EDISON

InMed Pharmaceuticals

Initiation of coverage

Innovating cannabinoids

Pharma & biotech

InMed is a Canada-based biopharmaceutical company focused on maximizing the therapeutic potential of cannabinoids. Through its biosynthesis platform, the company believes it has distinct advantages over both naturally sourced and chemically synthesized cannabinoids, which could give it access to both the medical and retail markets, although the process is still in development. The company is also developing a proprietary pipeline, including INM-750 for epidermolysis bullosa (EB), a serious orphan indication, and expects to file an IND for INM-750 in H219.

Year end	Revenue (C$m)	PBT* (C$m)	EPS* (C$)	DPS (C$)	P/E (x)	Yield (%)
06/16	0.0	(1.8)	(0.03)	0.00	N/A	N/A
06/17	0.0	(3.2)	(0.03)	0.00	N/A	N/A
06/18e	0.0	(5.3)	(0.04)	0.00	N/A	N/A
06/19e	0.0	(7.5)	(0.05)	0.00	N/A	N/A

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

InMed's biosynthesis platform may have advantages

InMed's *E. coli* bacteria-based biosynthesis platform may have some distinct advantages over currently used methods, according to management. It may be faster and provide a better-controlled and purer product than extraction from plants and chemical synthesis, and provide a cost-efficient way to manufacture over 90 minor cannabinoids that have different properties than tetrahydrocannabinol (THC) and cannabidiol (CBD). However, the process is still under development and is undergoing optimization and commercial scale-up.

INM-750, a topical cream for EB

InMed is developing INM-750, a topical cannabinoid cream, for EB, a debilitating genetic disorder characterized by skin fragility leading to blistering and wounding. The company believes the product could provide symptomatic relief in all patients and potentially treat the underlying disease in a subset of patients, and expects to file an IND in H219.

An $8bn market in the US, growing fast

In 2017, the US market for legal cannabis is estimated to be $8bn per year by Ackrell Capital and we expect it to grow to over $28bn by 2023 as more states adopt recreational and medical marijuana laws and the FDA approves cannabinoid therapies. If proven, we expect InMed's sales to this market to commence in 2021 and assume a notional 10% market share in the non-flower market.

Valuation: C$221m or C$1.45 per basic share

We arrive at our valuation of C$221m or C$1.45 per basic share (C$1.20 per diluted share) based on a risk-adjusted NPV analysis. Because of the early stage of InMed's proprietary pipeline, we only attribute a value of C$11m to it, although that will change as it progresses into the clinic. The company ended its fiscal Q318 (31 March) with C$13.9m in cash and we estimate this provides a runway into FY20.

7 June 2018

Price	**C$1.08**
Market cap	**C$165m**
	0.79C$/US$
Net cash (C$m) as of 31 March 2018	13.9
Shares in issue	152.8m
Free float	91.2%
Code	IN
Primary exchange	TSX
Secondary exchange	OTC Markets

Share price performance

%	1m	3m	12m
Abs	11.3	(42.6)	195.9
Rel (local)	8.2	(44.8)	182.7
52-week high/low	C$2.37		C$0.26

Business description

InMed is a Canada-based biopharmaceutical company focused on manufacturing and developing cannabinoids. Its biosynthesis platform may be able to produce cannabinoids for less cost and with improved purity compared to currently used methods. The company is also developing a proprietary pipeline, including INM-750 for epidermolysis bullosa, a serious, debilitating orphan indication.

Next events

Finalize fermentation and purification optimization and scaleup	H119
INM-750 IND filing	H219

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Edison profile page

Investment summary

Company description: A cannabinoid platform

InMed is a Vancouver-based biopharmaceutical company focused on the manufacture and development of cannabinoids for the therapeutic market. It is developing a biosynthesis process to individually manufacture each of the 90+ cannabinoids in *E. coli*, a bacteria that has previously been engineered to produce products such as insulin and Neulasta/Neupogen. It is also developing a proprietary pipeline through its own bioinformatics platform, which helps it identify cannabinoid candidates for target diseases. Its lead program is INM-750, a topical cream for EB, for which the company should file an IND in H219. It is also developing INM-085 for glaucoma and INM-405 for trigeminal nerve pain disorders, both of which are relatively early stage and likely to be a couple of years away from entering the clinic. InMed was formed in March 2014 and reverse merged with a public company to gain a listing in May of that year. Originally listed on the Canadian Stock Exchange, InMed moved to the Toronto Stock Exchange on 26 March 2018.

Valuation: C$221m or C$1.45 per basic share

We assign a base valuation of C$221m or C$1.45 per basic share (C$1.20 per diluted share) based on a risk-adjusted NPV analysis. Given the early stage of InMed's proprietary pipeline, the bulk of the valuation comprises its biosynthesis platform, which targets a large and growing international market. For the purpose of our model, we assume InMed could achieve a notional 10% share of its addressable market if the process is successfully validated and scaled to commercial use. In the pipeline, we value INM-750 at a risk-adjusted C$11m as it is still preclinical with a 5% probability of success and is several years away from the market. We currently are not valuing either InMed's glaucoma or pain programs due to their early stage and unclear timelines of when they would enter the clinic. We will revisit this as these programs, which target large markets, progress.

Financials: Runway into FY20

InMed reported an operating loss of C$2.2m for their fiscal Q318 (period ending 31 March, 2018) and C$4.5m for FY17. We expect these losses to increase steadily (to C$7.7m in FY18 and C$10.1m in FY19) as the company advances its manufacturing platform and proprietary pipeline. The company ended its fiscal Q318 (31 March) with C$13.9m in cash and marketable securities after it competed a C$9.4m private placement in January, which included 100% warrant coverage. We estimate this provides a runway into FY20.

Sensitivities: Two sets of risks

As InMed is developing a manufacturing process and a proprietary pipeline, it faces two sets of risks. With regard to the biosynthesis process, InMed needs to show that its process can manufacture cannabinoids in a cost-effective manner, scaled up for commercial use, compared to the current natural and synthetic processes. Also, there may be cost effectiveness in some cannabinoids but not others, which could significantly curtail the size of the addressable market. InMed's pipeline has a separate set of risks. It is very early stage with no clinical data. Its lead indication, EB, is a difficult-to-treat disease, with a recent development failure involving a competitive compound being developed by Amicus. Also, so far the endpoints in trials related to EB have been related to wound healing, which is difficult as bodies do heal naturally even in EB patients, so the risk of a high placebo response is elevated, making it difficult to reach statistical significance.

