Research reports of Biotech on Hub&Spoke Model

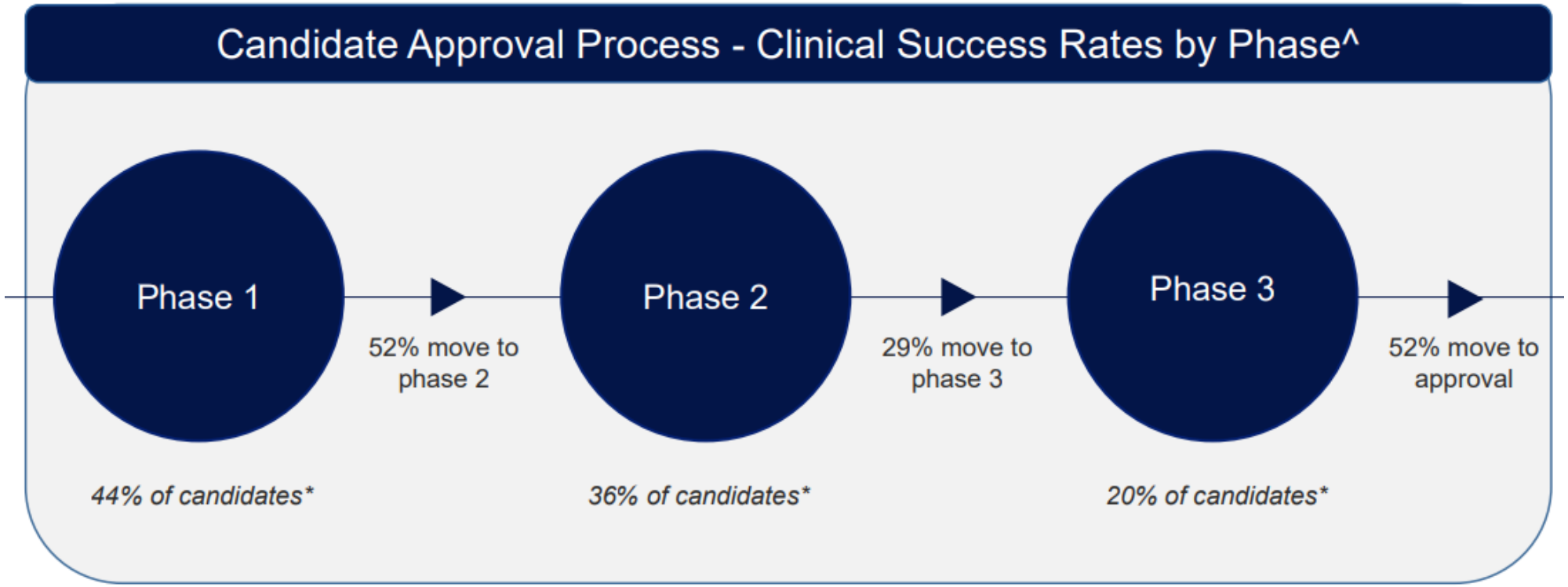
Xiang

XBI since Jan-31-2006

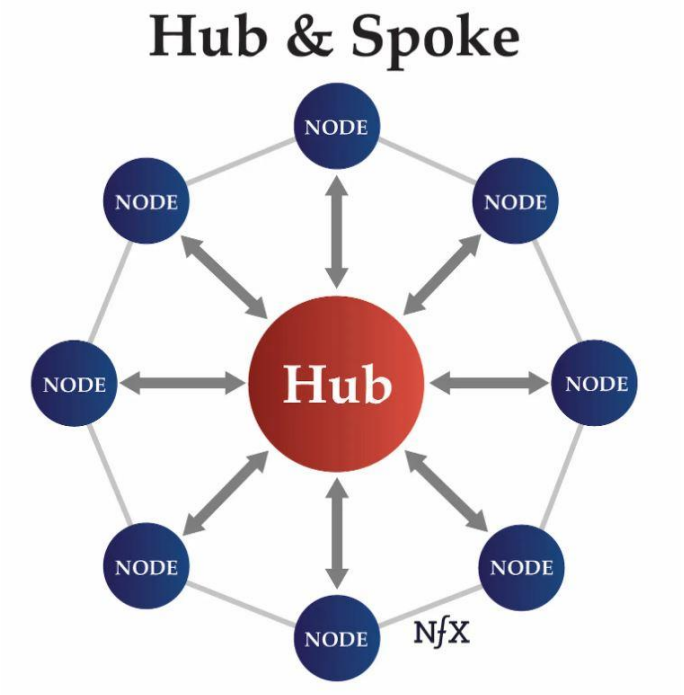
XBI SSGA Funds Management Inc

As of Dec-31-2023$7.0B

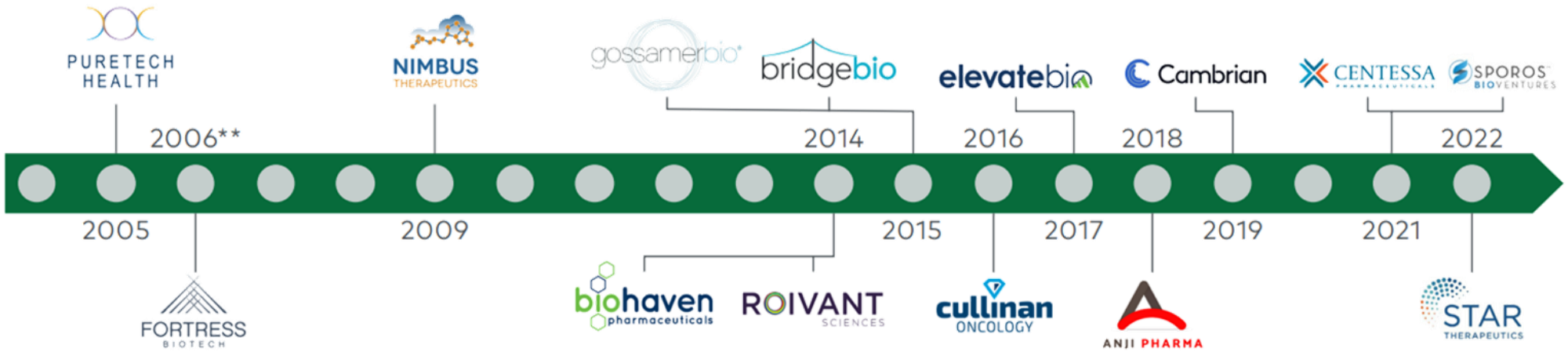
Struggle on drug developments



Emerging Biopharma Trend



$Sticker (Name if private)	Market cap (as 01/31/24, Billion)
$ROIV (Roivant)	7.95
$BBIO	5.9
$BHVN	3.6
$CNTA	0.77
$CGEM	0.76
$PTCHF	0.65
$GOSS	0.19
$FBIO	0.079
ElevateBio	
Nimbus Thx	



Ref: https://www.lek.com/sites/default/files/PDFs/2420_hub-spoke.pdf

FBIO

- **Intro: 10 companies**
- **Ownership:** Market Cap 34 M + 45M FBIOP
  - Chairman 32%, COO 15%, CFO 2.6%, Retail 27.2%,
- **Revenue: 15M/Q from $DERM,**
- **Cost:** -62M/Q , FTE: 20 (5LT, 6 accountant) + subsidiaries
- Sum: from 80M to 300~400M, >3X increase

From SEC10Q 3Q23

Convention:

