



AMGEN

University of Connecticut
Student Managed Fund
2018 Analyst Report

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Amgen INC NASDAQ:(AMGN)

Sector: Biotech

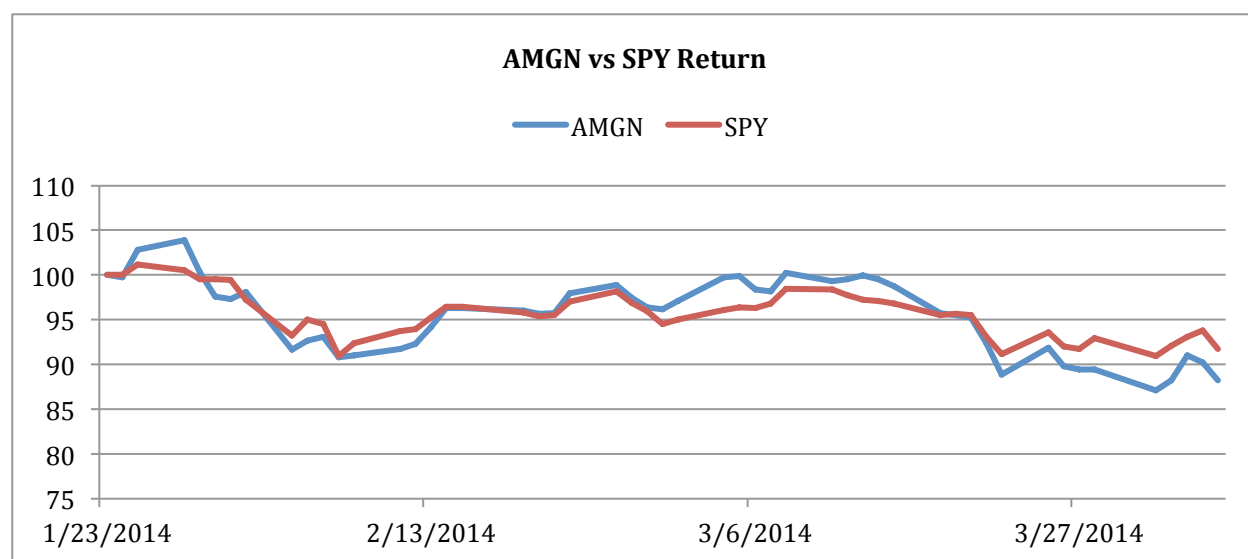
Recommendation: **Buy**



Report Highlights

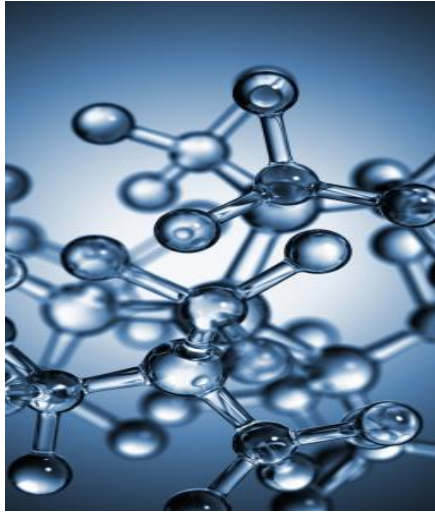
Target Price	Current Price	52 Week High	52 Week Low	P/E	Market Cap.
\$221.59	\$172.89	\$196.60	\$150.03	14.84	\$139.37B

We recommend a Buy rating for Amgen based off our analysis with a target price of \$221.59 per share. This allows for a margin of safety of about 15% based of its closing price on January 23, 2018.



Basis for Recommendation:

1. **High barriers to entry** – Amgen is the world's largest independent biotech firm and is positioned well against entrants. Amgen also holds many key long-term patents for its drugs which will help to protect against the competition.
2. **Innovation** – One of amgen's strengths is its ability to innovate in order to substantially grow revenues. Amgen's development of biosimilars will play a significant role, including ABP 501, commonly know as AMJEVITA (adalimumad-atto), which is expected to bring in excess of \$3 billion in revenue.
3. **Increasing Global Presence** – Amgen is tapping emerging markets with aging populations. Amgen's drugs reach over 80 countries, and new product launches, including biosimilars, are fueling ongoing international revenue growth.
4. **Next-Generation Biomanufacturing** – Amgen is the industry leader in Next-Gen Biomanufacturing. This includes building facilities in less time, at less cost, all while producing the same amount of output as a normal facility in 80% less space.