Biosynthesis and pipeline

InMed is focusing both on improving cannabinoid manufacturing and developing its own internal pipeline. With regards to manufacturing, current methods have some significant drawbacks. Plant-based extraction of cannabinoids is time consuming (3–10 months just to cultivate the plant), which also requires a high degree of purification as otherwise the product would have unwanted pesticides, molds, fungi or bacteria, residual solvents, and non-target cannabinoids. For example, it was noted during the FDA advisory committee meeting to discuss the potential approval of GW Pharmaceuticals's Epidiolex (CBD) for pediatric epilepsies that there was as much THC in its pharmaceutical grade compound as some of the lower doses of dronabinol, an FDA-approved THC product. Chemical synthesis is not as time-consuming as plant-based extraction but still would take weeks and has a purity problem as the process results in excessive waste and the creation of stereoisomers, which could affect the efficacy and safety of the product. Using *E. coli*, InMed believes it will be able to provide a purer product faster and at less cost than competitors, which, if successfully scaled up to commercialization, could enable the company to gain a share of the non-flower wholesale market in concentrated or infused products and edibles; these account for approximately half of the legal cannabis market according to Top Shelf Data, which tracks the market in Washington State.

InMed's intention to focus on the 90+ minor cannabinoids (especially those without psychoactive effects) is significant to the discussion, as only a few cannabinoids, such as THC and CBD, are plentiful enough in the plant to be extracted in a viable fashion. Cannabinoids also tend to be chemically complex molecules that are difficult to synthesize through current methods. If InMed is able to produce its biosynthesized cannabinoids in large quantities, it would be able to differentiate itself as most other cannabinoid companies focus exclusively on THC and CBD. It is important to note that some of these cannabinoids have unique properties that could treat a large number of diseases – as can be seen in Exhibit 1, which gives an idea of how each one may give different effects. For example, THC is psychoactive so not always a suitable treatment. Similarly, CBD is more effective for some applications and not others. Minor cannabinoids may offer equally differentiated applications. These minor cannabinoids could potentially be a material opportunity for InMed, although at this early stage we are not attempting to quantify this as data on these cannabinoids, particularly in humans, are limited.

Exhibit 1: Select cannabinoids and what they do

Name	Acronym	Comments
Tetrahydrocannabinol	THC	Most abundant cannabinoid in cannabis. Responsible for the euphoric feeling. A synthetic version is FDA approved for treating anorexia in AIDS patients and to treat nausea in cancer patients. Believed to have efficacy with regards to pain, anxiety, depression, nausea, spasms and certain cancers. CB1 agonist (central nervous system disorders).
Cannabidiol	CBD	Second most abundant cannabinoid. Not psychoactive. A natural version likely will be approved by the FDA soon for refractory epilepsy. Also thought to work against pain, anxiety, depression, nausea, insomnia, spasms, psychosis and certain cancers. Antagonist of CB1/CB2 agonists, CB2 inverse agonist (anti-inflammatory), positive allosteric modulator (pain), TRPA1 agonist (pain), TRPM8 antagonist (prostate cancer), TRPV1 agonist (psychosis, pain).
Cannabichromene	CBC	Third most abundant cannabinoid. Not psychoactive. Has been shown in various studies to potentially treat acne, diarrhea, pain, inflammation, depression, anxiety, multiple sclerosis and increase bone growth. Anandamide reuptake inhibitor (various neurological conditions).
Cannabigerol	CBG	Cannabis plants usually contain less than 1% CBG. Not psychoactive. Potential to treat pain, bacterial and fungal infections, cancers and depression. CB1 and CB2 partial agonist (neurological conditions), anandamide reuptake inhibitor (neurological conditions), TRPA1 agonist (pain), TRPV1 agonist (pain), TRPM8 antagonist (prostate cancer).
Cannabigerolic acid	CBGA	Precursor to all other cannabinoids. Not psychoactive. May have applications in pain and inflammation.
Cannabinol	CBN	Produced through the degradation of THC and typically plants contain less than 1% CBN. Minor psychoactive effects. Potential against bacteria, epilepsy, inflammation, anorexia, cancer, insomnia, glaucoma, bone healing and pain.
Delta-9-Tetrahydrocannabinolic Acid	THCA	Precursor to THC, which turns into THC when burned or vaporized. Not-psychoactive. Potential to treat inflammation, nausea, cancers and act as a neuroprotective. TRPA1 partial agonist (pain), TRPM8 antagonist (prostate cancer).
Cannabidiolic acid	CBDA	Precursor to CBD, believed to have efficacy in cancer, nausea and inflammation. TRPA1 partial agonist (pain), TRPV1 agonist (pain), TRPM8 (prostate cancer), COX-2 inhibitor (pain/inflammation).
Tetrahydrocannabivarin	THCV	Works very differently from THC. Potential to treat obesity, diabetes, anxiety, Alzheimer's disease, epilepsy and stimulate bone growth. CB1 antagonism (epilepsy).

Source: Izzo et al., Non-psychotropic plant cannabinoids, Trends in Pharmacological Sciences. 2009 Oct;30(10):515–27. 2018 Cannabis Investment Report by Ackrell Capital

InMed's pipeline is relatively early stage and comes from discoveries from its bioinformatics platform, which identifies specific cannabinoids or combinations of cannabinoids that may treat specific diseases. Importantly, the individual cannabinoid components of the pipeline are currently being manufactured by third parties, so it is not dependent on the success of the biosynthesis process. Its lead compound is INM-750, being developed for EB, with an IND filing expected in H219. INM-085 for glaucoma should enter animal studies in H218 and may enter the clinic in 2020. INM-405 for certain forms of neuropathic pain is longer term, with timing for advancement unclear.

Exhibit 2: InMed pipeline

Product	Indication	Mode of administration	Comments
INM-750	Epidermolysis bullosa	Topical cream	Expect a filing of the IND in H219.
INM-085	Glaucoma	Hydrogel eyedrop	Animal studies H218.
INM-405	Pain of the trigeminal nerve	Topical	Preclinical. Timing of advancement TBD.

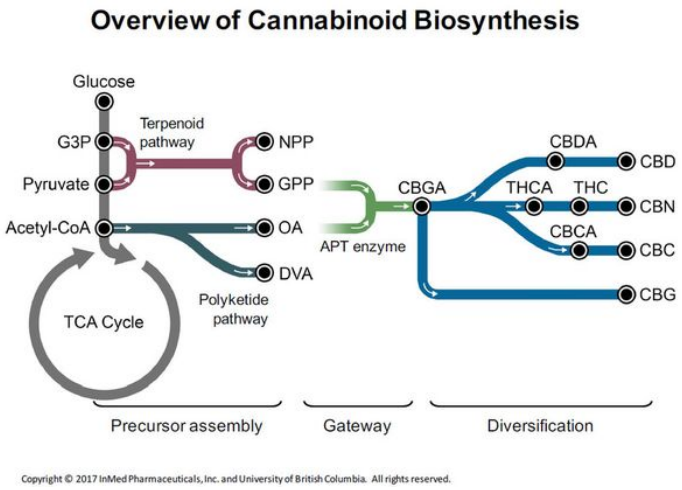
Source: InMed

Biosynthesis for the manufacture of cannabinoids

There are several key hurdles to reconstituting the biosynthesis of cannabinoids in a synthetic biologic system. The key enzymes for the production of cannabinoids and cannabinoid precursors must be introduced transgenically into the system. Additionally, although the molecular building blocks for cannabinoids are present in metabolic pathways outside of cannabis, sufficient quantities of these molecules must be generated to support cannabinoid synthesis at commercially significant levels. The key metabolic inputs for the formation of cannabinoids are geranyl pyrophosphate (GPP), a product of the terpenoid pathway common to all organisms, and olivetolic acid (OA), a polyketide product specific to cannabis. These molecules are condensed into cannabigerolic acid (CBGA), the key gateway compound for the biosynthesis of cannabinoids. Historically, CBGA biosynthesis in *E. coli* has been limited because CBGA synthase has been difficult to express in this system, and the concentration of the building blocks are low in the case of GPP and absent for OA.

