BofA SECURITIES

US Biopharmaceuticals

What to expect in 2024 from each company in our coverage universe

Price Objective Change

Growth oriented Biopharma's to remain in focus for 2024

US Biopharma had a strong year for new product approvals / launches as well as higher M&A activity; but both Pharma (DRG index: +5%) and Biotech (NBI index: +4%) underperformed the broader market (S&P500: +24%). Some of the bright spots came from companies with innovative new product cycles such as Lilly (+59%) and Vertex (+41%) which we expect to continue looking to 2024. Moreover, we suspect the macro environment will further improve, creating a more favorable backdrop versus 2023. In this report, we highlight what we expect from each company in our coverage universe in 2024 including major debates, upcoming catalysts, and our expectations vs. consensus. For our broader Biopharma industry thoughts, see The 2024 US Biopharma Outlook report and join our webinar TODAY at 10:30 am ET.

Favorite biopharma names

Eli Lilly (LLY): LLY shares had another strong year, finishing up 59% in 2023 (DRG index: +5%) largely based on broad investor interest surrounding obesity / diabetes drugs. Given the outperformance as well as the multiple (2024 P/E: >40x; peers: 17x), investors are not surprisingly concerned about how sustainable current trends are. However, there are many elements to the Lilly story that remain highly differentiated with the Biopharma sector including: 1) best-in-class growth, 2) significant margin expansion, and 3) high impact pipeline / portfolio opportunities. While **Merck (MRK)** shares modestly lagged last year (-2%; DRG index: +5%) given drug pricing policy concerns (IRA lawsuit) and deal digestion (Daiichi, Prometheus), we expect differentiated revenue growth (anchored by Keytruda/ Gardasil), an exciting launch for sotatercept in PAH, multiple ADCs updates (e.g., HER3-DXd approval, TROP2), to keep investors engaged. We recognize that LLY and MRK were our favorite Pharma's in 2023 (and now for 2024 as well), but it underscores the scarcity value of higher growth / higher quality names in an industry with policy risks and widespread LOEs.

Favorite biotech names

Although **Gilead (GILD)** had strong commercial performance in HIV as well as heme/onc in 2023, worries about the competitive landscape for Gilead oncology portfolio (Trodelvy, CAR-T's) as well as setbacks for magrolimab led to underperformance (-6% vs. NBI index: +4%). That said, we think consensus growth expectations are beatable in 2024 (sales + non-GAAP EPS: +2% / + 8%; BofA: +5% / +17%) and think GILD offers one of the better risk-reward profiles among large cap Biotech names, in our view.

Smid biotech basket and ratings changes

SMid Biotech Basket: There are many SMid caps in our coverage with meaningful 2024 events that confers significant optionality, especially given 2023 underperformance. Some of the names we'd highlight which are all Buy rated include: **Amylyx (AMLX)**: we like the risk/reward going into TUDCA-ALS data in January and PHOENIX readout in 2Q, which should bolster investor sentiment on Relyvrio's >$1.5B peak sales opportunity; **Neumora (NMRA)**: we see multiple shots on goal going into J&J's aticaprant readout in mid-24, KOSTAL-1 in 2H, and Cerevel's pivotal data in 2H.

Ratings/PO changes: We downgraded Bristol (our BMY downgrade report) to Neutral ($60 PO), Kymera (our KYMR downgrade report) to Neutral ($30 PO), and LianBio (our LIAN downgrade report) to Underperform ($3 PO). We increase our PO for Moderna to $120 (from $110), lower our PO for CRISPR to $100 (from $110), and increase our PO for Neumora to $20 (from $18).

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Large-Cap Biopharma

AbbVie

ABBV US – Rating: NEUTRAL (B-2-7) | PO: 160.00 USD | Price: 159.82 USD

What we expect in 2024

Given the focus on initial Humira erosion from biosimilars, ABBV shares underperformed most of 2023, but finished the year with clear momentum (-4%; DRG index: +5%) driven by 1) 2024 diluted EPS guidance floor coming up from $10.70 to $11 and 2) two proposed acquisitions (ImmunoGen note and Cerevel note) in rapid succession. Looking to 2024, we expect less of a focus on Humira erosion (US sales: BofA: -48% to $7.2B vs. consensus: -38% to $8.9B) and more on the increasing contribution from WW Skyrizi (BofA: + 29% to $10.2B; consensus: +30% to $10.1B) and WW Rinvoq (BofA: + 24% to $4.9B; consensus: +37% to $5.3B), helped by robust growth in the IBD markets.

Clearly, the pushout of biosimilar launches of J&J's Stelara (to 2025e) and the maturation of the US Humira biosimilar impact has provided relief to consensus expectations. That said, we remain more cautious on pricing / reimbursement in I&I given the level of Humira discounting and the potential spillover impact on Skyrizi / Rinvoq. In addition, we expect the investor focus in 1H24 to remain on the closing and impact of ImmunoGen / Cerevel to long-term growth, but the size of the two deals (ImmunoGen: $10.1B; Cerevel: $8.7B) likely means that BD activity could be more modest in 2024. Beyond BD, we still expect macro uncertainties to impact the aesthetics franchise (BofA / consensus: +7% vs. double digit growth) with mixed Oncology franchise growth (2024: +4%; consensus: -2%) but solid Neuroscience growth (2024e BofA / consensus: +14%). Overall, we still think investors are looking to 2025 to begin a "normalized" growth (2025e BofA EPS: +9%; consensus: +9%). Hence, we're maintaining our Neutral rating, $160 PO.

A recent focus on diversifying the portfolio

Given the competitive pressures on Imbruvica (BofA 2023: -17%; 2024 -15%) in CLL and what is likely to remain a modestly impactful franchise in Venclexta (4% and 5% of 2023/2024 product revenues), we think the proposed ImmunoGen deal makes strategic sense in addition to adding full capabilities in ADCs. That said, consensus peak forecasts for Elahere in ovarian cancer were modest prior to the AbbVie proposed takeout (non-risk adjusted: $3B) with AbbVie likely to drive only incremental market growth in 2024/25. Line extensions in ovarian (1L maintenance; platinum sensitive+ resistant) make sense but in our view guidance of 4X market growth in ovarian (to $12B) in ~10 years looks aggressive. Beyond ovarian, the proposed Cerevel deal is, in our view, supported by strong science in the neuro-psychiatric space (notably, the M4 and KOR targets), but with a margin contribution in 2028 / accretion in 2030, the long-term value is uncertain. Hence, we're positively inclined on both deals but cautious on how much the portfolios from each company can move the growth needle over the intermediate/long term.

Important pipeline updates over next 12 months

From AbbVie's internal pipeline, we highlight: 1) Skyrizi label expansion to UC (1H24), which, while expected, should provide a tailwind to sales, 2) regulatory filing and potential approval of navitoclax for 1L myelofibrosis (MF) with disease modification biomarker data mid-2024, 3) 2L MF navitoclax data, and 4) Teliso-V filing with potential for accelerated approval, though we are somewhat skeptical that phase 2 data is sufficient, especially in a highly competitive indication like NSCLC.

Valuation / P&L Thoughts Headed into 2024

Our $160 price objective (PO) is based on a 50/50 blended valuation of our DCF and 2024 non-GAAP EPS estimate P/E multiple of 12x (giving a value of $132). We assume a 7% WACC and a -1% terminal growth in our estimates to arrive at our $188 DCF valuation. We think there is potential for AbbVie shares to re-rate modestly following deal closure and de-risking catalysts in 2H24, namely pivotal Elahere and emraclidine data, which could support revenue upside and help address I&I concentration risk.

Amgen

AMGN US – Rating: NEUTRAL (B-2-7) | PO: 290.00 USD | Price: 297.39 USD

What we expect in 2024

2023 marked the beginning of a new chapter for Amgen with the closing of the Horizon acquisition in 4Q after a year of tortuous FTC review, which expands Amgen's portfolio breadth and opens opportunities in rare diseases (see our coverage resumption note). The deal, however, wasn't exactly inexpensive (5X EV / peak revenue) and AMGN shares traded sideways for most of 2023 until obesity momentum caught on. Indeed, AMGN shares have outperformed the broader sector since June's low and finished the year strong (+10%. DRG index +5%). Investors we've spoken to view Amgen as a "value play" in the obesity space with AMG133 (GLP-1-GIP antibody) / 786 (non-incretin) in its portfolio. Looking to 2024, we expect investor to remain focused on the obesity opportunity with AMG786 phase 1 data expected in 1H24 and AMG133 phase 2 data in 2H24. Beyond obesity, while we expect to see solid growth from Tezspire and Evenity, we see limited upside from the rest of key franchises such as Lumakras, Otezla, Enbrel, and Tepezza. Overall, despite recent progress in pipeline expansion, near and intermediate-term growth concerns (2024-27 revenue / EPS CAGR: 2% / 5% vs peers at 5% / 9%) as well as emerging LOEs for some major franchises in the next 3-5 years could remain headwinds to growth. Hence, we're maintaining a Neutral rating, $290 PO.

Obesity remains the topic du jour

We expect obesity to remain top of mind in 2024 given key data readouts, including Amgen's AMG133 phase 2 data and multiple readouts for Lilly/Novo, as well as continued M&A in the category. Indeed, we believe Amgen's obesity readouts will be key to share re-rating in 2H24. While AMG786 non-incretin data readout in 1H24 could be interesting, given management's 3Q23 commentary regarding treating AMG 786 as a "phase 1 asset with a novel mechanism-of-action," we think it's unlikely that a non-incretin-based agent could demonstrate a more favorable weight-loss / tolerability profile than a GLP-1 especially with a small, shorter duration trial. On the other hand, AMG133 (if de-risked) could have a unique profile in obesity given its potential once-monthly dosing frequency. The phase 2 data will be able to address long-term weight loss benefit and more importantly, safety and tolerability of the GIP antagonistic effect. That said, if AMG133 data are less than ideal, we think Amgen could turn to additional BD to further enhance the growth profile. Indeed, recent appointment of James Bradner (formerly President of Novartis Institutes for BioMedical Research) as Chief Scientific Officer suggests that Amgen is looking to further optimize its portfolio.

Important pipeline updates over next 12 months

Despite being highly competitive markets across several therapeutic areas, such as cardiometabolic, I&I, and heme/onc, we think there's a lot to like in Amgen's pipeline given recent progress, including tarlatamab for SCLC (3L+ PDUFA on June 12; phase 3 in progress for 2L; see ESMO takeaways report), rocatinlimab for atopic dermatitis (see our Sanofi 3Q read-through note), AMG 786 / 133 for obesity (phase 1 data in 1H24 and phase 2 data in 2H24, respectively), and Tezspire for COPD (phase 2 data in 1H24). While we'll be looking to compare Tezspire COPD data vs. Dupixent, we think the bar is high and will need to wait until phase 3 data to determine the profile in this crowded market.

Valuation / P&L Thoughts Headed into 2024

We value AMGN using a sum of the parts NPV analysis of key marketed drugs ($247/sh) and pipeline and others ($122/sh), which assumes a range of weighted average cost of capital (WACC) from 5% and terminal growth rate ranging from -5% to -30% depending on the product lifecycle. Our PO also reflects -$79/sh in net debt.

BioMarin

BMRN US – Rating: BUY (B-1-9) | PO: 170.00 USD | Price: 98.05 USD

What we expect in 2024

BioMarin had a tough 2023 but finished the year with momentum (-7% vs. NBI index +4%) mostly driven by enhanced strategic interest surrounding the retirement of CEO JJ Bienaime and an investment by an activist fund (Elliott). Despite differentiated growth historically (2018-2023 revenue CAGR: +34%) and an "IRA-proof" portfolio of orphan drugs, BMRN shares have traded in a range for well over 5 years. In our view, regulatory / commercial uncertainty for Roctavian (gene therapy for severe hemophilia A) was the main reason, even with a robust global launch for Voxzogo (achondroplasia).

Looking to 2024, we think that BioMarin is well positioned given: 1) beatable consensus expectations for Roctavian (2024 consensus: $167M; BofA: $453M), 2) new leadership, including CEO Alex Hardy (from Roche), 3) growth acceleration (2024-2027 CAGR: revenue: +25%; EPS: +44%) which is up from 2020-2023 levels (+10%; +9%) and 4) higher strategic value given Elliott's engagement and a backdrop of higher Biopharma M&A activity. Clearly, new starts on Roctavian remain the key value driver in 2024 and we expect visible momentum in the EU (approved in late 2022) and US (approved in mid 2023) following lengthy pricing / reimbursement discussions. Indeed, BofA forecasts remain $453M, $976M and $1.8B well ahead of consensus for 2024-2026 based on our KOL feedback and what should be much broader access, especially in the context of Mr. Hardy's commercial experience with Roche's Hemlibra (biologic for hemophilia A). Overall, we continue to like the risk/reward profile in BMRN shares based on core business trends plus strategic optionality. Maintain Buy, $170 PO.

Story focused on Voxzogo and Roctavian, not the pipeline

In the orphan disease space, investors can be acutely worried about competition which applies to BioMarin for Voxzogo (BridgeBio- covered by Harrison, Ascendis- covered by Ahmad) and to a lesser degree Roctavian (namely Pfizer). We'd highlight Voxzogo's first-to-market status, particularly prescriber + patient comfort, as key competitive elements in our 2028-2030 Voxzogo forecasts of $1.7B, $1.5B and $1.4B, with line extensions adding upside as we only include achondroplasia in our forecasts. Indeed, Voxzogo + Roctavian should contribute meaningfully to the P&L over time from 36% ($1.2B) in 2024 to 73% ($4.9B) by 2028. Beyond Voxzogo / Roctavian, we're modeling a flat 5-year CAGR (2023-2028) for the rest of the commercial portfolio, even with patent expirations, with benefit of pipeline contributions as upside. Indeed, expectations are low for BioMarin's pipeline with no value in consensus (or BofA forecasts) for BMN331 (hereditary angioedema (HAE)), BMN351 (DMD). BMN349 (AATD) and BMN293/365 (cardiomyopathies). We suspect that the pipeline will gain increased interest in 2024.

Important pipeline updates over next 12 months

In our view, BioMarin's early-stage pipeline provides optionality, with proof-of-concept results expected for BMN 255 for hyperoxaluria in chronic liver disease in 2024 and for BMN 331 for HAE, BMRN 351 for DMD and BMRN 349 for AATD in 2025. Moreover, BioMarin expects to initiate clinical trials for BMN 293 for MYBPC3 hypertrophic cardiomyopathy and BMN 365 for PKP2 arrhythmogenic cardiomyopathy in 2024 and BMN 355 for long-QT syndrome in 2025.

Valuation / P&L Thoughts Headed into 2024

We value BMRN using an NPV analysis of legacy ($55/sh), new products ($95/sh), the early-stage pipeline ($11) and net cash ($9/sh) for a PO of $170. We forecast sales of products to 2035 using a WACC of 4.5%, and a terminal growth rate of -5.5%.

Biogen Inc.

BIIB US – Rating: NEUTRAL (B-2-9) | PO: 290.00 USD | Price: 267.71 USD

What we expect in 2024

BIIB shares finished 2023 modestly lower (-7%; NBI index: +4%) with some optimism going into 2024 on rising US demand for Leqembi (Alzheimer's) and the US + likely EU launch of Skyclarys (Friedreich's Ataxia). In our view, while the Leqembi outlook is much brighter than Biogen's first product Aduhelm (Alzheimer's) given Leqembi's full FDA approval / clean CMS reimbursement, we and the Street expect 2024 to still be a year of commercial investment. Indeed, a streamlined diagnostic / therapeutic pathway still needs to be established, which is reflected in 2024-2026 net Leqembi consensus forecasts for Biogen of $102M, $329M and $730M. We view the 1H24e approval of Lilly's donanemab (Alzheimer's) as a positive for Biogen (and partner Eisai) given greater promotion / awareness for the a-beta class of Alzheimer's therapies.

