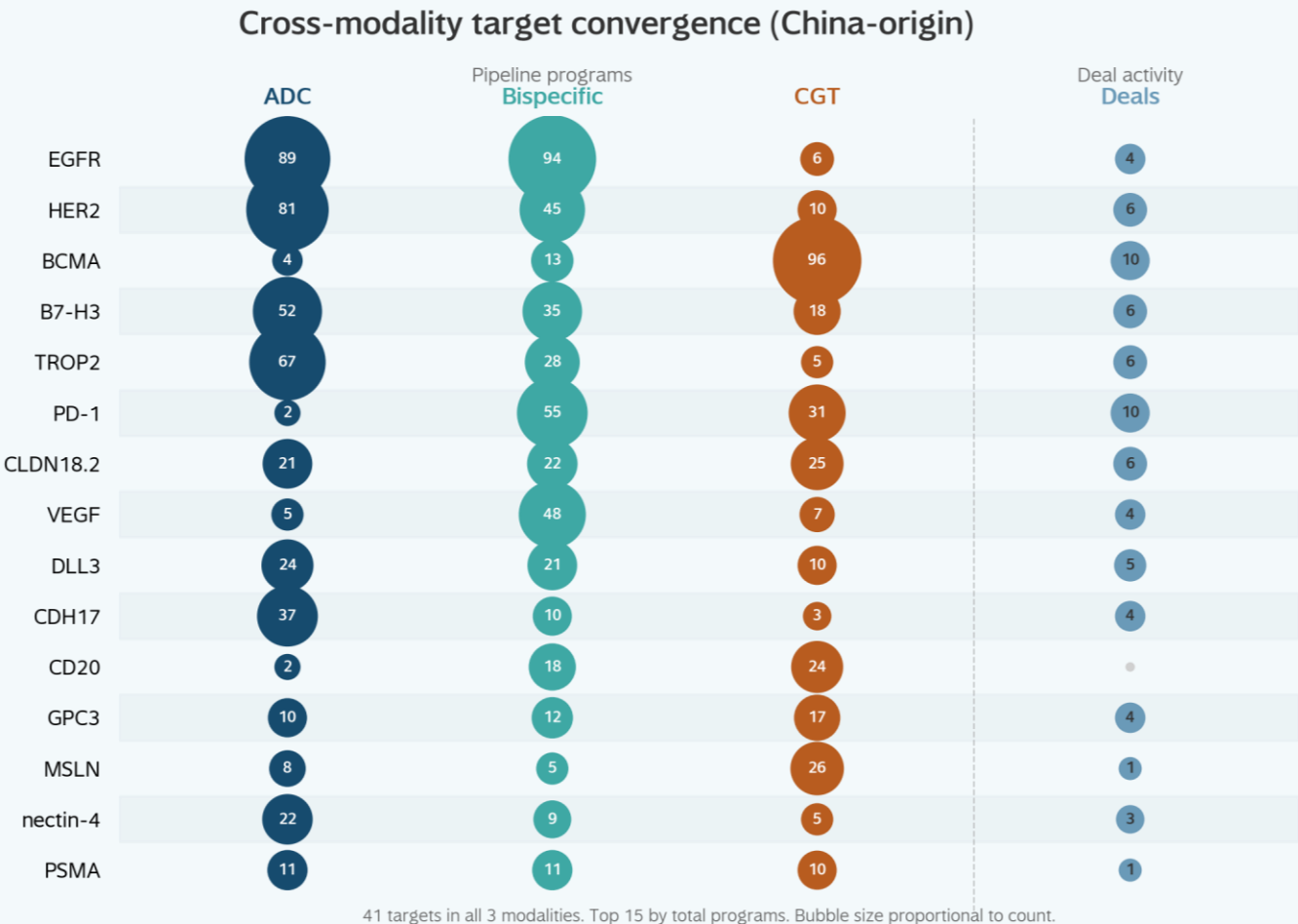


Modality Deep Dives



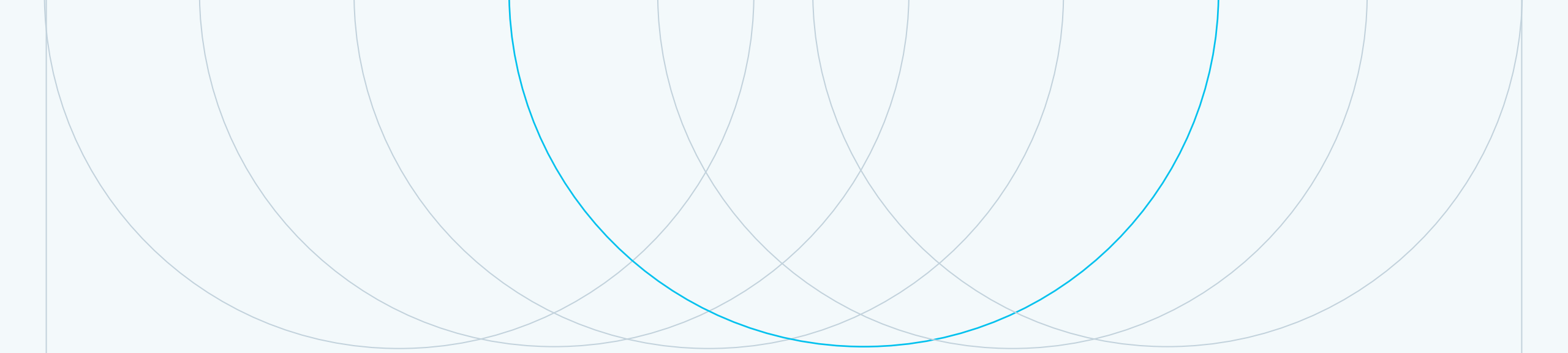
China's target bets cluster where Western pipelines are thinnest

Cross-modality convergence signals durable originator commitment, not duplication



- EGFR, HER2, and BCMA each exceed 100 programs across all three formats, creating layered competitive moats that single-modality entrants cannot match.
- Convergence shape reveals strategic intent: ADC/bispecific-led targets like EGFR signal combination plays, while CGT-led targets like BCMA signal curative positioning.
- Western deal teams are selectively accessing convergence targets but overlooking CD20 entirely, leaving ~44 China-origin programs with no Western development path.
- Targets appearing in all three modalities are the leading indicators of where China-origin assets will define competitive standard.