InMed has made several key innovations that have enabled CBGA biosynthesis in *E. coli*. The first and perhaps most significant was the development of a version of the CBGA synthase protein that expresses well in *E. coli* and is catalytically active. Additionally the company developed a transgenic system to enhance the abundance of the GPP building block, which may increase the yield of CBGA approximately 10-fold. Finally, OA is able to be supplemented to the organism directly through the culture medium, abrogating the need to reconstitute its biosynthesis. By combining these elements, the company was able to achieve a yield of 14 µg of CBGA per mL of culture medium, which is likely to improve on optimization.[1]

Exhibit 3: Cannabinoid biosynthesis



Source: InMed

The landscape – biosynthesis for cannabinoids

One key issue to note is that both the competitive and intellectual property landscapes are evolving in this area as there are a number of competitors working on novel approaches to manufacturing cannabinoids. One competitor is Teewinot Life Sciences, which raised a $12.3m Series B round in May 2017 and has patented a process to manufacture certain cannabinoids in yeast or *E. coli* (patent number 9,359,625), although data supporting its claims on *E. coli* are very limited. Teewinot uses two key enzymes (THCA synthase and CBDA synthase), made in a microorganism then extracted and used outside the cell in a bioreactor. This uses CBGA as a starting point. The system produces biologically active THCA, CBDA and CBCA. The CBGA used for the process can be produced using synthetic biology or chemical synthesis.

Another competitor is Librede, which holds a patent to manufacture cannabinoids in yeast (patent number 9,822,384). This is a full biosynthetic process possible because yeast is able to make higher-order enzymes and has the metabolic capability to feed enough starting materials to the cannabinoid biosynthetic pathway. However, this company, perhaps handicapped by US legislation, has not yet scaled the process; although in 2018 it obtained a $1.4m US government grant to scale up the production of pharmaceutical grade cannabidiol. The competitors tend to be small and private, so it is too early to tell how viable both the technologies and companies will ultimately be (eg Librede only has two employees, according to its website).

1 Kabiri et al., A stimulus-responsive, in situ-forming, nanoparticle-laden hydrogel for ocular drug delivery. *Drug Delivery and Translational Research* (2018) 8:484–495

The market for legal cannabinoids

At present, only Uruguay has a nationwide law allowing for the recreational use of cannabis and cannabis products. Canada is likely to be next and is expected to enact a recreational cannabis law on 1 July 2018, with the support of both the ruling Liberal Party and the New Democratic Party.

The US, which will likely be the most important market for cannabis for some time, is a hybrid state. Eight states and the District of Columbia (over 21% of the US population, see Exhibit 4 have legalized the recreational use of cannabis (and have legalized cannabis for medical use). Another 21 states, representing 41% of the US population, have legalized the medical use of cannabis. In total, 17 states have legalized medical CBD, which is not psychoactive and hence deemed not abusable, and only four relatively small states continue to deem all forms of cannabis illegal. In addition, Vermont has passed legislation that will legalize recreational marijuana in small quantities on 1 July 2018 and New Jersey's Governor is advocating for legislation that would legalize recreational marijuana as of 1 January 2019.

However, the federal level is different, with all forms of cannabis outside of an FDA-approved product deemed illegal. The federal authorities, however, have not been enforcing federal law, instead deferring to state law. As this policy is not based on any legislation, it could change at any moment, although President Trump has indicated his support of a legislative solution to take the US cannabis industry out of regulatory limbo. Until there is federal legislation that legalizes cannabis, the ability to import cannabis or even move it across state lines would continue to be illegal (state laws would not apply in either situation). Any manufacturer of cannabis products needs to have facilities in each state where it sells products, which does hamper the ability for a company to scale up into a multi-state business.

Despite this, even with this regulatory limbo the market for cannabis products in the states where it is legal is relatively large. In Colorado, for example, which has a population of 5.5 million (1.7% of the total US population and about one-seventh the size of Canada) had legal cannabis sales of $1.5bn in 2017 according to the Colorado Department of Revenue, with 72% of that being recreational). As the ability to buy and sell cannabis for recreational use only started in California in January 2018, it is too early to tell the size of that market but it is likely to be very large. As of August 2017, there were 1.5 million medical marijuana patients in the state according to the Marijuana Policy Project with sales totalling $2.7bn in 2016, according to the Hemp Business Journal.

Exhibit 4: Cannabis legality by state

State	Population (2016)	Percent of US population	Legal status
California	39,250,017	12.2%	Recreational
Washington	7,288,000	2.3%	Recreational
Massachusetts	6,811,779	2.1%	Recreational
Colorado	5,540,545	1.7%	Recreational
Oregon	4,093,465	1.3%	Recreational
Nevada	2,940,058	0.9%	Recreational
Maine	1,331,479	0.4%	Recreational
Alaska	741,894	0.2%	Recreational
District of Columbia	681,170	0.2%	Recreational
Florida	20,612,439	6.4%	Medical cannabis
New York	19,745,289	6.1%	Medical cannabis
Illinois	12,801,539	4.0%	Medical cannabis
Pennsylvania	12,784,227	4.0%	Medical cannabis
Ohio	11,614,373	3.6%	Medical cannabis
Michigan	9,928,300	3.1%	Medical cannabis
New Jersey	8,944,469	2.8%	Medical cannabis
Arizona	6,931,071	2.2%	Medical cannabis
Maryland	6,016,447	1.9%	Medical cannabis
Minnesota	5,519,952	1.7%	Medical cannabis
Connecticut	3,576,452	1.1%	Medical cannabis
Arkansas	2,988,248	0.9%	Medical cannabis
New Mexico	2,081,015	0.6%	Medical cannabis
West Virginia	1,831,102	0.6%	Medical cannabis
Hawaii	1,428,557	0.4%	Medical cannabis
New Hampshire	1,334,795	0.4%	Medical cannabis
Rhode Island	1,056,426	0.3%	Medical cannabis
Montana	1,042,520	0.3%	Medical cannabis
Delaware	952,065	0.3%	Medical cannabis
North Dakota	757,952	0.2%	Medical cannabis
Vermont	624,594	0.2%	Medical cannabis
Texas	27,862,596	8.6%	Medical CBD
Georgia	10,310,371	3.2%	Medical CBD
North Carolina	10,146,788	3.1%	Medical CBD
Virginia	8,411,808	2.6%	Medical CBD
Tennessee	6,651,194	2.1%	Medical CBD
Indiana	6,633,053	2.1%	Medical CBD
Missouri	6,093,000	1.9%	Medical CBD
Wisconsin	5,778,708	1.8%	Medical CBD
South Carolina	4,961,119	1.5%	Medical CBD
Alabama	4,863,300	1.5%	Medical CBD
Louisiana	4,681,666	1.5%	Medical CBD
Kentucky	4,436,974	1.4%	Medical CBD
Oklahoma	3,923,561	1.2%	Medical CBD
Iowa	3,134,693	1.0%	Medical CBD
Utah	3,051,217	0.9%	Medical CBD
Mississippi	2,988,726	0.9%	Medical CBD
Wyoming	585,501	0.2%	Medical CBD
Kansas	2,907,289	0.9%	Illegal
Nebraska	1,907,116	0.6%	Illegal
Idaho	1,683,140	0.5%	Illegal
South Dakota	865,454	0.3%	Illegal
Recreational total	**68,678,407**	**21.3%**	
Medical cannabis total	**132,571,832**	**41.0%**	
Medical CBD total	**114,514,275**	**35.4%**	
Illegal total	**7,362,999**	**2.28%**	