While Biogen's new launches (Leqembi, Skyclarys and Zurzuvae for postpartum depression) add excitement to the story, its legacy franchises are still a headwind to growth. For example, the MS franchise could contract 15% in 2023 with expectations of -18% and -19% in 2024-25, largely based on biosimilar launches for Tysabri (US) and generic launches of Tecfidera (EU). Spinraza (SMA) has mostly recovered from a competitive entrant but 2023-2025 expected growth is only 0%, +1% and +2%. Finally, CD-20 royalty growth looks more stable but isn't going back to historical growth levels with 2023-2025 CAGR of +3.5%. While we think that new CEO Chris Viehbacher has done a good job optimizing the business with cost savings ("fit for growth" strategy), deals (Reata) and a likely divestiture of the biosimilar business (2024e revenue: $812M, +5%), we haven't seen growth return to levels seem among biotech / pharma peers. Indeed, we're modeling 2024-2025 revenue growth of 0% / 2% (consensus: -2% / +2%) with 2024-25 non-GAAP EPS growth a little better at 15% /13% (consensus: +3% / +18%). Hence, we are maintaining our Neutral rating, $290 PO.

New product cycle inflection likely more of a 2025 story

Biogen (and partner Eisai) remain bullish on the Leqembi long-term outlook with launch with life cycle management well underway (1Q24e: submission of SC formulation and IV maintenance label). That said, we expect the focus to remain on new start trends and scripts, over end-user sales (e.g., hitting 10K patients on therapy by 1Q24). On the other hand, a full year of US Skyclarys sales (and partial EU sales) could add to the growth profile, particularly on the earnings given commercial leverage in rare diseases. Our 2024-2026 WW forecasts for Skyclarys are $377M, $649M, and $876M, incrementally higher than consensus forecasts. Moreover, we do see an opportunity for this product to reach $1.2B by 2028, in-line with consensus' $1.3B forecast. Beyond Leqembi and Skyclarys, investors were previously excited about the Zurzuvae launch, but given the narrower opportunity in PPD, following the CRL for major depressive disorder, which was arguably the larger opportunity, we've seen interest wane. Indeed, commercial expectations are very modest (2026- BofA: $120M; consensus: $226M) in large part due to the open questions on the risk/benefit from prescribers for the targeted patient population (postpartum mothers). Finally, while Biogen secured approval of Qalsody (genetic forms of ALS) in April 2023, the opportunity is restricted to a narrower population, which is highlighted by modest 2026 sales (cons: $81M).

Valuation / P&L Thoughts Headed into 2024

Our $290 price objective is based on a sum-of-the parts NPV analysis. We value MS franchise at $73/sh, Spinraza at $39/sh, anti-CD20 royalty at $64/sh, biosimilars at $7/sh, Alzheimer's at $90/sh, Skyclarys at $43/sh, Zurzuvae at $2/sh, the pipeline at $5/sh, and net cash at -$34/sh.

Bristol Myers Squibb

BMY US – Rating: NEUTRAL (B-2-7) | PO: 60.00 USD | Price: 52.76 USD

What we expect in 2024

BMY shares had a difficult 2023 (-29% vs. +5% for the DRG index) based largely on greater than expected headwinds from generic Revlimid and underperformance of the new product portfolio. Our prior thesis was that the LOEs for Bristol are well-known (including Revlimid, Eliquis, Opdivo) and that upside from the new product portfolio could drive optimism and multiple expansion. The report card from the new product launches wasn't great, however, with three straight quarters of disappointing sales versus consensus over the past year. Although the y/y growth of the new launch portfolio has been collectively strong (averaging 87% in 2022, 81% in 2023e), there has not been "breakout" product demand that would drive multiple expansion. Hence, we've downgraded BMY shares to Neutral (from Buy) with a PO going to $60 (from $68). We understand the product differentiation story for many of the assets in the launch portfolio, but our view is that even assuming an impact from announced new deals (See our Mirati / Karuna / Rayze acquisition reports), the launch portfolio will likely go from $3.7B (8% of 2023e total revenues) to $18B (35% of 2027e total revenues). In our view, this may not be enough of an offset for the Eliquis / Opdivo LOEs. Hence, while we could see modest multiple expansion in 2024 (perhaps 1 turn), we still expect investors to focus on the LOE headwinds especially if we don't see material product sales upside from new launches.

Overall, we are expecting Bristol's 2025-2030 revenue / EPS growth to average -2% / 0% over this period, which captures growth from new launches as well as impact from Eliquis/ Opdivo LOE. Clearly, this growth profile versus Biopharma peers (+3% on revenue / +5% on EPS over 2025-2030) justifies Bristol's 8X multiple (peers: 14X). While LOEs are a reality for almost every Biopharma in our coverage universe, only Bristol and Pfizer have multi-year periods that are impacted. We are optimistic that the pipeline including new assets (milvexian, LPA1, among others) and the dozens of line extensions in phase 2/3 for newer products will have a long-term P&L impact. That said, success is likely measured over a 5+ year period with not many major data reveals in 2024.

Commercial execution remains a focus in 2024

We'd point to a few products that have the potential to inflect in 2024, Sotyktu, Opdualag and Reblozyl. For Sotyktu, we're modeling WW growth of 230% (to $775M) in 2024 based on broader access/ reimbursement in psoriasis. Additional indications (PsA - 2024-2025; lupus - 2025-2025; Sjogren's - 2027) are in the works but shouldn't impact the 2024-2025 demand picture, in our view. Opdualag saw rapid adoption in 2023 (see our IO Brandimpact report) with BofA expectations of 50% growth in 2024 (to $1B) with label expansion phase 3 opportunities a few years away (adjuvant melanoma - 2026; MSS CRC - 2025). Finally, Reblozyl has been the largest contributor to the new launch portfolio (30% in 2022; 32% in 2023e) with expectations of 45% growth in 2024 (to $1.4B) based on the COMMANDS study (COMMAND note). We are impressed with Bristol's capabilities in gene/cell therapy beyond commercial adoption for Abecma (myeloma) and Breyanzi (DLBCL) but notably, these categories are hyper-competitive with JNJ, Gilead and many SMid biotechs with next-gen products.

Important pipeline updates over next 12 months

1) Opdualag phase 2 data in 1L NSCLC (1Q24) and in 1L liver cancer (2024), which may provide meaningful incremental revenue despite the high bar from existing SOC and competitive markets with other combo regimens (TIGIT, ADC). 2) Karuna's KarXT approval (PDUFA Sept 26) and AbbVie/Cerevel's emraclidine's two pivotal data readouts in 2H24 present a meaningful upside/downside scenario. 3) Krazati KRAS G12C confirmatory data will be key to differentiate from Lumakras.

Valuation / P&L Thoughts Headed into 2024

Our $60 price objective (PO) is based on a 50/50 blended average of our risk-adjusted discounted cash flow (DCF) and 8x P/E multiple applied to 2024E EPS.

Eli Lilly & Company

LLY US – Rating: BUY (B-1-7) | PO: 700.00 USD | Price: 592.20 USD

What we expect in 2024

LLY shares had another strong year, finishing up 59% in 2023 (DRG index: +5%) largely based on broad investor interest surrounding the GLP-1 class of obesity / diabetes drugs based on their clinical and commercial success (see our thoughts on the commercial oppty here). Given the outperformance as well as the multiple (2024 P/E: >40x; peers: 17x), investors are not surprisingly concerned about how sustainable current trends are. While there is likely to be high volatility surrounding initial 2024 guidance (Feb 6) and quarterly performance versus consensus expectations, the main message is that Lilly's fundamentals from top to bottom are the strongest in the sector. Indeed, there are many elements to the Lilly story that are highly differentiated with the Biopharma (or Healthcare broadly) sector including: 1) top-tier **growth**: 3 year (2023-2025) revenue / EPS CAGR of +20% / +32% versus Biopharma peers of -1% / +5%, 2) material **margin** expansion: operating margins going from 21% in 2023e to 46% in 2027 versus Biopharma peers averaging 28% (2023e) and 41% (2027), and 3) robust **pipeline / portfolio** opportunities as measured by revenue "gains" with $5B (2023; cons $5B) going to $73B (2030: cons $68B); this gain of $68B is much higher than peers.

Importantly, upside to the three metrics above is key to share performance and based on our model, we see ample upside opportunities. For example, BofA / consensus is modeling only $1.5B / $1.7B for WW donanemab (Alzheimer's) sales in 2026, two years post launch. In addition, our 2025 total diabetes/obesity forecast is >75% from the US market, with minimal EU / ROW contribution. Finally, higher profile pipeline assets such as orforglipron (oral GLP-1) and retatrutide (GGG) have transformational potential (and phase 3 risk) but BofA / consensus expectations are beatable at $12.4B / $18.1B in 2030. Overall, while we understand the hesitation on LLY shares based on the P/E multiple, the P/E/G looking to 2025 and 2026 is reasonable especially as the initial commercial picture plays out for Zepbound (obesity) in 2024. Maintain Buy, $700 PO.

Not just a metabolic disease play, but that's what matters

While investors rarely focus on them, several franchises outside of the metabolic disease arena have differentiated products and are expected to grow quite well. For example, from 2023 to 2026, we expect CAGR's for the I&I and hematology/oncology franchises of +7% and +15%, reaching sales of $4.5B and >$10B. Given the high impact from the metabolic disease franchise, however, it is easy to see why it's the key value driver. For the entire metabolic portfolio, we expect a 2023-26 CAGR of +26%, reaching sales of $40B in 2026 and representing 66% of revenues. In terms of 2024 expectations, we're modeling total revenues and EPS of $42B (+23%) and $13.55 (+101%), versus the cons of $39.2B and $12.52. We suspect this will be a major focus going into 4Q23 earnings.

Important pipeline updates over next 12 months

In terms of catalysts to look out for in 2024, we point to 1) donanemab FDA approval in Alzheimer's, likely in early 2024, 2) lebrikizumab approval in Atopic dermatitis following the manufacturing CRL (see our thoughts on the CRL here), and 3) label expansion opportunities for tirzepatide with readouts in NASH in 1Q24 (phase 2), sleep apnea in 1H24 (phase 3), and HFpEF in mid-2024 (phase 3) that could provide upside to current forecasts. Moreover, we should receive pivotal results for Verzenio in CPRC (CYCLONE-2), which we think the Street underappreciates based on our investor discussions.

Valuation / P&L Thoughts Headed into 2024

Our $700 price objective is based on a sum-of-the parts NPV analysis. We utilize a WACC of 5-8.5% and a terminal growth rate of -12% to 1% based on projected sales decline following loss of exclusivity within each business vertical. We value the endocrinology franchise at $392/sh, oncology at $127/sh, cardiovascular at $4/sh, neuroscience at $11/sh, immunology at $40/sh, with the pipeline at $143/sh (includes Zepbound and donanemab) and net cash at -$17/sh.

Gilead Sciences

GILD US – Rating: BUY (B-1-7) | PO: 95.00 USD | Price: 83.24 USD

What we expect in 2024

Gilead had a number of positive developments in 2023 including strong commercial performance in HIV as well as heme/onc but worries about the competitive landscape for Trodelvy (and to some degree Yescarta) as well as setbacks for magrolimab led to share underperformance (-6% vs. NBI index: +4%). Looking to 2024, we'd characterize consensus growth expectations as modest on revenues (+2%; BofA: +5%) and non-GAAP EPS (+8%; BofA: +17%). That said, the pipeline will be closely watched with progress / new data likely to be a bigger contributor to outperformance in 2024 (e.g., multiple expansion vs. P&L upside). This is especially the case as Trodelvy continues to show proof-of-concept in tumors outside of the core breast cancer indication including NSCLC, SCCHN, SCLC and endometrial cancers. In addition, Gilead's CAR-T BCMA (myeloma; partnered with Arcellx) is emerging as a more formidable competitor to J&J/Legend's Carvytki. Finally, we'd characterize expectations for Gilead's TIGIT (domvanalimab; partnered with Arcus) as quite low, though progress with this MoA is closely followed with Merck and Roche having high profile programs.

In our view, Gilead's HIV portfolio and pipeline is often taken for granted given its consistency and the emphasis on emerging data for the more dynamic heme/onc segment. We're modeling HIV growth of +8% in 2024 (consensus: +4%), which is a step up from depressed levels seen over the 2020-2022 period, which averaged +2%. Given a smaller population, we don't expect Sunlenca to be a major growth driver in resistant HIV in 2024 or beyond, but the lenacapavir pipeline, in our view, could have transformational potential in PReP (commercial launch: 2025) and more critically, as a backbone of different combos in the HIV treatment setting. For the latter, we expect to see proof-of-concept phase 2 data for various additional lenacapavir combos in 2024, perhaps starting with the CROI meeting (March 3-6; Denver). While competitor GSK (covered by Jain + Parry) is currently optimizing its LAI portfolio (starting with Cabenuva), we note that the bar from potentially a Q6 month dosing regimen from Gilead sets an incredibly high clinical / commercial bar. Given the long development cycle, however, consensus lenacapavir sales in 2030 only total $1.5B (vs. BofA $2.6B). Overall, based on good clinical / commercial execution across the portfolio, we continue to favor GILD shares (upgraded to Buy in September 2023), $95 PO.

Long-term growth picture still uncertain

Given a $3B+ run rate and >40% y/y growth over the past 3 quarters, it's clear that the heme/onc franchise has commercial momentum. The big uncertainty is whether it will constitute 1/3 of Gilead product revenue (by 2030), which isn't reflected in our numbers (21%) or consensus (22%). The US Biopharma space remains split between "haves and have-nots" in terms of long-term sustainable growth and Gilead has the clear potential based on the heme/onc portfolio to be a "have". We're modeling revenue / EPS growth averaging 2% / 3% annually until 2030 which is in-line with Biopharma peers of no growth to low single digits but not "top-tier" which Gilead aspires to. In our view, phase 3 success for lenacapavir (PReP and treatment), continued label expansion for Trodelvy, plus a pipeline "wild card" could reach that level but at this point, it still looks less certain to us.

Valuation / P&L Thoughts Headed into 2024

Our $95 price objective is based on a sum-of-the parts net present value (NPV) analysis. We forecast sales of key franchises or products to 2030 using a weighted average cost of capital (WACC) of 8% and include a terminal value where appropriate. Under these assumptions, we value the HIV franchise at $80/share, HCV and HDV at $7/share, the Kite platform at $8/share, remdesivir at $2/share, Trodelvy at $9/share, with the pipeline at $5/share and net cash at -$15/share.

Johnson & Johnson

JNJ US – Rating: NEUTRAL (A-2-7) | PO: 180.00 USD | Price: 159.97 USD

What we expect in 2024

Operationally, JNJ had a solid 2023 with completion of the Kenvue separation and several major updates within the Pharma segment (e.g., positive MARIPOSA/ Cartitude-4 data, Talvey approval, among others). From a share perspective, however, JNJ shares underperformed (-12%; DRG index: +5%) based largely on talc liability fears, near-term growth concerns as well as unwinding of defensive positioning as the macro backdrop improved. Indeed, as JNJ shifts to a more concentrated Pharma / MedTech business post Kenvue, we suspect that shares will trade with greater sensitivity to pipeline / commercial updates, much like PFE or LLY shares did post-spin. In our view, JNJ has very differentiated and defensible franchises in hematology / oncology, and immunology, but consensus implies lower Pharma revenue growth in 2024 (3%) / 2025 (0%) compared to the past 10 years (average: 7%).

At its recent Enterprise Business Review Day (December 2023, see our JNJ takeaway note), JNJ expressed confidence in the $57B Pharma sales target (2025), which remains above BofA and in-line with consensus ($55B / $57B). In addition, JNJ highlighted 11 products with $5B peak sales potential, which was six more than previously discussed with investors (e.g., Carvykti, TARIS, nipocalimab, milvexian and Rybrevant/lazertinib). Collectively, consensus implies sales of ~$6B for the latter assets in a 2030 timeframe; hence the sales inflection is levered to the phase 3 reveal / commercial optimization. We expect the Stelara (LOE) and Imbruvica (competition) headwinds to continue into 2025-2026 timeframe with collective sales for 2023-2026 of $14.2B, $14.3B, $9.8B, $7.4B, which (in addition to the talc overhang) have pressured the multiple. Beyond 2026, we suspect that JNJ's Pharma franchise could be very well-positioned based on new launches and what should be a portfolio of differentiated assets, the largest of which ultimately could be Carvytki (myeloma), depending on supply and 1L results (Cartitude-5/6). Consensus projects Pharma growth averaging -1% from 2025-2030, below the overall JNJ revenue growth (2%) and the average Large-cap Biopharma growth (4%) over this period. Overall, while we like the science and portfolio differentiation in JNJ Pharma (now called Innovative Medicine), we don't see an event outside of a major talc settlement to drive shares significantly higher. Maintain Neutral, $180 PO.