Business Overview

Business Description

Amgen is committed to unlocking the potential of biology for patients suffering from serious illnesses by discovering, developing, manufacturing and delivering innovative human therapeutics. Their medicines typically address diseases for which there are limited treatment options. Amgen's "biology first" approach explores complex molecular pathways of disease before determining what type of medicine is most likely to deliver optimal effectiveness and safety. At Amgen, they believe in the core of their strategy, which is, "innovative, highly differentiated medicines that provide large clinical benefits in addressing serious diseases are medicines that will not only help patients, but also will help reduce the social and economic burden of disease in society today." For Amgen, quality control and a reliable supply of medicines is just as important as research and development.

Innovative Medicines

Our medicines typically address diseases for which there are limited treatment options, or they are medicines that provide a viable option to what is otherwise available.

Transformative Research

Amgen's "biology first" explores the complex molecular pathways of disease before determining what type of medicine, or modality, is most likely to deliver optimal efficacy and safety.

World-Class Biomanufacturing

Robust quality control and a reliable supply of medicines for patients are every bit as important as scientific innovation.

History



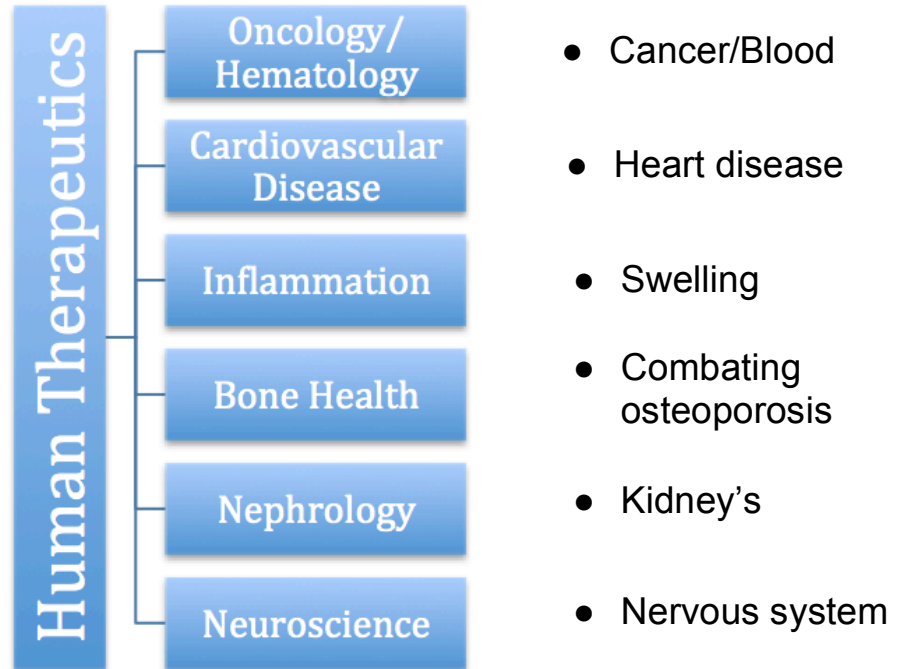
Applied Molecular Genetics, shortened to Amgen in 1983, the year it went public, has been among the early pioneers in the biotechnology industry since it opened in 1980. Ever since then, Amgen scientists have been working to develop therapies for patients that have serious illnesses. Through research and development, Amgen has created innovative, never-before-seen therapies that have helped thousands of patients around the globe. Along with a better understanding of technology, Amgen has been able to develop new platforms and build on the progress they have continually made. Throughout the years, Amgen has built a culture that is committed to unlocking new pathways that lead to more effective drugs as well as a culture that breeds creativity and innovation, all in the name of finding cures.

Recent Awards



Business Segment

Amgen operates within one business segment: human therapeutics. Within that, they focus on six areas: oncology/hematology, cardiovascular disease, inflammation, bone health, nephrology, and neuroscience.