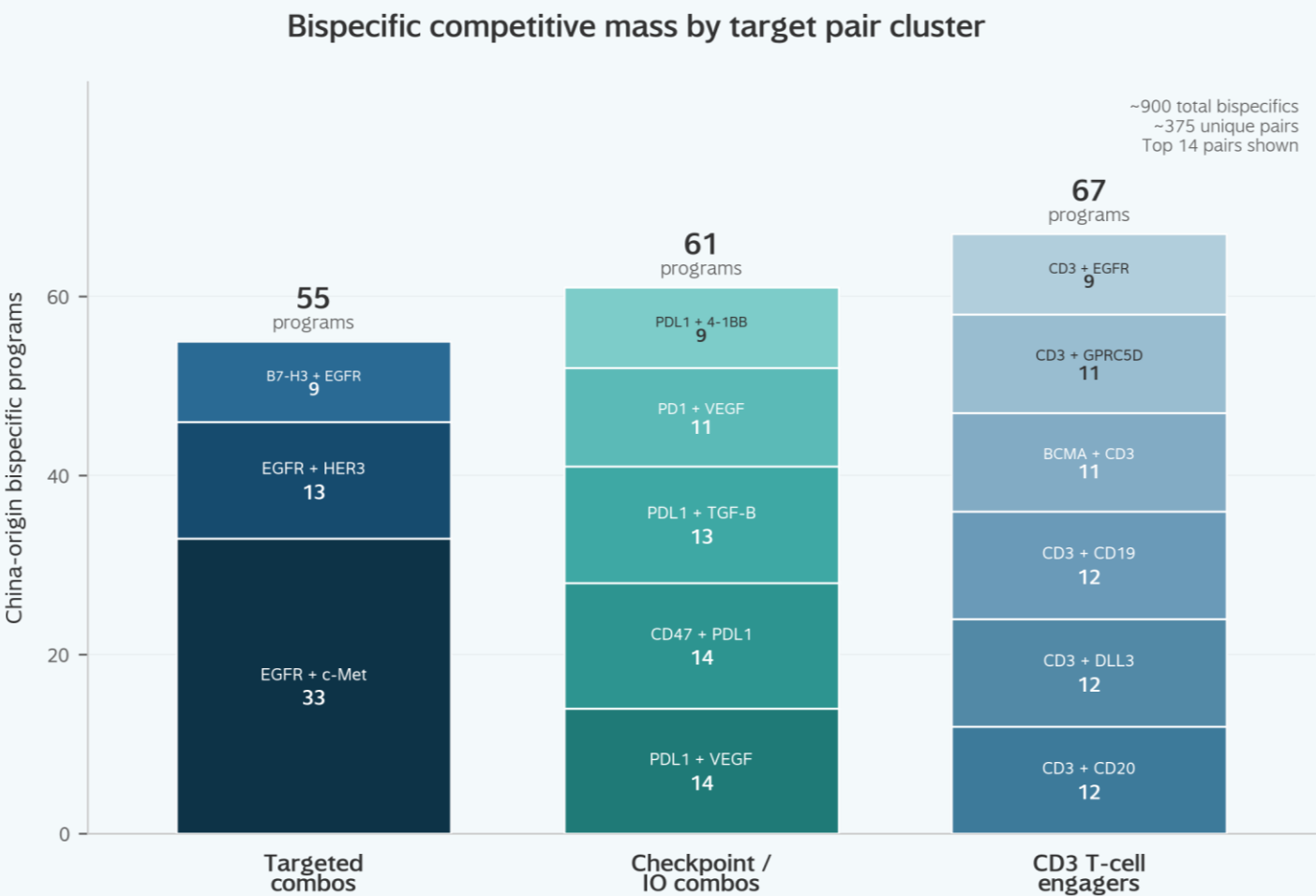
Deep Dive: Bispecifics



China's ~900 bispecifics cluster into three competitive mechanisms

Three mechanism clusters carry similar total mass but internal concentration varies dramatically

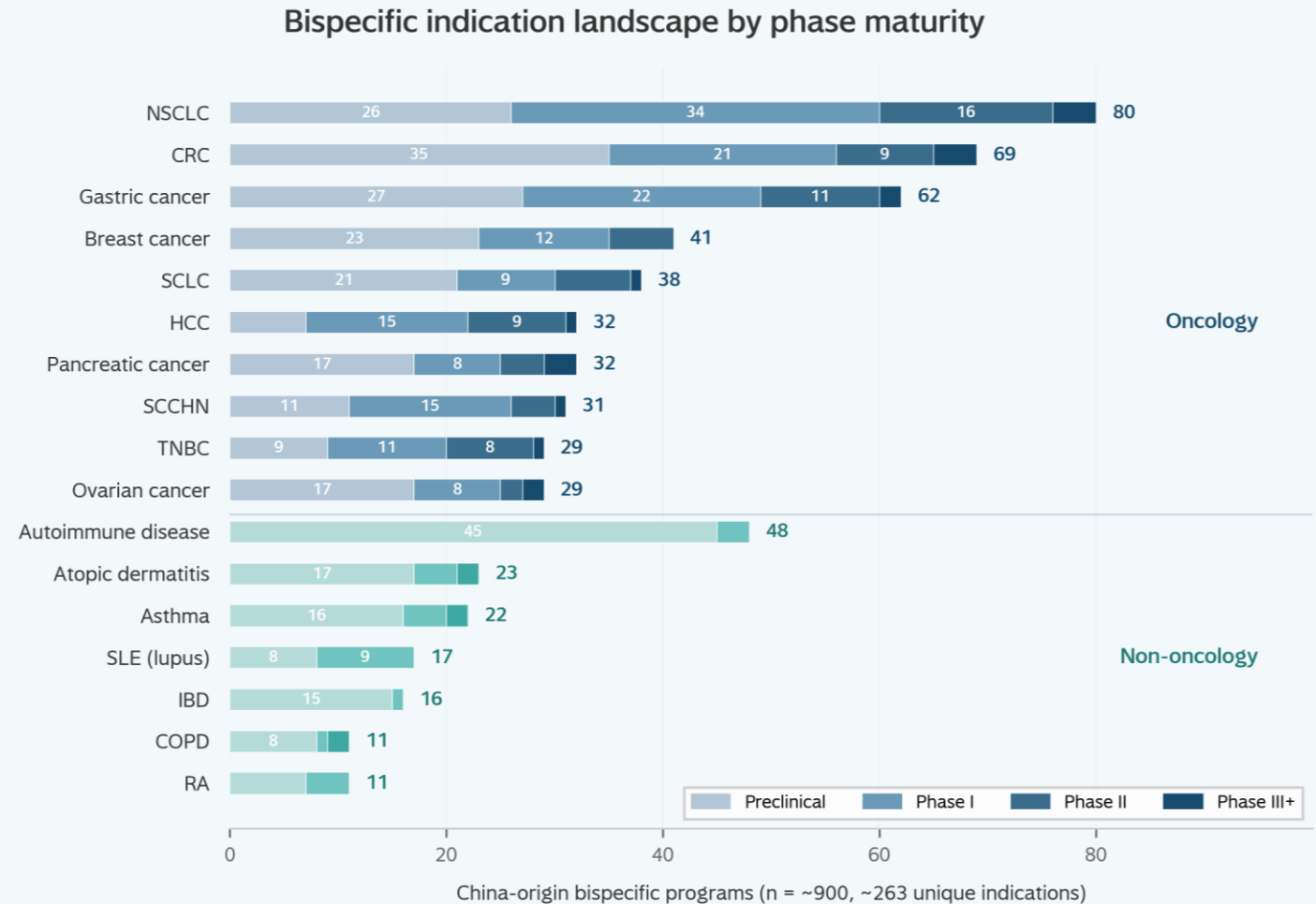
- ~900 China-origin bispecifics represent ~48% of the global pipeline, grouped here into three clusters by mechanism.
- EGFR + c-Met accounts for 33 of 55 targeted combo programs (60%), the most concentrated position across all clusters.
- Checkpoint/IO and CD3 T-cell engager clusters distribute evenly across 5-6 pairs each, with no single pair dominating.
- All three clusters carry similar total mass at 55-67 programs, but targeted combos are a one-horse race while the others reward breadth.

