180 LIFE SCIENCES

Stock Analysis Report

Date: August, 31st 2021 - **Current price:** $5.43 - **Target price:** $21.00 - **Ticker symbol:** ATNF

Company Metrics

Market cap.	$183.3M
Shares outstanding	36.27M
52wk high / low	$13.05 / $1.90
Average volume (3M)	444K
Insider ownership	27.74%
Institutional ownership	21.98%

Financial Metrics

Metric	2020	Q1-21	Q2-21
Revenue	n.a.	n.a.	n.a.
Op. exp.	5.65M	2.95M	4.01M
Net loss	10.88M	16.12M	23.46M
EPS	(0.66)	(0.58)	(0.75)

Valuation

Current price	$5,43
Target price	$21,00
Upside potential	~300%
Valuation method	DCF

Timeline

Q4 '21

- Phase 2B/3 results Dupuytren
- Phase 2 launch Frozen Shoulder

2022

- Phase 2 launch POCD (Q2-'22)
- Phase 1 launch Chronic Pain (Q3-'22)

2023

- Phase 2 results Frozen shoulder

Ratings

Pipeline ★★★★★

Trials ★★★★★

Mngmt ★★★★★

TAM ★★★★☆

Valuation ★★★★★

Company Description

180 Life Sciences Corp. is a clinical-stage biotechnology company focused on the development of novel drugs that fulfill unmet needs in inflammatory diseases which lead to fibrosis and pain by leveraging the combined expertise of luminaries in therapeutics from Oxford University, the Hebrew University and Stanford University. 180 Life Sciences is leading the research into solving one of the world's biggest drivers of disease – inflammation. The company conducts groundbreaking studies which translate into strong support for its clinical programs. These programs are seeking to treat diseases with an unmet medical need utilizing proven strategies. The primary platform is to treat widespread inflammation related afflictions such as Dupuytren's disease and frozen shoulder using the anti-TNF drug adalimumab. Its lead program is in phase 2b/3 clinical trial.

Highlights.

- Experienced management team with proven track record in identification, commercialization of new drugs/treatments and leading biotech companies
- Decorated scientists who identified TNF as a target in the treatment of arthritis
- Trials fully funded by top universities in the field
- Great growth opportunities given the current market capitalization, pipeline and target addressable market

Risks

- High cash burn which increases the chances of dilution
- Very limited analyst coverage on this company
- Disappointing Phase 2B/3 results on Dupuytren
- Dilution as a result from additional capital raises

Stock Performance

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Pipeline Review (1/2)

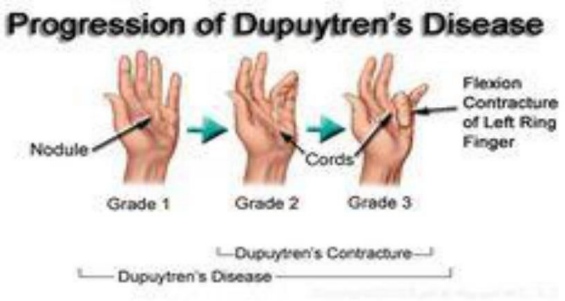
180 Life Sciences currently has three platform technologies targeting multiple indications. In this section we will take a closer look at the Fibrosis & Anti-TNF program and cover the three most advanced pipeline products, Dupuytren's Disease (DD), Frozen Shoulder and POCD.