Industry Overview and Competitive Positioning

Industry Overview

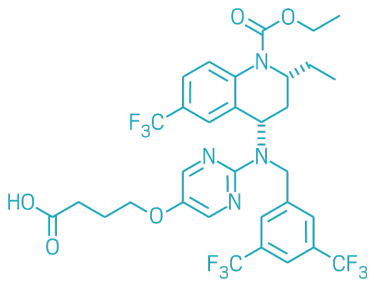
Amgen operates in the biotech industry, which is intensely competitive driven by R&D innovation. 2017 saw a significant increase in NME (new molecular entities) and BLA (Biologic License Applications) drug approvals from the previous year. With more drugs entering the market, an increase in sales are expected to take place. Biosimilars have been approved in Europe since 2006 yet were not approved in the United States until 2015. Significant growth within biosimilars is now expected to occur both domestically and abroad, as many firms seek to continue to develop these drugs.

The United States tax overhaul has the potential to repatriate over \$150 billion in the biotech industry, and analysts predict this will lead to stock buybacks and continued growth through M&A, which will drive growth and earnings. Stable, healthy growth from recent drugs will continue for the next few years. Orphan drugs, drugs for diseases in which less than 200,000 Americans are affected, are forecasted to grow at 11.1% for the next five years. The Trump Administration seems to be easing its tone on the industry as a whole. President Trump has mentioned the possibility of shortening trial times as well as speeding up the FDA approval process, all incentives for firms to develop even more drugs.



Competition

As mentioned earlier, the biotechnology industry is intensely competitive. Many firms have significant expenditures on their R&D, as this is what ultimately can lead to the next big drug. Amgen has one of the best EBITDA margins in the industry at 52%. Furthermore, the company has long lasting patents in place that will protect against competition in the long run. Amgen is also developing effective biosimilars that will help take market share from competitors, including a biosimilar of Abbvie's Humira that is expected to add \$3 billion in revenue.



Biosimilars have recently become a part of the competitive market in recent years. Similar to pharmaceutical generics, biosimilar drugs target the same disease as the name brand drug does; rather biosimilars are structurally different unlike generics. This means that biosimilars have their own regulatory approval process to go through, meaning that just because a biosimilar has been developed does not always mean it will be approved and commercialized. While some think biosimilars add to the competitive landscape, Amgen believes that patients will continue to use their drugs as they have developed a reputation in terms of safety, security and reliability. Biosimilars are expected to help Amgen gain market share from competitors while they continue to safeguard their own name brand drugs.

Competing Firms

The following is a brief summary of some of Amgen's biggest and most direct competitors.

abbvie

- Sells Humira, the number 1 overall selling drug (63% of Abbvie's revenue in 2016)
- In the US, biosimilars for Humira have been approved
- Humira US patent expired in 2016, EU patent expires in 2018



GILEAD
Advancing Therapeutics.
Improving Lives.

- 3 products command 55% of all revenues
- Harvoni, (#1 selling drug) had a decrease in sales of 34% YOY
- Sovaldi, (#2 selling drug) had a decrease in sales of 24% YOY
- Recently infringed on one of Merck's patents, owed \$2.5B



Biogen

- Treat 38% of MS patients globally
- Focuses on only 2 areas, MS and Hemophilia
- Tecfidera, (#1 selling drug) has 2 formulation patents expiring in 2019

Investment Thesis



Amgen is the world's largest independent biotech firm and is positioned well against entrants

As the world's largest independent biotech firm, Amgen's large economic moat helps position itself well against new entrants. Amgen also holds many key long-term patents for its drugs, which helps to protect its revenue against competition.