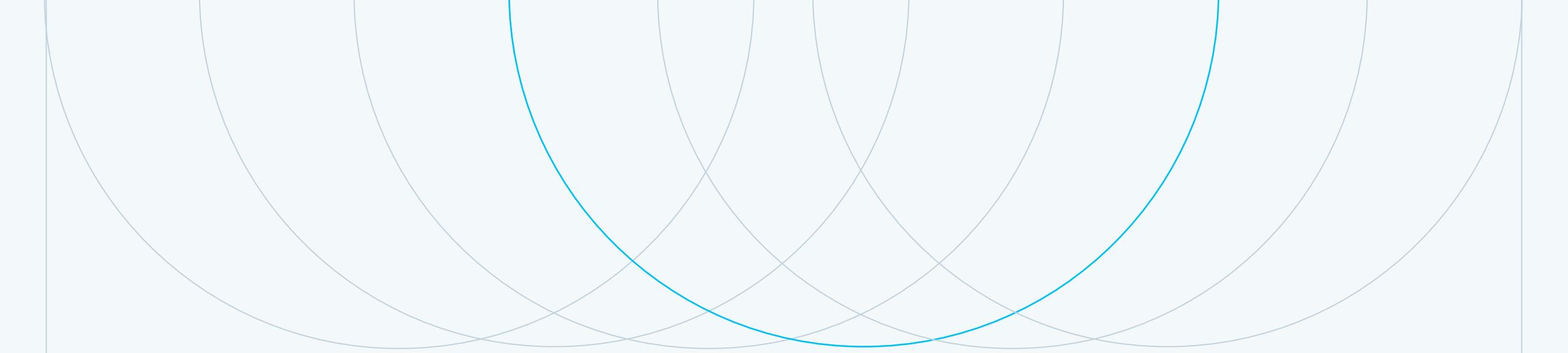


Unlike ADCs, bispecifics show real non-oncology depth

Non-oncology is 73-94% preclinical, a forming wave not yet in clinical competition

- NSCLC has 4 Phase III+ programs, putting China-originated bispecifics into registrational competition with Western assets within 12-18 months.
- Autoimmune at 94% preclinical is deceptively early: deals are already flowing into this corridor and CDMO infrastructure will compress IND timelines.
- HCC at 78% clinical-stage is the acceleration template for any indication with large Chinese patient pools and single-arm registration pathways.
- Non-oncology bispecifics open a second front, forcing Western companies to monitor China across oncology and autoimmune portfolios simultaneously.