In MedTech, JNJ sees its device markets growing 5-7% in 2024 versus what has historically been 4-6% as JNJ expects procedure volumes to remain elevated again in 2024. JNJ likely continues to focus inorganically in MedTech after the Abiomed and Laminar acquisitions help build out JNJ's MedTech cardio franchise. With competitor pulse field ablation timelines moving up in the last few weeks and JNJ's electrophysiology business driving some of the best growth at JNJ MedTech we think this will be a key business to watch in 2024. We also expect durability of elevated hip/knee market growth rates to be a key focus area in 2024.

Important pipeline updates over next 12 months

While expectations are generally low for nipocalimab due to albumin binding/LDL safety concerns, there may be an upside opportunity for the phase 3 readouts in myasthenia gravis and warm autoimmune hemolytic anemia in early 2024 if nipocalimab can demonstrate a competitive efficacy/safety profile vs. Argenx's Vyvgart. On TARIS, we will have a greater clarity on the long-term durability/tolerability profile of the pretzel system versus competitor CG Oncology's oncolytic virus in bladder cancer (see CG bladder data takeaway). Importantly, a positive aticaprant phase 3 data in adjunctive MDD (data expected in mid-2024) could lift the overall sentiment on the KOR approach for the treatment of MDD, a multi-billion dollar opportunity (see NMRA initiation).

Valuation/P&L Thoughts Headed into 2024

Our price objective of $180/share is based on a sum of the parts (SOTP) of roughly 18x MedTech multiple, and 14x pharma '24 multiple, slightly below peers given looming loss of exclusivity (LOE) and talc uncertainty, yielding $57/share, and $123/share, respectively.

Merck

MRK US – Rating: BUY (A-1-7) | PO: 130.00 USD | Price: 113.34 USD

What we expect in 2024

Despite significant commercial and share momentum going into 2023, MRK shares modestly lagged last year (-2%; DRG index: +5%) mostly given drug pricing policy concerns (IRA lawsuit) as well as deal digestion (Daiichi Sankyo: $22B total consideration (see Daiichi note); Prometheus: $10.8B (see Prometheus note)). Looking to 2024, we expect less P&L volatility from IPR&D charges, continued top-tier revenue growth (anchored by Keytruda / Gardasil) and an exciting launch for sotatercept in PAH (PDUFA date: March 26). In our view, investors typically look to Merck for differentiated revenue growth (2023-2025 CAGR: 6%; peers: 3%) at a reasonable multiple (~12.5x versus peers at ~17x) with the only major risk still being the Keytruda LOE (2028+) and the concentration in oncology. Regarding portfolio diversification, Merck has done a good job, in our view, with two higher-impact deals outside of oncology (Acceleron - $11.5B - cardiovascular focus; Prometheus - $10.8B - immunology focus), both of which could contribute meaningfully to the top line over time (sotatercept consensus: $4.5B peak; MK-7240 consensus: $2B peak). Beyond M&A, other products add diversification (and are growing) to the P&L such as Gardasil (+20% growth in 2024 to $11B) and Animal Health (+3% growth in 2024 to $5.8B). Overall, we'd say that concerns from oncology concentration risk previously pressured the multiple but today, we suspect this has become less of an issue to investors. Based on differentiated growth of Merck's core I/O franchise and a launch (sotatercept) which should see strong initial demand, we view MRK shares favorably for 2024. Maintain Buy, $130 PO.

For Keytruda, WW sales over the past few quarters have been above consensus (1Q23: +$210M; 2Q23: +$360M; 3Q23: +$130M) but with less upside than was seen throughout 2022. Looking to 2024, we're modeling 15% growth to $28.7B (consensus: $27.4B) mostly driven by continued uptake in the adjuvant setting (RCC, NSCLC, melanoma) and early-stage cancers such as TNBC as well as bladder cancer. For bladder / urothelial cancer in particular, we suspect combos with Pfizer's Padcev will show robust growth in 2024+ based on the recent EV-302 study (see ESMO takeaway note). From an oncology pipeline perspective, Merck has had a clear emphasis on adding core capabilities in ADC technology with collaborations with Daiichi Sankyo and Kelun Biotech on a huge number of targets including HER3 and TROP2 (both in phase 3) as well as B7H3, CDH6, Claudin 18.2 (all in phase 1 or 2). Beyond ADCs, while the two phase 3s in NSCLC and melanoma of Keytruda + Moderna's INT (individualized neoantigen therapy; see AACR takeaway note) are exciting, we wouldn't expect the studies to mature for several years. Internally, Merck is also evaluating many interesting assets as potential Keytruda combo partners (e.g., TIGIT, LAG-3, CTLA-4).

Important pipeline updates over next 12 months

1) Sotatercept approval (PDUFA March 26) in PAH and a fast uptake could bolster Merck's CV portfolio outlook. Our KOLs think sotatercept brings differentiated benefit to PAH patients, which should drive strong demand. We model sotatercept 2030 revenue at $4.4B vs. $4.5B consensus. 2) HER3-DXd approval (PDUFA June 26) and launch in EGFR lung cancer. 3) TROP2 ADCs incremental data updates, providing additional clarity on efficacy/safety differentiation and the opportunity in various solid tumors, and 4) Keytruda subcutaneous formulation positive results could extend the runaway beyond patent cliff.

Valuation / P&L Thoughts Headed into 2024

We value Merck shares using a 50/50 blended average of our risk-adjusted DCF analysis and P/E multiple applied to 2023 EPS. We recognize the strength of Merck's core business (i.e., Keytruda and Gardasil) and think the current 15x multiple is warranted (vs. ~17x Pharma average). We model 2024 EPS of $9.30 on $66B in total revenues.

Moderna

MRNA US – Rating: NEUTRAL (C-2-9) | PO: 120.00 USD | Price: 112.50 USD

What we expect in 2024

MRNA shares rallied yesterday but were under pressure in 2023 (-45%; NBI Index: +4%) which we'd attribute to 1) rotation out of COVID-19 specific names following lower than expected vaccine demand (2023e BofA $5.9B vs. $6.1B cons), 2) uncertainty on long-term COVID-19 demand (2026e BofA $2.3B vs. $3.7B cons), 3) lack of clarity on the possibility for accelerated approval for Moderna's INT vaccine in combination with Merck's Keytruda for adjuvant melanoma, and 4) P&L concerns given Moderna's high OpEx spend. That said, there were some bright spots, including phase 3 RSV results (see our thoughts on the RSV results here) that were favorable, though Pfizer and GSK (covered by Jain + Parry) have first mover advantage. And while positive phase 3 flu results will allow Moderna to pursue accelerated approval in 2024 (see our thoughts on the flu results here), our forecasts remain below the Street (BofA $10.3M vs $167M cons) as seasonal ordering patterns will likely prevent a robust launch in 2024 (e.g., ordering occurs at the beginning of the year).

But perhaps of greater focus, we expect P&L concerns to remain in focus, particularly as we expect OpEx to be relatively locked in for 2024 (BofA $6.2B vs. $5.9B cons) given ongoing clinical trials (plan to double number of phase 3 programs by 2025) + commercialization of RSV + flu. While this wouldn't be a concern if Moderna's revenue growth was higher but we forecast a decrease of -29% / -13% in 2024/ 2025, with only +1% growth in 2026. While we do expect new product launches such as flu, RSV or INT to help stabilize the revenue picture, the ramp will likely take time to inflect given the competitive landscape + new modalities. Looking to EPS, as we expect OpEx to remain high and revenue to decrease in the near-term, we model Moderna as unprofitable from 2024-2028 versus the Street of 2024-2026 (Moderna expects to break even in 2026). As such, we think it's unlikely any clinical or commercial updates in 2024 will be able to meaningfully lift sentiment, hence, we maintain our Neutral rating. However, given the more favorable rates environment, we have lowered our WACC to 10% (from 12%) and thus, increased our PO to $120 (from ($110).

Non-COVID pipeline remains in focus in 2024

Given the uncertainty of long-term COVID-19 demand, we expect Moderna's non-COVID pipeline to be in acute focus by investors in 2024. Indeed, we'd point to Moderna's likely launch of its RSV vaccine in 2Q (approval likely March/ April; BofA $291M vs. $208M consensus), regulatory submission/ commercial launch for its flu vaccine in late 2024 and phase 3 interim results for its CMV in mid-2024. On CMV, recall the phase 3 is fully enrolled and accruing cases (25% accrued as of September). For the interim look, Moderna needs 81 cases to perform the first analysis, with a vaccine efficacy bound of 57.7%. If Moderna beats this objective, they trial may be stopped early. However, if it doesn't, it wouldn't necessarily mean that the vaccine isn't efficacious, just the case split wasn't powerful enough to conclude the study. Given the high unmet need in the space, we suspect the commercial opportunity could be meaningful, but will likely take some time to ramp comparable other latent disease vaccine launches (2026 BofA $101M vs. $308M consensus). Ultimately, while we think there's a lot to like about Moderna's new product pipeline, there's still a lot of wood to chop in our view in regards to commercialization hurdles, which could further pressure Moderna's P&L.

Valuation / P&L Thoughts Headed into 2024

We value MRNA shares using a sum of the parts NPV analysis, where we forecast sales to 2038 using a WACC of 10% (12% prior) and include a terminal rate when appropriate. We value prophylactic vaccines including Spikevax at $82/sh, systemic secreted cell surfaces therapeutics at $1/sh, cancer vaccines at $3/sh, intratumor IO therapies at $1/sh and systemic intracellular therapies at $1/sh with cash at $22/sh.

Pfizer

PFE US – Rating: NEUTRAL (B-2-7) | PO: 35.00 USD | Price: 29.73 USD

What we expect in 2024

PFE shares had a difficult 2023 (-44%; DRG index: +5%) based on a more pronounced deceleration for the COVID-19 franchise (Comirnaty / Paxlovid) as well as downward revisions to growth guidance. In our view, investors have long been skeptical of the COVID-19 opportunity as it entered the endemic phase, but weaker demand was more dramatic than expected (2023 Comirnaty / Paxlovid consensus prior to updated guidance: $19.7B versus $12.2B today). Looking to 2024, following Pfizer's recently issued guidance, we'd argue that the mid-point of consensus revenue / non-GAAP EPS expectations look beatable at $60.2B (+3%) and $2.21; we're modeling $58.2B and $2.20. While the dividend yield (currently: 6%; Biopharma peers: 3-4%) seemingly set a floor for shares and valuation looks reasonable currently (2024 P/E: 8x; Biopharma peers: 17x), the challenge is creating optimism on the pipeline and new launches going into the 2025+ LOE period (~$17B impact by 2030). Having Seagen's pipeline / portfolio and its ADC platform now in-house at Pfizer is a major positive, in our view, but the cadence of new pipeline asset progression will be key.

From a sentiment / valuation perspective, major LOEs in Biopharma can be difficult to overcome with resolution coming from two main scenarios: 1) when the impact from generic / biosimilar penetration approaches a maximum or 2) when the trajectory of new products (internal or acquired) substantially offsets the LOE period. For Pfizer, the latter scenario is more likely given the number of new launches: Elrexfio (myeloma), Velsipity (UC), Litfulo (alopecia) and Abrysvo (RSV), and line extensions for Xtandi and Braftovi/Mektovi. Of note, all Biopharma's have LOE headwinds at some point, but Pfizer's is difficult given clustering over a ~5 year period. Overall, we are of the view that Pfizer's deployment of "COVID cash" in the form of deals was the right approach to address the 2025+ LOE period. That said, upside from new launches (including Seagen) and pipeline progression / prioritization will be key to multiple expansion from current levels. We view this as more of a 2025+ dynamic and maintain Neutral rating, $35 PO.

Execution rather than binary catalysts a focus next year

If the 2024 guidance call (Dec 13) was any indication, we expect Pfizer to make a major push in oncology this year, especially given the Seagen portfolio (namely Padcev and Adcetris) but also full deployment of the ADC platform / pipeline. On the commercial outlook for Seagen, we like the near/intermediate term growth potential from Adcetris (2024-2028e CAGR: 8%) and Padcev (2024-2028e CAGR: 18%), though there is some skepticism on Pfizer's >$10B revenue guidance in 2030 (BofA: $7.5B; consensus: $6.8B). Beyond Seagen, the Prevnar / pneumococcal franchise has good durability though the LOE period with 2030 consensus at $7.3B (BofA: $7.9B) but clearly, we'd expect a growth impact from LOEs for Eliquis, Ibrance, Vyndaqel, and Xtandi. Furthermore, Merck may be introducing a pneumococcal vaccine (V116, a 21-valent pneumococcal conjugate vaccine) competitor in 2024. Indeed, Pfizer's 3-5% revenue growth guidance (ex-COVID, ex-Seagen) in 2024, could turn into -2% in the 2025-2030 period, even when including COVID and Seagen.

Valuation/ P&L Thoughts Headed into 2024

Our $35/share for Pfizer is based on a 50/50 blended average of our discounted cash flow (DCF) analysis and P/E multiple based on the large cap global therapeutics group. For our DCF, we use a weighted-average cost of capital (WACC) of 7% and 2% terminal growth for an intrinsic value of $47/share. Our P/E analysis assumes a 10x multiple of our 2024 EPS estimate, which yields a $22 intrinsic value.

Regeneron

REGN US – Rating: UNDERPERFORM (B-3-9) | PO: 700.00 USD | Price: 905 USD

What we expect in 2024

REGN shares were stronger in 2H23 based on optimism on the US Eylea outlook (+22%; NBI index: +4%) and following the interim NOTUS data for Dupixent in COPD. We often are questioned by investors about our U/P rating which is based on our view of weaker fundamentals / growth profile / pipeline. On growth, looking to 2024 and beyond, Regeneron's growth profile falls into the bottom tier versus Biopharma peers on both revenue and EPS (2024-2028 CAGR: +3% / +6%), which is only nominally lower than consensus expectations. In our view, all the hype and bullishness on the platform / pipeline / portfolio hasn't played out in reality with total revenue in the $12-13B range and EPS in the $42-45 range in 2022 and 2023 but also at these same levels going out as far as 2027. Indeed, while Dupixent is growing nicely and could be a $18B+ opportunity at peak, Libtayo hasn't broken out commercially ($850M in 2023e going to $1.5B in 2030e) and Eylea could decline 5-10% annually from 2023+ even with an offset from the HD launch. We understand the volatility surrounding the impending Eylea LOE and perhaps a settlement could materialize in the 2025-26 timeframe, but the reality is that the P&L is highly levered to Eylea (~60% of revenues in 2020; 45% of 2023e revenues), where Roche's Vabysmo continues to gain share and biosimilar Eylea is a matter of "when not if" starting in 2024 or 2025. From a y/y growth basis, Eylea was -3% (4Q22), -6% (1Q23), -7% (2Q23) and -11% (3Q23) with likely declines in 4Q23 and 1Q24. Indeed, we don't expect HD Eylea to materially offset declines until 2H24 or 2025, with the risk that biosimilar Eylea changes the price / volume assumptions in the market.

Beyond current products, Regeneron remains quite bullish on the pipeline and bispecific antibody platform but there is a lot of clinical work ahead and the targets (LAG3, PSMA, MUC16, EGFR, MET) are all very well characterized and have evaluated across the Biopharma industry in some cases for 10-15 years. Overall, while we remain optimistic on the Dupixent franchise, our commercial concerns on Eylea and its concentration risk keeps us at Underperform with a $700 PO.

On linvoseltamab and odronextamab launch in 2024

With filing underway for linvoseltamab and filing completed for odronextamab, and approval likely for both, commercial execution will be key for Regeneron as the company looks to diversify its revenue concentration risk. Overall, we are incrementally more positive about the commercial prospects for linvoseltamab in r/r MM given solid data presented at ASH 2023 (see our takeaways on the ASH 2023 Regeneron call), though we maintain that gaining share remains challenging given linvoseltamab's more complex dosing schema. Separately, we maintain that commercialization of odronextamab in DLBCL could be challenging for Regeneron as both Roche's Columvi (fixed dose IV) and AbbVie / GenMab's Epkinly (SC) have first-to-market advantages.