= cost, = income, =alert

FBIO Pipelines

	Partner Company	Asset(s)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+	Potential Peak Sales* (Global)
+60M	Journey (DERM)	Commercial Portfolio (Qbrexza, Amzeeq, etc.)	$63.1M *Net revenue*	$73.7M *Net revenue*	■	■	■	■	■	■	■	■	●●
		DFD-29 (small molecule for rosacea)				▨■	■	■	■	■	■	■	
+10~100M	Checkpoint (CKPT)	Cosibelimab (anti-PD-L1 mAb for cSCC)				▨■	■	■	■	■	■	■	●●
		Olafertinib (3rd gen EGFRi)					(Asia)						
+100M	Cyprium^	CUTX-101 (copper histidinate for Menkes)	$8M *Milestone*		$4.5M *Milestone*	▲■	■	■	■	■	■	■	●●●
+40M	Caelum**	CAEL-101 (fibril-reactive mAb)	$56.9M *Monetization*			▨▲▨	▨	■	■	■	■		●●●
-10~50M	Avenue (ATXI)	IV Tramadol (small molecule for post-op pain)					▨■	■	■	■	■	■	●●
		AJ201 (small molecule for SBMA)				*Ongoing Phase 1b/2a clinical trial in SBMA*							●●
		BAER-101 (GABAA α2/3 PAM)				*Potential Phase 2a initiation*							●●
+5M	Mustang (MBIO)	MB-106 (CD20 CAR-T for NHL)							▨■	■	■	■	●●●
		MB-109 (CAR-T + oncolytic virus for GBM)							▨■	■	■	■	●●
		MB-117 (gene therapy for XSCID)							▨■	■	■	■	●
		MB-217 (gene therapy for XSCID)							▨■	■	■	■	●
		MB-110 (gene therapy for RAG1-SCID)				*Ongoing Phase 1/2 clinical trial in Europe*							●
+50M	Urica	Dotinurad (URAT1 inhibitor for gout)							▨■	■	■	■	●●●
+50M	Helocyte	Triplex (Cytomegalovirus vaccine)				*Ongoing Phase 1 and Phase 2 clinical trials in various indications*							●●

■ = Anticipated product revenue/royalties ▲ = Potential PRV/milestone/monetization proceeds ▨ = Potential regulatory approval ● **< $500M** | ●● **$500M - $1B** | ●●● **> $1B**

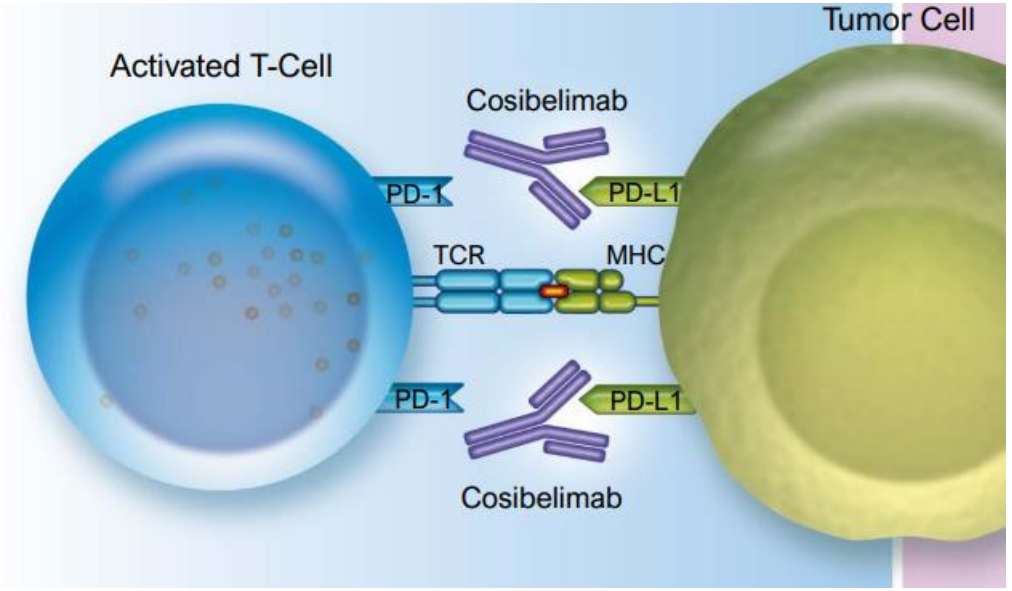
Sum = 305M – 455M vs 34M Market Cap

Journey $DERM for Dermatology

Product	2023 Revenue ($)	2022 Revenue ($)	Change (%)
Qbrexza®	18,038	19,752	-9%
Accutane®	15,109	14,228	6%
Amzeeq®	4,904	5,892	-17%
Zilxi®	1,567	1,851	-15%
Targadox®	2,386	6,558	-64%
Exelderm®	1,813	3,018	-40%
Ximino®	567	3,775	-85%
Luxamend®	21	—	100%

