Agios Pharmaceutical Inc.

Stock Price: $33.45
Market Cap: 1.83 B
Position: Long

Rational Capital Investment Fund
Report by Ahmed Abdulrahman

Investment Thesis

Agios pharmaceutical is an extremely attractive company with high potential for growth, with a base case of 181 percent upside. The company's products are one of a kind and protected by its strong moats and high selling costs. Although the time horizon for when the company will be able to commercialize and launch its products is uncertain, the potential growth is. With the various medicines in their late stages of clinical trials, Agios is expected to grow at least as much as the industry CAGR of 15.85%.

Overview:

Agios Pharmaceutical INC. is a pharmaceutical and biotechnology company based in Massachusetts. It focuses on small molecule anticancer therapeutics targeting cancer cell metabolism in the growth factor pathway. Cancer metabolism refers to the cells ability to heal itself, after facing white blood cells and such, by affecting the growth factor pathway, Agios medicines will be able to help cancer and gene designed disease patients.

Company History

The company was founded in 2009, when it found a link between metabolic gene IDH1 and cancer genes. In 2011, they gained 78 million dollars in financing to research rare gene metabolic processes. In 2013 they completed their IPO of 18 dollars per share, and showed their preclinical research on IDH1 and cancer genes. In 2014 they started clinical trials for IDHFA and TIBSOVO. Which are medicine for leukemia and Glioma, both rare diseases. In 2015 to 2016 they started new research into new medicine, and applied to the FDA for the IDHIFA to commercialize it after clinical trials and presentation. In 2017 it was approved, and they applied for FDA certification for TIBSOVO, which was later certified. 2020 was a successful year for Agios, they sold the rights to their IDHIFA medicine which is FDA certified for 255 million, as well their oncology business, their internal medicine business, for over 2 billion dollars plus royalties to focus solely on genetically defined diseases. In 2021 they received positive information for their first genetically defined medicine, and in 2022 it was FDA approved.

Reason for Growth

The reason there is potential long term growth for this company is due to its clinical programs, and the positions they are in and the way they work. As of now Agios has 6 clinical programs, meaning projects for medicine. Some of these projects are in late stages. Each clinical trial is separated into 5 stages, Drug discovery, early stage clinical trial, late stage clinical trial, regulatory submission and approval. The interesting thing about Agios medicine is that it can work for different scenarios for the same disease. For example, TIBSOVO is the main clinical program, it is being researched for 6 different conditions. As of now it has been FDA approved for R/R AMl and frontline AML monotherapy. R/R AMl is relapsed to acute myeloid leukemia, when AML has returned after treatment. Frontline AML monotherapy is treatment for individuals who just discovered they possess AML. There are still 4 other conditions in the clinical program for IDHIFA to be certified, and when they do this will boost its sales, as the medicine is useful for multiple scenarios for individuals with AML.

Looking at the company's progress in their clinical trial, we see that TIBSOVO is the most advanced with all scenarios in the late stage clinical trial. However the other clinical programs are not lacking either, with most of their scenarios in the late stage clinical trials. Out of the 6 programs, 4 of them haven't had a single scenario approved by the FDA. 2 out of the 4 are made for genetically defined diseases. As of now it's almost impossible to cure genetically defined diseases because the patient's blood contains these cancer cells that move around the body alongside red blood cells. Agios clinical program Mitapivat, designed to help with Pyruvate kinase (PK) deficiency which is an inherited red blood cell enzyme disorder that causes chronic hemolysis, which basically causes white blood cells to kill red blood cells. This Medicine, 3 out of the 4 scenarios are in late stage clinical trials. The other medicine AG-946 is only in phase one. However once Mitapivat is FDA approved, this drug will help millions of lives affected by Pk deficiency, and other autosomal diseases. Because the drug is made for genetically defined diseases, which do not have medicine to treat for those conditions, it will generate a lot of attention and revenue. Because of the clinical programs, the company has a lot of potential for growth in the future.