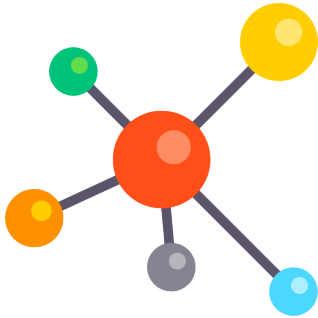


Amgen's ability to Innovate, in turn substantially growing revenues

Amgen's strength in developing innovative solutions, including biosimilars helps to set it apart from the competition. One of Amgen's biosimilars rivals Humira, the world's number one selling drug. This biosimilar for Amgen is expected to bring in excess of \$3 billion in revenue. Similar to pharmaceutical generics, biosimilars target the same diseases as the name brand drug. However, biosimilars are structurally different, so they have their own approval process. Humira recently had a few patents lapse, and Amgen was able to take advantage of this and develop its own biosimilar for that disease.

Amgen's Global Presence

Amgen is tapping emerging markets and aging populations, reaching new patients through its global expansion. Amgen's drugs reach 80+ countries and new product launches are fueling ongoing international revenue growth. Amgen's drugs are reaching more patients than ever before, helping to grow its presence both domestically and abroad. Aside from increased global revenue, Amgen is continuing to develop its brand and global recognition through its expansion efforts.



Next-Generation Biomanufacturing

Amgen is the industry leader in Next-Generation Biomanufacturing. A traditional biomanufacturing facility can take four years to build at a cost of \$1 billion or more. Amgen's first Next-Generation Biomanufacturing facility has been constructed in less than half the time and at a quarter of the cost of a traditional facility. This plant produces approximately the same output as a traditional one, but does so using 80 percent less space.

Smaller, More Efficient Facilities Create Favorable Environmental Impact



Energy use
decrease:

4-6x



Carbon emissions
decrease*:

4-6x



Water use
decrease:

10-12x



Solid waste
generation decrease:

2-3x

5

Source: Amgen Next-Generation Biomanufacturing Infographic

Financial Analysis

Figure 1

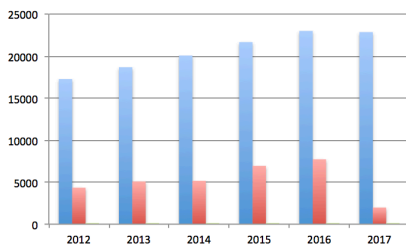


Figure 2

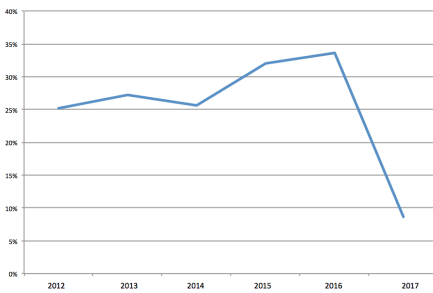


Figure 3

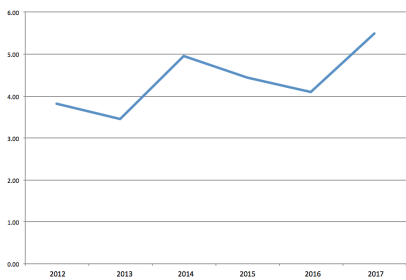
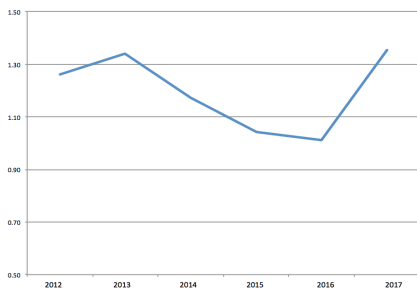


Figure 4



Revenue and Income

Amgen has demonstrated strong revenue growth growing at a CAGR of 105% over the past six years. **Figure 2** demonstrates that Amgen has not only been able to grow its top line, but also return a higher, and growing, income margin year over year. The one exception was in 2017 because the company recorded a net charge of \$6.1 billion as a result of the 2017 Tax Act alteration. Despite the company having slightly negative revenue growth in 2017 it was able to grow its gross margin to 82.2%, up 0.3% from the prior year. We expect Amgen's margin to increase in the future based on the company's long-term drug patents, protecting its current revenue, and innovative products coming to market soon in order to spur future growth.

Liquidity and Leverage

Amgen maintains a strong balance sheet, which we expect to continue and grow in the future. The company's current liquidity ratio is displayed in **Figure 3** growing at CAGR of 105% over the past six years. In respect to leverage, Amgen has had relatively steady levels of debt to equity as shown in **Figure 4**. There was a small dip to 1.01 in 2016 largely due to several small acquisitions. Additionally, the company has strong cash flow generation, which gives it relatively high interest coverage. The company's financial position leads us to believe that these metrics will continue to improve moving forward.