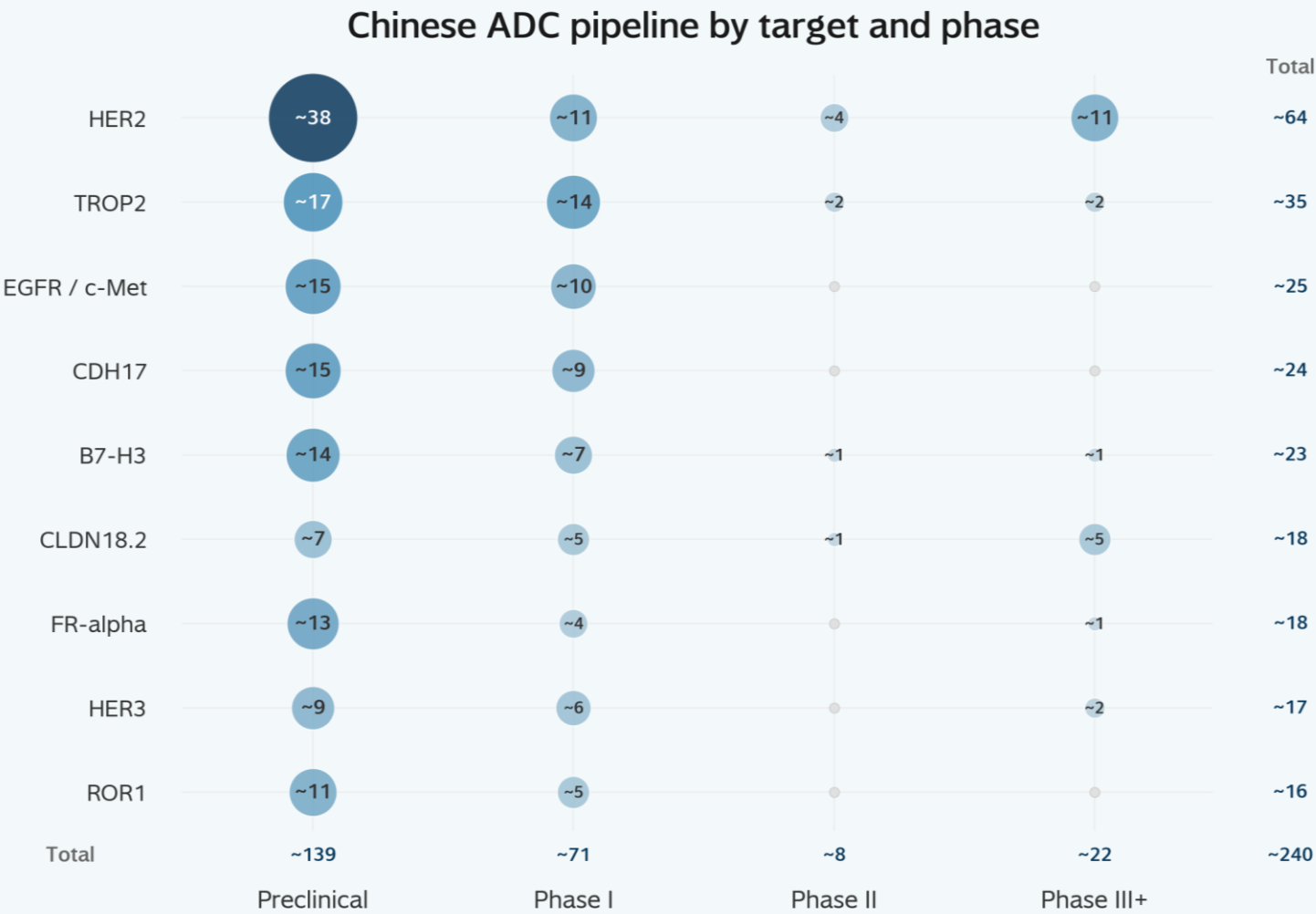


Deep Dive: ADCs



China's ~865 ADCs spread across ~150 targets with no target exceeding ~10%

The top 9 named targets account for only ~240 assets, leaving the majority scattered across a long tail

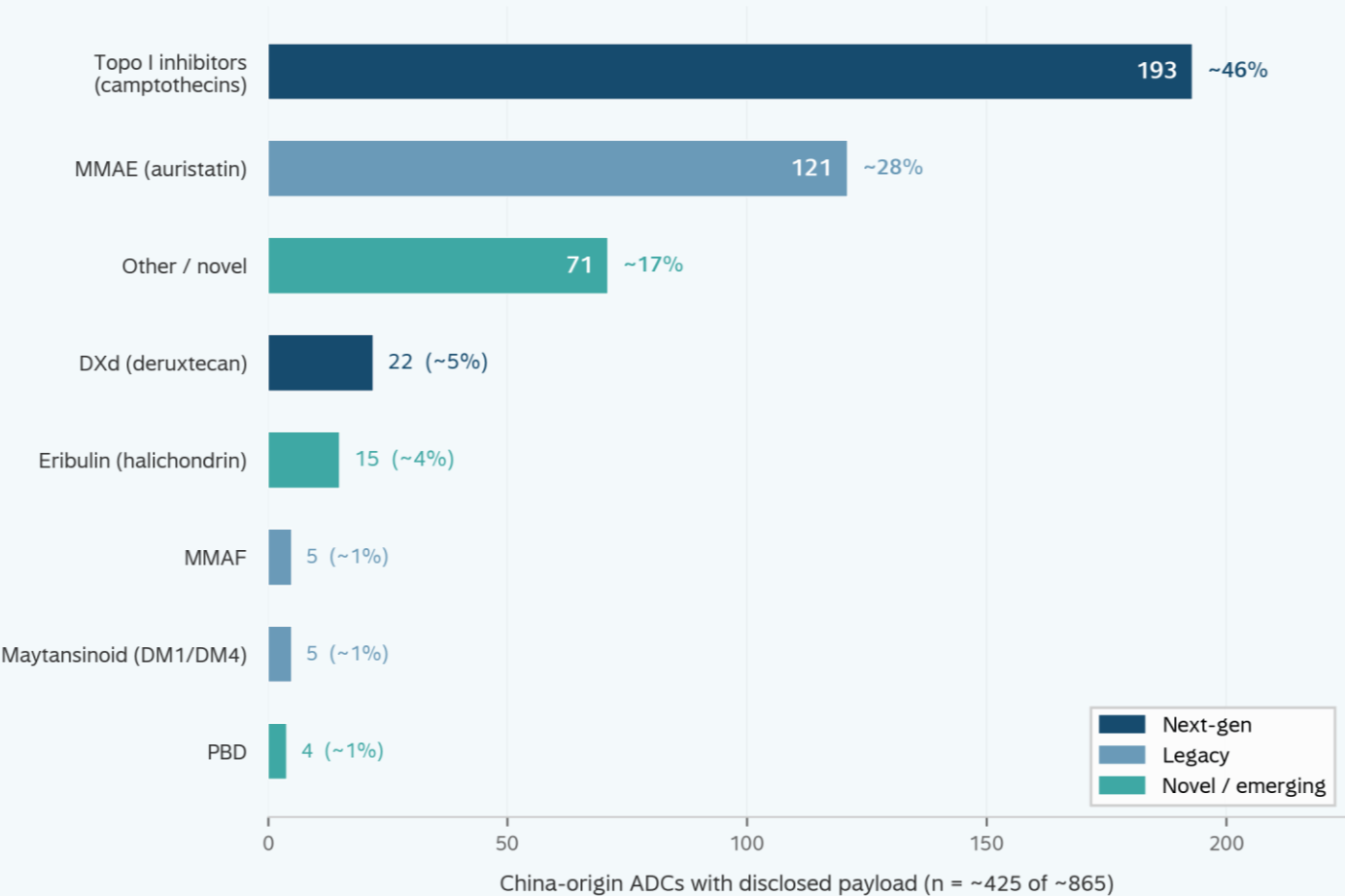


- The top 9 targets account for only ~28% of ~865 China-origin ADCs, with ~625 programs spread across ~140+ other targets. Fragmentation, not concentration.
- HER2 is the closest thing to a crowded target at ~64 assets (~7% of total) and the only one with depth across all four phase stages.
- CLDN18.2 shows disproportionate advancement: ~5 late-stage assets from just ~18 total, the highest conversion rate among the top 9.
- Phase II is sparse (~8 assets across the top 9), suggesting a funnel bottleneck. Three targets have zero assets beyond Phase I.