Valuation / P&L Thoughts Headed into 2024

Our $700 price objective is based on a probability-adjusted net present value (NPV) analysis of Eylea, including outside of US (OUS) revenues from the Bayer collaboration ($166/share), Sanofi collaboration revenue including Dupixent and other product revenues ($358/share), Libtayo ($56/share), early pipeline assets ($31/share), and the rest from net cash. We use a weighted-average cost of capital (WACC) ranging from 7% for approved products to 10% for pipeline products and terminal growth ranging from -3 to 3%. While we could see our Eylea sales forecast challenged by a delay to the LOE, we maintain that competitive erosion due to Vabysmo remains underappreciated and believe re-rating should be primarily driven by long-term outlook on the company's revenue growth through portfolio diversification.

Royalty Pharma

RPRX US – Rating: BUY (B-1-7) | PO: 40.00 USD | Price: 28.27 USD

What we expect in 2024

RPRX shares were weak in 2023 (-29% vs DRG index: +5%) despite a consistent quarterly beat-and-raise trend. We think the lack of surprise in the company's numbers and concerns over the rising cost of capital (6%, 2012-2021) to 7-8%, have pressured shares in 2023. That said, we think RP maintains a comfortable risk level and likely to focus on lower risk assets that are cash-flow positive in 2024. Furthermore, we think additional de-risking of late-stage royalty assets in the company's pipeline may have been underappreciated. We remain confident in RP's ability to manage its financial position and execute accordingly. In 2024, we forecast total cash receipts of $3.0B and adjusted cash flow of $4.20 per share, which we view as beatable given our estimates are primarily driven by the company's active portfolio. Furthermore, at current price levels, it is likely that RP will continue to leverage its share repurchase program and help support a floor for price fluctuations. Overall, RP's business model remains an attractive option for stable cash flows and exposure to the broader healthcare space, in our view. We maintain our Buy rating and $40 PO.

Outlook on royalty portfolio additions

We'd note that Cytokinetics' aficamtem results in oHC (SEQUOIA-HCM), and MorphoSys's pelabresib / Jakafi data in myelofibrosis (MANIFEST-2) were mostly positive and likely support regulatory filing in 2024, which would add two additional assets to RP's active portfolio. Peak sales estimates for aficamtem in 2030e are $2.0B and $1.2B for pelabresib (non-risk adjusted). Separately, we'd note that Bristol's pending acquisition of Karuna (see our note on the Bristol-Karuna deal) may impact the economics of RP's stake in KarXT, which may be approved as early as 3Q24. Recall that Pfizer bought back royalty rights to Nurtec from RP when the company acquired Biohaven.

Revisiting CF portfolio risk

Recall we previously lowered our CF royalties to a midpoint of 7% (4-9%) in 2025e and beyond to account for continued uncertainty over royalty rights of Vertex's next-generation triple combo. While the potential impact of the CF business is not insignificant, we don't think adjusted cash receipts losses of ~$300M by 2030e at the higher range is insurmountable with new additions to the royalty portfolio. That said, we acknowledge that CF portfolio risk has been a major overhang for RPRX and clarity on the likely financial impact could help RPRX shares recover momentum in 2024. Vertex confirmed during the 3Q call that the pivotal SKYLINE 102, SKYLINE 103 studies, and RIDGELINE studies remain on track with data expected in early 2024. Given that RP may seek to pursue royalty rights of the new CF triple combo through a lawsuit if data are positive though, we think the final outcome of financial risk to RP remains to be seen.

Valuation/P&L Thoughts Headed into 2024

Our $40/share price objective is based on a probability-adjusted SOTP NPV analysis which includes current growth products ($34/sh, 80% of our valuation), and projected revenues from future investments ($11/sh, 31%). We project out revenues through 2038, apply a WACC of 5% (mature products) to 8% (future growth products), and use terminal growth rates ranging from -5% (current growth products) to 5% (future growth products), in-line with other mature biopharma companies. We calculate net cash as -$5/sh (-11% of our valuation).

With 80% of our valuation from current growth products, we maintain that the risk-reward tradeoff for RPRX is favorable and suggests that limited value has been assigned to the company's pipeline assets and future investments. With ~86% of capital deployed in 2023 for commercial assets rather than development stage, we think upside from new investments is underappreciated.

Vertex Pharmaceuticals

VRTX US – Rating: BUY (B-1-9) | PO: 450.00 USD | Price: 410.91 USD

What we expect in 2024

VRTX shares had another strong year in 2023 (+41%; NBI index: +4%) with consistent growth from the CF portfolio, FDA approval of Casgevy (SCD; partnered with CRISPR; see our thoughts on Casgevy's approval here) and positive phase 2 data of VX-548 in DPN (see our thoughts on the DPN results here). In 2024, the Vertex story should be even more dynamic given 1) commercialization of Casgevy in SCD (with TDT label expansion in March), 2) new phase 3 data for VX-548 in acute pain followed by an NDA, and 3) continued growth from the CF portfolio combined with new phase 3 data for a next gen triple combo (vanzacaftor / tezacaftor / deutivacaftor) in CF. While some investors would argue that these developments are reflected in shares (2024 P/E: 25x; biopharma peers: 17x), we believe that VRTX shares have more room to run based on 1) revenue growth acceleration in 2025+, 2) higher portfolio diversification with new therapeutic areas, 2) a reasonable P/E/G looking to 2025-2026 expectations. In addition, Vertex should continue to accumulate cash (>$15B by YE23) while investing in a broad range of R&D programs, most of which are not reflected in consensus forecasts (e.g., inaxaplin in AMKD, VX-880 in T1D, VX-522 in "X-mutation" CF).

While adding new products to the mix is critical and answers the key question of "what will be the encore to CF success?", we fully expect the CF franchise to drive the P&L for the foreseeable future. Indeed, we're assuming 2024 CF sales of $10.4B (consensus: $10.5B), up 3.4% and non-GAAP EPS (BofA: $16.30, up 8.7%; consensus: $16.47). As noted above, we expect phase 3 data in 1Q24 from Vertex's next-gen triple combo (vanzacaftor / tezacaftor / deutivacaftor) in CF, which in our view could add incremental growth to the CF franchise from eligible patients not on Trikafta (elexacaftor / tezacaftor / ivacaftor). That said, we think that meaningful clinical differentiation (beyond dosing frequency) between Trikafta and the vanzacaftor combo seems less likely, but it is critical to continue to optimize a standard of care regimen. Moreover, the vanzacaftor combo could carry a lower royalty burden and nominally improve margins which isn't reflected in our forecasts, but it is subject to an ongoing dispute with Royalty Pharma. Overall, based on Vertex's leadership in CF, a new launch in SCD (and TDT) plus higher visibility of the pain opportunity, we think that 2024 sets up well. We maintain Buy and our $450 PO.

Sizing expectations for Casgevy and VX-548

While FDA approval of Casgevy brought a transformational / curative intent product to the market for SCD (and TDT soon), sales expectations remain modest. Indeed, 2024-2026 consensus implies WW sales of $162M, $548M and $1B, all in-line with BofA forecasts. Clearly, these forecasts have good upside potential, but we suspect a real commercial inflection could come following improvements (in perhaps 2 years) to the busulfan conditioning regimen. For VX-548, we'd argue that consensus expectations are robust with 2024-2026 sales of $78M, $265M and $605M (all meaningfully above BofA forecasts). Indeed, in our view, the opportunity in pain could be more levered to access / pricing reimbursement given broad availability of generic Lyrica as well opioids and the challenges of launching in hospital settings. But we expect to have a better commercial picture with phase 3 data from multiple studies in acute pain (1Q24) as well as the phase 3 design in neuropathic pain. In our view, while there is likely to be a major push to minimize opioid use in healthcare systems in many states, cost and access will be a major consideration that could dictate the ultimate opportunity.

Valuation / P&L Thoughts Headed into 2024

Our 12-month price objective for Vertex of $450/sh is based on our NPV analysis. We estimate a value of $4/sh for Kalydeco, $2/sh for Orkambi, $0/sh for Symdeko, $336/sh for Trikafta, $24/sh for Casgevy, $19/sh for VX-548, $46/sh in net cash, and $19/sh for the pipeline (e.g., vanzacaftor).

SMid-Cap Biotech

89bio

ETNB US – Rating: BUY (C-1-9) | PO: 25.00 USD | Price: 11.29 USD

What we expect in 2024

ETNB shares have been under pressure in 2024, in-line with other NASH companies (e.g., Akero and Madrigal), which isn't surprising given investors acute focus on the potential impact of GLP-1's such as Lilly's tirzepatide in the space. That said, we continue to think the move is overdone, particularly for FGF21 assets such as 89Bio's pegozafermin and Akero's efruxifermin as their differentiated mechanism of action (MoA) allows the drugs to target later stage patients (e.g., progressing F3 patients and F4). Moreover. 89Bio has made good clinical progress in 2023 with pegozafermin's favorable phase 2b results (see our initial thoughts on the results here and long-term follow up here) which not only validated the MoA, but also the benefit of adding a GLP-1 on top of pegozafermin. Looking forward, 89Bio completed its end of phase 2 meeting with FDA + EMA for pegozafermin, which management noted was "best-case-scenario" as they now have clarity on what it will take to gain approve in pre-cirrhotic and cirrhotic patients. Indeed, 89Bio will initiate two pivotal phase 3 trials in 2024, ENLIGHTEN-Cirrhosis which will enroll patients with compensated cirrhosis (F4) and ENLIGHTEN-Fibrosis which will enroll patients with fibrosis stage F2-F3. Management expects to initiate the trials in 2Q24 and 1Q24, respectively. We maintain Buy and our $25 PO.

NASH pivotal trial design and timelines

Importantly, during the end of phase 2 meeting, 89Bio and FDA came to alignment on the regulatory path forward for pegozafermin in F4 patients, including an accelerated approval pathway using histology and for the outcomes portion, modified clinical outcomes definitions that could allow for an expedited readout. Also notable, 89Bio will be able to utilize the ongoing SHTG phase 3 program to create a safety database, eliminating the need to run safety trial, saving ~$50-$100M in trial costs. Turning to the trial design, the co-primary endpoints for ENLIGHTEN-Fibrosis will be a one-point improvement in fibrosis with no worsening of NASH and NASH resolution with no worsening of fibrosis at week 52. Management expects the ENLIGHTEN-Fibrosis trial to enroll relatively quickly given the F2-F3 patient population, with totality of the trial taking about 3 years, supporting accelerated approval. ENLIGHTEN-Cirrhosis will likely take longer to enroll given the smaller patient population for F4 (~1M patients in the US), but management expects to enroll the trial reasonably quickly, which we think makes sense based on precedent. For ENLIGHTEN-Cirrhosis, the primary endpoint will be regression of fibrosis from F4 to an earlier stage of fibrosis, assessed at 24 mos, which is important given mixed results for Akero's efruxifermin at 36-weeks (see our thoughts on the results here). Moreover, for both trials, 89Bio plans to enroll patients currently on GLP-1's, likely in the range of 40%, to highlight pegozafermin's benefit on top of GLP-1's, which we expect to be viewed favorably. Indeed, 89Bio plans to stratify use of GLP-1's and will power the trials based on the current phase 2b ENLIVEN data, where 22% of patients were on GLP-1's.

Valuation/P&L Thoughts Headed into 2024

Our DCF-based derived PO of $25 for ETNB includes $19/sh for pegozafermin in NASH and $3/sh for pegozafermin in SHTG after adjusting for risk. We assume a 61% POS (+16%, prior 45%) for NASH and 15% POS for SHTG, with the remaining value in our PO coming from cash ($3). Indeed, our confidence in ETNB's NASH program was increased following the positive phase 2b results we saw earlier this year (see above), plus the end of phase 2 meeting with FDA which creates a favorable backdrop in terms of regulatory requirements for approval of pegozafermin. We maintain our 15% WACC in NASH and SHTG and assume no terminal value for these assets.

Amylyx Pharmaceuticals

AMLX US – Rating: BUY (C-1-9) | PO: 42.00 USD | Price: 14.97 USD

What we expect in 2024

AMLX had a tough 2023 with shares underperforming the broader biotech market (-59% vs. +10% XBI index) due in part to macro headwinds and Relyvrio's launch challenges post 1Q/ failure to gain EU (European Union) approval. Indeed, after an initial bolus of demand, Relyvrio revenue and net patient add experienced a slowdown over the past two quarters (3Q/2Q/1Q: +100/ +800/ +1,700), which gave investors pause on whether the demand has reached the ceiling already. That said, we'd argue that it's a matter of "when and not if" Relyvrio achieves >$1.5B in peak sales if the PHOENIX trial succeeds. Indeed, we'd treat near-term sales as noise since ultimately the PHOENIX readout is the main value driver and determinant of Relyvrio's outlook. Looking to 2024, we don't anticipate a major growth inflection in 4Q but expect a modest improvement starting in 2024 since Part D redesign will eliminate the 5% co-pay in the catastrophic phase. Overall, we think there's a lot to like about Amylyx at its current valuation as investors shift focus to TUDCA-ALS (data early '24) and PHOENIX data (data in 2Q24). Indeed, we like the risk-reward setup going into these events and remain optimistic on the trial outcome. We maintain our Buy rating, $42 PO.

TUDCA-ALS near-term noise; PHOENIX is the key

While management does not think TUDCA-ALS, which evaluates one of Relyvrio's components, should be used as a read-through to PHOENIX, investors we've talked to generally view an overwhelming positive TUDCA-ALS outcome as a potential threat given it may put pressure on Relyvrio's net pricing in Europe (but no impact to the US market). On the other hand, a negative readout may dampen the investors' confidence on PHOENIX's potential success. The best-case scenario, according to investors, is that the trial barely misses stat sig. while showing a positive trend, which would give investors more confidence on PHOENIX readout. That said, given the TUDCA-ALS trial was conducted during COVID, a smaller number of trial participants were enrolled, which could be further reduced due to COVID drop out, making it difficult to draw conclusions and read-throughs to PHOENIX. We expect to see TUDCA-ALS data in Jan 2024 and PHOENIX results in 2Q24.

Valuation / P&L Thoughts Headed into 2024

Our $42 PO is based on probability-adjusted NPV analysis of AMX0035 in ALS ($37/sh) and net cash ($6/sh). We model AMX0035 revenues through 2035 in key markets including US, Canada, and Europe, and apply a 15% WACC and -35% terminal growth rate.

Caribou Biosciences

CRBU US – Rating: BUY (C-1-9) | PO: 20.00 USD | Price: 5.57 USD

What we expect in 2024

We think Caribou executed well in 2023 which bodes well for 2024, in our view. Importantly, the company was able to reach an agreement with FDA on a pivotal trial development plan for CB-010 in 2L DLBCL, confirming an accelerated approval timeline. In all, we think data presented to date and solid clinical development progress supports the company's platform value and differentiated approach to CAR-T development. Caribou expects to initiate a pivotal trial as early as YE24. We maintain Buy and our $20 PO.

RP2D for CB-010 will be established by 2Q24

As per the company's most recent update, the ANTLER Phase 1 trial continues dose expansion enrollment with initial dose expansion data and RP2D expected in 2Q24. Most recently, Caribou reported a 94% (15/16) overall response rate (ORR) and 69% (11/16) complete response (CR), confirming impressive efficacy in r/r NHL patients. Given alignment with FDA for an accelerated approval process in 2L DLBCL patients, we suspect additional patient data from the dose expansion cohorts will be robust. We remain interested in the durability of CB-010 as a potential area of differentiation. At ASH this year, we noted that CD20xCD3 combo bispecific data in 1L DLBCL were robust (see our ASH 2023 updates in lymphoma report), but overall still see CB-010 as offering a differentiated clinical profile compared to current CAR-T options. In addition to longer follow-up and more patients treated, we're looking for biomarker data that might support further patient stratification.

High bar set in MM for CB-011 data

We continue to look for an update from the phase 1 trial of CB-011 (CaMMouflage study), which is now enrolling r/r MM patients in the dose level 2 cohort, in early 2024. We'd note that the MM treatment landscape has rapidly evolved in the last year with J&J / Legend's Carvykti setting a high bar for newer CAR-T entrants; updated Carvykti Cartitude-2 Cohort A (1-3 lines prior therapy) and Cohort B (1 prior therapy) data demonstrated strong efficacy with an ORR of 95-100% and 90% CR. Furthermore, Arcellx/Gilead's CAR-T-ddBCMA appeared to demonstrate comparable efficacy to Carvykti in phase 1 with potential for a better safety profile (see our ASH 2023 MM updates). Indeed, while we like Caribou's platform, we think the MM treatment landscape has grown more competitive. Separately, Caribou also plans to enroll r/r AML patients in the phase 1 study (AMpLify) of CB-012 by mid-2024.