- **Intro:** Treating skin conditions, healing wounds
  - Qbrexza®, Accutane®, Amzeeq®, Zilxi®, Luxamend®,
  - Legacy: Targadox®, Ximino®, Exelderm®
- **Ownership:** Market Cap 60M
  - FBIO 53%, CEO 16.8%, Retail %
- **Revenue: 15M/Q,** 15 yrs 0.5M/yr consulting fee to FBIO, 19M deal Maruho
- **Cost: -22M/Q, 65 FTE (**3LT, 3R&D, 2Admin, rest are sales**)**
- **Pipeline & Market**: *Table
- **FDA:** +50M Approval 2024 DFD-29, BiC for Rosacea vs Oracea, 10~15% royalty to DRL (paid 34M to license from DRL)
- Sum: >110M

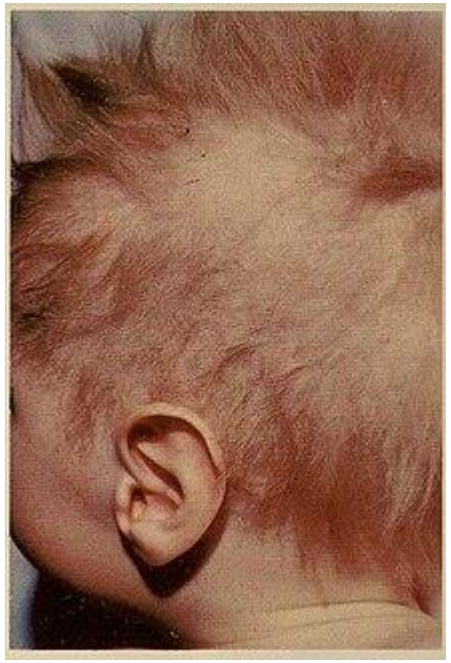
Checkpoint $CKPT



- **Intro:** Treating Cancer: Cosibelimab(PD1)
- **Ownership: Market Cap~46M**
  - FBIO 20%, CEO 2.4%, Retail 70%
- **Revenue: 0,** 15 yrs 0.5M annual consulting fee to FBIO
- **Cost: -11M/Q, ~20FTE (2LT, 15CMC, 2Admin)**
- **Pipeline**: Cosibelimab
- **Market:** ~1.6B shared cSCC
- **FDA:** 1H2024
- Sum: >100M