Topo I inhibitors have overtaken MMAE as China's dominant ADC payload

~49% of China-origin ADCs disclose payload data, revealing a generational shift

ADC payload distribution by technology generation



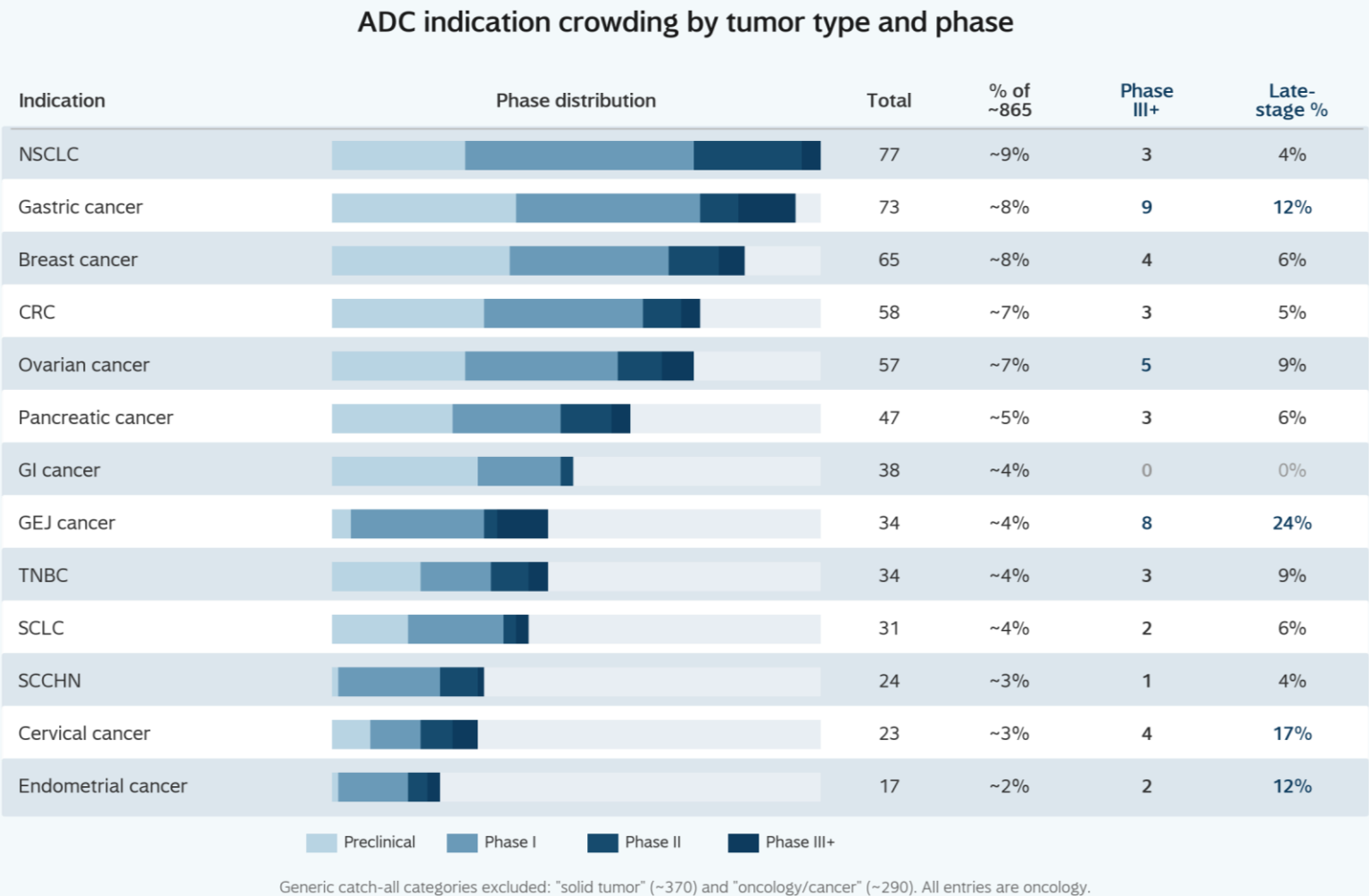
- Topo I inhibitors account for 193 of ~425 tagged ADCs (~46%), with MMAE trailing at 121 (~29%) after a rapid generational shift.
- Enhertu and Trodelvy validated the payload class commercially, and China's established camptothecin chemistry supply chain made the pivot natural.
- 71 ADCs carry novel or undisclosed payloads, signaling a second diversification wave beyond both the Topo I and auristatin platforms.
- MMAE at ~29% reflects first-generation chemistry where the narrower therapeutic window limits further differentiation.

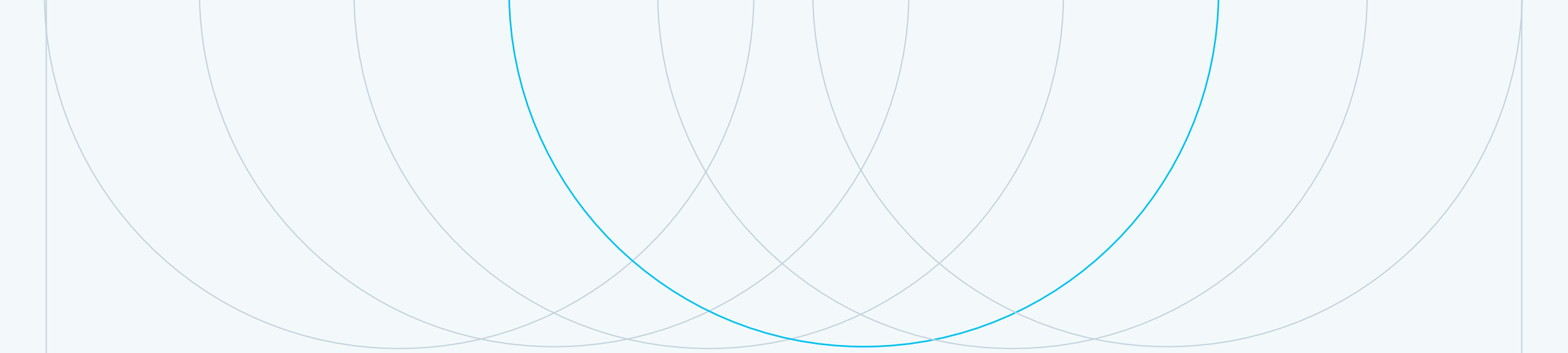


Early-stage crowding masks late-stage concentration in select ADC indications

13 top tumor types show very different competitive dynamics when filtered by development stage

- NSCLC crowding is largely illusory for late-stage competition, with only 3 of 77 programs at Phase III+ (4%).
- GEJ cancer at 24% late-stage rate signals the most imminent competitive saturation of any top ADC indication.
- Gastric cancer leads absolute Phase III+ count at 9 programs, making it the highest-stakes near-term approval battleground.
- GI cancer remains wide open beyond Phase II, with zero late-stage programs despite 38 total in development.