Valuation

Discounted Cash Flow Model

Amgen is worth about \$220.90 per share using a discounted cash flow model, which was around a 15% margin of safety above the original stock price when elected to purchase. This model assumes a large pick up in growth in the next couple of forecasted years from Amgen's new products, such as biosimilars, hitting the market. Another significant assumption was a normalization of Amgen's historical capital expenditures as well as the business's change in working capital. The company is expected to maintain its margins well into the future from patents protecting its revenue and consistent cost of revenue.

In regards to the terminal growth rate, we assumed 2%, which is right in line with the growth rate of U.S. GDP. Our discounted cash flow model assumed a 7.74% discount rate, which reflects a conservative risk free rate since we believe that rates will have minor raises in the future. Finally, assuming our discount rate and terminal growth rate, we used a sensitivity analysis to calculate a price range of \$194.37 - \$258.21 per share.

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Total FCF	\$ 5,665.54	\$ 5,338.78	\$ 5,883.84	\$ 6,649.59	\$ 7,260.34	\$ 7,407.05	\$ 7,999.96	\$ 8,632.36	\$ 9,191.28
Discounted FCF	\$ 5,502.00	\$ 4,880.97	\$ 4,269.13	\$ 4,367.07	\$ 4,580.96	\$ 4,642.49	\$ 4,396.15	\$ 4,407.04	\$ 4,413.89

Sensitivity Analysis					
	7.24%	7.49%	7.74%	7.99%	8.24%
1.50%	\$ 221.45	\$ 213.87	\$ 206.93	\$ 200.39	\$ 194.37
1.75%	\$ 229.39	\$ 221.14	\$ 213.63	\$ 206.56	\$ 200.09
2.00%	\$ 238.08	\$ 229.07	\$ 220.90	\$ 213.25	\$ 206.26
2.25%	\$ 247.64	\$ 237.77	\$ 228.84	\$ 220.52	\$ 212.95
2.50%	\$ 258.21	\$ 247.33	\$ 237.54	\$ 228.46	\$ 220.22

Valuation	
Sum of PV of FCF	28,242.63
Terminal Value	126,538.40
Total EV	154,781.03
Less: Debt	-35,776.00
Plus: Cash	41,351.00
Total Equity Value	160,356.03
Shares Outstanding	725.91
Intrinsic Value	220.90
Current Price	191.99
Margin of Safety	15.06%

Comparative Model

EV/EBITDA		
Mean EV/EBITDA		13.50x
AMGN EBITDA	\$	12,278.00
AMGN EV	\$	165,735.27
Less: Debt		(35,776.00)
Equity Value	\$	129,959.27
Shares Outstanding		725.91
Share Price	\$	179.03

P/B		
Mean P/B		5.6x
AMGN Book Value Per Share	\$	44.36
Share Price	\$	249.75

P/E		
Mean P/E		19.7x
AMGN Adj. EPS	\$	12.29
Share Price	\$	242.22

Weighted Valuation			
EV/EBITDA		33%	\$ 179.03
P/E		33%	\$ 242.22
P/B		33%	\$ 249.75
Share Price	\$		223.64



Investment Risks

Regulation

One major risk Amgen faces is increased regulation, whether through U.S. healthcare reform, the regulatory process or the internal product phases. Under the Trump Administration, the U.S. healthcare system has been placed under scrutiny, with some changes having already been made. It seems as though President Trump could push for more change, which could bring uncertainty for Amgen.

Other regulation comes from the regulatory approval process. Once Amgen deems a drug ready for commercial use, before it can become commercialized, it must undergo federal testing. These tests include clinical trials and a waiting period so the drug can be reviewed. If the FDA finds something they do not like or understand, the drug might not be approved.

As for Amgen's internal process, there are three phases each drug must pass before they put it up for FDA approval. A drug may pass Amgen's first and second levels, however this does not always mean it will pass the third and final level. Significant R&D is used to create these drugs with no guarantee they can be commercialized.

