Cell Therapy: Autologous and Allogeneic

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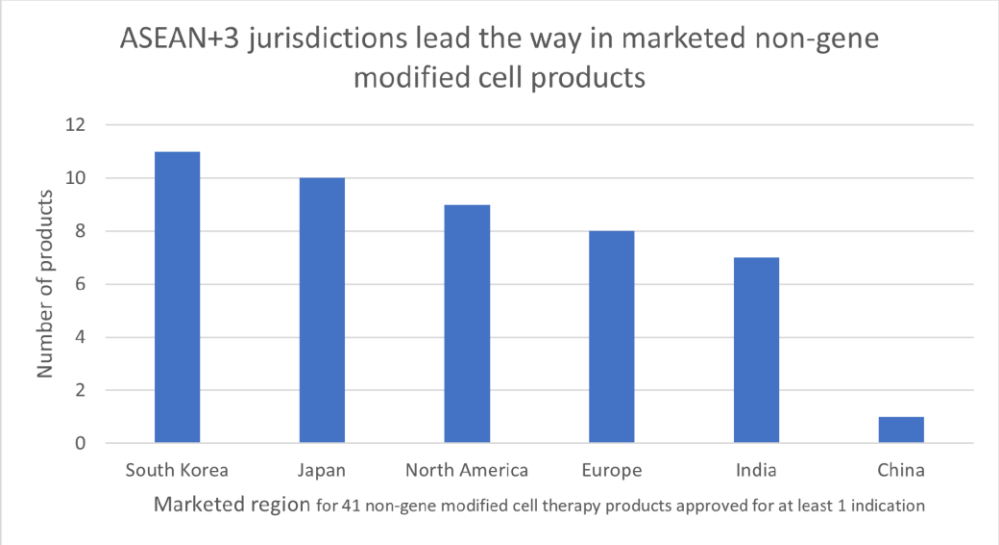
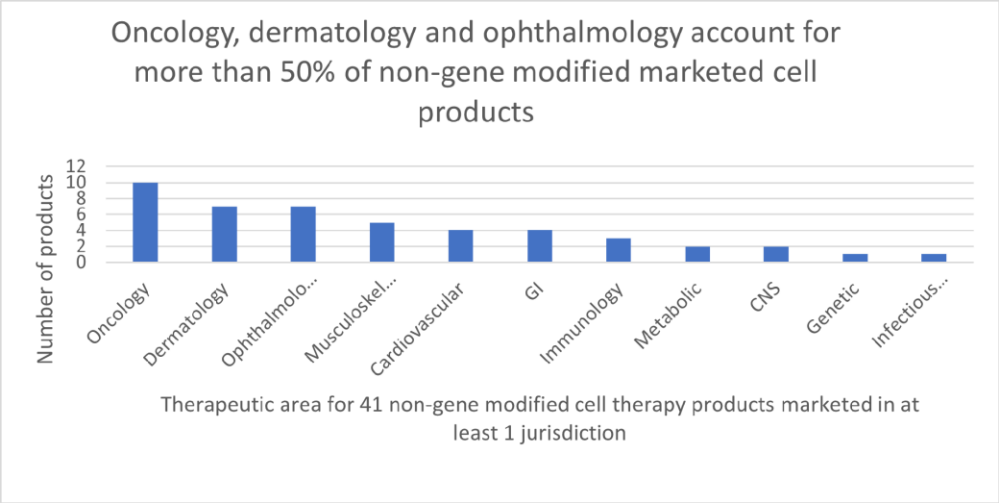
Over the next two issues I will explore cell therapies in brief, including stand-alone cell therapies, to gene-modified cell therapies and finally in vivo/in situ cell therapy technologies.

Cell Therapy Part I – Straight-up, non-gene modified cell products (Autologous and Allogeneic)