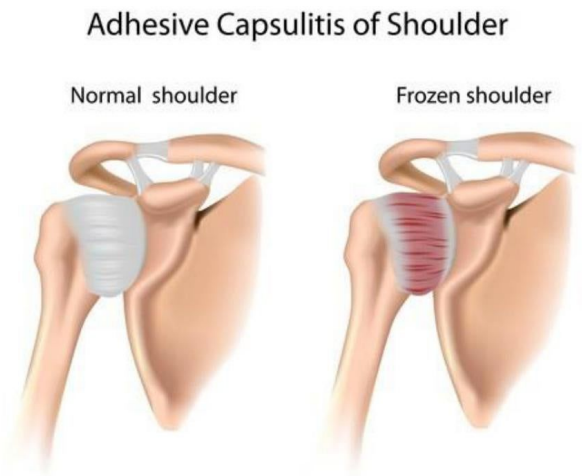
	Indication	Preclinical	Phase 1	Phase 2	Phase 3
Fibrosis & Anti-TNF*	Dupuytren's Disease	Results: Q4 2021			
	Frozen Shoulder			Est. Start: Q3 2021	
	POCD			Est. Start: Q2 2022	
	NASH	Started Q2 2020			
SCAs	Chronic Pain	Ongoing	Est. Start: Q3 2022	Est. Start: Q3 2023	
	Early Arthritis	Ongoing		Est. Start: Q1 2024	
a7nAChR	Smoking cessation induced ulcerative colitis	Ongoing			

*Regulatory approvals obtained from the MHRA and CCMO and the relevant accredited ethics committees to perform clinical trials in the UK and The Netherlands. No meetings have been held with, and no applications or requests for approval have been submitted to the FDA for any products at this time.

Dupuytren's Disease

Dupuytren's disease (DD) is a progressive affliction and is characterized by the appearance of hard nodules in the hands. These nodule can grow into cords. These cords then can become attached to the tendon sheaths and start pulling fingers involuntarily and inhibiting hand use.





Frozen Shoulder

Frozen shoulder, also known as adhesive capsulitis, is a condition characterized by stiffness and pain in your shoulder joint. Signs and symptoms typically begin gradually, worsen over time and then resolve, usually within one to three years.

Your risk of developing frozen shoulder increases if you're recovering from a medical condition or procedure that prevents you from moving your arm — such as a stroke or a mastectomy.

Treatment for frozen shoulder involves range-of-motion exercises and, sometimes, corticosteroids and numbing medications injected into the joint capsule. In a small percentage of cases, arthroscopic surgery may be indicated to loosen the joint capsule so that it can move more freely.

Post Operative Cognitive Decline (POCD)

Post-operative cognitive dysfunction (POCD) is a state in which a patient's memory and learning decline after surgery. The symptoms of POCD vary amongst patients and can occur on a spectrum –some patients may experience many aspects of this disorder and have a severe presentation, while others may only notice mild differences.

Some common symptoms that have been reported include:

- Difficulty in remembering and recalling – misplacing things, entering a room and forgetting the reason why you are there
- Inability to complete tasks that were previously not difficult
- Issues with intellectual performance – no longer able to keep up with crosswords, reading
- Difficulty with combining tasks – multitasking, etc.
- Reduced psychomotor skills – challenges with fine movements
- Language comprehension difficulties
- Issues with social integration – problems following conversations, etc.

Often, patients may not overtly notice these changes immediately upon discharge, as they can be subtle. However, these changes to a patient's brain function may have a significant negative impact on their ability to stay in the workforce and even live independently at home. Family and friends will often be the first to spot the changes, with patients becoming aware at later stages of the impairments.

The exact cause of POCD is not known. Currently, researchers think that POCD is the result of an interplay between the stress and inflammation induced by surgery and anesthesia with the underlying sensitive brain of patients at risk. Inflammation is the body's response to harmful stimuli such as bacteria and viruses that has a domino effect on one's health.

Since inflammation seems to be a key player in POCD, drugs that can modulate this step could provide some benefit to patients. Some studies have also started investigating the use of biologically active substances that have specific targets on certain binding regions in our brain cells involved in the development of cognitive impairments similar to POCD.

Pipeline Rating

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Trial evaluation DD (1/2)

Progression

The appearance of nodes and cords seen in DD coincides with the appearance of too many myofibroblasts, these are likely derived from fibroblasts of the Palmar fascia, which forms the connective tissue in the palm of your hand. This lays over the tendons in your hand. The myofibroblasts then produce too much extracellular collagen. Collagen is a protein that forms the basis of many structural features in biology, like connective tissue, cartilage, bones, hair, and extracellular matrices[1]. Together with the production of α-smooth muscle actin (α-SM actin) (which is correlated with the generation of force) they are thought to play a role in the DD contractures[2]. These events are fibrotic (the thickening or scarring of tissue).