Reliance on Third Parties

Sales depend on some third party materials, drug delivery mechanisms, and other medical devices. Some of Amgen's drugs, including Neulasta's OnPro Kit as well as Repatha's Pushttronex system, offer patients the ability to administer the correct dosage themselves, in the comfortability of their own home. However, in order to be used in conjunction with the drug, these third party devices must go through and pass their own regulatory approval process. Amgen can only market their drugs as having in-home delivery systems so long as the third party medical devices stay up to date with regulations. Should any third party device get denied, Amgen could lose sales as patients could choose to go with another similar drug that offers the convenience they are looking for.

Conclusion

In conclusion, we believe Amgen is a Buy, with a price target of \$221.59, providing about a 15% margin of safety. Amgen has drugs with long-term patents that will provide protection for Amgen's revenue in the future. We believe that Amgen's developing biosimilars and Next-Generation Bio-manufacturing facilities will give the company a competitive advantage in the biotech industry and prompt strong diverse revenue growth. Finally, we believe that Amgen's demonstrated ability to innovate new and successfully tested drugs will position the company to prosper well into the future.

Appendix

Aggregate Valuation Output		
Method	Weight	Value
DCF	75%	\$ 220.90
Comps	25%	\$ 223.64
Intrinsic Value		\$ 221.59
Margin of Safety		
Current Share Price	\$ 191.99	
Intrinsic Value	\$ 221.59	
Margin of Safety	15.42%	

Corporate Social Responsibility

In our 2016 Responsibility Highlights Report, we are expanding the scope of reporting beyond environmental sustainability to share the many ways in which we serve the greater good beyond our medicines. These efforts include supporting science education, volunteering in our communities, providing access to medicines for qualifying patients with a financial need and ensuring that our suppliers hold themselves to high standards. We are proud to showcase our commitment to responsible operations in this report.

- Staff contributed more than **26,000 VOLUNTEER HOURS**
- \$19M+** INVESTED WORLDWIDE to advance science education and support our communities
- 100% OF STAFF COMPLETED** "Do the Right Thing" Training
- REDUCED** 104,200 METRIC TONS of carbon emissions since 2007, saving \$24 million in operating costs annually
- 9 GLOBAL EMPLOYEE GROUPS** at Amgen organized around a primary diversity dimension
- \$3M+** MATCHED by Amgen Foundation Matching Gifts Program
- CR's **100 Best Corporate Citizens** 2016
- A TOP 50 EMPLOYER** for STEM
- MEMBER OF **Dow Jones Sustainability Indices** In Collaboration with RobecoSAM

Product Portfolio

Aranesp®
(darbepoetin alfa)

 **BLINCYTO®**
(blinatumomab) for injection
35 mcg single-use vial

Corlanor.
(ivabradine) 5 mg tablets
75 mg tablets

 **Enbrel®**
etanercept

EPOGEN®
(EPOETIN ALFA)
RECOMBINANT

 **IMLYGIC®**
(talimogene laherparepvec)
SUSPENSION FOR INJECTION
10⁸ PFU/mL and 10⁹ PFU/mL single-use vials

Kyprolis.
(carfilzomib) for injection

 **Neulasta®**
(pegfilgrastim)

NEUPOGEN®
(FILGRASTIM)