Valuation / P&L Thoughts Headed into 2024

Our $20/share price objective is based on a probability adjusted NPV of CB-010 ($5/sh), CB-011 ($4/sh), CB-012 ($3/sh), CB-020 ($3/sh), early pipeline and partnerships ($1/sh), and cash ($4/sh). We apply a WACC of 11-13% and 3% terminal growth rate, which is comparable to our valuation methodology for other biotech companies of similar size and stage of clinical development. Caribou maintains a healthy cash balance of >$400M, sufficient to fund operations into 4Q25, and demonstrate proof-of-concept for all current assets.

CRISPR Therapeutics

CRSP US – Rating: BUY (C-1-9) | PO: 100.00 USD | Price: 66.06 USD

What we expect in 2024

CRISPR had a strong 2023, with shares outperforming the broader biotech market (+54% vs. +4% NBI index) due in large part to Casgevy's positive Advisory Committee (see our thoughts on the briefing documents here and panel here)/ FDA approval in SCD (see our thoughts on Casgevy's approval here) + strategic clinical reorganizations of its immuno-oncology franchise. That said, we expect commercial hurdles for Casgevy to weigh on the stock looking to 2024, particularly considering its high cost ($2.2M) and requirement for myeloablative conditioning which creates a challenging tolerability profile. Indeed, a "short the launch" thesis is a risk to 2024 but fundamentally approval is still a major positive. Nevertheless, we think there are easy improvements to the product, especially as both CRISPR and partner Vertex and working towards gentler conditioning regimens (could take about 2 years) that could meaningfully increase market penetration based on our KOL discussions. Moreover, we'd say CRISPR, and partner Vertex, have done a job setting expectations for the launch, but even the Street's forecast of ~$162M (BofA $166M) could be challenging to hit if we look at precedent from other curative intent gene therapy launches (e.g., BioMarin's Roctavian for severe hemophilia A). Ultimately, we see the risk/ reward for shares remaining favorable, as we expect CRISPR to continue making progress on 1) Casgevy's launch in SCD and TDT (PDUFA March 30th, 2024), 2) its next-generation CAR-T agents, for both immuno-oncology and autoimmune disease and 3) in-vivo programs targeting ASCVD. We reiterate Buy but lower our PO to $100 to account for a measured Casgevy launch.

Commercial hurdles weigh heavy on Casgevy's launch

As mentioned above, we expect Casgevy's commercial launch inflection to take time as the patient journey to receive Casgevy could be onerous. Indeed, the journey can be characterized as 1) a screening period, 2) a pre-treatment period (CD34+ hHSPCs collected), 3) manufacturing period (enrichment of cells + CRISPR/Cas9 gene editing), and 4) treatment period (busulfan myeloablative conditioning regimen), which is a multi-month process according to management. That said, CRISPR has already activated multiple authorized treatment centers which are required as treatment necessitates specialized experience in stem cell transplantation, which is important as we assess patient uptake in year 1. Notably, we expect Casgevy's price of $2.2M to be viewed favorably by payers + prescribers as its a steep discount to competitor BlueBird's (covered by Jason Gerberry) Lyfgenia, a lentiviral gene therapy, with a price of $3.1M.

Strategic pivot for CAR-T's makes sense

CRISPR provided a favorable update for its immuno-oncology pipeline recently, with management deciding to focus on CTX112 and CTX131 (next generation CAR T products) versus the first-generation allogenic CAR T candidates, CTX110 and CTX130. Indeed, we think this strategy makes a lot of sense as these next generation candidates incorporate two gene edits to knock out Regnase-1 and TGFBR2 which prior literature has shown to increase potency and reduce CAR T exhaustion, which has remained a challenge in the CAR-T space. Moreover, while CRISPR isn't cash constrained, focusing its capital on more promising assets, with a pipeline in a drug approach, sets CRISPR up well, especially with CRISPR also expanding CTX112 into autoimmune disease (e.g., SLE) and CTX131 into hematologic malignancies.

Valuation / P&L Thoughts Headed into 2024

Our $100 price objective for CRISPR Therapeutics is based on a probability adjusted (40-100%) NPV sum-of-the-parts analysis of its new product cycle and early-stage pipeline. We use a WACC of 12% (from 15% due to lower rates), comparable to other early-stage companies in our coverage universe, and a 2% terminal growth rate given the long patent life and difficulty of replication. Given these assumptions, our $100 PO includes $44/share for Casgevy, $3/sh for CTX112, $2/sh for CTX121, $4/sh for CTX131, $22/sh in net cash, and $25/sh for the technology platform and early-stage assets.

CureVac

CVAC US – Rating: UNDERPERFORM (C-3-9) | PO: 6.40 USD | Price: 4.19 USD

What we expect in 2024

CureVac had a difficult 2023 given declining COVID-19 interest and challenges in cancer vaccine development. Additionally, like SMid peers, CureVac faced pressure from macro concerns and the rising rate environment. While the company has made some progress in the current generation of COVID-19 and flu vaccines, we remain skeptical about the commercial opportunity in these indications, however, with competitors (Pfizer/Moderna) already entrenched and unclear differentiation. In our view, CureVac's pipeline is a "wait and see" story that will take time to play out beyond 2024 even if upcoming data read-outs are positive. Moreover, CureVac's litigation strategy also faces significant roadblocks given Germany Patent Court recently invalidated CureVac's '122 patent (G/C enrichment) violation claim against BioNTech (covered by Ahmad). Indeed, this is a major setback for CureVac given that the company had high hopes that it could receive a portion of the >$90B COVID-19 revenue generated by Pfizer/BioNTech, and the G/C enrichment patent is considered a "bellwether" case to them. Overall, we remain cautious on CureVac's outlook given the company's fundamental outlook remains uncertain. Maintain Underperform rating, and PO $6.40.

Fundamental outlook remains muddy

Due to the early stage of CureVac's clinical pipeline, we continue to take a cautious stance. The company has initiated a phase 2 study in COVID-19 with various mRNA vaccine candidates (interim data in early 2024) and phase 2 study in influenza (data in 2024). That said, we remain skeptical about the commercial opportunity in these indications, however, with competitors (Pfizer/Moderna) already entrenched and unclear differentiation. Turning to oncology, we note that CureVac has initiated a phase 1 cancer vaccine study in glioblastoma, with readout expected in 2H24. That said, the oncology program is still early (pre-clinical) given that CureVac intends to focus on developing second generation cancer vaccines via Frame Cancer's antigen discovery platform.

Valuation/ P&L Thoughts Headed into 2024

Our $6.40/share PO is based on a probability-adjusted net present value (NPV) of CureVac's pipeline, including its oncology program and its other prophylactic vaccines. We apply a 10% weighted-average cost of capital (WACC) and a terminal value ranging from -15% to -5% depending on the program (we project revenues out through 2035), in line with other biotech companies of similar size and stage of clinical development. We also include approximately $2/share from CureVac's current cash position.

Kiniksa Pharmaceuticals

KNSA US – Rating: BUY (C-1-9) | PO: 28.00 USD | Price: 18.53 USD

What we expect in 2024

KNSA shares had a solid year in 2023 (+17% vs. NBI index +4%) with impressive progress for Arcalyst's commercial growth in recurrent pericarditis (2023e sales grew 95% vs. 2022). That said, pipeline progress has been minimal as the company continues to focus on commercial execution. We continue to view Kiniksa as differentiated from SMid biotech peers, and at current levels, we think the risk/ reward profile remains attractive, especially with the improving macro backdrop. Indeed, Kiniksa has a proven track record of re-investing into the business, while providing optionality for its earlier pipeline and retaining strategic attractiveness given the growth of Arcalyst and a path to profitability

We view Arcalyst's commercial execution as the biggest value driver for Kiniksa heading into 2024, bolstered by the company's successful investment in its sales force. Indeed, we continue to be above the Street for Arcalyst sales in 2024 (BofA $347M, cons $343M) given the positive metrics from prescribers (22% repeat prescriber rate) and payers (>90% reimbursement), which is also echoed by our KOLs. Overall, given the open question on duration of treatment due to the chronic auto immune nature of RP (duration is likely higher than the Street's 12 mo forecast) and Kiniksa's solid commercial execution to date, we remain positive on Arcalyst's ongoing growth. We'd argue Arcalyst's continued momentum taken together with financial/ pipeline optionality set Kiniksa up for a solid 2024 and keep us as buyers of the name. Maintain Buy, $28 PO.

Commercial not pipeline progression is a key value driver

While we suspect investor attention will remain on commercial execution of Arcalyst in 2024, we expect phase 2 results for KPL-404 in rheumatoid arthritis (RA) in 1H24. This is clearly a competitive market but one where even a modestly differentiated profile could lead to a reasonable market share. That said, we excluded '404 from our model and await further data before we ascribe any value. Longer term, we view Kiniksa's continued pursuit of collaborative study agreements for KPL-404 (given the breadth of I&I indications it could target) and mavrilimumab, as favorable from a P&L and optionality perspective. Indeed, strategic pipeline deals could be an important source of capital for Kiniksa to not only help with clinical development, but also successful commercialization. Importantly, Kiniksa is also very focused on BD following the out-licensing of vixarelimab, which could further help build out its late-stage pipeline and engage investors. We suspect Kiniksa will target rare CV disease assets to leverage its sales force and expertise, but management has noted the high clinical /scientific bar required for in-licensing, so we do not expect multiple deals to be announced in the near-term. Ultimately, we'd say Kiniksa's strategy of innovative deals to both out-license and in-license assets based on 1) the clinical data, 2) the number of potential indications, and 3) patient populations, set it apart and provide optionality.

Valuation/ P&L Thoughts Headed into 2024

We use sum of the parts NPV model to value Kiniksa shares based on our risk adjusted revenue forecasts and estimated margin assumptions. Our $28 PO is based on a sum-of-the parts NPV analysis, forecasting sales of Kiniksa's only commercialized product, Arcalyst, out to 2030 using a WACC of 8% and a terminal value of -7.5%, in-line with peer companies of similar size and risk. Under our model assumptions, we value Arcalyst at $25/sh and net cash at approximately $3/sh.

Kymera Therapeutics

KYMR US – Rating: NEUTRAL (C-2-9) | PO: 30.00 USD | Price: 25.35 USD

What we expect in 2024

While we continue to like the best-in-class potential of Kymera's targeted protein degradation platform and think the pivot to focusing on immunology further differentiates the company's pipeline, we think timelines to additional pivotal data coupled with the uncertain macro backdrop support a more wait-and-see approach. Looking ahead to 2024, we await updates at the virtual Immunology R&D Day on January 4, 2024, to unveil the company's priorities in its growing immunology pipeline. We thought partner Sanofi progressing KT-474 (IRAK4 degrader) to phase 2 clinical development provided early validation of the potential of protein degraders in immunology and were especially impressed with the higher potency of KT-474 compared to Pfizer's PF-06550833. That said, we think any pivotal updates from the pipeline are a way away. Maintain Neutral, $30 PO.

On KT-333 and KT-253 updates

Following the discontinuation of Kymera's KT-413 (IRAKiMID degrader) program, 2024 is expected to be a quiet year for catalysts as the company focuses on clinical execution ahead of what is looking to be a pivotal year in 2025. At ASH 2023 this year, Kymera presented a poster on KT-333, which included data from 29 patients (10 liquid tumor and 19 solid tumor patients) across five dose levels (DL1-5). Overall, we thought the translational data were solid with 84% mean maximum STAT3 degradation in peripheral blood mononuclear cells (PBMCs) at DL4-5 and maximum degradation up to 96% and downregulation of inflammatory biomarkers. However, we think the clinical data are still too early and results are challenging to interpret given the limited number of patients. That said, we think clinical benefit of 3/5 for cutaneous T-cell lymphoma (CTCL) stood out as most promising. Overall, there were three partial responses (one Hodgkin's lymphoma, two CTCL) and five stable disease (one CTCL, four solid tumors) observed. For KT-333, we're looking for establishing RP2D and additional disclosure on solid tumor data. Separately, we also look for updates on the patient stratification and development strategy for KT-253 (MDM2 degrader).

Valuation/ P&L Thoughts Headed into 2024

We use a sum of the parts NPV model to value Kymera shares based on our risk-adjusted revenue forecasts and estimated margin assumptions. Our $30 price objective gives credit to the company's two lead programs, KT-474 and STAT3, through 2039 and uses a 15% WACC for both programs.

While we think Kymera's cash position ($435M as of 3Q23) is solid and should fund operations into 2026, which includes initial investments for strategic realignment, the longer time horizon and uncertainty for earlier stage assets give us pause on OpEx cost savings from discontinuing the KT-413 (IRAKiMID degrader) program.

LianBio

LIAN US – Rating: UNDERPERFORM (C-3-9) | PO: 3.00 USD | Price: 4.37 USD

What we expect in 2024

LianBio finished the year up +185% (NBI +4%) after a very busy 2023 both clinically and financially. In April, the company's largest drug mavacamten met its primary endpoint in the treatment of hypertrophic cardiomyopathy in Chinese patients and was on track for a commercial launch in China by mid-2024. However, in October this year the company announced it had terminated its agreement with Bristol (who acquired mavacamten's parent company MyoKardia in August 2020) to sell the drug in Asia in exchange for $350M. Looking further down the pipeline, the company's LIBRA trial of its TP-03 candidate in Demodex blepharitis (DB) failed to meet is primary endpoints for a complete collarette cure and they sold the rights of NBTXR3 to J&J for $25M in late December. While the cash inflow from the rights cancellation has greatly extended their runway, we think the loss of three major programs in the pipeline significantly limits optionality.

On financials, LianBio had >$250M in cash as of 3Q, which the company predicts will support business development until 1H25. However, given the uncertainty of how the company will use its cash inflow from Bristol it's unclear if excess cash will be used to acquire new drug rights or advance its current pipeline. Furthermore, the company is in the midst of a "strategic review to realize the value of the company's platform and product candidates" and saw both its CEO and CFO depart following the board's rejection of a takeover offer in December. In our view, the new cash may relieve the constraints that have affected LianBio's licensing appetite–but even with the higher likelihood of adding additional programs, the uncertainty surrounding the company's future and higher projected OpEx spending in 2024 as they execute their strategic review / executive search significantly reduces upside in the name. Accordingly, we have moved our rating to Underperform and lowered our PO (to $3 from $5) as we believe the management change and pipeline concerns cast a doubt over how effectively they can deploy their cash.

Notable 2024 catalysts

Given the uncertainty over the direction of LianBio's future, we believe that 2024's top catalyst is an update on the company's strategic review which is currently expected in 1H24. Looking to clinical catalysts, data from BridgeBio's phase 1 study of BBP-398 in US patients with NSCLC is expected in 3Q24, providing a readthrough to LianBio's Phase 1 trial results of the drug in China. Otherwise, we expect 2024 to be a year of commercial execution and strategic realignment for LianBio.

Valuation/ P&L Thoughts Headed into 2024

We use a sum-of-the parts NPV model to value LianBio shares based on our risk adjusted revenue forecasts and estimated margin assumptions. Our $3 price objective is based on the sum-of-the parts NPV analysis, forecasting sales of TP-03 in DB and infigratinib in Cholangiocarcinoma (CCA) and gastric cancer out to 2038, using a WACC of 20% growth rate for NBTXR3. Under our assumptions, we value TP-03 at $-2/sh, cash at $6/sh, and we've modeled a placeholder NPV for other programs including infigratinib (-$1/sh) pending more line of sight into next steps.