Types of Revenue

The business has three sources of income. Royalty, Collaboration revenue and product revenue. The royalty revenue is due to the sale of their oncology business to servier. Collaboration Revenue is from contracts Agios has with customers, they are based on a commercial good that both parties are benefiting from. Each contract is different and brings in different revenues. Product sales are associated with their direct medine sales.

The royalty payments will be constant and last perpetually as a result of the contract between Agios and servier. Product sales increase once different scenarios for the already approved Medicine TIBSOVO and IDHIFA are provided by the FDA. And alongside new medicines approvals, product sales will multiply, as demand for these medicines are very high.

Moats:

Intangible Assets: Agios is a pharmaceutical company as a result, it does have intangible assets as moats. All of the medicines are results of the companies years of research, they patent them so others are unable to copy their vaccine and sell it for cheaper. These patents help the company in two ways, it allows them to sell their products without worry about someone copying it, and it also allows them to sell their patent for extremely high costs if the situation ever arises.

First in its industry: The company also has a moat due to the category of its product. Cancer related medicine or even treatment is very limited. There are not many options for patients but to do chemotherapy. The medicine Agios provides is in a sense one of the only options patients have available. IDHIFO for example helps some patients fully be cleaned of Cancer cells, while some partially cleaned. This is one of the only medicines in the world that treats AMI, like this. This gives the company a moat on its own. As it's the first in its industry, but with cancer related medicine there are not many options. It is not like cold medicine where there are hundreds of medicines you could take.

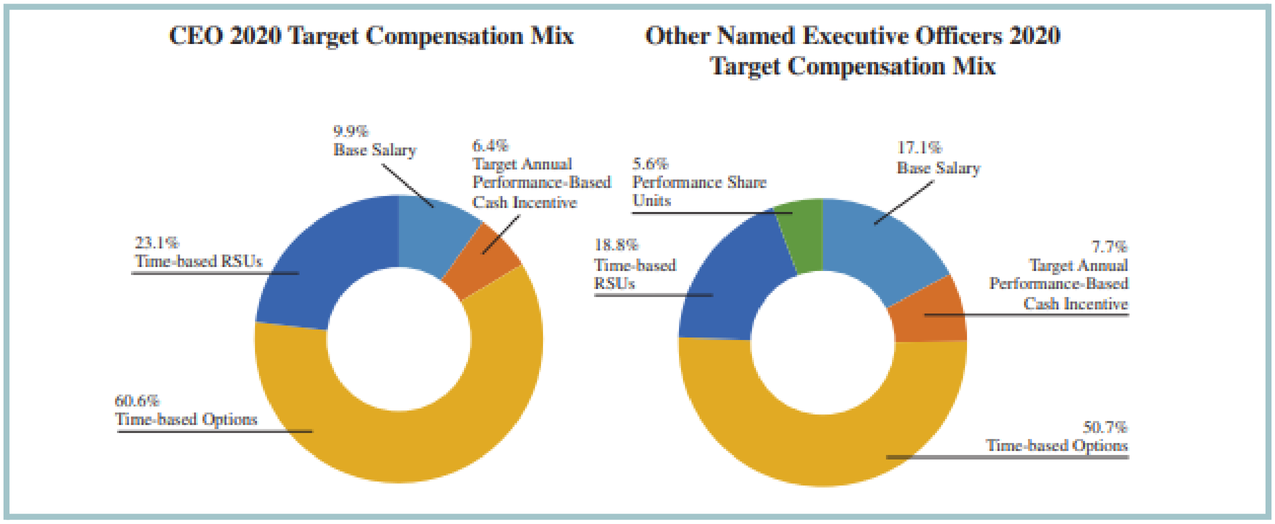
High Barrier of entry: Pharmaceutical companies also have very high barriers of entry, research into cancer is extremely expensive and requires millions of dollars because of the difficulty. The reason for that is technology, drugs, and the people working in the research. The facilities need state of the art technology which for the medical field is very expensive. The people working are specialized in their own field of research having doctorates and masters, which makes it very expensive to employ them. The drugs themselves have a very high patent cost, as well as the government wants them to be cheaper to be more affordable to citizens. As a result, it's very expensive to enter the cancer research industry.

