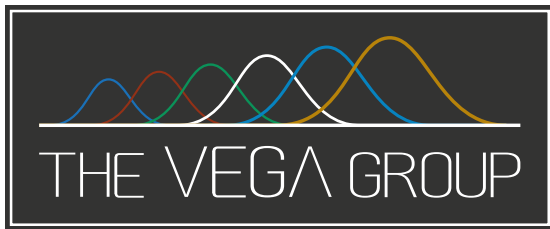


March 27, 2016



Research Report: GW Pharmaceuticals (GWPH)



Photo Source: GWP Website

GW Pharmaceuticals: Overhyped & Grossly Overvalued Marijuana Rx Company with Significant Downside Risk

The VEGA Group believes GWPH stock has greater than 50% downside risk as analysts ignore history of failure and flagrantly overestimate market potential.

Overview & Purpose of Report

GW Pharmaceuticals' (GWP) stock soared greater than 100% last week on euphoric buying and short covering as the company released data from its Phase III trial of their CBD-derived drug Epidiolex® targeting a rare form of epilepsy called Dravet syndrome.

Analysts soon chimed in with pie-in-the-sky valuations for the company, completely disregarding their history of failure to meet market expectations for their previously hyped cannabis-derived drug Sativex®; the reality that competition in the market for Cannabis-derived medicines will be fierce; the risk that IP on so-called proprietary extraction methods have a high

likelihood of proving altogether useless and defenseless in court; and the fact that GWP continues to burn capital at an astonishing rate, yet aggressively dilutes shareholders via secondaries and aggressive share issuances.

In this research report, we seek to offer a more realistic perspective on GWP's future potential and value, and ultimately warn shareholders and those interested in the stock that shares in GWP are grossly overvalued, posing a significant short and long-term risk of greater than 50% downside from the current share price.



Introducing GW Pharmaceuticals

According to their website,

“GW Pharmaceuticals was founded in 1998 and is listed on both the NASDAQ Global Market (GWPH) and AIM, a market of the London Stock Exchange. GW is licensed by the UK Home Office to work with a range of controlled drugs for medical research purposes. The Group's lead programme is the development of a product portfolio of cannabinoid prescription medicines to meet patient needs in a wide range of therapeutic indications, including Sativex® Oromucosal Spray and Epidiolex® for childhood epilepsy.”

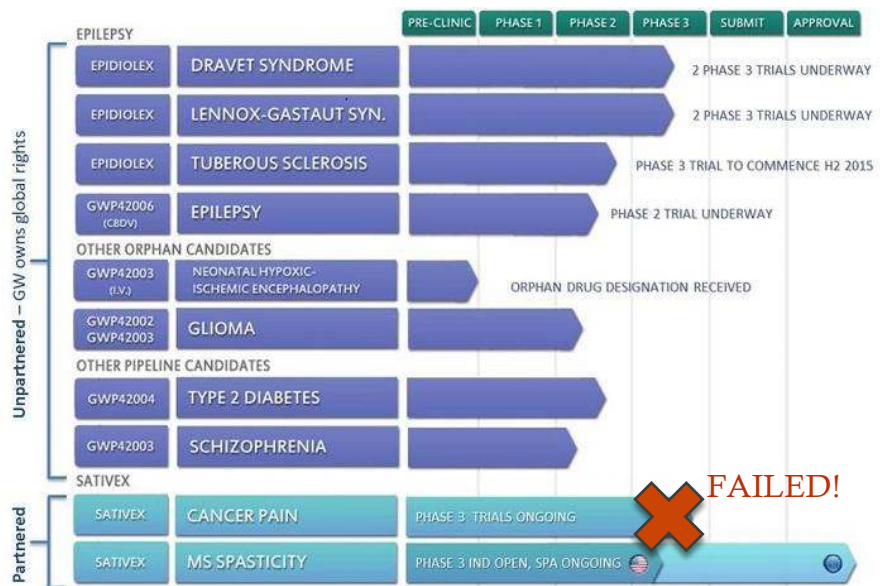
Sativex, a cannabinoid formulation of Cannabidiol (CBD) and Delta-9 Tetrahydrocannabinol (THC), is currently approved in 27 countries as a “symptom improvement” treatment for Multiple Sclerosis (MS) patients suffering moderate to severe spasticity. Sativex has been the subject of over 20 randomised placebo-controlled trials, including over 3,000 patients. GWP has partnered with and licensed Sativex for distribution and sale to six different pharmaceutical companies, covering all major geographical regions, including Bayer HealthCare, Almirall, Otsuka Pharmaceutical Co. Ltd., Novartis, Ipsen and Neopharm.