Source: National Organization for the Reform of Marijuana Laws (NORML), US Census Bureau

In the US, the legal cannabis market is estimated to have been $8bn in 2017 (both recreational and medical) by Ackrell Capital, an investment bank focused on cannabis companies. Importantly, this number does not include any recreational sales in California, as those sales just started in January

of this year. We estimate that the US market will grow to over $28bn in 2023. If the level of consumption per capita is similar in the states that recently legalized recreational cannabis to that seen in Colorado, the market could grow to $18.8bn in just a few years, as markets mature in these states alone. Additional legalizations (New Jersey alone could be a $2.5bn market at Colorado per-capita usage levels) and medical cannabis sales outside of the fully legalized states make our estimates achievable. If there were a full legalization in the US, at Colorado per-capita usage levels, the US could potentially be an $88bn market. As a comparison, total alcoholic beverage sales in the US were $223bn in 2016 according to the Beverage Information Group.

Exhibit 5: Annual legal sales in the US by market

Market	Annual sales
Total legal cannabis market in the US (recreational and medical, 2017)	$8.0bn
Total medical marijuana market (2016)	$4.7bn
California medical marijuana market (2016)	$2.7bn
Colorado (recreational and medical, 2017)	$1.5bn
Washington (recreational and medical, 2017 annualized)	$1.4bn
Oregon (recreational and medical, 2017)	$470m
CBD oil (2017)	$358m

Source: Ackrell Capital, LLC, New Frontier Data, Colorado Department of Revenue, Washington State Liquor and Cannabis Board, Hemp Business Journal.

The size of the international market is difficult to gauge but Canada is estimated by Ackrell Capital to have had $1.5bn in sales in 2017. We estimate the Canadian market could grow to $5.3bn in sales in 2023, which is achievable in light of the fact that recreational cannabis is likely to be legalized on 1 July 2018 and referencing the fact that Colorado has $1.5bn in sales with one-seventh of the total population of Canada. We assume that InMed will target the 50% of the US and Canadian markets that is not based on the cannabis flower itself but on concentrates, infusions and edibles. We also assume (based on wholesale vs retail pricing data in Washington State) that the wholesale market is about 30% of the level of the retail market, such that InMed's target market would be $4.3bn in the US and $800m in Canada in 2023. These are competitive markets, but we assume, for the purpose of our model, that if InMed is able to show that its *E. coli* manufacturing technology provides a more cost-effective or purer product, and can bring it to commercial scale, then it could achieve 10% market share. The company is concurrently working on optimizing the genes to get *E. coli* to express the cannabinoids and scaling up the fermentation process, these being the crucial steps needed to achieve commercial scale to address the market. Once the manufacturing process is fully in place to mass-produce cannabinoids, it should be relatively easy for the company to rent or buy manufacturing capacity as *E. coli* manufacturing facilities are relatively plentiful and inexpensive (compared to other manufacturing media). We expect manufacturing revenues to commence around 2021. We model revenues out to 2037 as InMed filed a patent in September 2017 on the engineering of *E. coli* to produce cannabinoids. As it continues to develop the process, we expect additional patents to be filed, which would lengthen the patent protection.

INM-750 for EB

EB is a rare debilitating genetic dermatologic disorder characterized by skin fragility, leading to blistering and wounding; just wearing normal clothing can lead to wound formation. In some cases, EB also leads to the erosion of the epithelial lining of other organs. To give a sense of how severe the disease can be, there was a documentary about a child with EB entitled *The boy whose skin fell off*. There are several variations of EB (see Exhibit 6) but all share the problem of painful blistering

and wounding at the slightest friction. Prevalence is estimated at 11.07 per million,[2] which would indicate approximately 3,600 patients in the US and 5,700 in the EU.

Exhibit 6: EB variations and the genetic defects that cause them

EB type	% of EB population	Genetic defect	Type of defect	Defective protein
EB simplex	55%	K_5	Autosomal dominance	Keratin-5
		K_{14}	Autosomal recessive, autosomal dominance	Keratin-14
		TGM5, DSP, PKP1, PLEC, DST, ITGA6, ITGB4, COL17A1	Autosomal recessive	Transglutaminase 5, desmoplakin, plakophilin-1, plectin, α6β4 integrin, type XVII collagen
		JUP	Autosomal recessive, autosomal dominance	Plakoglobin
EB junctional	5%	LAMA3 (9% of cases)	Autosomal recessive	Laminin-332, type XVII collagen, α6β4 integrin
		LAMB3 (70% of cases)		
		LAMC2 (9% of cases)		
		COL17A1 (10% of cases)		
		ITGA6, ITGB4		
EB dystrophic	30%	COL7A1	Autosomal recessive or autosomal dominance	Type VII collagen
EB Kindler type	Rare	FERMT1	Autosomal recessive	Kindlin-1

Source: InMed

As there are currently no therapies to treat the underlying causes of EB, treatment is based on promoting wound healing. EB patients often have large areas of their body in need of care and can take 30 minutes to 3–4 hours a day (seven hours in an extreme example) just changing their dressings.[3] According to the Dystrophic Epidermolysis Bullosa Research Association, bandages and other necessary supplies can have a retail cost of over $10,000 per month.

Exhibit 7: Wound dressings typically used in EB patients

Type of dressing	Comments
Honey	Honey is an antimicrobial agent but can be very sticky and may sting.
Silicone	Soft and adhere easily but may move or buckle and can be expensive.
Foam	Encourage healing by absorbing liquids oozing from the wound but tends to cause overheating.
Alginates	Long-lasting dressing that becomes a gel in the presence of liquid oozing from the wound but is difficult to remove, stings and can cause damage to surrounding skin.
Hydrocolloid	Provides a moist environment for healing but may be difficult to remove and can be problematic for open wounds.
Charcoal	Controls odour but can lose effectiveness.
Eclipse	Highly absorbent and thick but difficulties in conforming to body parts, causes blistering and sweatiness.