Lyell Immunopharma

LYEL US – Rating: BUY (C-1-9) | PO: 9.00 USD | Price: 2.11 USD

What we expect in 2024

Lyell shares struggled in 2023 (-44% vs NBI index +4%) mainly because of broader SMid cap biotech weakness, but also from slower than expected clinical progress. That said, at our Napa Biopharma conference, we caught up with company management, who remained confident in the therapeutic potential of Lyell's platform. As a reminder, the company's platform offers the ability to overcome T cell exhaustion and the inability to self-renew, which could in turn drive deeper and more durable tumor responses. Management noted that the LYL797 (ROR1-targeted CAR-T therapy) phase 1 study is on track with data expected in 2024. Looking into 2024, management is committed to focusing on clinical execution with phase 1 data for LYL797 and LYL845 (a Tumor-infiltrating lymphocytes (TIL) product candidate) likely in 2024. To be fair, the faster Lyell can advance the clinical studies, the more likely we think the Street will focus on the differentiation of its CAR-T and TIL technologies in solid tumors. In our view, initial data in 2024 from LYL845 and/ or LYL797 could be viewed as positive clinical progress. Regardless, we continue to like Lyell's story given its differentiated technology platform that targets multiple solid tumors with robust preclinical data. At the end of 3Q23, the company had $598M of cash and cash equivalents, sufficient to fund the operation into 2027 and support proof-of-concept clinical readouts of multiple product candidates. We maintain our Buy rating and $9 PO.

Differentiated technology targeting large solid tumor markets

While we acknowledge that clinical validation is needed, we are optimistic about Lyell's cell therapy platform that consists of 1) genetic reprogramming (Gen-R) and 2) epigenetic reprogramming (Epi-R). The Gen-R platform, through two stackable technologies (c-Jun and NR4A3), offers the ability to overcome T cell exhaustion, allowing more robust antitumor activity. The Epi-R platform, through two stackable technologies (*ex vivo* manufacturing protocol and cell activation reagent), offers the ability to confer durable stemness, allowing for deeper and more durable clinical responses. Indeed, preclinical studies showed that Lyell's cell therapy technology could offer meaningful anti-tumor benefit over standard cell therapies. To be fair, deep, and durable efficacy will need to be demonstrated in humans to justify the high cost of cell therapies (>$350,000) vs. less expensive standard of care, but we think Lyell's technology has the potential to fill this niche. Indeed, we think both LYL797 and LYL845 have blockbuster potentials at peak sales. More importantly, if Lyell's platform is validated clinically, meaningful additional opportunity exists.

Pipeline updates for 2024

We see large peak potential opportunities for LYL797 and LYL845, we expect to see clinical de-risking in 2024, as we expect to see initial proof-of-concept data for Lyell's technology in humans. LYL presented pre-clinical development for LYL119 (ROR1-targeted CAR-T) at SITC earlier this year and remains on track to submit an IND in 1H24. Following a quiet 2023, we expect Lyell to demonstrate results from its differentiated technology platform in 2024.

Valuation/P&L Thoughts Headed into 2024

We use a sum-of-the parts NPV model to value Lyell shares based on our risk adjusted revenue forecasts and estimated margin assumptions Our $9 PO is based on a probability-adjusted NPV of Lyell's pipeline, including LYL797 in NSCLC and TNBC, LYL845 in melanoma, head and neck cancer, and colorectal cancer, and earlier stage pipeline assets. We apply a 13-16% WACC in-line with similar preclinical stage biotech's (we project revenues through 2035). We also include $3/share from Lyell's cash position.

Neumora

NMRA US – Rating: BUY (C-1-9) | PO: 20.00 USD | Price: 16.90 USD

What we expect in 2024

Neumora became a publicly traded company in September 2023, after emerged from stealth mode in 2021 via the backing of Arch Ventures and an investment from Amgen. Since the inception, Neumora has built a broad pipeline of clinical and preclinical assets (seven molecules disclosed to date) with novel mechanisms of action (MoA) that could potentially treat large patient populations with significant unmet needs. Several of these drugs, including lead asset navacaprant for major depressive disorder (MDD)/bipolar depression, and NMRA-266 for schizophrenia, have been clinically validated and/or have a strong scientific rationale. That said, many investors remain skeptical on navacaprant's KOR target and see NMRA-266 as a me-too drug that's undifferentiated and late to the market compared to Karuna's KarXT and Cerevel's emraclidine. Indeed, NMRA shares underperformed the initial IPO price following its debut until December, following AbbVie/Cerevel and Bristol/Karuna's acquisitions that raised investor interests in the neuropsych space. Looking to 2024, J&J's aticaprant, which shares the same MoA as navacaprant, is expected to report the first Phase 3 data in adjunctive MDD (VENTURA-1) in mid-2024, which will be a key read-through to navacaprant's phase 3 data in 2H24. In addition, investors will look to Cerevel's emraclidine two pivotal schizophrenia trial results to re-assess expected value of NMRA-511 (see our NMRA initiation report). As such, we reiterate Buy and raise PO to $20 (from $18 PO) by lowering WACC from 15% to 14% on improved sector sentiment and macro backdrop.

Nava may be game changer for major depressive disorder

Navacaprant is a novel, oral once-daily, selective kappa opioid receptor (KOR) antagonist with the potential to differentiate on tolerability vs. existing antidepressants for MDD, which have undesirable side effects such as weight gain and sexual dysfunction. Overall, phase 2 efficacy also looks promising given there is strong scientific rationale in targeting the KOR pathway, which is well-characterized and known to modulate depression, anhedonia, and anxiety. That said, development of MDD/neuropsych drugs carries significant risk given the high placebo response rate but we're encouraged by management's focus on selecting the best trial sites to run the studies and optimizing phase 3 trial design to maximize the probability of success. We expect to see first data readout in 2H24 (KOSTAL-1), with two more readouts 1H25 (KOSTAL-2 & -3) after.

Schizophrenia portfolio could drive upside in 2H24

NMRA-266 is a muscarinic receptor 4 (M4R) modulator and a clinically validated target for schizophrenia (e.g., Karuna's KarXT and Cerevel's emraclidine). Given Karuna's strong data set (effect size: 0.60 to 0.75), it may be an uphill battle for emraclidine and navacaprant to demonstrate superior efficacy cross-trials. That said, while overall KarXT has a relatively clean safety profile, it has GI side effects similar to an SSRI. In that regard, selective M4 targeting may potentially preserve the antipsychotic activity while avoiding the undesirable cholinergic side effects that are believed to be associated with M1 target, based on animal models. On the other hand, there's a debate among investors on whether the M1(muscarinic 1) component is important for cognition. Nevertheless, given the similarity between NMRA-266 and emraclidine, emraclidine's phase 2 readout in 2H24 will serve as an important readthrough for NMRA-266.

Valuation / P&L Thoughts Headed into 2024

Overall, we think navacaprant has the potential to become a cornerstone therapy in MDD. Our sales estimate is predicated on the successful development of navacaprant and NMRA-266 with a timetable of 2039. Our $20 PO is based on a probability-adjusted NPV with 80% of value from MDD ($14/sh), $2/sh from schizophrenia, $1/sh from bipolar depression, and the remaining in cash $2/sh.

Sana Biotechnology

SANA US – Rating: BUY (C-1-9) | PO: 10.00 USD | Price: 4.20 USD

What we expect in 2024

Sana had a strong 2023 relative to other SMIDs in our coverage (+3% vs. +4% NBI index). Indeed, the company made an announcement that it has re-prioritized its pipeline by putting its SG299 IND on hold in 4Q which led to a 29% reduction in the workforce but resulted in a cash runway into 2025. Sana initiated clinical trials for its SC291 (CD19-targeted allo CAR T) in NHL and CLL with data from its ARDENT study expected in 1H25 and submitted an IND for its SC262 (CD22-targeted Allo CAR-T) in NHL, ALL, and CLL. This will provide the first in human validation of Sana's platform, which is differentiated from other CAR-T offerings, in our view. We are also looking for further updates on Sana's other preclinical programs, notably SC451 islet cells to treat T1D which Sana has called-out as its most valuable pipeline program, as they progress towards IND in 2024+. Indeed, we see a strong setup for Sana in 2024 as it advances programs in a range of therapeutic areas including oncology and type 1 diabetes. We maintain our Buy rating and $10 PO based on Sana's unique platform which we argue has the potential to generate best-in-class assets in multiple indications.

Preclinical data continues to support differentiation of Sana technology

Recent preclinical data presented at ASH focused on Sana's CD-19 hypoimmune CAR-T generation process and highlighted the ability of the cells to avoid the immune system while retaining their anti-tumor effects. Another ASH presentation also explored the use of a novel allogenic GPRC5D-Directed CAR for Treatment of Multiple Myeloma, outlining that preclinical data shows the GPRC5D CARs elicited in vitro cytotoxicity and effector cytokine production that is comparable to clinically validated benchmark control CARs. Additionally, these GPRC5D CAR T cells controlled multiple myeloma tumor cells both in vitro and in vivo, demonstrating efficacy that is on par with clinical benchmark GPRC5D CAR T cells. While this data is very early and there is plenty of de-risking needed for the pipeline, we are encouraged by the expanding body of preclinical evidence that supports the differentiation of Sana's technology and the company's ability to reproducibly manufacture cells at a larger scale.

Pipeline highlights for 2024

Following its pipeline reprioritization, we expect a quiet 2024 from Sana as the company focused on commercial execution. Sana is expected to file an IND for SC262 (HIP-modified CD22-directed allogeneic CAR T) in B-cell leukemias and lymphomas in early 2024, and SC451 (CD-22 targeted CAR-T) in T1D later this year. We also look for further pre-clinical updates for programs including SC451 (pancreatic islet cells for T1D), SC262 (CD22-targeted allo CAR T), SC379 (glial progenitor cells), and SG255 (BCMA-targeted allo CAR T) which should further validate the potential of Sana's platform in multiple indications.

Valuation/P&L Thoughts Headed into 2024

Our $10 PO is based on a probability-adjusted NPV of Sana's pipeline (12% likelihood of success), including its in vivo and ex vivo platform programs. We apply a 15% WACC and a terminal growth of -30% (we project revenues out through 2035), in-line with other biotech companies of similar size and stage of clinical development. We also include approximately $2/share from Sana's current cash position.

Turnstone Biologics

TSBX US – Rating: BUY (C-1-9) | PO: 15.00 USD | Price: 2.59 USD

What we expect in 2024

Turnstone remains on-track to report TIDAL-01 clinical data in melanoma and other solid tumors by mid-2024. We note that the phase 1 trial in melanoma is investigator-led through the Moffit Cancer Center, a well-known leader in TIL research/therapy; we expect to make some indirect comparisons between bulk and selected TILs on response rates. Indeed, we remain interested in Iovance's lifileucel regulatory decision (PDUFA: February 24, 2024), which we think will have broad read-through. Based on our discussions with management, we'd expect the initial cohort of patients in the non-melanoma trial to be primarily colorectal patients and would view ORR rates >30% (in-line with best responses observed prior from academia) as early validation of Turnstone's platform, and a substantial de-risking event. Overall, we think 2024 should be a pivotal year for Turnstone and could see a re-rating of the stock following initial clinical proof-of-concept. We maintain Buy and our $15 PO.

Expectations for mid-year clinical data

Initial data from 20-30 patients are anticipated from both studies. The primary objectives of the phase 1 study are safety and tolerability, which we do not anticipate being an issue given the personalized nature of selected TIL therapy. More importantly, we look forward to early response data. We'd view response rates ≥30% clinically compelling for non-melanoma solid tumors, and supportive of continued development for melanoma patients with potential for longer durability or deepening responses over time. We think Turnstone's approach is supported by a robust body of literature, and enhancements to tumor reactivity should support clinical efficacy in both melanoma and nonmelanoma patients.

Thoughts on manufacturing updates

Management expects clinical and commercial TIL production will be more robust than what was presented at SITC for colorectal cancer patients, adding that initial tumor sample quantity and quality has a major impact on yield. Currently turnaround for treatment is ~8 weeks, which would need to shorten to ~4 weeks for larger scale pivotal trials to be feasible. We suspect that management will wait until after clinical proof-of-concept is presented before investing more substantially in manufacturing and see YE24 as the most likely timeline for any manufacturing updates.

Valuation/ P&L Thoughts Headed into 2024

Our 12-month PO of $15 is based on a probability adjusted SOTP NPV of TIDAL-01 in melanoma (42% of our valuation) and other solid tumors, primarily breast / CRC / uveal melanoma (3% of our valuation). We assign a valuation of $1/share valuation to TIDAL-02 (3% of our valuation), given its stage of development. We apply a midpoint WACC of 15% (13-17%) and -10% terminal growth rate, which is comparable to our valuation methodology for other biotech companies of similar size and stage of clinical development. The remaining $3/sh comes from net cash. Turnstone ended 3Q23 with a cash balance of $109M, expected to fund operations into 2Q25, through initial clinical proof-of-concept data. That said, we could see the company opportunistically seek financing following data mid-2024.

Exhibit 1: BofA EPS Estimate Changes
We summarize our updated EPS numbers with this report

			Updated earnings		Previous earnings		
Company	Ticker	Rating	2023e	2024e	2023e	2024e	Changes to our model
Bristol	BMY	Neutral	$7.57	$6.70	$7.57	$6.70	Included Karuna/ Rayze acquisitions
Kymera	KYMR	Neutral	-$2.90	-$3.35	-$2.90	-$3.30	Decreased operating margins
Vertex	VRTX	Buy	$15.00	$16.30	$15.00	$16.50	Reduced Casgevy launch trajectory
CRISPR	CRSP	Buy	-$4.40	-$6.55	-$3.15	-$0.65	Reduced Casgevy launch trajectory +immune/oncology delays
LianBio	LIAN	Underperform	$2.40	-1.35	$2.15	-$1.35	Removed Mavacamten, TP0-3, and NBTXR3 Programs, raised WACC
Neumora	NMRA	Buy	-$1.04	-$1.13	-$1.04	-$1.13	Increased WACC

Source: BofA Global Research estimates

BofA GLOBAL RESEARCH

Abbreviations:
TIL: tumor infiltrating lymphocyte
PDUFA: Prescription Drug User Fee Act
CRC: colorectal cancer
oHCM: obstructive hypertrophic cardiomyopathy
DB: Demodex Blepharitis
CCA: Cholangiocarcinoma
H&N: head and neck
PK: pharmacokinetic
WACC: weighted average cost of capital
FGFR2/ EGFR: genes
NSCLC: non-small cell lung cancer
NDA: new drug application
REMS: Risk Evaluation and Mitigation Strategy
NPV: net present value
CAR-T: chimeric antigen receptor T
TIL: tumor infiltrating lymphocyte
ROR1: receptor tyrosine kinase like orphan receptor 1
NR4A3: nuclear receptor subfamily 4 group A member 3
NSCLC: non-small cell lung cancer
TNBC: triple-negative breast cancer
GSK: GlaxoSmithKline
SSRI: Selective serotonin reuptake inhibitors
CAR-T: Chimeric antigen receptor T-cell
CNS: Central nervous system
ASH: American Society of Hematology
IND: Investigational new drug
CD: Cluster of differentiation
T1D: Type-1 diabetes
Cas12b: CRISPR-associated endonuclease 12b
BCMA: B-cell maturation antigen
CAR-T: Chimeric antigen receptor T-cell
TDT: Transfusion-dependent beta-thalassemia
SCD: Sickle cell disease
KOL: key opinion leader
PDUFA: Prescription Drug User Fee Act
ASCVD: atherosclerotic cardiovascular disease
TGFBR2: transforming growth factor-beta receptor type 2'
SLE: systemic lupus erythematosus
CD34+: cluster of differentiation 34+
hHSPCs: hematopoietic stem and progenitor cell
CRISPR/Cas9: gene-editing technology
ATC: authorized treatment centers
TGFBR2: gene

PD-1: Programmed cell death protein 1
GSK: GlaxoSmithKline
mRNA: Messenger ribonucleic acid
RP: recurrent pericarditis
GCA: giant cell arteritis
CV: cardiovascular
Mavri: mavrilimumab
BD: business development
RA: Rheumatoid arthritis
KOL: key opinion leader
I&I: immunology and inflammation
PoC: proof of concept
WACC: weighted average cost of capital
ARDS: acute respiratory syndrome
EUA: Emergency Use Authorization
PN: prurigo nodularis
ASH: American Society of Hematology
IRAKiMID: interleukin 1 receptor-associated kinase and immune-mediated inflammatory diseases
STAT3: signal transducer and activator of transcription 3
MDM2: murine double minute 2
DL: dose level
IRAK4: interleukin-1 receptor-associated kinase 4
RP2D: recommended phase 2 data
NASH: nonalcoholic steatohepatitis
SHTG: severe hypertriglyceridemia
FDA: Food and Drug Administration
EMA: European Medicines Agency
GLP-1: glucagon-like peptide 1
Gene names: FGF21
POS: probability of success
CR: complete response
ORR: overall response rate
NHL: non-Hodgkin's lymphoma
DLBCL: diffuse large B-cell lymphoma
1L: first line therapy
2L: second line therapy
MM: multiple myeloma
AML: acute myeloid leukemia
r/r: relapsed and refractory
FDA: Food and Drug Administration
CRS: cytokine release syndrome
CAR-T: chimeric antigen receptor T-cell
RP2D: recommended phase 2 dose
CD: cluster of differentiation
BCMA: B-cell maturation antigen
LOE: loss of exclusivity
RSV: respiratory syncytial virus
CAR-T: chimeric antigen receptor T-cell
BD: business development
UC: ulcerative colitis
LOE: loss of exclusivity
COPD: chronic obstructive pulmonary disease
ASH: American Society of Hematology
NSCLC: non-small cell lung cancer
1L: first-line treatment
r/r: relapsed and refractory
MM: multiple myeloma