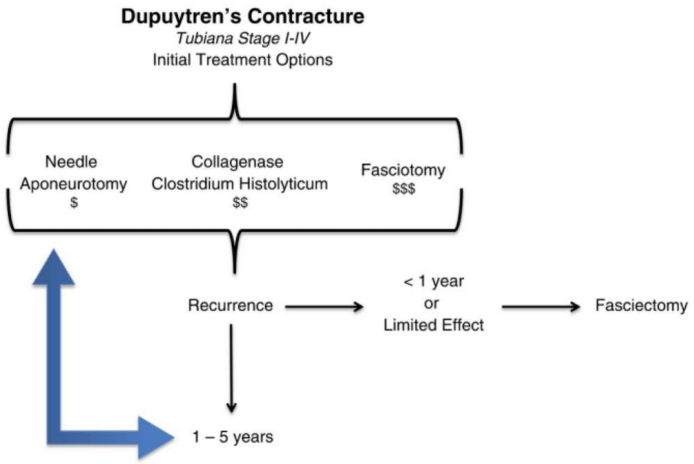
Studies on tissue take directly from nodules from DD patients revealed that the fibrosis in DD is driven by tumor necrosis factor-α (TNF-α). TNF-α is a signaling molecule produced by the innate immune system (macrophages and monocytes) and plays an important role in driving inflammation in healthy individuals. In DD, however, TNF-α has been shown to drive the differentiation of fibroblasts to myofibroblasts (scar tissue forming cells) that produce collagen and α-SM actin.

Anti-TNF-α approach

Adalimumab, commercially known as Humira, is an antibody specific for TNF-α. The specificity has the effect that it removes the signaling capability of TNF-α and thereby its function. Injecting adalimumab into nodules of DD patients has been shown to halt the differentiation of fibroblasts into myofibroblasts and even reducing the number of myofibroblast and in turn reduce the production of collagen[3]. This principle is the basis of using adalimumab as treatment modality for DD.

Current approaches

Current treatment modalities are generally most effective in later stages of DD[4]. What sets the approach of 180 Life Sciences apart from current approaches is that it can be used early stage and it inhibits the progression of the disease. Although it seems that this approach will not be effective in late stages due to the extracellular collagen, it would be great to administer following later stage treatments in order to reduce recurrence. What makes adalimumab even more interesting is that it can be used in combination with current treatment modalities. For example, surgical removal of nodules or cords followed up by adalimumab treatment to prevent recurrence. This means it does not have to compete with any current treatment modalities



Algorithm for managing DD (adapted from Mella et al. 2018)[4]

Study design

This phase 2b/3 study is designed to test the use of Adalimumab (Humira) for the treatment of DD. It will be compared with saline injections and not with any other modalities. This is likely because the treatment is the first-of-its-kind and is aimed at preventing progression and not the removal of the cords/nodules or amelioration of the contracture.

1.Murrell GA. The role of the fibroblast in Dupuytren's contracture. Hand Clin. 1991 Nov;7(4):669-80; discussion 681. PMID: 1769989.
2.Tomasek J, Rayan GM. Correlation of alpha-smooth muscle actin expression and contraction in Dupuytren's disease fibroblasts. J Hand Surg Am. 1995 May;20(3):450-5. doi: 10.1016/S0363-5023(05)80105-4. PMID: 7642925
3.Verjee LS, Verhoekx JS, Chan JK, Krausgruber T, Nicolaidou V, Izadi D, Davidson D, Feldmann M, Midwood KS, Nanchahal J. Unraveling the signaling pathways promoting fibrosis in Dupuytren's disease reveals TNF as a therapeutic target. Proc Natl Acad Sci U S A. 2013 Mar 5;110(10):E928-37.
4.Mella JR, Guo L, Hung V. Dupuytren's Contracture: An Evidence Based Review. Ann Plast Surg. 2018 Dec;81(6S Suppl 1):S97-S101. doi: 10.1097/SAP.0000000000001607. PMID: 30161050.