Source: Grocott et al., Living in dressings and bandages: findings from workshops with people with Epidermolysis bullosa. *International Wound Journal*. 2013; 10:274

The biopharmaceutical industry has found it difficult to develop therapies for EB. Most recently, in September 2017, SD-101 from Amicus Therapeutics failed in a 169-patient Phase III study. SD-101 was a topical 6% formulation of allantoin, a common ingredient in over-the-counter cosmetics at lower concentrations due to its moisturizing effect. Amicus acquired the drug through its acquisition of Scioderm in September 2015 for $229m in cash and stock, an additional $361m in clinical and regulatory milestones and a further $257m in sales milestones, for a total consideration of $847m. Additionally if a priority review voucher (PRV) was awarded for SD-101, 50% of the PRV's value would have had to be transferred to Scioderm's shareholders (a PRV had been sold in 2017 for $110–130m).

The acquisition was based on data from 45 patients in a Phase IIb trial in which SD-101 had a statistically significant benefit in the proportion of patients with complete target wound closure at the two-month time point (82% in the SD-101 6% concentration versus 41% placebo, p=0.04).

[2] Fine et al., Epidemiology of Inherited Epidermolysis Bullosa Based on Incidence and Prevalence Estimates From the National Epidermolysis Bullosa Registry. *JAMA Dermatology* 2016:152(11):1231-1238.

[3] Grocott et al., Living in dressings and bandages: findings from workshops with people with Epidermolysis bullosa. *International Wound Journal* 2013; 10:274

However, at the one-month and three-month time points the results were not significant. In the 169-patient Phase III ESSENCE study there was practically no difference in one primary endpoint (time to target wound closure within three months, p=0.985) and a trend towards placebo in the other (percentage of target wound closure by month three, 49% SD-101 vs 54% placebo).

Current products in later stages include AP101 from Amryt and diacerein from Castle Creek (see Exhibit 8). AP101 is in a 164-patient Phase III trial, which is expected to read out by the end of this year. It is a mixture of birch bark extract and sunflower oil that works by stimulating keratinocyte migration and differentiation into mature epithelial cells, promoting wound healing. Previous data are limited as the prior Phase II was conducted in 10 patients where wounds in essence were their own controls in that one half of the wound was treated with AP101 and the other half was not. Improvement in wound epithelialization at days seven and 14 was trending in the right direction but not significant. The primary endpoint is the proportion of patients with first complete closure of the target wound within 45 days of treatment, which is an endpoint we do not have data on for this drug.

Exhibit 8: Competitive landscape in EB

Company	Drug	Composition	Mechanism	Phase	Comments
Amryt	AP101 (Oleogel-S10)	10% birch bark extract in 90% sunflower oil	Causes keratinocytes (cells that regenerate outer skin layer) to migrate and differentiate into mature epithelial skin cells, promoting wound healing.	Phase III	In a 164-pt Phase III trial, which is expected to complete in Q318. Primary endpoint is proportion of patients with first complete closure of the EB target wound within 45 days of treatment. Prior Phase II data in 10 patients showed 69.7% wound epithelialization at day seven versus 57.4% placebo (p=0.21) and 87.7% wound epithelialization at day 14 versus 79.2% placebo (p=0.33).
Castle Creek	Diacerein 1%	A prodrug of the IL-1 converting enzyme inhibitor rhein which is approved for the systemic treatment of osteoarthritis	Suppresses interleukin-1 beta, which is believed to reduce keratin 14 and stabilize the intermediate filament network of basal keratinocytes.	Phase II	In an 80-pt Phase II trial that is expected to complete in Q418. Primary endpoint is proportion of subjects who achieve a greater than 40% reduction in body surface area of lesions from baseline to week 16. In a pilot study in five patients the number of blisters was reduced significantly by 78% in the left armpit and 66% in the right in the Phase I portion. In the Phase II portion there was no loss of efficacy in those patients who had previously received diacerein, so there was no significant difference between the two arms compared to the end of the Phase I portion.
InMed	INM-750	Proprietary formulation of a combination of two cannabinoids	Upregulates K15.	Preclinical	Expected to file an IND in H219.

Source: InMed, Amryt, Castle Creek, Clinicaltrials.gov, Wally et al. Topical diacerein for epidermolysis bullosa: a randomized controlled pilot study. *Orphanet Journal of Rare Diseases* 2013, 8:69

Castle Creek is developing a topical 1% formulation of diacerein, currently approved as an oral version in certain EU and Asian companies for the treatment of osteoarthritis. It is supposed to suppress interleukin-1 beta, which may then reduce keratin 14 and stabilize the intermediate filament network of basal keratinocytes. Again, data so far have been limited, as we only have results from a pilot study of five patients. In the Phase I portion where all patients received diacerein, blister counts in armpits were reduced by 78% in the right armpit and then 66% in the left. In the Phase II portion, left armpits were given placebo but there was no little or no loss of efficacy so the study was not able to discern a statistically significant benefit for diacerein over placebo.[4]

[4] Wally et al., Topical diacerein for epidermolysis bullosa: a randomized controlled pilot study. *Orphanet Journal of Rare Diseases* 2013, 8:69

INM-750 is a combination of two undisclosed cannabinoids and may be able to help EB patients in several ways. According to management, based on preclinical research findings, INM-750 may significantly upregulate the keratin K_{15}, which may be able to compensate for a malfunctioning K_{14} and combine with K_5 to form the necessary adhesion between the epidermis and dermis, potentially reversing the underlying cause of EB simplex in some patients. There is also evidence of increase in the level of E-cadherin, a major component of epithelium integrity and MCP-1, which plays a key role in wound healing.[5] Also, not surprisingly as cannabinoids are known to have a mild impact on pain[6], INM-750 has demonstrated a positive impact in Nerve growth factor (NGF) induced pain models in rats. In addition, there is evidence of antibacterial activity among cannabinoids,[7] which could reduce the infection risk. In sum, INM-750 may be able to treat the many troublesome symptoms as well as the underlying cause of the disease in patients with K_{14} defects.

The company expects to complete its IND-enabling toxicology studies next year and file the IND around H219, with the initiation of a Phase I in healthy volunteers to proceed thereafter. Recognizing its early stage, we project a 2026 launch and a 5% probability of success, our standard probability of success for a preclinical product (which would increase to 10–20% as INM-750 advances into the clinic). As EB is an orphan indication, we would expect INM-750 to be priced at a premium: $100,000 per year in the US and $50,000 per year in the EU, based on, but still allowing for, a discount to typical orphan pricing for indications that are of similar size to EB of $300,000–500,000 per year. The market share will ultimately be determined by the quality of the data and benefit to patients but we estimate 16.5% market share for EB, as the underlying disease may be treated in the subset of EB simplex patients with K_{14} defects while the rest would receive only symptomatic relief. Also, as EB is an especially difficult condition to treat, positive data in EB may indicate applications in other wound healing-related indications, although we do not model any of these currently. Using these preliminary estimates, peak sales could achieve C$345m per year. As this is an orphan indication that would not require a large sales force, the company expects to market INM-750 for EB itself. We model out to 2037 although that will likely be extended as the company files to patent the formulation once it is finalized (the company has indicated multiple patent filings will occur later in 2018).