The company’s other main drug Epidiolex is an investigational CBD formulation targeting a specific syndrome classification of epilepsy called “electroclinical syndromes.” These syndromes are rare and represent only a tiny fraction of epilepsy patients. GWP has been granted Orphan Drug Designation for Epidiolex in Dravet and Lennox-Gastaut syndromes by the FDA and Fast Track Designation for Dravet.

Additional drug candidate pipeline information has been shared by the company below:

Key Points

1. GWP is a production and developmental-stage drug company from the UK that focuses on medicinal applications of Cannabinoid compounds derived from Marijuana plant material.
2. The company has been granted several patents related to the extraction and isolation of most cannabinoid compounds. (More on this below.)
3. GWP currently markets an FDA approved CBD & THC Oromucosal Spray for MS patients suffering from moderate to severe spasticity.
4. The company has been granted Orphan Drug and Fast Track designations for rare epileptic syndromes.



Medical Cannabis Primer

Cannabis has been used in the treatment of various illnesses by cultures spanning the globe for thousands of years. Some of the earliest records of Chinese, Indian and Egyptian medicine proscribed cannabis for a wide swath of ailments, including gout, rheumatism, insomnia, and more generally as an analgesic.

Due to his exposure to cannabis during his sojourn in India for the British East India Company, 19th century Irish physician William Brooke O'Shaughnessy was the first to research and publish findings that cannabis could be successfully utilised in “stilling convulsions in infants.”

Over the years, an overwhelming amount of anecdotal evidence has shown cannabis and cannabis extracts with varying degrees of CBD and THC help in relieving symptoms of a vast number of physical and psychological ailments and illnesses; however, until recently there has been very little scientific study to establish these claims.

In 1987, Jamaican researchers Albert Lockhart and Manley West discovered that cannabis was an effective treatment in the prevention and relief of symptoms associated with glaucoma. The duo developed a cannabis-extract pharmaceutical called Canasol for this treatment and attempted to gain FDA approval for sale in the US; however, it was rejected by the FDA on grounds the studies were not conducted on US soil.

Due to Federal regulations, pharmaceutical companies and research organizations in the US seeking to explore the medical benefits of any of the 85 active cannabinoid compounds derived from the cannabis plant must receive government approval. A simple search for “cannabis” on the clinicaltrials.gov website reveals over 553 studies in various stages of clinical trials, so it is clear there is a path being carved out for this research.

Though cannabis remains classified as a Schedule 1 Drug by the Controlled Substances Act of 1970, 26 states have legalized the cultivation,

sale and consumption of cannabis for medicinal purposes. This has resulted in a wellspring of entrepreneurs looking to capitalize on what had been a completely untapped market.

According to the research arm of a leading cannabis industry investment fund The ArcView Group, “The legal cannabis market is expected to maintain double digit growth for the foreseeable future growing to \$6.7 billion in 2016 and nearly \$22 billion by 2020.”

Within the overall “legal cannabis market,” informal medical use of CBD and THC extracts in tincture or oil form has exploded in popularity, resulting in hundreds of newly formed companies seeking to develop supplements of all kinds for sale online or via the rapidly spreading network of dispensaries throughout the “legal states.”

Meanwhile, several very visible lobbying organizations like the [Marijuana Policy Project](#) and [Coalition for Access Now](#) are pushing for legalization of cannabis in whole form, or CBD and THC extracts at the Federal level.

One very relevant story to the GWP narrative that forms the basis of CBD legalisation efforts is that of a 5-year-old girl name Charlotte Figi who suffers from Dravet syndrome. Renowned medical marijuana researcher Dr. Sanjay Gupta featured Charlotte in the CNN special *Weed* that highlights the controversy and complexities surrounding the medical marijuana industry.

According to her mother, Paige Figi, after ingesting cannabis oil from a particularly high-CBD, low-THC strain of Cannabis *sativa*, now dubbed Charlotte’s Web, Charlotte’s seizure event count went from “hundreds of seizures per week” to “less than three per month.”

As word spread through the epilepsy patient community, extracts of this particular strain have come under heavy demand, and producers like the Stanley Brothers, out of Colorado, have focused efforts solely on its production.

It is this very market that GPW seeks to dominate...

What’s the Big Deal, Anyway?