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Trial evaluation DD (2/2)

Primary outcome measures

Patients scheduled for surgery will be treated using either adalimumab or saline (salt solution. 12-18 days following treatment, biopsies will be taken will be tested for the mRNA levels of α-SM actin (functional biomarker for myofibroblasts). They will also quantify nodule hardness after 12 weeks. The hypothesis being that if there are no myofibroblasts producing α-SM actin there will be no production of collagen resulting in a halt of the disease progression (as measured by nodule hardness). This is considered an objective measure of nodule hardness and DD progression.

Secondary outcome measures

Here they will look at many important supporting factors, in our opinion, perhaps as important as the primary outcome measures in indicating the potential success as a treatment. Among these measures are:

1. Protein levels of α-SM actin and collagen
2. mRNA levels of COL-1A1 and COL-3A1 (different kinds of collagen, with 1A1 being the most rigid and 3A1 being more flexible)
3. Nodule hardness
4. Comparison of surgical wounds
5. Comparison of vascularization of nodules
6. Range of motion (Goniometer)
7. Grip strength (Jamar meter)
8. Patient reported outcome

Pre-specified outcome measures

1. Circulating levels adalimumab in blood
2. Circulating anti-adalimumab antibodies
3. Time to return to work
4. Cost effectiveness (EQ-5D-5L)
5. Analysis of resource use
6. Investigation of newly identified relevant molecular biomarkers

We believe these measures will be very valuable for marketing the drug and insurance coverage. Particularly the last measure can be interesting for increasing capabilities of early detection of DD.

Concluding remarks on trial design

We believe that the primary outcome measures of mRNA will be met, as supported by phase 2a data. However, whether they will observe reduction in nodule hardness will remain to be seen, as they did not observe changes in the phase 2a studies[1]. They claimed it to be unsurprising but did not further elaborate

Secondary outcome measures will be important in supporting the efficacy of the drug.
The pre-specified outcome measures will be very interesting to keep an eye on as the financial analyses will support the potential to be covered by insurances. This was an issue for Xiaflex (a collagen destroying enzyme that is used for late-stage DD), which ended up being dropped by several insurance companies.
Particularly the identification of novel biomarkers can potentially be valuable as this could lead to new detection methods leading to an earlier diagnosis of DD and thus more patients for early-stage DD treatment with adalimumab

Concluding remarks on the adalimumab approach

By targeting the driving force of inflammation, which is shown to be the cause of the collagen build-up, and thus DD, we believe this a scientifically sound approach. A peer review study in the highly respected journal PNAS, clearly shows strong support for the hypothesis[1]. Considering that Adalimumab is a drug that has been on the market since 2002 and has a good safety profile[2], we believe that the chances of it generating unforeseen side effects new to this indication are very low. This in combination with the supporting fundamental data on the treatment and its outcome lead us to adapt a favourable view of this treatment modality

**We believe it's important to look at total protein levels instead of mRNA levels because it is more indicative of the disease phenotype (e.g. the protein (protein levels) instead of the potential of a protein (mRNA)*

1. Nanchahal J, Ball C, Davidson D, Williams L, Sones W, McCann FE, Cabrita M, Swettenham J, Cahoon NJ, Copsey B, Anne Francis E, Taylor PC, Black J, Barber VS, Dutton S, Feldmann M, Lamb SE.
Anti-Tumour Necrosis Factor Therapy for Dupuytren's Disease: A Randomised Dose Response Proof of Concept Phase 2a Clinical Trial. EBioMedicine. 2018 Jul;33:282-288. doi: 10.1016/j.ebiom.2018.06.022. Epub 2018 Jul 6. PMID: 29983350; PMCID: PMC6085556.
2. Burmester, Gerd R et al. "Long-Term Safety of Adalimumab in 29,967 Adult Patients From Global Clinical Trials Across Multiple Indications: An Updated Analysis." Advances in therapy vol. 37,1 (2020): 364-380. doi:10.1007/s12325-019-01145-8