Glaucoma and pain programs

InMed is developing INM-085 for glaucoma, the leading cause of irreversible blindness globally. Glaucoma is a group of eye diseases caused by high intraocular pressure (IOP) and results in nerve damage and permanent vision loss. Worldwide there are over 64 million glaucoma sufferers, 39 million are in Asia, around 3.4 million are in North America with another 6.8 million in Europe[8]. According to one study in Sweden, at diagnosis 35% of sufferers have early glaucoma, 31% have moderate disease and 33% had advanced visual field loss in at least one eye, including blindness in 3.4%.

[5] Van Roy et al., The cell-cell adhesion molecule E-cadherin. *Cellular and Molecular Life Sciences* 2008 Nov;65(23):3756-88

[6] Russo et al., Cannabinoids in the management of difficult to treat pain. *Therapeutics and Clinical Risk Management* 2008 Feb; 4(1): 245–259

[7] Appendino et al., Antibacterial Cannabinoids from Cannabis sativa: A Structure−Activity Study *Journal of Natural Products.* 2008, 71 (8), pp 1427–1430

[8] Tham et al., Global Prevalence of Glaucoma and Projections of Glaucoma Burden through 2040 *Opthamology*. November 2014, Volume 121, Issue 11, 2081-2090

The goal of therapy is generally to lower IOP. There are five key classes of therapies on the market (see Exhibit 9) but all have issues with toxicity, which lead to low patient compliance, estimated at 41–78% of patients.[9] Most are working by either decreasing fluid production or increasing drainage.

Exhibit 9: Glaucoma treatment landscape

Drug class	Examples	Comments
Prostaglandins	Latanoprost (Xalatan, Pfizer), Lumigan (Allergan), Travatan Z (Alcon)	Reduce IOP by 28–33% (though may take three to five weeks to reach maximum IOP lowering) by relaxing muscles in the eye's interior structure to allow better outflow of fluids. Adverse events include redness and stinging, change of eye color, change in the pigment of the eye lashes or eyelid skin, lengthening and curling of the eyelashes, reactivation of herpes infection in the cornea, and uveitis.
Beta-blockers	Timoptic XE (Merck), Istalol (ISTA), Betoptic S (Alcon)	Reduce IOP by 20–30% by decreasing fluid production in the eye; typically additive to most IOP lowering agents. Exacerbate obstructive pulmonary diseases, slows heart rate and lowers blood pressure. Not recommended in patients with life-threatening depression. Betoptic tends to be the best tolerated drug in this class but at the expense of efficacy.
Alpha-adrenergic agonists	Iopidine (Alcon), Alphagan (Allergan)	Reduce IOP by 20–30% by decreasing rate of aqueous humor production (Iopidine and Alphagan) and increasing drainage (Alphagan). Adverse events include irregular heart rate, high blood pressure, fatigue and red, itchy or swollen eyes. Also there is a high rate of allergy with Iopidine, which limits its use in chronic treatment.
Carbonic anhydrase inhibitors	Eyedrops: Trusopt (Merck) and Azopt (Alcon). Oral pills: Diamox (Sigma), Neptazane (Wyeth-Ayerst) and Daranide (Merck).	Eyedrops typically reduce IOP by 15–22% while oral versions reduce IOP by 25–35%. They work by decreasing the rate of aqueous humor production. Adverse events from eye drops include stinging, burning, eye discomfort and corneal edema. Adverse events from oral versions include tingling hands and feet, fatigue, decreased libido, depression, stomach upset, memory problems, frequent urination (from pill form).
Parasympathomimetics or cholinergic agents	Pilocarpine, carbachol	Reduce IOP by 15–25% by increasing the outflow of aqueous humor from the eye. Adverse events include constriction of the pupils, possible blurred or dim vision, nearsightedness, retinal detachment, intestinal cramps and bronchospasm.

Source: InMed, Canadian Ophthalmological Society

Cannabinoids have been researched for the treatment of glaucoma since the 1970s. In a study in healthy volunteers, marijuana smoking was seen to decrease IOP by around 30%; in another placebo-controlled study in glaucoma patients IOP was decreased by 21%.[10] However, the duration of action was relatively short, with peak at two hours and a positive effect lasting about 3.5 hours. Therefore, a patient would have to smoke several times a day to treat their glaucoma, which is impractical due to the psychoactive effects and negative impacts on cognition. Research has indicated that the mechanism of action is not through the central nervous system, as originally thought, but through CB1 receptors in the eye,[11] which when targeted properly may decrease aqueous humor production and improve drainage.

Topical administration has been attempted but cannabinoids are highly lipophilic with low water solubility, which makes the intraocular bioavailability low. In a trial with 23 volunteers, there was no difference in IOP between eyes treated with 1% THC and those receiving vehicle.[12] INM-085 is a combination of two undisclosed cannabinoids being developed in a hydrogel vehicle. It is envisioned as a once-a-day formulation applied before bedtime. As we already know that cannabinoids have an impact on IOP, the big hurdle will be successfully formulating INM-085 so that intraocular bioavailability increases to acceptable levels where the drug can be efficacious. The formulation is still being optimized and we estimate INM-085 will likely not enter the clinic before 2020. We also expect the company to partner the product as the clinical program (especially Phase III) for glaucoma is likely to be large and expensive and a large commercial organization would be needed to market it. There likely will not be a shortage of suitors if InMed is successful in formulating an effective product from a new class, differentiated from the current standards.

[9] Denis et al., Adverse effects, adherence and cost-benefits in glaucoma treatment. *European Ophthalmic Review* 2011;5:116–122

[10] Novack et al., Cannabinoids for treatment of glaucoma. *Current Opinion in Ophthalmology* 2016, 27:146–150

[11] Tomida et al., Cannabinoids and glaucoma. *British Journal of Ophthalmology* 2004;88:708–713.

[12] Novack et al., Cannabinoids for treatment of glaucoma. *Current Opinion in Ophthalmology* 2016, 27:146–150

InMed is also developing INM-405, a topical gel for trigeminal nerve pain disorders, specifically temporomandibular disorders (TMD) and trigeminal neuralgia (TN). The trigeminal nerve services the head, specifically the eyes, the cheek and upper lip and the jaw. According to the National Institute of Dental and Craniofacial Research, prevalence of TMD is between 5–12% of the general population (which translates into 17–40m sufferers in the US alone) though only a fraction seek treatment. TN tends to be much more severe (involving sudden, sharp, stabbing and recurrent pain) but is rarer, with between 20,000 and 100,000 sufferers in the US according to various epidemiological studies.[13] There is evidence of the benefit of cannabinoid use in pain,[14] so targeting pain does make sense. Timing for entry into the clinic is unclear but will likely be after glaucoma, hence we are not including INM-405 in our current valuation.