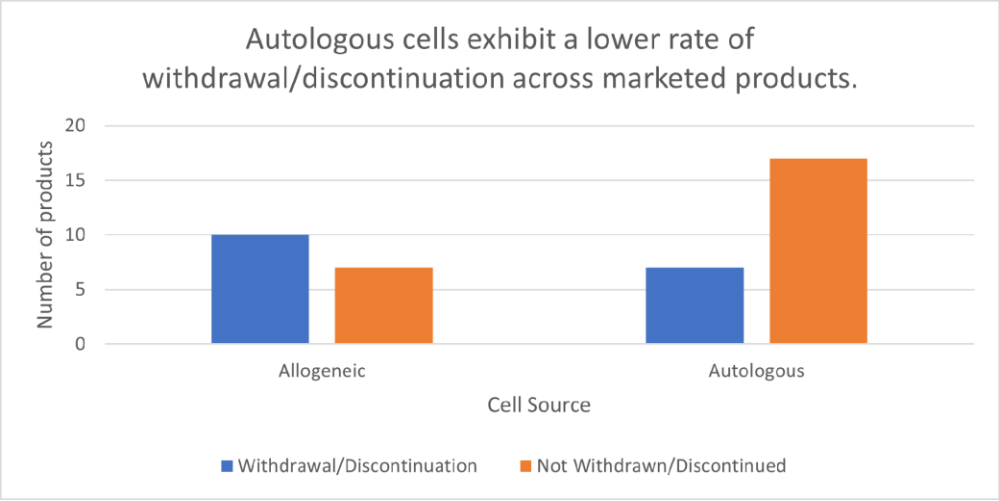
Products having received a marketing authorization for at least one indication in at least one jurisdiction represent some of the earliest cell therapies invented and provide some insights into the dynamics of primary innovation in the space.





Marketed oncology products are primarily found in North America and Europe (7/10, 70%) whereas marketed dermatology and ophthalmology products are primarily found outside of North America and Europe (11/14, 79%) with strong presence in Japan and South Korea (8/14, 57%).

Not surprisingly, autologous cells which were used to pioneer much of the early cell therapy innovation landscape have produced a larger cohort of marketed products.



As expected with such a high global CAGR, near average growth for some treatments is bounded by very much lower and much higher growth for others within a given modality type.

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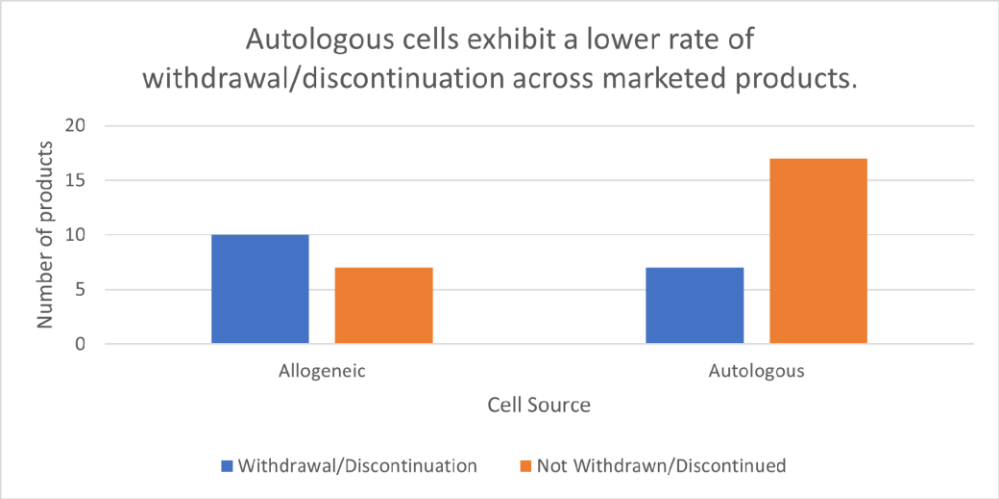
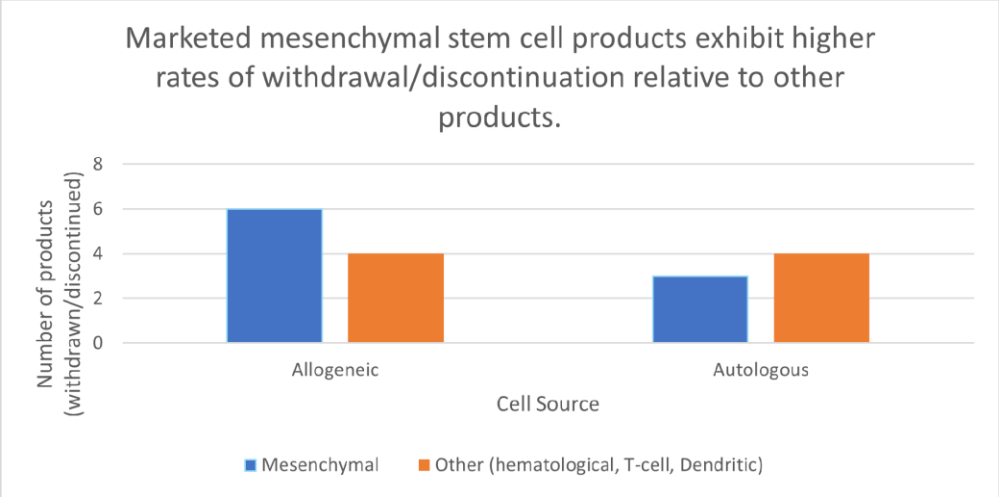