FL: follicular lymphoma
DLBCL: diffuse large B-cell lymphoma
Oncology
PSMA: prostate-specific membrane antigen
CD: cluster of differentiation
MUC16: mucin 16
MET: mesenchymal epithelial transition factor receptor
EGFR: epidermal growth factor receptor
LAG3: lymphocyte-activation protein 3
SC: subcutaneous
IV: intravenous
RP: Royalty Pharma
CF: cystic fibrosis
oHC: obstructive hypertrophic cardiomyopathy
CF: cystic fibrosis
FDA: Food and Drug Administration
APOL1: apolipoprotein L1
SCD: sickle cell disease
DPN: diabetic peripheral neuropathy
TDT: transfusion dependent beta-thalassemia
NDA: new drug application
T1D: type 1 diabetes
AKMD: APOL1-Mediated Kidney disease
HIV: human immunodeficiency virus
TIGIT: T-cell immunoreceptor with Ig and ITIM domains
HR: hormone receptor
HER2: human epidermal growth factor receptor 2
CAR-T: chimeric antigen receptor T-cell
BCMA: B-cell maturation antigen
SCCHN: squamous cell carcinoma of the head and neck
SCLC: small cell lung cancer
PrEP: pre-exposure prophylaxis
MOA: mechanism of action
KOL: key opinion leaders
LAI: long-acting injjectable
ASH: American Society of Hematology
CROI: Conference on Retroviruses and Opportunistic Viruses
NSCLC: non-small cell lung cancer
NSCLC: non small cell lung cancer
La/m UC: locally advanced or metastatic urothelial carcinoma
ADC: antibody drug conjugate
PDUFA: Prescription Drug User Act
1L: first line
B7H3, CDH6, Claudin 18.2, HER3, TROP2: common targets for ADCs
PCV: personalized cancer vaccine
BD: business development
ADC: antibody drug conjugate
PAH: pulmonary arterial hypertension
TIGIT: T cell immunoreceptor with immunoglobulin and ITIM domain
LAG-3: lymphocyte-activation gene 3
CTLA-4: cytotoxic T-lymphocyte antigen-4
RCC: renal cell carcinoma
LOE: loss of exclusivity
RSV: respiratory syncytial virus
WACC: weighted average cost of capital
INT: individualized neoantigen therapy
OpEx: operating expenses

CMV: Cytomegalovirus
FTC: Federal trade commission
GLP-1: glucagon like peptide 1
GIP: Glucose-dependent insulinotropic polypeptide
LOE: loss of exclusivity
BD: business development
SCLC: small cell lung cancer
PDUFA: The Prescription Drug User Fee Act
COPD: Chronic obstructive pulmonary disease
AATD: alpha-1 antitrypsin deficiency
EU: European Union
KOL: key opinion leader
DMD: Duchenne Muscular Dystrophy
FDA: Food and Drug Administration
MYBPC3/ PKP2: genes
Long QT syndrome: a type of conduction disorder
IRA: inflation reduction act
MS: multiple sclerosis
FDA: Food and Drug Administration
SMA: spinal muscular atrophy
CMS: Centers for Medicare & Medicaid Services
a-beta: amyloid beta
CD20: B-cell marker
PPD: postpartum depression
CRL: complete response letter
ALS: amyotrophic lateral sclerosis
SC: subcutaneous
IV: intravenous
WW: worldwide
LOE: loss of exclusivity
MOA: mechanism of action
KOL: key opinion leader
NSCLC: non small cell lung cancer
MM: multiple myeloma
BCMA: B-cell maturation antigen
NSCLC: non-small cell lung cancer
ADC: antibody-drug conjugate
PDUFA: The Prescription Drug User Fee Act
MSS CRC: Microsatellite stability colorectal cancer
DLBCL: diffuse B cell lymphoma
1L: first line
LPA1: Lysophosphatidic acid receptor 1
TIGIT: checkpoint inhibitor
KRAS G12C: oncogene
IO: immuno-oncology
CAGR: compound annual growth rate
NASH: nonalcoholic steatohepatitis
HFpEF: heart failure with preserved ejection fraction
GLP-1: glucagon like peptide 1
GGG: GLP-1, GIP, and glucagon
WW: worldwide
CRPC: Castration-resistant prostate cancer
ROW: rest of world
EU: European Union
I&I: inflammation and immunology
1L: first line therapy
UC: ulcerative colitis

IBD: inflammatory bowel disease
CLL: chronic lymphocytic leukemia
r/r: relapsed and refractory
ADC: antibody drug conjugate
BD: business development
M4: muscarinic acetylcholine receptor 4
KOR: Kappa opioid receptor
MDS: myelodysplastic syndrome
NSCLC: non-small cell lung cancer
Oppty: opportunity
FDA: Food and Drug Administration

Investment Rationale

Bristol-Myers Squibb
Our Neutral rating is driven by the uncertainty on long-term growth profile of the company given LOE headwinds despite recent acquisitions. That said, BMY has multiple new launches (recent/ upcoming) which could potentially re-rate the stock if the company can execute the launch successfully.

Kymera Therapeutics
We like Kymera's story, as we see a positive risk/reward moving into this year's major data readout, and see an opportunity for increased momentum over the next few months. We'd argue that valuation from here will be driven almost entirely by increased probabilities of success for Kymera's lead programs (IRAK4 and STAT3).

LianBio
Our Underperform rating on LIAN is based on the limited optionality of its current pipeline, which lacks high impact candidates and concerns over high opex spending / strategic uncertainty over the company's future.

Price objective basis & risk

89bio, Inc (ETNB)
Our DCF-based derived PO of $25 for ETNB includes $19/share for pegozafermin in NASH and $3/share for pegozafermin in SHTG. The remaining value in our PO comes from cash. We use a 15% WACC in NASH and SHTG and assume no terminal value for ETNB.

Upside risks to our price objective are 1) additional positive clinical results in NASH showing potential dosing superiority, 2) positive clinical data in SHTG showing differentiation against standard of care, and 3) higher than expected prevalence/diagnosis rate in NASH/SHTG leading to high market penetration.

Downside risks are 1) failure in phase 2b study in NASH, 2) subpar efficacy/lack of dosing advantage of pegozafermin in NASH compared to other FGF21 analogs, 3) low penetration/poor uptake in the NASH/SHTG market for pegozafermin and 4) failure to show clinical benefits in SHTG.

AbbVie (ABBV)
Our $160 price objective (PO) is based on a 50/50 blended valuation of our DCF and 2024 non-GAAP EPS estimate P/E multiple of 12x (giving a value of $132). Our 12x P/E multiple lags peers (18.0x) due to concentration risk of the company's assets and LOE concerns to drive significant growth in the future. We assume a 7% WACC and a -1% terminal growth in our estimates to arrive at our $188 DCF valuation.

Downside risks are underachievement of key growth drivers, clinical pipeline failure(s), and reduced cash flow generation to pay down debt or dividend.

Amgen Inc. (AMGN)
Our PO for AMGN is $290 per share. We value AMGN using a sum of the parts NPV analysis of key marketed drugs ($247/sh) and pipeline and others ($122/sh), which assumes a range of weighted average cost of capital (WACC) from 5% and terminal growth rate ranging from -5% to -30% depending on the product lifecycle. Our PO also reflects -$79/sh in net debt.

Upside risks to our price objective are 1) less than-expected base business erosion2) stronger-than-expected sales of Lumakras, Tezspire, Tepezza, and 3) competitor clinical trial failures

Downside risks to our price objective are 1) faster-than-expected revenue erosion from legacy brands, 2) slower-than-expected growth of new drug launches, and 3) clinical trial failures.

Amylyx Pharmaceuticals (AMLX)
Our $42 PO is based on probability-adjusted NPV analysis of AMX0035 in ALS ($37/sh) and net cash ($6/sh). We model AMX0035 revenues through 2035 in key markets including US, Canada, and Europe, and apply a 15% WACC and -35% terminal growth rate.

Upside Risks to our PO
1) Positive confirmatory phase 3 PHOENIX trial readout in 2024 that drives strong market uptake, especially in OUS markets, 2) better than expected reimbursement and market uptake.

Downside Risks to our PO
1) failure to receive approval in EU, 2) commercial pushback from payers and providers, 3) failure of confirmatory phase 3 PHOENIX trial, resulting in pushback from payers and providers and drug could be withdrawn from the market.

Biogen Inc. (BIIB)
Our $290 price objective is based on a sum-of-the parts net present value (NPV) analysis and a discount rate of 8%. We value the MS franchise at $74/share, Spinraza at $36/share, Roche collaboration/royalty at $64/share, biosimilars at $7/share, Alzheimer's at $87/share, zuranolone at $7/share, Skyclarys at $42/share, the pipeline at $5/share, and net cash at -$33/share.

Upside risks to our PO are 1) less erosion of Tecfidera, Avonex, Plegridy, and Tysabri than anticipated, 2) Vumerity meaningfully capturing market share, 3) durability of Spinraza, 4) rapid uptake of lecanemab, and 5) success of a number of pipeline programs

Downside risks are 1) greater-than-expected moderation of MS sales (Tecfidera, Avonex, Plegridy, and Tysabri) due to increased competition/ generics, 2) rapid erosion of Spinraza's market share in SMA, 3) limited success of the R&D pipeline, with many products failing to advance or approved with narrow indications for smaller patient populations, and 4) limited uptake of lecanemab.

BioMarin (BMRN)
Our valuation approach for BMRN shares employs a discounted cash flow analysis of approved and pipeline products reflected in our $170 price objective. We value BioMarin shares using a sum-of-the-parts net present value (NPV) analysis of approved assets, which assumes a weighted average cost of capital (WACC) of 4.5% and terminal growth rate of -5.5%. Under our assumptions, our NPV analysis suggests a legacy product value of $55/share, Roctavian and Voxzogo of $95/share, early stage pipeline of $11/share and cash value of $9/share.

Risks to our price objective are 1) faster-than-expected revenue runoff from Kuvan, 2) competition from other orphan drug developers, 3) slower-than-expected growth of new drug launches, and 4) clinical trial failures.

Bristol-Myers Squibb (BMY)
Our $60 price objective (PO) is based on a 50/50 blended average of our risk-adjusted discounted cash flow (DCF) and P/E multiple applied to 2024E EPS. Our DCF assumes 7% WACC and -4% terminal growth rate, and we assume an approximate 8x 2024 P/E multiple given an impending patent cliff and risks associated with later-stage pipeline.

Risks to our PO are 1) uninspiring readouts from late-stage trials in key I/O indications, 2) more rapid deceleration of Revlimid erosion than expected, 3) negative outcomes from the company's later-stage pipeline assets in development, 4) pressures from headline risks facing the sector (including drug pricing reform), and 5) negative patent rulings.

Caribou (CRBU)
Our $20/share price objective is based on a probability adjusted NPV of CB-010 ($5/sh), CB-011 ($4/sh), CB-012 ($3/sh), CB-020 ($3/sh), early pipeline and partnerships ($1/sh), and cash ($4/sh). We apply a WACC of 11-13% and 3% terminal growth rate, which is comparable to our valuation methodology for other biotech companies of similar size and stage of clinical development.

Downside risks: 1) initial clinical data for pipeline programs fails to demonstrate a meaningful benefit in patients, 2) pipeline therapies fail to differentiate from similar competing products, 3) regulatory/reimbursement environment weighs on commercial economics, 4) patent litigation invalidates or otherwise undermines the IP portfolio, 5) funding is insufficient to move forward pipeline aspirations or manufacturing buildout.

CRISPR Therapeutics (CRSP)
Our $100 price objective for CRISPR Therapeutics is based on a probability adjusted (35-80%) net present value (NPV) sum-of-the-parts analysis of its four primary programs under development. We use a weighted-average cost of capital (WACC) of 12%, similar to other early-stage companies in our coverage universe, and a 2% terminal growth rate given the long patent life (2033 at earliest) and difficulty of replication. Given these assumptions, our $100 PO includes $44/share for CTX001, $3/share for CTX112, $2/share for CTX121, $4/share for CTX131, $22/share in net cash, and $25/share for the technology platform.

Downside risks: 1) failure of early clinical trials, 2) dangerous safety signals, 3) superior competitor data, and 4) soft market uptake.

CureVac (CVAC)
Our $6.40/share PO is based on a probability-adjusted net present value (NPV) of CureVac's pipeline, including its oncology program and its other prophylactic vaccines. We apply a 10% weighted-average cost of capital (WACC) and a terminal value ranging from -15% to -5% depending on the program (we project revenues out through 2035), in line with other biotech companies of similar size and stage of clinical development. We also include approximately $2/share from CureVac's current cash position.

Upside risks are 1) faster-than-expected clinical development, 2) competitor failures, 3) better than expected clinical data.

Downside risks are 1) clinical risk to early stage programs, 2) regulatory risk from newer mechanisms, 3) competition to key assets.

Eli Lilly and Company (LLY)
Our $700 price objective is based on a probability-adjusted net present value (NPV) analysis of franchise verticals including Endocrinology ($393/share), Oncology ($127/share), Cardiovascular ($4/share), Neuroscience ($12/share), Immunology ($28/share), other pharmaceutical products and early pipeline assets ($150/share), as well as approximately -$15/share in net cash. We use a WACC ranging from 5% for approved products to 9% for pipeline products, depending on the stage of development. We apply terminal values ranging from -12% (cardiology) to 1% (endocrinology) based on projected sales decline following loss of exclusivity within each business vertical.

Risks to our price objective are 1) better-than-expected launches of competing products, 2) emerging clinical data for pipeline assets that does not confirm prior observations, 3) failure to effectively commercialize approved products, 4) potential drug pricing system restructuring in the US.

Gilead Sciences Inc. (GILD)
Our $95 price objective is based on a sum-of-the parts net present value (NPV) analysis. We forecast sales of key franchises or products to 2030 using a weighted average cost of capital (WACC) of 8%, and include a terminal value where appropriate. Under these assumptions, we value the HIV franchise at $80/share, HCV and HDV at $7/share, the Kite platform at $8/share, remdesivir at $2/share, Trodelvy at $9/share, with the pipeline at $5/share and net cash at -$15/share.

Upside risks: 1) stronger-than-expected sales of Biktarvy in HIV and faster uptake of Descovy in PrEP, 2) greater durability of HCV revenues, 3) rapid uptake of Kite, 4) and success of the oncology pipeline may lead investors to assign further value to these programs.

Downside risks: 1) moderating sales of Biktarvy, Genvoya, Odefsey, and Descovy due to competition, which may include long-acting injectable formulations, 2) greater than expected erosion of HCV revenues, 3) limited upside from Gilead's CAR-Ts, 4) the oncology pipeline may have limited clinical success or be meaningfully delayed.

Johnson & Johnson (JNJ)
Our price objective of $180/share is based on a sum of the parts (SOTP) of roughly 18x MedTech multiple, and 14x pharma '24 multiple, slightly below peers given looming loss of exclusivity (LOE) and talc uncertainty, yielding $57/share, and $123/share, respectively.

The downside risks to our PO are slower growth in MedTech due to competitive pressure and faster-than-expected erosion from biosimilars to the pharma business.

Upside risks to our PO are better-than-expected launch of new products, better-than-expected clinical data for the pharma pipeline, quick resolution of talc litigation, and constructive M&A.

Kiniksa Pharmaceuticals, Ltd. (KNSA)
We use a sum of the parts NPV model to value Kiniksa shares based on our risk adjusted revenue forecasts and estimated margin assumptions. Our $28 price objective is based on a sum-of-the parts NPV analysis, forecasting sales of rilonacept out to 2030 using a WACC of 8%, respectively and a terminal value of -7.5%. Under our assumptions, we value rilonacept at $25/share, the pipeline at $0/share and net cash of approximately $3/share.