Sensitivities

As InMed is developing a manufacturing process and a proprietary pipeline, it faces two sets of risks. With regards to the biosynthesis process, InMed needs to show its process can manufacture cannabinoids in a cost-effective manner, scaled up for commercial use, compared to the current natural and synthetic processes. Also, there may be cost effectiveness in some cannabinoids but not others, which could significantly curtail the size of the addressable market. For example, according to the Hemp Business Journal, CBD consumer sales only amounted to $358m in the US in 2017, making it only around 4.5% of the cannabinoid market.

Plus, besides the competition from more traditional extraction and synthesis processes, there are other competitors working on synthesizing cannabinoids. One competitor is Teewinot Life Sciences, which raised a $12.3m Series B round in May 2017 and has patented a process to manufacture certain cannabinoids in yeast or *E. coli* (patent number 9,359,625), although data supporting its claims on *E. coli* are very limited. Another competitor is Librede, which holds a patent to manufacture cannabinoids in yeast (patent number 9,822,384). The competitors tend to be small and private so it is too early to tell how viable both the technologies and companies will ultimately be.

The company also faces regulatory risk, especially in the US as the status of cannabis products is somewhat like the paradox of Schrödinger's cat, legal and illegal at the same time. While 46 states have legalized either medical or recreational cannabis, it is still illegal under federal law so if the Department of Justice decides to enforce federal drug laws, the legal cannabis market would be decimated. We do not expect this to happen and President Trump has indicated his support of a legislative solution to take the US cannabis industry out of regulatory limbo. Also, the FDA has been very supportive of new cannabinoid therapies for serious diseases, as evidenced by recent positive comments at the recent Epidiolex advisory committee meeting.

InMed's pipeline has a separate set of risks. It is very early stage with no clinical data. Its lead indication, EB, is very difficult with a recent development failure involving a competitive compound being developed by Amicus. Also, so far the endpoints in trials related to EB have been related to wound healing, which is difficult as bodies do heal naturally even in EB patients, so the risk of a high placebo response is elevated, making it difficult to reach statistical significance. The commercial opportunity will be heavily dependent on the clinical significance of the data as some patients might prefer to continue with their current system of bandaging. With regards to glaucoma, while there is strong evidence of efficacy for cannabinoids, it has been very difficult to formulate them for topical administration due to their lipophilic nature.

[13] McMillan et al., Trigeminal Neuralgia — A Debilitating Facial Pain. *Reviews in Pain* 2011 Mar; 5(1): 26–34.

[14] Russo et al., Cannabinoids in the management of difficult to treat pain. *Therapeutics and Clinical Risk Management* 2008 Feb; 4(1): 245–259

Valuation

We arrive at our base valuation of C$221m or C$1.45 per basic share (C$1.20 per diluted share) based on a risk-adjusted NPV analysis. Because of the early stage of the proprietary pipeline, the bulk of the valuation comprises InMed's biosynthesis platform, which targets a large and growing international market. For the purpose of our model, we assume InMed could achieve a notional 10% share of its addressable market if the process is successfully validated and scaled to commercial use. We assume that InMed will target the 50% of the market that is not based on the cannabis flower itself but on concentrates, infusions and edibles. We also assume the wholesale market is about 30% of the level of the retail market (referencing wholesale vs retail pricing data in Washington State), so that InMed's target market will be $4.3bn in the US and $800m in Canada in 2023, which assumes a 23.5% CAGR in those markets from 2017 to 2023. These are competitive markets, but we assume in our model that if InMed is able to show that its *E. coli* manufacturing technology provides a more cost-effective or purer product on a commercial scale, then it could achieve 10% market share. We apply a 12.5% discount rate, our standard for development-stage companies. We also ascribe a 22.5% probability of success to the manufacturing business, equivalent to what we usually give a drug development program that has passed safety trials but has yet to have evidence of efficacy, as InMed's claims of being able to manufacture cannabinoids is still to be validated. We expect manufacturing revenues to commence around 2021. We model revenues out to 2037 as InMed filed a patent in September 2017 on the engineering of *E. coli* to produce cannabinoids. As it continues to develop the process, we expect additional patents to be filed, which would lengthen the patent protection. As our estimates are heavily dependent on market growth and peak market share estimates, we include an analysis that indicates the different values for the biosynthesis platform under different scenarios (see Exhibit 10) in which all other variables are the same (such as probability of success, etc). The value of the platform can range from C$20.4m, if the market only grows at 10% per year and they only achieve peak market share of 5%, to C$614.1m, if the market grows 30% a year and they achieve 20% peak market share.

Exhibit 10: InMed biosynthesis platform scenario analysis

	Peak market share			
Market CAGR (2017–2023, %)	**5%**	**10%**	**15%**	**20%**
10.0	C$20.4m	C$71.5m	C$122.6m	C$173.6m
20.0	C$62.2m	C$155.1m	C$248.0m	C$340.8m
23.5	C$82.6m	**C$195.7m**	C$308.9m	C$422.1m
30.0	C$130.6m	C$291.8m	C$452.9m	C$614.1m

Source: Edison Investment Research

We value INM-750 at C$11m on a risk-adjusted basis as it is still preclinical with a 5% probability of success and is several years away from the market. The value of INM-750 should increase as launch comes closer and our probability of success goes up as it advances to higher clinical phases. For example, based on our current model, the value of INM-750 should be around C$200m in 2023, when we expect its Phase III to begin (assuming positive Phase I and II trials and no time lags) and when we would normally use a 60% probability of success. We currently are not valuing InMed's glaucoma or pain programs due to their early stage and the unclear timelines of when they would enter the clinic. We will revisit this as the programs, which target large markets, progress.

Exhibit 11: InMed valuation table

Program	Stage	Probability of success	Launch year	Peak sales (C$m)	rNPV (C$m)
Biosynthesis (manufacturing)	Development	23%	2020	1,574	$196
INM-750	Preclinical	5.0%	2026	345	$11
Total					$207.0
Net cash and equivalents (As of 31 March 2018) (C$m)					$13.9
Total firm value (C$m)					$220.9
Total basic shares (as of April 2018, m)					152.8
Value per basic share (C$)					$1.45
Options and warrants (as of April 2018, m)					31.5
Total diluted shares (m)					184.3
Value per diluted share (C$)					$1.20

Source: Edison Investment Research

Financials

InMed reported an operating loss of C$2.2m for its fiscal Q318 (period ending 31 March, 2018) and C$4.5m for FY17. R&D expenses were C$0.7m in FY17 and C$0.6m in fiscal Q318. We expect these losses to increase steadily (to C$7.8m in FY18 and C$10.1m in FY19) as the company advances its manufacturing platform and proprietary pipeline with projected R&D spending of C$2.0m in FY18 and C$4.0m in FY19. The company ended its fiscal Q318 (31 March) with C$13.9m in cash and marketable securities after it had completed a C$9.4m private placement in January, which included 100% warrant coverage. We estimate this provides runway into FY20.