Talent and Difficulty due to nature of work: Although It requires millions of dollars to research cancer, viruses and diseases, not anyone is able to do as such. Researching requires great expertise in the biomedical field, an abundant amount of talent specifically excelling in biomedical research is not just found. Most of these individuals are already researching in these top pharmaceutical companies. Just having the capital does not let outside competitors copy Agios. They patent their medicines and the nature of the industry makes it hard to find breakthroughs in cancer related research. If it was so easy cancer related deaths would have stopped years ago

Management:

 Jackie Fouse	**Chief Operating Officer** - B.A and Masters in Economics, and a P.H.D In Finance, and management in environmental studies - Previously a president from Clegene corporation - Appointed to spearhead leukemia drug launches - Manages the various different products in the different stages of each medicine pipeline with her management experience and skills
 Jonathan Biller	**Chief Financial office and Corporate affairs** - B.A from Brown university and J.D from Yale Law school - Previously worked as Senior vice president for celgene corporation - Handles all the Patent work for Agios pharmaceuticals medicine in the various stages after FDA approval
 Jim Burns	**Chief Legal Officer** - B.A and J.D from Seton Hall university school - Worked as an attorney for 15 years - Works as the senior attorney and the first head of compliance for the company - Regulates company research project sto fit standard worldwide
 Bruce Car	**Chief Medical Officer** - Dr. Car received veterinary medicine and Masters in pathology degrees from The University of Melbourne - Undertook his postdoctoral studies in immunology and inflammation at the Theodor Kocher Institute - Lead researcher in Mitavipat, the genetically defined medicine for Pk deficiency. - Tasked with discovering, defining and refining medicines for undiscovered patient needs

Executive Compensation



Executives are compensated through base salary, performance related cash incentives, Time based Restricted stock unit, and time based options. The executives are paid a base salary on top of bonuses related to company performance, however it is capped at 150% the target performance, so there is not an inequality in payment for employees. Then they are also given RSU which is company stock should they continue to work for the company each year.

Base Salary

	2019 Base Salary ($)	2020 Base Salary ($)
Jacqualyn A. Fouse, Ph.D.	725,000	746,750
Jonathan Biller(2)	500,000	500,000
Christopher Bowden, M.D.	490,539	515,007
Bruce Car, Ph.D.(4)	—	500,000
Andrew Hirsch(5)	500,476	515,490

Looking at the chart above we see that executives' base salary is on average approximately 500,000 USD. However from the Executive compensation pie chart we see that this is only a small amount compared to the total compensation these executives have. We can approximate the CEO making about 5 million USD from these two charts. Compared to the market cap of 1.7 billion USD, this is 0.05 percent, which explains that the compensation for these individuals is not very high.

Industry:

The Biotechnology industry has extremely cyclical revenue and profit is generated through the sales of medicine, which comes after a very long arduous task. The drug needs to be discovered after extensive research, then put into preclinical and post clinical trials. And After that it has to be FDA approved before it can go into the market, and because Patent costs for drugs like these cost extremely expensive, profits are generated at the very end of this process. Only when the company has its products in sales does the company stock and revenue grow.

The business is not a commodity business or semi commodity business, it produces finished goods made to specifically help certain conditions. Looking at past stock performance, when the market crashed or has been affected, the company stock doesn't seem to be affected. Medicines that are critical for patients, and hospitals are purchased regardless of the macro environment as it is critical for patient survival. People's lives are very important, so the sales of Agios Products conceited even during small recessions or market drops. The stock price went up and down but stayed relatively the same.