However, within the group of products having at least 1 withdrawal or discontinuation in at least 1 marketed jurisdiction allogeneic and autologous cells appear to track closely. And again, not surprisingly, mesenchymal stem cells, an early cell therapy type, predominate across withdrawn/discontinued products irrespective of cell source.



Indication and regulatory path have a significant impact on product uptake and growth, but sales of non-gene modified cell therapies remain weak across marketed products.

Product	Cell Source	Indication	Review	1st Year Sales	CAGR (next 7 years)	CAGR (2031, 7-year forecast)
Maci	Autologous	Musculoskeletal	Standard	$26M	16.4%	13.8%
Lifileucel	Autologous	Oncology	Fast Track, Priority Review, Accelerated Approval, Orphan Drug, Regenerative Medicine Advanced Therapy Designation (RMAT)	$104M	N/A	23.9%
Sipuleucel-T	Autologous	Oncology	Standard	$48M	-3.70%	N/A

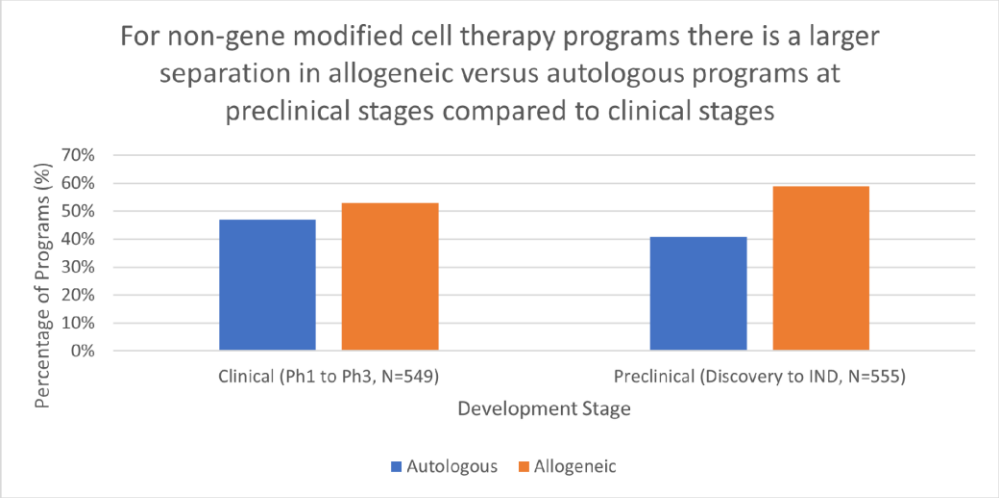
A handful of active pre-registration products highlight continued focus on autologous cell sources and interest in oncology.

Drug Name	Company Name	Therapy Area	Cell Source/Type
CardiAMP	BioCardia Inc	Cardiovascular	Autologous/Bone Marrow
EAL	Immunotech Biopharm Ltd	Oncology	Autologous/Lymphocyte
TRGFT-201	Orca Biosystems Inc	Oncology	Autologous/Hematopoietic