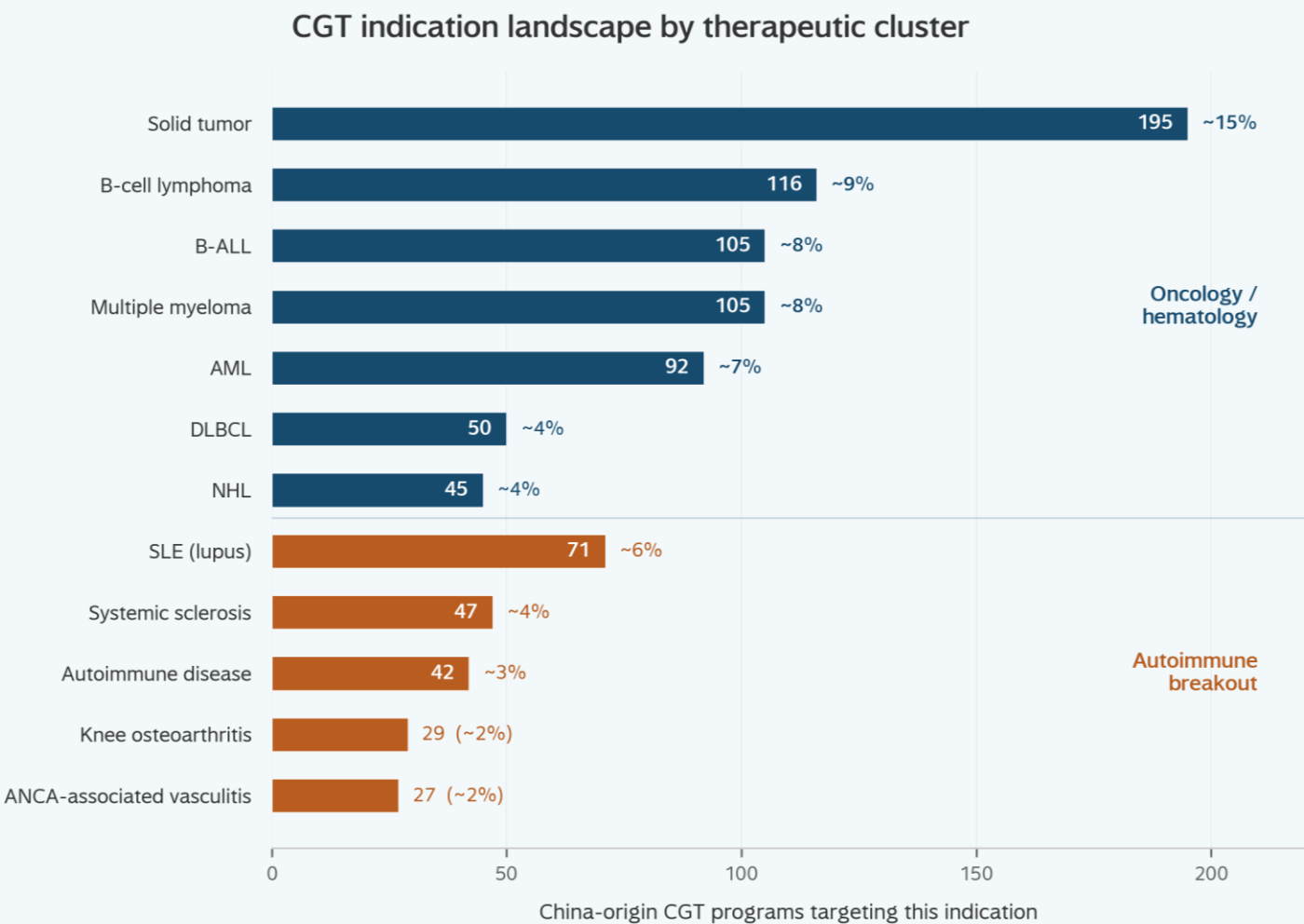
Deep Dive: Cell and Gene Therapy



Hospital-based manufacturing gives China first-mover position in autoimmune CGT

Hematology built the infrastructure that autoimmune indications now exploit at clinical scale

- China's 71 SLE programs reflect hospital-based CAR-T manufacturing pivoting into autoimmune, where rapid IIT enrollment creates first-mover datasets globally.
- Spread into systemic sclerosis and vasculitis signals durable infrastructure redeployment, not a single-indication experiment.
- 542 unique indications mean China-origin programs will produce first clinical data in dozens of niche settings, creating de facto evidence before Western competitors enter.
- Gene therapy indications remain underrepresented relative to CAR-T, suggesting China's CGT advantage is infrastructure-dependent rather than broadly modality-wide.