Competitors

AstraZeneca ALEXION	- Public company, subsidy of Astrozenca - Specializes in medicine creation for Genetic conditions - Has multiple medicines related to certain genetic conditions in market - Medicine mostly related to cardiology, nephrology genetic conditions - Few medicines in after clinical trials - No scenarios, for each medicine.
VIATRIS™	- Publicly traded company, very high volume and market cap compared to low stock price - produce medicines for patients across a broad range of major therapeutic areas, spanning both noncommunicable and infectious diseases - Have products in various fields of medicine, lots of various medicine
GILEAD Creating Possible	- Publicly traded company currently at 55 dollars, with market cap of 79 billion - Focuses on HIV, Hepatitis A,B,C - Worked on a vaccine treatment - Focusing on cancer research for the future - Has a wide range of products

	- Publicly traded biotechnology company currently at 243 dollars - Focuses on small cell medicine, in varying conditions such as Hematology, oncology,and inflammation - Has a wide variety of products in various different stages of the clinical trials

Each and every one of these companies are very different and unique in the aspect that they specialize their medical and clinical research in different conditions, very few products help the same condition. All of the competitors for Agios are more mature with a lot more products FDA approved and already being sold commercially. And the reason you would want to invest in Agios over these companies is that there are still so many products and scenarios of the drugs that haven't completed the FDA approval, meaning there is a lot of growth and sales ot be made for Agios a much smaller company than thes mature firms.

Although, the nature of the industry makes it so that no one firm is competing with each other directly, their products are made for different conditions and because each and every product is a new drug that is researched, tested and tested again it makes each product very unique. Whichever company with many new drush that are approved and sold will generate larger revenues. That is the only reason you would want to invest in the other companies, but the time frame for those drugs to be commercially sold is unknown.

Looking at the industry CAGR, we see that It is expected to expand at a CAGR of 15.83% from 2021 to 2028. Compared to the 10.5% of the S&P 500, the industry is expected to grow more than 5% relatively. With software and evolution of technologies, cancer related research and normal oncology related trials have been made easier making these companies and firms to achieve their research at much faster rates, and put their products in the market. These products are life saving and critical for human beings affected with various conditions, so the demand for products such as these will always be high. Agios specifically is expected to grow at the same rate if not faster than the industry, its main few drugs are almost all in late stage clinical trials, after that it's just

Financial

I took a precedent transaction approach to value the company, by looking at past M&A transactions in the biotechnology field. The data below finds the Median total enterprise value divided by revenue and ebitda for each Transaction.

Precedent Transaction: Implied share price

($ in Millions Except Per Share and Per Unit Data)											
Agios Pharmecutical, INC - Comparable M&A Transactions				Operating Metrics		Valuation Multiples			Share price		
Acquirer Name	Target Name	Date	Transaction Enterprise Value	LTM Revenue	LTM EBITDA	TEV / LTM Revenue	TEV / LTM EBITDA	Offer Price	One Day before	One week prior	One month Prior
AstraZeneca PLC	Alexion Pharmaceuticals, Inc.	2020-12-12	$ 40,021.1	$ 5,862.4	$ 3,061.8	6.8 x	13.1 x	$ 175.3	$ 121.0	$ 120.5	$ 127.6
Sanofi S.A.	Bioverativ Inc.	2018-01-22	11,037.8	1,168.5	474.8	9.4 x	23.2 x	105.0	64.1	63.8	53.6
Shire plc	Baxalta Incorporated	2016-01-11	35,218.9	6,148.0	2,105.0	5.7 x	16.7 x	45.6	33.2	30.6	31.7
Allergan plc (fka: Actavis plc)	Allergan, Inc.	2014-11-17	68,725.9	7,003.2	2,330.0	9.8 x	29.5 x	219.0	142.0	124.0	125.1
Bristol-Myers Squibb Company	Amylin Pharmaceuticals, LLC	2012-06-29	6,637.7	651.7	(449.6)	10.2 x	14.8 x	31.0	15.4	15.3	17.9
Fresenius Kabi USA, LLC	Akorn, Inc.	2017-04-24	4,789.0	1,101.9	445.9	4.3 x	10.7 x	34.0	25.2	24.1	22.4
Lonza Group Ltd	Capsugel Inc.	2016-12-15	5,500.0	1,000.0	344.0	5.5 x	16.0 x	N/A	N/A	N/A	N/A
Danaher Corporation	Cepheid	2016-09-06	4,078.8	564.3	0.6	7.2 x	6936.7 x	53.0	34.2	34.6	35.8
Pfizer Inc.	Medivation, Inc.	2016-08-22	14,003.7	1,027.1	456.5	13.6 x	30.7 x	81.5	37.4	40.0	35.8
AbbVie Inc.	Pharmacyclics LLC	2015-03-04	20,166.7	816.1	112.9	24.7 x	178.7 x	261.3	188.5	167.2	158.6
Valeant Pharmaceuticals International Inc. (nka:Bausch Health Americas, Inc.)	Salix Pharmaceuticals Ltd.	2015-02-22	16,137.2	1,133.5	154.8	14.2 x	104.3 x	173.0	120.2	118.1	110.1
Merck & Co., Inc.	Cubist Pharmaceuticals LLC	2014-12-08	9,488.3	1,164.5	203.6	8.1 x	46.6 x	102.0	74.4	75.8	70.8
Mallinckrodt Public Limited Company	Questcor Pharmaceuticals, Inc. (nka:Mallinckrodt ARD Inc.)	2014-04-07	5,300.3	890.9	516.9	5.9 x	10.3 x	86.1	67.9	62.1	64.9