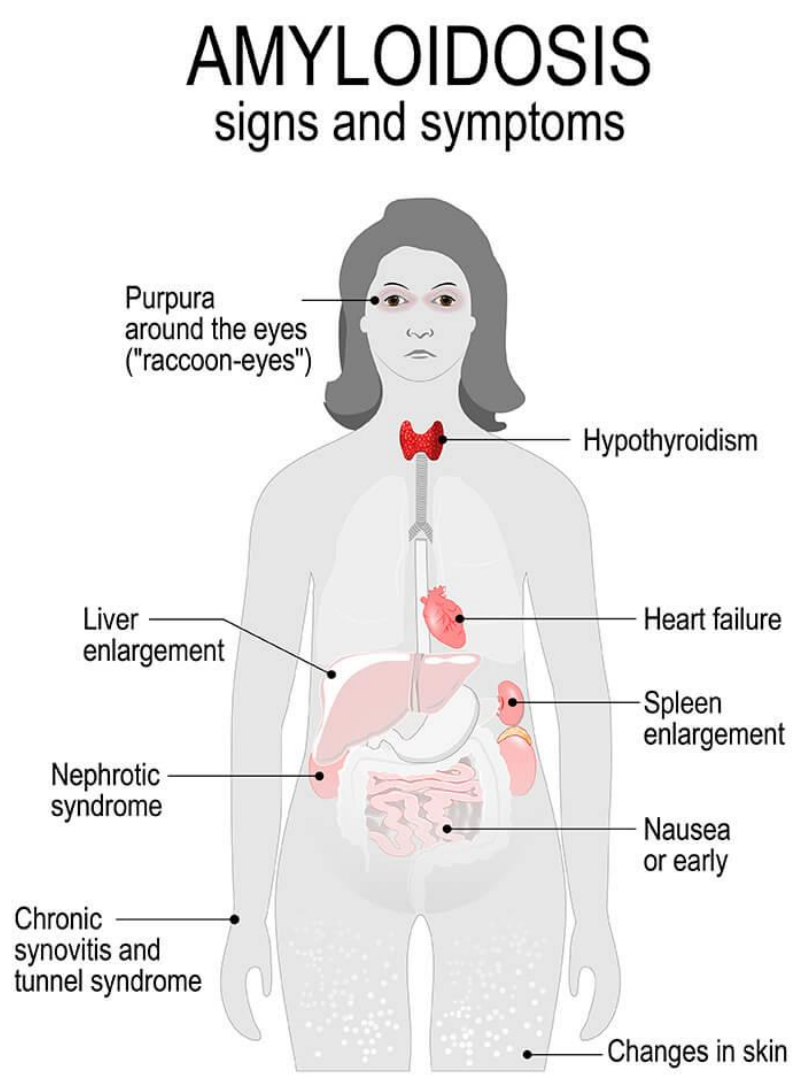
CUTX-101 Cypritum Theraputics

- **Intro: Menkes Disease (ATP7A Mut)**
- **Ownership:**
  - FBIO ~80%,
- **Revenue: 0**
- **Cost:** 0 employee
- **Pipeline**: CUTX-101 (injected twice/day)
- **Market:** ~50~225 patients/yr in US
- **FDA:** Approval 2024 + 100M RPV
- Sum: >100M



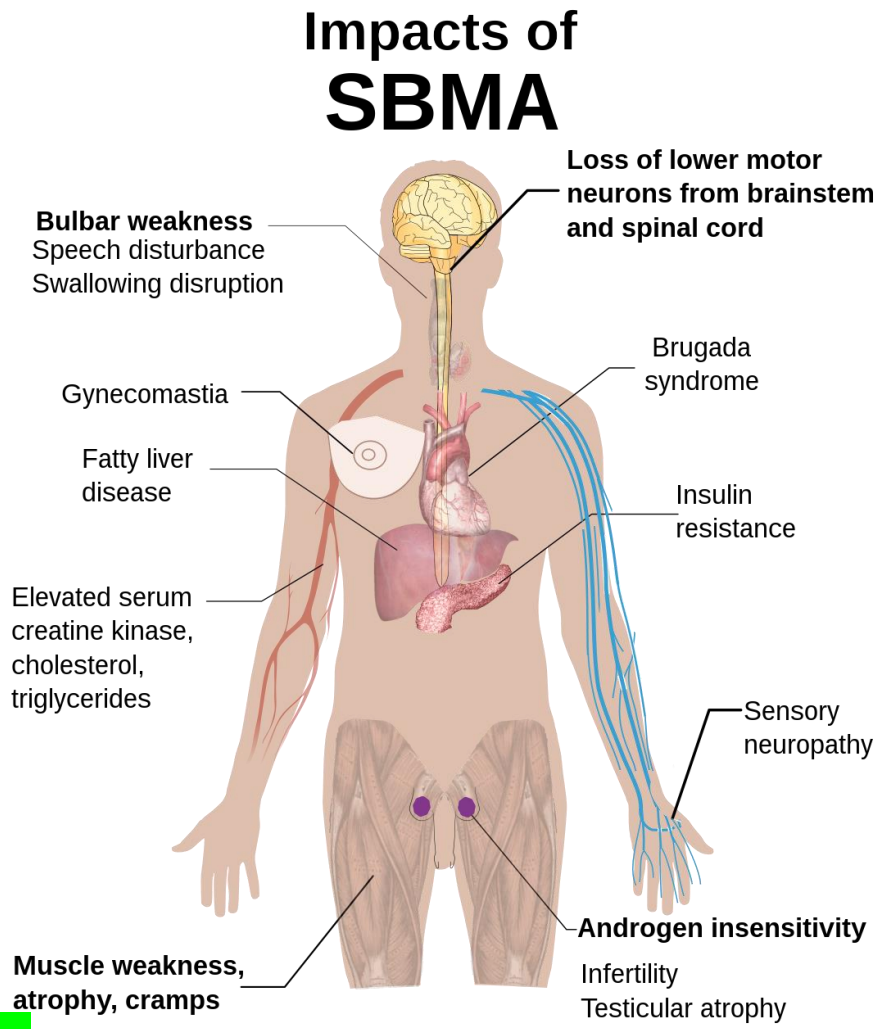
Caelum Biosciences (AstraZeneca) for light chain (AL) amyloidosis.