Analysts and the financial media are hyping GWP as the safest, most logical bet on the medical marijuana industry.

The idea being proffered is that should GWP be granted FDA approval for all the compounds and indications they have under trial, the company would be given a virtual monopoly on the medical cannabinoid market.

Additionally, the strong appeal to both those sympathetic to the legalization movement and individual investors seeking any means possible to plow their hard-earned capital into the industry simply cannot be ignored. Underwriters are keenly aware of this. Consequently, most of the sell-side analyst coverage plays heavily on these particular interests with stoner-friendly buzzwords and preposterous valuations, over-modeling TAM and penetration estimates while largely downplaying or outright avoiding discussion of the real risks to the GPW investment thesis.

In the remainder of this report, we outline several factors that we believe will prove catastrophic to GWP’s share price, as the hype fades and disappointing realities slowly come home to roost.

Stock Price Target GWP	
High	\$172.00
Median	\$147.00
Low	\$22.35
Average	\$116.39
Current Price	\$81.63

Analyst Estimates: wsj.com



Wet Noodles Stick...I Promise!

Anyone with the least bit of familiarity with cannabinoid science will tell you that there is nothing novel in what GPW is doing. GPW were not the discoverers of any new cannabinoid compounds, neither does it seem they are proposing any new indications for which those compounds might be applicable.

In fact, with what appears as non-existent science in new compound R&D the company is undertaking what we like to term a “wet noodle science” approach to drug approval with a matrix of all the major cannabinoids and indications that have surfaced through the long history of cannabis medicine—just not their history. Thus, we draw on the visual of spaghetti getting thrown at a wall to see what sticks...

With no serious or defensible innovation, how can GPW possibly fend off any other deep-pocketed pharmaceutical big-boys from doing the same?



Hoodwinking the Pro-Legalisation Public

While we certainly believe the analysts and financial media coverage to be narrow-minded in perspective and outright flawed in conclusion, any pro-legalization individual interested in investing in this company should seriously consider that were GPW capable of securing an FDA-backed monopoly in the medical marijuana

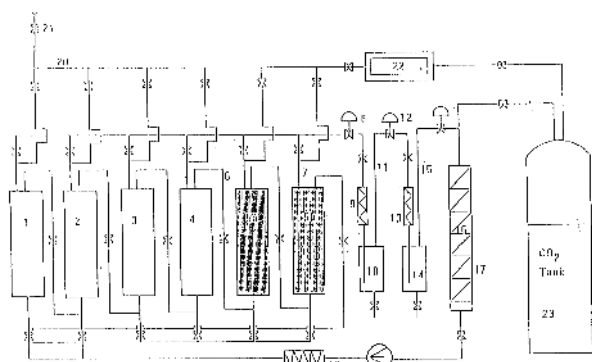
industry, it would mean certain death of the nascent and burgeoning local medical marijuana economies of each legal state—the very one being supplied by successful entrepreneurs like the Stanley Brothers, mentioned above.

Given that GWP is a UK company, is this a future you would like to see come to pass?

Did You Just Say What I Think You Said?! Inconceivable!

Yes, you read that correctly. After reviewing the admittedly large number of patents granted to GWP and rather lengthy list of FDA trials they have planned or are currently underway, we believe that the company's IP strength is not what sell-side analysts and stock promoters would have you believe.

For instance, we believe the company's English patent for "Extraction of pharmaceutically active cannabinoids from plant material" (EP1536810B1) is heavily based on prior art (for instance US20040049059A1 and US6403126B1, but in fact the list is very long) and/or could be easily circumvented (see [this video](#)), as most process patents are. The reality is chemists have been isolating compounds for decades; it simply is not new science.



f.g. 1 Apparatus Diagram from Patent US20040049059A1

With regard to the patents the company holds that cover usage of cannabinoids for broad indications such as cancer (US20130059018 A1), the company faces a mountain of prior scientific research (for instance, [this study](#)) and evidence that individuals have been using cannabis extracts (see [this video](#)) in this capacity for years prior to GWP's claims to have "invented" the application.

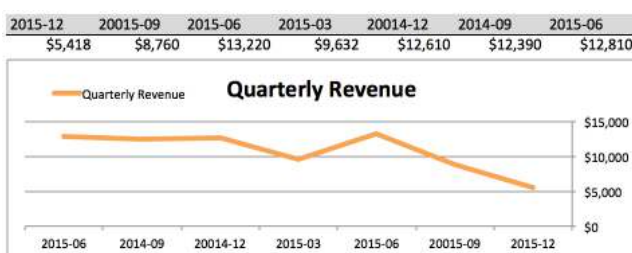
We strongly believe that defending this kind of intellectual—we use this term in the loosest possible sense given the nature of their "inventions"—property in a court setting will prove nigh impossible.