Trial Evaluation

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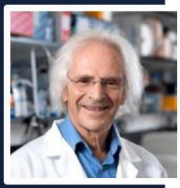
Management Review

Dr. Jim Woody – *Chief Executive Officer*

- Served as CEO / director since the closing of the business combination in November 2020. CEO of 180 since July 2020 and as a director of 180 Life Sciences since September 2020
- Served as chairman of Viracta Pharmaceuticals (lymphoma therapeutics)
- Served as President of Roche Bioscience and Senior Vice President of R&D for Centocor
- At Centocor, he was part of the team that discovered Remicade, which is one of the best selling drugs in the world
- He holds an MD from Loma Linda University and a PhD in Immunology from the University of Londen



Prof. Sir Marc Feldmann – *Co-Founder*

- Professor Sir Marc Feldmann, is a pre-eminent immunologist and an emeritus professor at the University of Oxford
- He identified TNF as a target in the treatment of arthritis. He led clinical trials and played a key role in the treatment that J&J now sells as Remicade. Remicade was the main driver of the $4.9B acquisition of Centocor by J&J in 1998. Since its approval, Remicade has sold over $50B and remains J&J's biggest selling drug
- His work is highly recognized worldwide, leading to multiple prestigious prizes in the field.

Prof. Lawrence Steinman – *Co-Founder*

- Currently serves as the Chair in the Neurology Department at Stanford University
- In the Steinman Laboratory of Stanford, which he founded, he has developed new therapies for autoimmune diseases, some of which are in advanced clinical trials.
- He was also on the board of Centocor and he was a founder of Neurocine Biosciences which went public in 1997
- He was instrumental in discovering the application of natalizumab in treating multiple sclerosis, which was sold to Royalty Pharma in 2017 for $2.85B

Insider Ownership

Insider	Shares Owned
Marc Feldmann – Director	2,617,760
Jim Woody – CEO	25,252
Lawrence Steinman – Director	592,358
Jonathan Rothbard – Chief Scientific Office	560,449
Total insider ownership - 22 insiders	**26.68%**

Highlights

- Even though we've only mentioned Jim Woody, Marc Feldmann and Lawrence Steinman in this section, the other directors and board members also have a great track record when it comes to the identification and commercialisation of new medicines and leading successful biotech companies.
- For a company of this size and market capitalization, this is one of the most accomplished management boards in the biotech sector.
- Great insider ownership across the board of directors and the management team. Insider ownership across 22 insiders is 26,68% and 59,48% insider ownership (float) at the time of writing.
- In prior positions, the management board showed that they are not only capable of finding treatments that address unmet medical needs, but they showed that they have the execution power to commercialise these products and create value for investors.
- The management board is a great team as they have worked together at Centocor. Together, they played a key role in developing Remicade, which has been acquired by Johnson & Johnson and is one of the best selling drugs in the world.

Management rating

★★★★★

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Target Addressable Market Review (1/2)

In this review, we will focus on the clinical stage lead program on Fibrosis and Anti-TNF, which is addressing three indications: Dupuytren's Disease (DD), Frozen Shoulder and POCD. The platform technologies that target SCAs and a7nAChR are not covered in this review, as they are currently in preclinical stages and are therefore, also not included in our DCF-model.