Clinical-stage CGT is China's most therapeutically diverse modality

Hospital-based manufacturing underpins dominant China shares across targets

Chinese clinical-stage cell and gene therapy pipeline by target

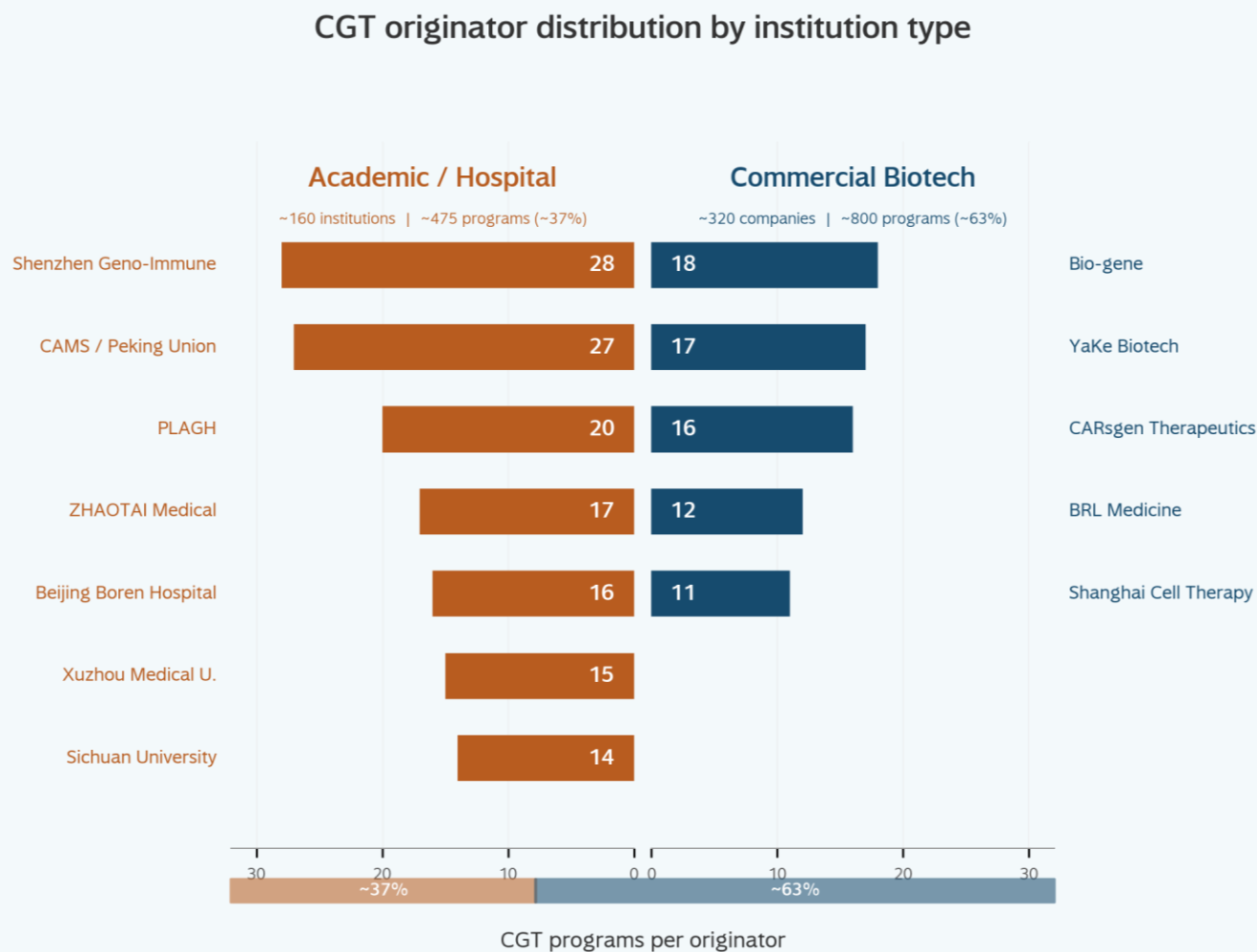
Category	Target	China Assets	Global Assets	China Share	Platform
Hematology	CD19	~115	~215	~55%	CAR-T, TCR-T, and NK cell platforms
	BCMA	~40	~75	~50%	Predominantly CAR-T
	BCMA + CD19	~35	~45	~80%	Dual-target CAR-T, China near-monopoly
	CD19 + CD20	~15	~30	~45%	Dual-target CAR-T
	CD19 + CD22	~15	~30	~50%	Dual-target CAR-T
Solid Tumor	CD7	~25	~30	~80%	T-cell malignancy CAR-T, China-dominated
	CLDN18.2	~20	~25	~80%	Gastric and pancreatic CAR-T
	GPC3	~15	~25	~55%	Hepatocellular carcinoma CAR-T
	MSLN	~15	~25	~60%	Mesothelioma and ovarian CAR-T

- China holds ~80% share in three distinct niches: dual-target CAR-T (BCMA+CD19), T-cell malignancy (CD7), and gastric/pancreatic (CLDN18.2), each reflecting different China-specific clinical advantages.
- ~42 programs have reached Phase III or beyond, including two approved CD19 CAR-Ts and CARsgen's CLDN18.2 CAR-T at filing, signaling conversion from clinical volume to registrational progress.
- Gene therapy remains a white space at ~20% China share versus ~45 to 50% for cell therapy, requiring infrastructure (AAV manufacturing, CNS/ophthalmology endpoints) outside China's hospital-based ecosystem.



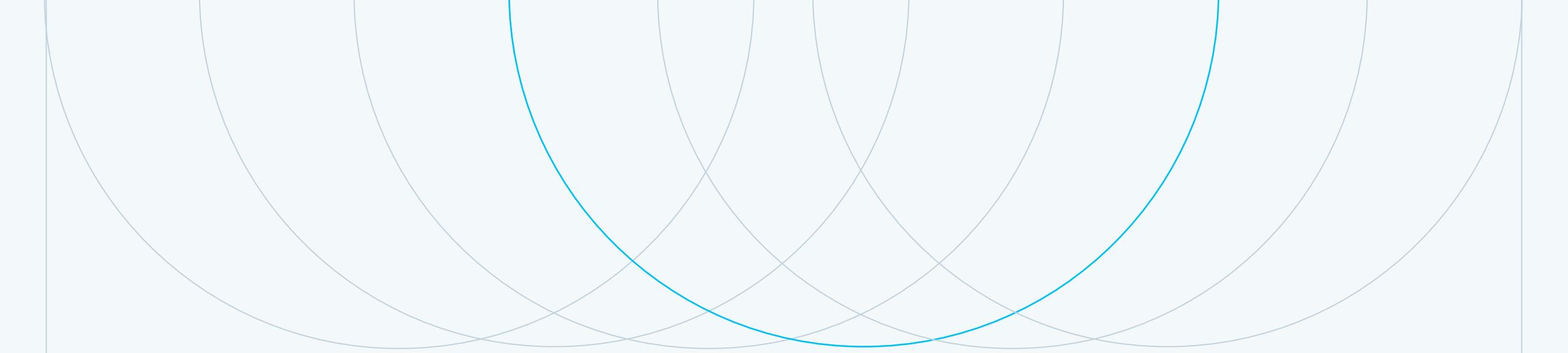
~160 academic hospitals originate 35 – 40% of China's CGT pipeline

CGT's development ecosystem is structurally unlike ADCs or bispecifics



- Academic hospitals and research institutes originate ~37% of China's CGT pipeline, a development model with no parallel in ADCs or bispecifics.
- The largest academic originators run 28 programs each, outpacing every commercial CGT company in the dataset by a wide margin.
- Of ~478 CGT institutions, 419 appear in CGT only with just 16 spanning all three modalities, so existing partnerships won't open CGT doors.
- Western BD teams evaluating CGT assets often face hospitals as counterparties, requiring different diligence around IP and deal structure.





Strategic Imperatives



Strategic imperatives for Western pharma navigating Chinese competition

Navigating these answers requires a data partner. Here is where to start.

Strategic imperatives for Western pharma

01

Position portfolios synergistic with China's out-licensing flow

335+ deals are the signal. AZ, Merck, Novartis, and GSK have placed bets across oncology, metabolic, and I&I. Read the deal map to find where opportunities remain.



"Which oncology targets have 5+ China out-licensing deals but no Top 20 pharma buyer yet?"

02

Build for BIOSECURE optionality

~40% of translation barriers are policy-sensitive. Deals structured today without fallback provisions and vendor-switchable CMC are priced for a regulatory environment that may not exist tomorrow.