Sativex: A Model for Failure?

According to the company's website, their first commercially available THC & CBD solution, Sativex®, has "been launched in 15 countries (including the UK, Spain, Italy and Germany) and approved in a further 12." In fact, Sativex has been on the market for more than 10 years.

So, you might wonder, how has this previously hyped so-called wonder drug fared? Given the very low (and dwindling) sales accomplishment and high costs of maintaining the franchise, it wouldn't be too far of a stretch to call the drug a complete flop—a loss leader, even!

Below is the company's revenue for the past 7 quarters (the only product sold by the company is Sativex):



As you can see, Sativex sales are quickly heading to zero, ultimately bringing into question its efficacy.

To make matters worse, Sativex last year failed to meet primary endpoints in two randomized, double-blind, placebo controlled Phase III trials, testing for efficacy in alleviating pain in cancer patients, an indication for which analysts like Piper Jaffery rewarded GWP handsome valuation premium.

It is important to note that Otsuka Pharmaceuticals Co., Ltd. had partnered with GWP in these and other trials, and that Otsuka had funded development of Epidiolex six years until June 30th, 2013. At the end of that period, according the company's CEO confirmed in July, 2013 on a conference call that Otsuka allowed the agreement to expire, relinquishing their 50% rights to Epidiolex back to GWP for nothing.

Why would Otsuka, one of the largest and most successful pharmaceutical development and distribution companies in the world, just *give up* on Epidiolex if they didn't expect failure?



But, It's Marijuana!!

Many analysts and those promoting GPW on various news outlets like Seeking Alpha or TheStreet.com are quick to point out the companies involvement in the medical marijuana industry as an excuse for ignoring GPW's grossly overvalued shares.

This is a phenomenon we are not unfamiliar with in the domain of cannabis stocks. Soon after marijuana was legalized in several states in 2013, no less than 20 "marijuana stocks" rocketed in value, some, like MJNA, reaching 1000% their previous year lows.

Those familiar with the industry were ecstatic, early investors were raking in massive profits, and unfortunately, a large crowd of unscrupulous individuals rushed quickly onto the medical marijuana IPO—pseudo-IPOs, that is, through reverse merger—craze, seeking to bilk the unsuspecting public hungry to get in on the new *green rush*.

What was worse, like accelerant to a fire, several pseudo-analysts penny stock promoters engaged in pump & dumps tactics that eventually forced the SEC to issue an [official warning](#) to the general investing public regarding stock manipulation schemes surrounding the industry.

Since then, of course the hype and never-ending flow of newly minted reverse-merger cannabis IPOs continues; however, most investors have grown wary and skeptical of any stocks related to the industry.

Cue GWP...

Analysts and the financial media are attempting to position GPW as "the safe medical marijuana investment." And this mantra fits perfectly with an investment environment of both euphoria and apprehension.

Hook, Line and Sinker...

Let's face it: big pharma in the stock market means outsized management and underwriting fees. As early to mid-stage pharmaceutical companies like GPW burn money faster than "Nero burnt Rome," they are in dire need of access to market capital. Is it any wonder that Piper Jaffery—who was none other than the lead manager of GWP's last secondary—was the first out the door with a market cap projection more than double the stock price *after* it had just doubled, following Epidiolex data release?

A quick look at Tip Ranks shows the caliber of analysts we are dealing with when it comes to GWP:

Joshua Schimmer
Analyst at Piper Jaffray
Wall Street Analyst
Ranked #3,741 out of 3,810 analysts (#8,501 of 8,755 overall experts)

Follow
Followed by 445 investors

Analyst Ranking: 4 stars (out of 5)

Success Rate: 21% (64 out of 307 successful ratings)

Average Return: -22.9% (Average return per recommendation)

If you copied Joshua Schimmer's ratings since 2009 and opened each position for the duration of 1 Year*, then 21% of your transactions would have been profitable with an average return of -22.9%.