- **42% of future proceeds to Caelum from AstraZeneca**
- **~56.9M 2021, Another 42M from 100M is normal. Up 147M**
- AstraZeneca's Alexion acquired Caelum Biosciences on 10/5/2021 for up to $500 million, including $150 million upfront and up to $350 million in future contingent milestone payments. FBIO received ~$56.9 million of such upfront amount and is eligible to receive ~42% of the proceeds from all future milestone payments.

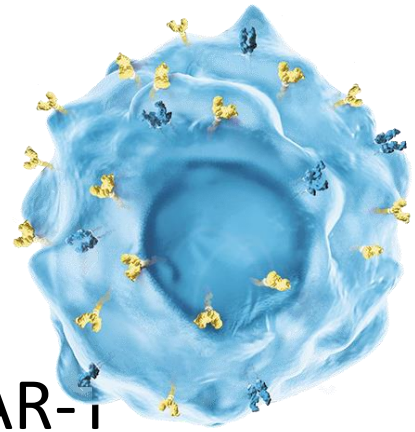


Avenue $ATXI AJ201

- **Intro:** SBMA/Kennedy's Disease: AJ201 (ODD)
- **Ownership:** Market Cap 5M
  - FBIO 20%, CEO <1%, Retail 88% (Robert.D 10%))
- **Revenue: 0,** 15 yrs 0.5M annual consulting fee to FBIO
- **Cost: -3.6M/Q, 10 FTE(5LT, 2CMC)**
  - To FBIO, annual, -3.6*4*12% + 0.5 = -1.23M
  - For all IND development, ~3-4yrs. -5M
- **Pipeline**: AJ201/BAER101/IV Tranmadol
- **Market:** ~shared 1.5B
- **FDA:** 2025 IV Tranmadol, rest 28/29
- **Sum:** Due hub&spoke model, this can be at least 0.5M/yr.