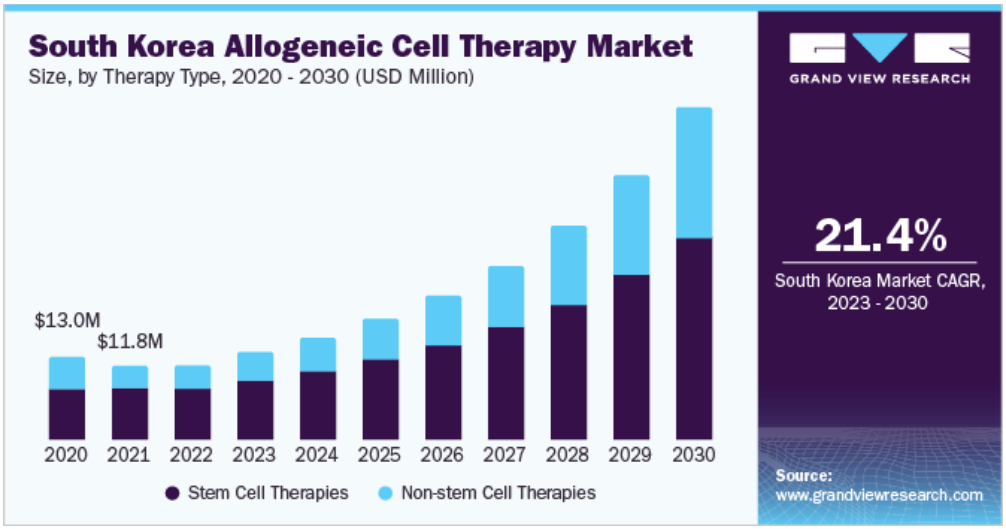
Sumitomo has a pre-registration program in CNS (Parkinson's disease) that is derived from induced pluripotent stem cells (iPSC's). While

directed (de)differentiation of a cell source to a particular lineage can involve epigenetic modifications to cell sources as opposed to direct genetic modification both may be involved and will be covered in next month's piece.

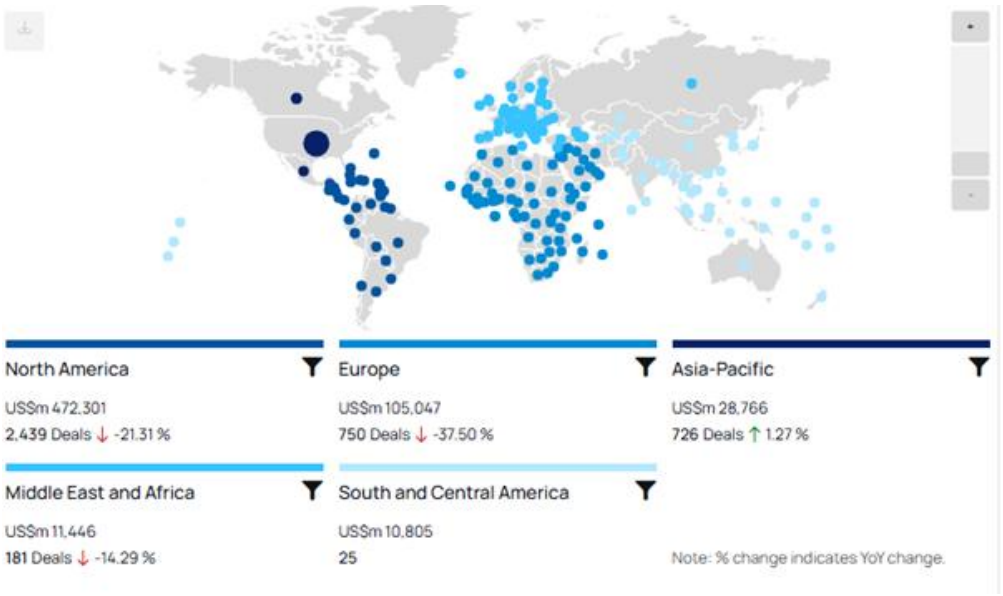
Key issues for non-gene modified cell therapy success are time and cost for therapeutic preparation, product heterogeneity, patient access and efficacy. Despite obvious benefits in immune compatibility, rapid scaling of highly homogenous autologous cell therapies has remained challenging and is driving early innovation in allogeneic cell therapies to address these key issues.



The separation between non-gene modified allogeneic and autologous therapies at the preclinical stage may be even more significant given that a relatively large number of programs may not be disclosed for cell source/type, and allogeneic cell production, and allogenic cell therapy market growth is predicted to rise substantially, particularly in jurisdictions where cell therapy adoption is common.



Historically North America and Europe are the largest markets for deal volume in the cell therapy space. However, the Asia-Pacific region is the only region that exhibited deal growth on a year-on-year basis (2024-2025) in this space (with many Asia-Pacific deals providing rights in the bigger markets of North America and Europe).