Ranking Settings | Main Sector: Healthcare

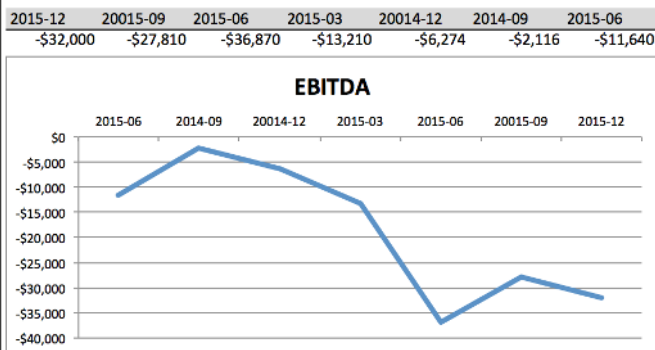
A 3741 ranking out of 3810 analysts with an average return of -22.9% does not exactly instill confidence.

But... It's Marijuana!!

So, how exactly is Mr. Schimmer reaching a \$147 price target for GWP shares?

A \$147 share price (per ADS) would imply a market capitalization of \$3.2B. Keep in mind, here, that the company failed with its flagship CBD/THC formulation Sativex, with revenues last quarter breaking below the \$6M market for the first time in years.

So, how about profit? After years of selling Sativex in the European market, the company is bound to have turned a profit, no?



As expected, the company's burn rate exceeds \$30M per quarter and appears to be accelerating. With \$332M in the bank, given a revenue stream heading quickly to \$0 and rising opex, we estimate the company will run out of cash by 2018.

That is, unless, Epidiolex delivers...and by deliver we do not mean like their flagship Sativex!

Strength in Numbers, Right?!

On March 14th, GWP announced positive Phase III pivotal study results of Epidiolex for the treatment of Dravet syndrome. According to some [commentators](#) familiar with the industry, GPW could "file with the FDA by end of 2016 and launch in 2017." So what exactly is the market for Dravet syndrome?

Calculations based on an [incidence rate](#) of between 1/16K and 1/20K births in the US, indicate that total incidence for Dravet syndrome in the US stands at around 224 infants per year.

Competing medicines, like Stiripentol, [have been noted](#) to cost around \$7400K per annum. According to [this source](#), with Dravet syndrome, decline in cognitive function tends to stabilize after the child is 4 years old. It is hard to estimate total number of cases at any given time, but we assume a range between 3000 to 6000 patents currently exist in the US. Even with 100% penetration out of the gate (an impossible assumption, as it takes years to get a drug successfully marketed), Epidiolex's highest revenue run-rate would equal only \$22M ~ \$42M.

More realistic estimates must factor for competition from dispensaries selling products like Charlotte's Web, and rate & feasibility of market penetration. Given the above, we estimate GPW will most likely able to achieve no more than \$5M~\$7M in 2017 revenues.

The company is also set to release Phase III study results for the treatment of Lennox-Gastaut syndrome. This syndrome is known to affect a larger percentage of the refractory subset of epileptic patients. Calculations based on [this report](#) yield roughly 15000 child incidents in the US.

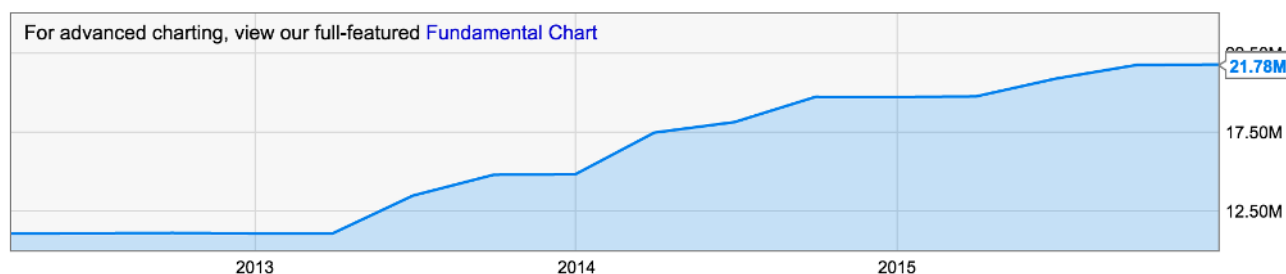
Pricing for a one-year regimen of Rufinamide is estimated at \$15K. Again, assuming 100% penetration out of the gate, GWP would stand to make \$175M from the market, with more circumspect estimates from \$50M~\$70M in 2H 2017~1H 2018 revenues.

The conclusion here is that GWP most certainly be looking to raise cash as early as 1H 2017, and we suspect this is the root cause for the pie-in-the-sky price targets from analysts.