Nplate®
romiplostim

 **Parsabiv™**
(etelcalcetide) injection for intravenous use
2.5mg/0.5mL | 5mg/1mL | 10mg/2mL

 **prolia**
(denosumab) injection

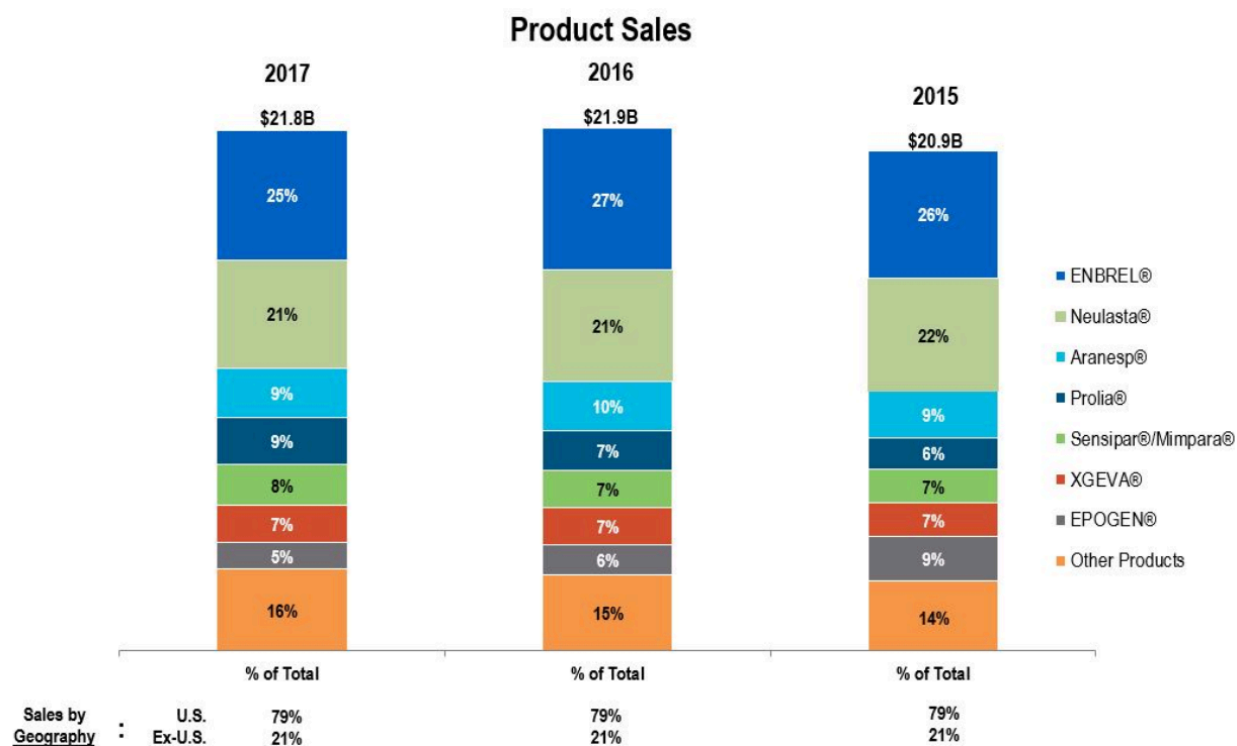
 **Repatha®**
(evolocumab) injection
140 mg/mL

Sensipar®
(cinacalcet) Tablets
30mg - 60mg - 90mg

 **Vectibix®**
(panitumumab)
Injection for IV Infusion

XGEVA®
(denosumab)

Revenue Breakdown by Drug



Management

CEO: Robert Bradway

- CEO since 2012
- MD at Morgan Stanley since 2001, corporate finance



CFO: David Meline

- CFO since 2014
- CFO at 3M
- Serving in various leadership capacities at GM



Pipeline

PHASE ONE			PHASE TWO			PHASE THREE		
AMG 176	AMG 224	AMG 330	AMG 301	AMG 557	AMG 714	AMG 520 / CNP520	Alimovig™ [†] (erenumab)	Aranesp® (darbepoetin alfa)
AMG 420	AMG 570	AMG 592	BLINCYTO® (blinatumomab)	Tezepelumab		BLINCYTO® (blinatumomab)	ENBREL (etanercept)	EVENTY™ [†] (romosozumab)
AMG 596	AMG 598	AMG 673				IMLYGIC® (talimogene laherparepvec)	KYPROLIS® (carfilizomib)	Omeclamiv mecarbil
AMG 701	AMG 757	AMG 820				Prolia® (denosumab)	Tezepelumab	
AMG 966	AMG 986	IMLYGIC® (talimogene laherparepvec)						
KYPROLIS® (carfilizomib)	Oprozomib							
BIOSIMILARS †								
			ABP 494 (biosimilar cetuximab)	ABP 710 (biosimilar infliximab)	ABP 798 (biosimilar rituximab)	ABP 959 (biosimilar eculizumab)	ABP 980 (biosimilar trastuzumab)	