We calculated share price in two separate ways: one from finding implied enterprise value and dividing it by shares diluted, and the other was looking at the share price premium these biotechnology companies paid to buy other biotechnology firms.

Precendent Transactions	
Median TEV/LTM Revenue multiple	**Median TEV/LTM EBITDA Multiple**
8.15	23.25
Agios	
2021 Revenue(in millions)	Implied Enterprise Value with TEV/ REV
$ 1,604.72	$ 13,074.83
2021 Ebitda(in millions)	Implied Enterprise Value with TEV/ EBITDA
$ 1,630.03	$ 37,893.60
Implied interprice value	**$ 13,074.83**
(+) Cash and investments	1378.221
(+)Net operatin loses	(-)
(-)debt and finance leases	146.61
(-)preffered Stock	
(-)operating leases	85.669
(-) noncontrolling interest	
(-) unfounded pensions	
Implied Interprise Value	**$ 14,220.77**
Diluted share price	29.36896047
Implied share price	**$ 484.21**

We calculated the median multiples, and multiplied revenue and ebitda for 2021 of Agios, to find implied enterprise value, and then added cash and investments, subtracting debt and operating leases to achieve an implied enterprise value of 14,220 million dollars.

Calculated diluted share price by taking 2021 revenue divided by total shares outstanding. Then divided implied enterprise value by dilated share price outstanding. **Of 484.21 Dollars**

Precedent Transactions: Share price Premium Approach

Share Price Premium							
			Share Price			Share Price Premium	
Target Name	Offer Price	One Day before	One week prior	One month Prior	One Day before	One week prior	One month Prior
Alexion Pharmaceuticals, Inc.	$ 175.3	$ 121.0	$ 120.5	$ 127.6	45%	45%	37%
Bioverativ Inc.	105.0	64.1	63.8	53.6	173%	175%	227%
Baxalta Incorporated	45.6	33.2	30.6	31.7	429%	473%	453%
Allergan, Inc.	219.0	142.0	124.0	125.1	23%	41%	40%
Amylin Pharmaceuticals, LLC	31.0	15.4	15.3	17.9	1039%	1048%	881%
Akorn, Inc.	34.0	25.2	24.1	22.4	595%	628%	683%
Capsugel Inc.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cepheid	53.0	34.2	34.6	35.8	412%	407%	389%
Medivation, Inc.	81.5	37.4	40.0	35.8	369%	339%	390%
Pharmacyclics LLC	261.3	188.5	167.2	158.6	-7%	5%	11%
Salix Pharmaceuticals Ltd.	173.0	120.2	118.1	110.1	46%	48%	59%
Cubist Pharmaceuticals LLC	102.0	74.4	75.8	70.8	136%	131%	148%
Questcor Pharmaceuticals, Inc. (nka:Mallinckrodt ARD Inc.)	86.1	67.9	62.1	64.9	158%	182%	170%