History of Egregious Dilution

From early 2013 to now, in less than 3 years, GPW has diluted shareholders nearly 100%. Additionally, directors continue to dump shares on the market like a college binger at a frat party. In 2015 alone, directors exercised and sold 1,326,525 options. Below illustrates the company's shareholder abuse quite aptly:

Outstanding Share Count (Source: YCharts.com)



Go There, But No Further...

Casting the outlandish third-rate sell-side rhetoric aside, we present a more sober approach to valuing GPW based on more realistic assumptions and accounting for the following risks:

- Failure to progress Sativex beyond current indications.
- Competition from the already entrenched players in the cannabis extract market.
- Competition from other, more well-funded players in the pharma space.
- Protectionist legislation aimed at excluding foreign entities from addressing the market for medicinal cannabinoids.
- Protracted time-to-market due to reluctance of partners to enter US market and/or lower than expected penetration rates.
- Federal legalization of all cannabinoid compounds for medicine and, to a lesser extent, recreational use. (The biggest threat, in our minds.)

All of these factors considered, we believe the current share price of GPW is overvalued by more than 50% and shareholders stand to see a significant depreciation in the value of their holdings over the short, medium and long-terms. We hold this belief based on the following Discounted EBITDA, SOTP valuation:

GWPH Valuation: Pessimistic Case								
	2016	2017	2018	2019	2020	2021	2022	2023
Prob Adj. Total Rev	\$37.50	\$83.95	\$148.05	\$189.85	\$351.23	\$475.88	\$647.40	\$919.70
Est. COGS	\$3.75	\$8.40	\$14.81	\$18.99	\$35.12	\$47.59	\$64.74	\$91.97
Est. OPEX	\$160.00	\$288.00	\$345.60	\$414.72	\$497.66	\$547.43	\$602.17	\$662.39
Est. EBITDA	-\$126.25	-\$212.45	-\$212.36	-\$243.86	-\$181.56	-\$119.14	-\$19.51	\$165.34
Discounted (12.5%)	-\$112.22	-\$188.84	-\$188.76	-\$216.76	-\$161.39	-\$105.90	-\$17.35	\$146.97
							NPV	-\$844.25
							Exit Mult.	10
							Exit Val.	\$1,653.39
							Est. Value	\$809.14
							Value/ADS	\$36.28

Valuation Continued...

The above scenario represents a pessimistic case based on what we feel are realistically low probabilities of commercial success for general Epilepsy (30%), Glioma (20%) and Type-2 Diabetes (10%), which reflect our understanding of the scientific material covering the efficacy of cannabinoids in treating these symptoms, as well as higher potential for competition and barriers to entry.

In the following scenario, we increased the probability of successful market penetration for general Epilepsy to 40% and significantly for LSG and TS indications:

GWPH Valuation: Neutral Case

	2016	2017	2018	2019	2020	2021	2022	2023
Prob Adj. Total Rev	\$37.50	\$84.55	\$149.85	\$194.35	\$395.28	\$546.92	\$757.40	\$1,093.44
Est. COGS	\$3.75	\$8.46	\$14.99	\$19.44	\$39.53	\$54.69	\$75.74	\$109.34
Est. OPEX	\$160.00	\$288.00	\$345.60	\$414.72	\$497.66	\$597.20	\$716.64	\$788.30
Est. EBITDA	-\$126.25	-\$211.91	-\$210.74	-\$239.81	-\$141.92	-\$104.97	-\$34.98	\$195.80
Discounted (12.5%)	-\$112.22	-\$188.36	-\$187.32	-\$213.16	-\$126.15	-\$93.31	-\$31.09	\$174.04
							NPV	-\$777.57
							Exit Mult.	10
							Exit Val.	\$1,957.96
							Est. Value	\$1,180.39
							Value/ADS	\$52.93

As you can see, even a more neutral case lifts the valuation to only \$53/ADS. We simply cannot justify anything higher than this valuation given the risks, a history of failure to execute and the limited market opportunities that PWG faces.

Conclusion

GW Pharmaceuticals falls short in every metric of how one should evaluate an early-to-mid stage drug development company; and yet, we believe WS analysts covering the equity have entirely neglected to price in both internal and external risk factors, a history of operational weakness and unfathomable levels of shareholder dilution.

With this and the current nosebleed valuation in mind, we strongly believe shares of GWP pose both short and long-term risk to shareholders of a potentially greater than 50% fall from current levels to reflect more realistic risks and expectations.

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