Mustang Bio $MBIO

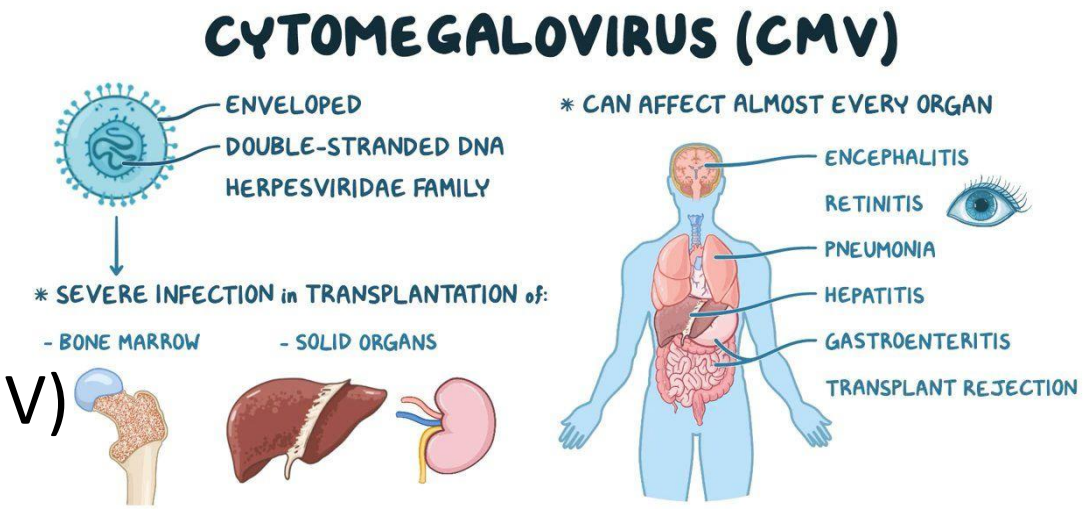


CAR T Cell

The T cell with the CAR added helps find and fight specific targeted cells

- Intro: Non-Hodgkin Lymphoma/CLL CAR-T
- **Ownership:** Market Cap 12.8M
  - FBIO ~30%, retail ~69.9%, CEO 1.2%
- **Revenue: 0,** 15 yrs, 1M annual MSA fee to FBIO
- **Cost:** -14.1M/Q, ~100 FTE (9LT, ~25R&D , ~25clinical),
  - To FBIO, annual, -14.1*4*20% + 1 = -10.8M
  - For all IND development, ~5yrs. -55M
- **Sum: Because of** hub&spoke model, at least 0.5-1M/yr.

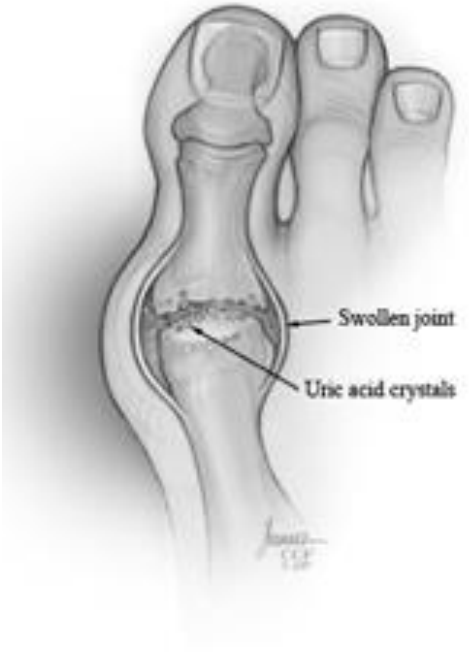
Helocyte Inc



- Immunotherapies for cytomegalovirus (CMV)
- **Ownership:**
  - FBIO ~90% effective
- **Pipeline**:
  - Phase2, 3.22 M Grant from NIH, Phase1b Funded by City of Hope
  - Phase 2: Liver Transplant (2024), funded up 20M from NIH
- **Cost:** 0 employee
- **Market:** ~1.5B shared SOT and HSCT
- **FDA:** ~potential Approval 2027
- Sum: >50M

Urica

- **Intro:** Treat gout and others associated with hyperuricemia
- **Ownership:** Market Cap M
  - FBIO 75%, CEO %, Retail %
- **Revenue: 0,** 15 yrs 0.5M annual consulting fee to FBIO
- **Cost:** 3 FTE (2.5LT),
- **Pipeline**: Dotinurad (approved in Japan, FUJI), oral URAT1 inhibitor
- **Market:** ~4M US gout patients, ~1.4B
- **FDA:** ~potential Approval 2027
- Sum: >50M



Summary of FBIO vs FBIOP

- Series (1 vs 1.09375^yr) Dividends accrue daily (effective 9.8%)
- **1 vs 1.098^yr**

Share Class	Common	9.375% Series A Prefered
# of shares	8.942M	3.427M
Price	$1.8	$13
If holding 3 yrs. 5yrs 10yrs 15yrs	1	1.32 1.60 2.55 4.06