Exhibit 12: Financial summary

C$000s	2016	2017	2018e	2019e
Year end 30 June	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS				
Revenue	0	0	0	0
Cost of Sales	0	0	0	0
Gross Profit	0	0	0	0
Research and development	(379)	(746)	(2,016)	(4,032)
Selling, general & administrative	(1,337)	(2,321)	(3,215)	(3,343)
EBITDA	(1,890)	(3,263)	(5,471)	(7,616)
Operating profit (before amort. and except.)	(1,803)	(3,165)	(5,351)	(7,495)
Intangible Amortisation	0	0	0	0
Exceptionals/Other/Share based payments	(574)	(1,309)	(2,466)	(2,565)
Operating Profit	(2,377)	(4,474)	(7,817)	(10,060)
Net Interest	0	0	68	0
Other (change in fair value of warrants)	0	0	0	0
Profit Before Tax (norm)	(1,803)	(3,165)	(5,283)	(7,495)
Profit Before Tax (IFRS)	(2,377)	(4,474)	(7,749)	(10,060)
Tax	0	0	0	0
Deferred tax	0	0	0	0
Profit After Tax (norm)	(1,803)	(3,165)	(5,283)	(7,495)
Profit After Tax (IFRS)	(2,377)	(4,474)	(7,749)	(10,060)
Average Number of Shares Outstanding (m)	60.2	96.8	142.0	156.2
EPS - normalised ($)	(0.03)	(0.03)	(0.04)	(0.05)
EPS - IFRS ($)	(0.04)	(0.05)	(0.05)	(0.06)
Dividend per share (c)	0.0	0.0	0.0	0.0
BALANCE SHEET				
Fixed Assets	1,464	1,392	1,344	1,306
Intangible Assets	1,459	1,365	1,296	1,296
Tangible Assets	5	27	48	10
Other	0	0	0	0
Current Assets	188	6,945	12,498	5,034
Stocks	0	0	0	0
Debtors	0	0	0	0
Cash	54	6,708	12,406	4,942
Other	133	237	92	92
Current Liabilities	(590)	(370)	(636)	(636)
Creditors	(590)	(370)	(636)	(636)
Short term borrowings	0	0	0	0
Long Term Liabilities	0	0	0	0
Long term borrowings	0	0	0	0
Other long term liabilities	0	0	0	0
Net Assets	1,062	7,966	13,206	5,704
CASH FLOW				
Operating Cash Flow	(499)	(3,076)	(4,763)	(7,384)
Net Interest	0	0	0	0
Tax	0	0	0	0
Capex	(1)	(25)	(73)	(80)
Acquisitions/disposals	0	0	0	0
Financing	388	9,755	10,531	0
Dividends	0	0	0	0
Other	0	0	0	0
Net Cash Flow	(112)	6,654	5,695	(7,464)
Opening net debt/(cash)	(167)	(54)	(6,708)	(12,403)
HP finance leases initiated	0	0	0	0
Exchange rate movements	0	0	0	0
Other	0	0	0	0
Closing net debt/(cash)	(54)	(6,708)	(12,403)	(4,939)

Source: Company data, Edison Investment Research

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Management team

President and CEO: Eric Adams	Chief scientific officer: Dr Sazzad Hossain, PhD, MSc
Mr Adams has over 25 years' experience in company and capital formation, global market development, mergers and acquisitions, licensing and corporate governance. Mr. Adams previously served as CEO at enGene, which he led from a nascent start-up to becoming a venture capital-backed leader in gene therapy. Prior to enGene, he held key senior roles in global market development with QLT (Vancouver), Advanced Tissues Science (La Jolla), Abbott Laboratories (Chicago), and Fresenius (Germany). He previously served as chairman of BIOTECanada's emerging company advisory board.	Dr Hossain has more than 20 years of academic and industrial experience in new drug discovery, natural health product development. He was group leader and senior scientist at Biotechnology Research Institute of National Research Council Canada, where he set up pharmacology laboratory to evaluate safety and efficacy of new drugs under development in the areas of cancer, cardiovascular and ocular diseases. Prior to joining the National Research Council Canada, he was at Xenon Pharmaceuticals in Vancouver, where he was associate director of pharmacology and led pharmacology teams targeting pain, inflammation and cardiovascular diseases. Dr Hossain received his PhD in biology from Moscow State Academy of Veterinary Medicine & Biotechnology and received post-doctoral training in the Department of Nutritional Science and Department of Medical Genetics of University of British Columbia. He is the author of more than 40 peer-reviewed papers, primarily in pharmacology, genetics and nutritional sciences.
SVP, Clinical and Regulatory Affairs: Alexandra Mancini	**Chief financial officer: Jeff Charpentier**
Ms Mancini has over 30 years of global biopharmaceutical R&D experience, with a particular emphasis on clinical development and regulatory affairs. She has been an executive with several biotech companies, overseeing a wide range of drug development activities. She served as VP of Regulatory Affairs at QLT for oncology and ocular diseases, playing a significant role in the development of VISUDYNE from the preclinical stage through to its approval as the first drug for age-related macular degeneration. While at QLT, Ms Mancini also led the regulatory approval process for the anticancer drug PHOTOFRIN and its associated medical devices, the first drug-device combination product approved by the US Food and Drug Administration. She has led the data analysis and assimilation, writing, submission and subsequent defence of drug submissions to regulatory agencies around the world, leading to several drug approvals and label extensions. Ms Mancini holds an MSc degree from the University of Toronto. She is also a visiting lecturer at the Segal Graduate School of Business, Simon Fraser University.	Mr Charpentier is a veteran of the biopharmaceutical industry with over 25 years of experience. He has held a series of senior financial roles at several public and private companies in the pharmaceutical and technology sectors where he led multiple equity financings, raising in excess of $150m and concluded a number of corporate partnering/product sale transactions. Mr Charpentier previously served as CFO for Lifebank (through to successful company sale in 2012), Inex Pharmaceuticals (now Arbutus Biopharma) and Chromos Molecular Systems. Mr Charpentier has a bachelor of commerce degree from the University of British Columbia and is a member of the Chartered Professional Accountants of British Columbia.

Principal shareholders	(%)
Christopher Bogart	5.53%
Craig Schneider	4.14%
Horizons Investment Management	3.36%
Sazzad Hossain	2.28%

Companies named in this report

GW Pharmaceuticals (GWPH), Amicus (FOLD), Amryt (AMYT.LN), Pfizer (PFE), Allergan (AGN), Novartis (NVS), Merck (MRK), Valeant (VRX),

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