Upside risks to our PO are: 1) stronger than expected phase 3/ phase 2 POC data, 2) upside to rilonacept launch expectations, and 3) rapid progression of KPL-404 and mavrilimumab development.

Downside risks to our PO are: 1) clinical trial failures, 2) greater than expected competitive threats, 3) delays in product approvals or pipeline developments, 4) unanticipated safety concerns, and 5) financial risks due to available cash.

Kymera Therapeutics (KYMR)
We use a sum of the parts NPV model to value Kymera shares based on our risk-adjusted revenue forecasts and estimated margin assumptions. Our $30 price objective gives credit to the company's two lead programs, KT-474 and STAT3, through 2039 and uses an 15% WACC for both programs.

Downside risks to our PO are: 1) unanticipated safety concerns in initial clinical studies, 2) clinical trial failures / limited efficacy results given preclinical nature of current data, 3) greater than expected competitive threats, 4) delays in pipeline development timelines, and 5) financial risks due to cash availability.

Upside risks to our PO are: 1) positive initial data sooner than expected, 2) additional pipeline partnerships that help de-risk the TPD mechanism, 3) more rapid advancement through the clinic and thus earlier commercial launch timelines, and 4) positive clinical data from other TPD companies that help de-risk the technology.

LianBio (LIAN)
Our $3/share price objective is based on a probability adjusted NPV of TP-03 ($-2/sh), infigratinib (-$1/sh), and cash ($6/sh). We apply a WACC of 20%, which is comparable to our valuation methodology for other biopharmaceutical companies of similar size and stage of development.

Upside risks to our PO are 1) stronger-than-expected phase 3/ phase 2 data, 2) upside to TP-03 launch expectations, and 3) rapid scaling from in-licensing differentiated assets.

Downside risks to our PO are 1) clinical trial failures, 2) greater-than-expected competitive threats, 3) delays in product approvals or pipeline developments, 4) unanticipated safety concerns, 5) financial risks due to available cash, and 6) Chinese regulatory risk.

Lyell Immunopharma (LYEL)
Our $9 PO is based on a probability-adjusted NPV of Lyell's pipeline, including LYL797 in NSCLC and TNBC, LYL845 in melanoma, head and neck cancer, and colorectal cancer, and earlier stage pipeline assets. We apply a 13-16% WACC in-line with similar preclinical stage biotechs (we project revenues through 2035). We also include $3/share from Lyell's cash position.

Downside risks to our PO are 1) clinical trial failures, 2) better-than-expected data from competitors, 3) dilution from cash raises

Merck & Co. (MRK)
Our $130 price objective (PO) is based on the intrinsic value of Merck standalone. We use a 50/50 blended average of our P/E multiple applied to 2024E EPS (we think the current 17x vs.18x peer average makes sense to reflect continued strength of Merck's core growth franchises but broader Keytruda concentration risk concerns) and risk-adjusted DCF (7% WACC and -2% terminal growth rate).

Risks to our PO are 1) impressive competitor readouts results in key immuno-oncology (I/O) indications, 2) more rapid declines across the diabetes franchise than expected, 3) negative outcomes from the company's later-stage assets in ongoing development, and 4) pressures from headline risks facing the sector (including drug pricing reform).

Moderna (MRNA)
Our PO of $120 is based on a probability-adjusted NPV of six different parts including prophylactic vaccines ($91/share), systemic secreted cell surface therapeutics ($1/share), cancer vaccines ($4/share), intratumoral immune-oncology ($2/share), cardiovascular diseases ($0/share) and systemic intracellular therapeutics ($1 share), and net cash ($22/share). We estimate sales of 46 pipeline programs that are slated to move forward with probability of success ranging from 6% to 95%. We use a WACC of 10% and terminal growth rate of -30%.

Upside risks to our PO are: 1) faster than expected pipeline development, 2) cleaner than expected safety findings, 3) accelerated product approvals, 4) stronger than expected launches, 5) lower competition, 6) moderating cash burn, and 7) potential upside from coronavirus vaccine program.

Downside risks to our PO are: 1) lower than expected revenues from the COVID-19 program, 2) unexpected safety findings, 3) slower than expected pipeline development/approvals, 4) more intense competition, and 5) accelerating cash burn.

Neumora Therapeutics (NMRA)
Our 12-month price objective of $20 is based on our NPV analysis on key products, including navacaprant for MDD, bipolar depression, and NMRA-266 for schizophrenia. We assign a valuation of $14/sh to navacaprant in MDD, $1/sh to navacaprant in bipolar depression, and $2/sh to NMRA-266 in schizophrenia, with the remaining $2/sh coming from net cash. We model sales through patent exclusivity with zero terminal value and apply a 14% WACC.

Upside risks to our PO:
1) Positive navacaprant MDD readouts in 2H24/1H25, 2) readthrough from competitor J&J's aticaprant's positive phase 3 adjunctive MDD data in 2H24, 3) readthrough from competitor Cerevel's emraclidine phase 2 EMPOWER data in 2H24.

Downside risks to our PO:
1) Failure of MDD trial readout, 2) failure of competitors' data in MDD, 3) weak market uptake for Karuna's schizophrenia drug and Axsome's MDD drug could dampen investor enthusiasm for the neuropsychiatric markets.

Pfizer (PFE)
Our $35/share for Pfizer is based on a 50/50 blended average of our discounted cash flow (DCF) analysis and P/E multiple based on the large cap global therapeutics group. For our DCF, we use a weighted-average cost of capital (WACC) of 7% and 2% terminal growth for an intrinsic value of $47/share. Our P/E analysis assumes a 10x multiple of our 2024 EPS estimate, which yields a $22 intrinsic value.

Downside risks: 1) sales downside, 2) inability for pipeline to overcome patent loss of exclusivities (LOEs) after 2025, 3) M&A transactions that are perceived to be value destructive.

Regeneron Pharmaceuticals Inc. (REGN)
Our $700 price objective is based on a probability-adjusted net present value (NPV) analysis of Eylea, including outside of US (OUS) revenues from the Bayer collaboration ($164/share), Sanofi collaboration revenue including Dupixent and other product revenues ($329/share), Libtayo ($56/share), early pipeline assets ($60/share), and the rest from net cash. We use a weighted-average cost of capital (WACC) ranging from 7% for approved products to 10% for pipeline products and terminal growth ranging from -3 to 3%. Upside risks to our price objective are 1) better-than-expected Eylea growth trajectory, 2) a larger contribution of Dupixent to Regeneron's topline from commercial uptake in new indications, and 3) better-than-expected economics realized by Regeneron from joint ventures. Downside risks to our price objective are 1) slower-than-expected growth from product sales, particularly Eylea and Dupixent, 2) failure to obtain approval for additional indications for Dupixent, and 3) pipeline setbacks.

Royalty Pharma (RPRX)
Our $40/share price objective is based on a probability-adjusted SOTP NPV analysis which includes current growth products ($34/sh, 80% of our valuation), and projected revenues from future investments ($11/sh, 31%). We project out revenues through 2038, apply a WACC of 5% (mature products) to 8% (future growth products), and use terminal

growth rates ranging from -5% (current growth products) to 5% (future growth products), in-line with other mature biopharma companies. We calculate net cash as -$5/sh (-11% of our valuation).

Downside risks: 1) current portfolio royalties do not reach current assumed levels, 2) new investments fail to replicate historical returns, 3) new corporate structure and shareholder base adversely impacts historically low tax rate, 4) competition in the royalty investing space makes it harder to attain new value accretive investments, 5) patent/royalty expiries are not replaced by new royalty streams.

Sana Biotechnology (SANA)
Our $10 PO is based on a probability-adjusted NPV of Sana's pipeline (12% likelihood of success), including its in vivo and ex vivo platform programs. We apply a 15% WACC and a terminal growth of -30% (we project revenues out through 2035), in-line with other biotech companies of similar size and stage of clinical development. We also include approximately $2/share from Sana's current cash position.

Downside risks to our PO are: 1) clinical trial failures, 2) better than expected data from competitors, 3) dilution from cash raises.

Turnstone Biologics (TSBX)
Our 12-month PO of $15 is based on a probability adjusted SOTP NPV of TIDAL-01 in melanoma (42% of our valuation) and other solid tumors, primarily breast / CRC / uveal melanoma (3% of our valuation). We assign a valuation of $1/share valuation to TIDAL-02 (3% of our valuation), given its stage of development. We apply a midpoint WACC of 15% (13-17%) and -10% terminal growth rate, which is comparable to our valuation methodology for other biotech companies of similar size and stage of clinical development. The remaining $3/sh comes from net cash.

Upside risks to our PO: 1) Lifileucel enjoys a broad label following approval, supporting robust coverage and uptake with positive read-through to the TIL space, 2) TIDAL-01 phase 1 trials enroll faster than expected and data readout comes prior to mid-2024, 3) breakthrough in TIDAL-02 or other pipeline programs, 4) business development contributes non-dilutive funding, 5) improvements in manufacturing bring down costs sooner, and 6) clinical data from the phase 1 TIDAL-01 trials are better than expected.

Downside risks to our PO: 1) Failure of lifileucel to receive accelerated approval in advanced refractory melanoma, 2) delays in TIDAL-01 clinical development, 3) cash balance is insufficient to fund TIDAL-01 clinical development through initial data mid-2024, 4) manufacturing and/or supply chain issues prevent production of selected TIL products, and 5) phase 1 TIDAL-01 clinical trials do not support continued development.

Vertex Pharmaceuticals Inc. (VRTX)
Our 12-month price objective for Vertex of $450/share is based on our net present value (NPV) analysis. We forecast sales for each of the approved products, Kalydeco, Orkambi, Symdeko, and Trikafta through 2030. We assume a weighted-average cost of capital (WACC) of 9%, in line with peer companies of similar size and risk and varying terminal growth rates for each asset based on its characteristics and patent life (-50% to 2%). Given these assumptions, we estimate a value of $4/share for Kalydeco, $2/share for Orkambi, $0/share for Symdeko, $335/share for Trikafta, $31/share for CTX001, $17/share for VX-548, $46/share in net cash, and $15/share for the pipeline.

Risks to our price objective are 1) payer pushback on pricing, 2) difficulty in securing reimbursement agreements, particularly in the EU, 3) clinical trial failures, and 4) new competitors in cystic fibrosis.

Analyst Certification

I, Geoff Meacham, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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US - Biopharmaceuticals Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	89bio, Inc	ETNB	ETNB US	Geoff Meacham
	Acumen Pharma	ABOS	ABOS US	Geoff Meacham
	Agios Pharmaceuticals	AGIO	AGIO US	Greg Harrison, CFA
	Amylyx Pharmaceuticals	AMLX	AMLX US	Geoff Meacham
	BioMarin	BMRN	BMRN US	Geoff Meacham
	BioXcel Therapeutics	BTAI	BTAI US	Greg Harrison, CFA
	BridgeBio Pharma	BBIO	BBIO US	Greg Harrison, CFA
	Caribou	CRBU	CRBU US	Geoff Meacham
	CRISPR Therapeutics	CRSP	CRSP US	Geoff Meacham
	Eli Lilly and Company	LLY	LLY US	Geoff Meacham
	Erasca	ERAS	ERAS US	Alec W. Stranahan
	Esperion	ESPR	ESPR US	Jason Zemansky
	Exscientia	EXAI	EXAI US	Alec W. Stranahan
	Gilead Sciences Inc.	GILD	GILD US	Geoff Meacham
	HUTCHMED	HCM	HCM US	Alec W. Stranahan
	Immatics	IMTX	IMTX US	Alec W. Stranahan
	Insmed Incorporated	INSM	INSM US	Jason Zemansky
	Intellia Therapeutics	NTLA	NTLA US	Greg Harrison, CFA
	Janux Therapeutics	JANX	JANX US	Geoff Meacham
	Keros	KROS	KROS US	Greg Harrison, CFA
	Kiniksa Pharmaceuticals, Ltd.	KNSA	KNSA US	Geoff Meacham
	Krystal Biotech	KRYS	KRYS US	Alec W. Stranahan
	Kura Oncology	KURA	KURA US	Jason Zemansky
	Liquidia Corporation	LQDA	LQDA US	Greg Harrison, CFA
	Lyell Immunopharma	LYEL	LYEL US	Geoff Meacham
	MeiraGTx	MGTX	MGTX US	Alec W. Stranahan
	Merck & Co.	MRK	MRK US	Geoff Meacham
	Mineralys Therapeutics	MLYS	MLYS US	Greg Harrison, CFA
	Neumora Therapeutics	NMRA	NMRA US	Geoff Meacham
	Rani Therapeutics	RANI	RANI US	Geoff Meacham
	Regenxbio, Inc.	RGNX	RGNX US	Alec W. Stranahan
	Rocket Pharmaceuticals, Inc.	RCKT	RCKT US	Greg Harrison, CFA
	Royalty Pharma	RPRX	RPRX US	Geoff Meacham
	Sana Biotechnology	SANA	SANA US	Geoff Meacham
	SpringWorks	SWTX	SWTX US	Alec W. Stranahan
	Syndax Pharmaceuticals	SNDX	SNDX US	Jason Zemansky
	Travere Therapeutics Inc	TVTX	TVTX US	Greg Harrison, CFA
	Turnstone Biologics	TSBX	TSBX US	Geoff Meacham
	Vertex Pharmaceuticals Inc.	VRTX	VRTX US	Geoff Meacham
	Werewolf Therapeutics	HOWL	HOWL US	Jason Zemansky
	Xencor	XNCR	XNCR US	Alec W. Stranahan
NEUTRAL				
	AbbVie	ABBV	ABBV US	Geoff Meacham
	Alector, Inc	ALEC	ALEC US	Greg Harrison, CFA
	Amgen Inc.	AMGN	AMGN US	Geoff Meacham
	Arcus Biosciences	RCUS	RCUS US	Jason Zemansky
	Beam Therapeutics	BEAM	BEAM US	Greg Harrison, CFA
	Biogen Inc.	BIIB	BIIB US	Geoff Meacham
	Bristol-Myers Squibb	BMY	BMY US	Geoff Meacham
	Cytokinetics, Incorporated	CYTK	CYTK US	Jason Zemansky
	Editas Medicine	EDIT	EDIT US	Greg Harrison, CFA
	IGM Biosciences	IGMS	IGMS US	Greg Harrison, CFA
	Johnson & Johnson	JNJ	JNJ US	Geoff Meacham
	Kymera Therapeutics	KYMR	KYMR US	Geoff Meacham
	Moderna	MRNA	MRNA US	Geoff Meacham
	Pfizer	PFE	PFE US	Geoff Meacham
	Recursion Pharmaceuticals, Inc.	RXRX	RXRX US	Alec W. Stranahan
	Revolution Medicines	RVMD	RVMD US	Alec W. Stranahan
	Tyra Biosciences	TYRA	TYRA US	Greg Harrison, CFA
	Vir	VIR	VIR US	Geoff Meacham
	Y-mAbs Therapeutics, Inc	YMAB	YMAB US	Alec W. Stranahan
UNDERPERFORM				
	AlloVir, Inc.	ALVR	ALVR US	Jason Zemansky

US - Biopharmaceuticals Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	CureVac	CVAC	CVAC US	Geoff Meacham
	Day One Biopharmaceuticals	DAWN	DAWN US	Alec W. Stranahan
	LianBio	LIAN	LIAN US	Geoff Meacham
	Novavax	NVAX	NVAX US	Alec W. Stranahan
	Regeneron Pharmaceuticals Inc.	REGN	REGN US	Geoff Meacham
	Reneo Pharmaceuticals	RPHM	RPHM US	Jason Zemansky
	TG Therapeutics	TGTX	TGTX US	Alec W. Stranahan
	United Therapeutics Corporation	UTHR	UTHR US	Greg Harrison, CFA

Disclosures

Important Disclosures

Equity Investment Rating Distribution: Health Care Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships [R1]	Count	Percent
Buy	234	60.94%	Buy	115	49.15%
Hold	80	20.83%	Hold	36	45.00%
Sell	70	18.23%	Sell	29	41.43%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships [R1]	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

[R1] Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster[R2]
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

[R2] Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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