Since 2020 deal activity in non-gene modified autologous cell therapies has been very limited. Three notable deals include the Novo Nordisk – Aspect Biosystems deal for bioprinted metabolic tissues ($725M total, $75M upfront) and two deals by Lineage Cell

Therapeutics with Roche and Immunomic Therapeutics for ophthalmic and oncology indications ($739M total, $52M upfront).

Year	Acquirer / Investor	Target / Partner	Deal Type	Deal Value (Est.)	Key Rationale
2021	**Public Market**	**Instil Bio**	**IPO**	**$339M**	Largest TIL-focused IPO; capital raised to advance ITIL-168 (later discontinued) .
2023	**Iovance**	**Clinigen**	**Asset Acquisition**	**~$223M**	Purchase of *Proleukin* rights to secure critical IL-2 supply for TIL commercialization .
2023	**Public Market**	**Iovance**	**Follow-on Offering**	**$161.5M**	Financing to support pre-commercialization activities for *Amtagvi* .

Allogenic deal spaces were more active with some high value partnerships and some high value restructuring following limited efficacy and commercial impacts.

Date	Partners / Entities	Deal Type	Key Financials / Terms	Status (2026)
Nov 2020	**Sanofi / Kiadis**	**Acquisition**	**€308M** (approx. $358M) all-cash offer	Assets impaired/deprioritized by Sanofi in 2024/2025 .
Jan 2021	**Artiva / Merck**	**Collaboration**	**$30M** upfront; up to $1.8B total potential	Terminated by Merck in Oct 2023 .
Jun 2021	**BeiGene / Shoreline**	**Collaboration**	**$45M** upfront for iPSC-NK targets	Terminated by BeiGene in Feb 2024 .
Oct 2021	**Takeda / GammaDelta**	**Acquisition**	Exercise of exclusive option (Undisclosed amount)	Program discontinued by Takeda in Oct 2025 .
Aug 2022	**Glycostem / medac**	**Licensing**	Undisclosed upfront; Exclusive EU/UK rights	Active; *oNKord* in clinical development .
Nov 2022	**Artiva / Affimed**	**Collaboration**	Profit share: **67% Affimed / 33% Artiva**	Active; Lead combination in Phase 2 .
Apr 2023	**Gamida Cell**	**Regulatory**	**FDA Approval** of *Omisirge*	Company taken private by Highbridge in Mar 2024 .
Aug 2025	**Celularity / Celeniv**	**Asset Sale**	**$33.8M** for IP assets + License back	Restructuring to retire senior debt .
Oct 2025	**Takeda**	**Discontinuation**	**JPY 58.2B** (~$400M) Impairment	Exit from internal gamma-delta T cell R&D .
Nov 2025	**CytoMed / TC BioPharm**	**Asset Acquisition**	Acquisition of TCB-002 technology	Active; targeting Asian markets .

To end, and before considering iPSC next month, I'll leave you with a comparative value proposition for both autologous and allogenic cell therapies as we are likely to see more of both given the more mature

stable autologous products in the pipeline, and the plethora of allogenic programs growing to address the autologous shortcomings.

Feature	Non-GM Autologous (e.g. TILs)	Non-GM Allogeneic (e.g. MSCs/NKs)
Primary Deal Driver	**Clinical & Commercial Data** (Revenue, Approvals)	**Scalability & COGS** (Off-the-shelf economics)
Dominant Investor	Public Markets / Specialist Healthcare Funds	Strategic Partners / Debt Financing
Key "Big Pharma" Activity	Low M&A interest; Pharma acts as *seller* of assets (e.g., Clinigen/Iovance)	High partnering interest (e.g., Takeda/TiGenix), though some retreats (Merck/Artiva)
Valuation Metric	Revenue Multiples / Peak Sales Estimates	Clinical Data / Partnership Milestones
Major Strengths	Proven efficacy in solid tumors (Melanoma, Lung) ; Regulatory precedence	Immediate availability; Lower manufacturing costs per dose
Major Weaknesses	Complex, expensive manufacturing; Supply chain fragility	Durability of response; Immunogenicity risks
Recent Trend	**Consolidation:** Failed platforms (Instil Bio, Achilles) exiting or restructuring	**Refinancing:** Leaders (Mesoblast) securing non-dilutive capital to bridge to profitability

iPSC and in vivo cell therapy are going to shake this space up more in the coming years and we will get to that next time.