Using the data from before, I was able to calculate the median for premium share price and use that as the average. If a company wanted to buy Agios they would have to pay at least a premium of 181% of the current stock price.

Maximum		1039%	1048%
75th Percentile		416%	424%
Median		**166%**	**179%**
25th Percentile		0.5	0.5
Minimum	-	(0.1)	0.0

Average Premium Paid		**181%**
Current Stock Price	$	30.12
Expected premium to be paye	**$**	**54.50**

As a result the current stock price of 30.12 will have to be sold at least 54.50, making the implied share price at least 54.50 USD.

Looking at the two methods of evaluations, we see that Agios has extremely high potential for growth. Using the precedent Premium price paid for biotechnology company share prices, the company stock price has at least a base case of 181% upside. When finding the implied enterprise value and using diluted share price we found the true implied share price to be over 400 dollars. This does not seem impossible as the company is in its early stages of business cycle, and haven't been able to launch all their products in the market yet. Looking at its competitors with market cap over 10 billion with shares prices of 200 dollars and more, its is likely that Agios with its special product be able to reach those stock prices and shareholder value,

A link to actual spreadsheet is posted below for ease
https://docs.google.com/spreadsheets/d/e/2PACX-1vROubgoVMVlup4nikRqD3TCakQIIuJLYT2zze0W_9Pveo4A5S3jHIR2YjjOqf4HVphYFQad-IPCGoau/pubhtm

Risks and Catalysts:

Catalysts

1. The company succeeds in its production of various drugs in their pipeline. A lot of their drugs are in the late stage of the clinical program, all being almost ready for FDA approval. These Drugs are all critical for patients afflicted with various conditions like sickle cell anemia, Acute meiosis leukemia. The demand for these drugs are very high, and provide an opportunity for Agios to generate large profits and make revenue. The company can also sell their rights to the drugs to bigger companies, like they did with IDHIFA for almost 250 million USD. All of these revenue generating opportunities are viable if the company succeeds in the production of their various drugs.
2. The Company specifically succeeds in the genetically defined disease medicine Mitavipat. This drug is one of the very few that help eliminate conditions related to patients' genes, and this one specifically helps with PK deficiency. Most cancer research and oncology medicines are able to help patients who develop these conditions due to events like smoking etc. But people born with these medicines have to live their entire lives that get shortened struggling due to their conditions, if Agios were to succeed they would make history as one of the only few companies that have solved genetically defined diseases. This would definitely improve the company's market standing and improve the firm's view in consumer mind and boost value for investors.
3. The selling cost of the companies products are extremely high, a current box of 30 tablets of IDHIFA is $30,835. These very high sellings costs applied to the various products Agios will be able to sell after FDA approval will expand profit and revenues and increase shareholder value.

Risks

1. Cancer research is very time consuming, the time it takes for one drug in one scenario to be tested in both preclinical and clinical trials then FDA approved is very unknown. The time horizon for the growth of Agios is uncertain, this makes it difficult to know when the company's value will grow. Although the company's medicines are in the late stages of the process, they may find breakthroughs and get them on the market than the typical firm starting their medicine in the early processes, we should expect their products to get into market in the coming years.
2. The genetically defined diseases medicine is expected to take longer than normal oncology medicine, as it's one of the conditions mankind hasn't created cures yet for. One of the key driving forces for Agios is Mitapivat which is supposed to help PK deficiency patients, because these cancer cells or these affected cells are in the blood and move around or even are induced by the human body to create, it makes it that much harder to find a cure.