"Which of the ~177 Chinese sellers have active US IND filings and non-BIOSECURE-flagged CMO partners?"

03

CGT autoimmune pivot will produce licensable data first

China's 71 SLE, 47 systemic sclerosis, and 27 AAV programs will generate first-mover datasets before most Western programs reach the clinic.



"Show me China CAR-T programs in SLE with clinical data expected in the next 18 months"



Strategic imperatives for Western biotech navigating Chinese competition

Systematic intelligence is how you navigate the complexity

Strategic imperatives for Western biotech

01

Lean into translation advantage, not target novelty

A US biotech with a clean CMC package and Phase II data in a crowded target (HER2, TROP2, PD-L1 combos) has a differentiated position. Regulatory readiness is the moat, not the target itself.



"How many China HER2 ADCs have US IND filings vs. my program's current phase?"

02

The translation gap is your moat

>95% of approved Chinese assets have no US approval. The 19% to 3% erosion rate means Western regulatory, CMC, and evidence-generation capabilities remain the bottleneck.



"For [my target], how many China-origin assets exist and what's the highest US development phase?"

03

Target fragmentation means diligence, not avoidance

ADCs spread across 150+ targets, bispecifics span ~375 unique pairs. The landscape is diversified, not concentrated. Scanning the long tail systematically is the only way to find differentiated assets before a competitor does.



"Show me ADC targets with fewer than 5 China programs but at least one entering Phase II"



Sleuth predictions: China biopharma through 2029

Our read when we look beyond the data

1. **The Phase I/II fault line becomes a permanent two-track market:** Most Chinese firms will stay in early-stage discovery. China's domestic market does not pay premium prices for innovative drugs, making out-licensing more lucrative than end-to-end development even as competition intensifies.
2. **Autoimmune CAR-T is where China sets the global clinical standard:** SLE and systemic sclerosis will be the first domains where China-origin datasets define standard of care. Hospital-based CAR-T manufacturing and rapid IIT enrollment give Chinese investigators first-mover clinical evidence.
3. **The fragmented seller market consolidates around ~30 "export-grade" platforms~177 sellers today:** A short list will emerge as Western buyers learn which firms meet FDA CMC standards, maintain BIOSECURE-clean supply chains, and run multi-ethnicity Phase I studies.
4. **A washout is coming in early-stage ADCs and bispecifics:** BD teams should keep valuations disciplined over the next 12-18 months. Programs that survive will command a premium once the field thins.
5. **Volume dominance will not equal value capture:** China and AI compress the cost of making molecules, but the bottleneck shifts to novel target identification upstream and differentiated global registrational studies downstream. China's influence is strongest in the middle: fast, cost-efficient Phase I PoC.



Sleuth helps biopharma teams get to conviction faster on strategic questions

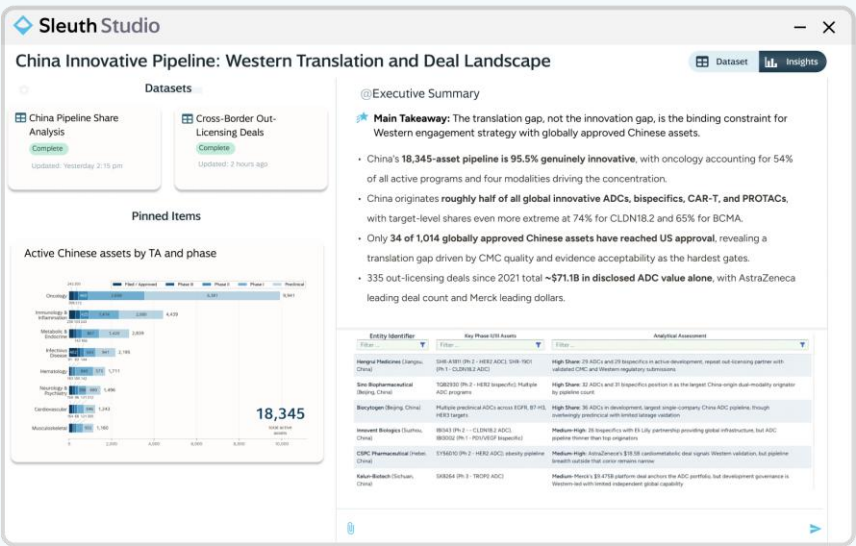
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Main Takeaway: The translation gap, not the innovation gap, is the binding constraint for Western engagement strategy with globally approved Chinese assets.



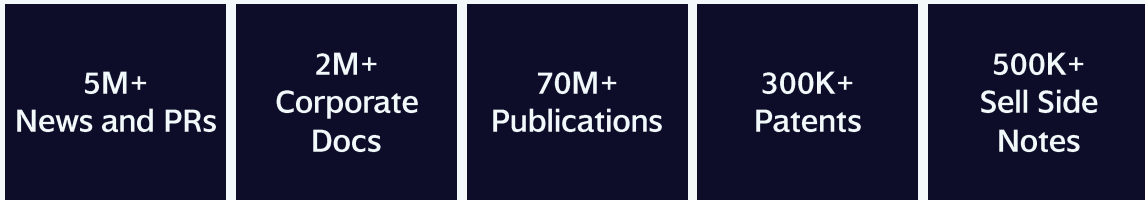
Intelligence you can stand behind

Bring Sleuth your questions, and pre-connected intelligence surfaces automatically. Our knowledge graph connects data across the landscape, with full traceability.

Structured core data



Enriched with source documents



Connected by billions of edges



Case study: Epana Bio indication prioritization

What happens when you evaluate 167 indications with the same effort as six? [Read the full case here.](#)

Stakes: Epana Bio needed to make a high-stakes decision on which indications to pursue first for their targeted cell depletion therapeutics.

167 Indications evaluated

Challenge: Standard evaluation is often limited by bandwidth, forcing teams to choose from just a few familiar diseases.

25 Evaluated with a tailored Epana focus that most processes never reach

Approach: Epana ran a comprehensive evaluation of 167 indications, using an iterative framework to challenge scores and pressure-test every assumption.

4 Shortlisted for deep commercial diligence

Outcome: Leadership built the conviction needed to select lead indications and raise capital with an investor-ready narrative.

1 Optimized basket

“All the strategy that used to be proprietary to pharma — the ‘game within the game’ that actually drives strategic decisions — Sleuth made that accessible to a nine-person biotech. **I think it's the most disruptive, amazing thing for small organizations like ours.** A massive, massive unlock.”



Danny Wells, PhD
CEO, Epana Bio