Dupuytren's Disease

Multiple studies have been carried out on the prevalence of DD over the last decades. The prevalence rates of DD ranged from 0.2% to 56% in varying age, population groups, and methods of data collection. The highest prevalence rate was reported in a study group of epileptic patients. Although, only one study calculated the incidence (as opposed to prevalence) of DD to be equal to 34.3 per 100,000 men (0.034%). In conclusion, the prevalence of DD in different geographical locations is extremely variable, and it is not clear whether DD is genetic, environmental, or a combination of both.[1]

According to Market Research Future[2] , the occurrence rate of DD in the United States is about 5% of people, while Scandinavian nations have a significant higher rate of about 30% of men over 60% having the condition. The market drivers for Dupuytren's contracture market are, increase in risk factors rising incomes, growing screening, increasing geriatric population etc. The market restraints are cost of Dupuytren's contracture surgery, complications and risk of the surgery, invasive nature of this treatment and the regression of the disease even after the treatment.

The majority of the prevalence studies have been conducted in Scandinavia or the UK, and the vast changes in population structure, the changes in prevalence of associated diseases, and the change in diagnostic criteria of DD makes understanding the epidemiology of this condition difficult.

All in all, the global Dupuytren's contracture market is expected to reach $5.5B by 2023, and the market is projected to grow at a CAGR of +/- 4.4% during the forecast period 2017 – 2023.

Looking at the EU & US populations, studies have found that 4% of these populations suffer from DD [1,2]. In the Investor Relations presentation of 180 Life Sciences, they assume that +/- 25% of this 4%, so 1% in total, are symptomatic and require treatment. They also estimate conservatively that 25% of the symptomatic patients in fact do get treatment. In the latest investor presentation of 180 Life Sciences, the management conservatively estimates the average treatment costs of DD to be around $1000. This gives us the following addressable market data for DD for the US and EU:

Geography	Population Assumptions	Number of patients	Market size
United States	1% x 315M	3.0M patients	+/- $3.0B
Europe	50% of USA	1.5M patients	+/- $1.5B

We think that the average treatment costs of $1000 as communicated by 180 Life Sciences is too conservative. In our analysis, we found that standardized costs for initial treatment of a single finger by NA, collagenase, and fasciectomy were $825, $4,008, and $4,812, respectively. Including all repeat interventions, the cumulative costs of NA, collagenase, and surgery were $1,694, $5,903, and $5,157, respectively.[4] If we combine these costs per treatment with the number of open fasciectomy, needle aponeurotomy and collagenase injections, we estimate the average costs to treat DD is around $2,500.

Currently, there is no approved treatment for the early stages of DD. In the later stage, where DD results in impaired hand function, there are three type of approved treatments[4] :

- Open fasciectomy – 3 month recovery time with a 6% chance of recurrence within 5 years
- Needle aponeurotomy (NA)– less invasive than surgery, but a 30% chance of recurrence within 5 years
- Collagenase injections – office procedure, but a 47% of recurrence within 5 years

1. Hindocha S. McGrouther DA, Bayat A (2009) Hand (NY) 4(3):256-69
2. Lanting et al. (2014) PRS 133: 593-603
3. https://peripheralnerve.org/meeting/abstracts/2018/HS202.cgi
4. Layton T & Nanchahal J. F1000Research 2019, 8(F1000Faculty Rev): 231

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Discounted Cashflow

Valuation methodology

We performed a DCF valuation based on the available financials, company presentations and more general biotech assumptions where there was no further information available. Our assumptions are highlighted in the yellow textboxes.

Given that 180 Life Sciences other assets are too early stage to properly model, our current DCF only includes expected sales for DD. As it is difficult to forecast the adoption for this, we will provide a table of price targets for different market shares. However, for our Base case we assumed a 30% peak market share

Applying the base case input as explained hereunder returns a **target price of USD 21– 22.00**

Market share (%)	Share price (USD)
15%	3.4
20%	9.3
25%	15.2
30%	21.1
35%	27.1
40%	33.0
45%	38.9

Assumptions

Expected US 2021 population and growth

ATNF estimates the EU market is 50% of the US market size

As per Lanting et al. (2014) and a published article in the Journal of hand surgery in 2011 which estimated 4-6%

Estimation based on 25% treatment requirement as per Nanchahal J, et al. (2017) Welcome Open Res 2:37

Assumption on the basis of Layton & Nanchahal (2019) who assume 25% patients will receive treatment

In our base case we conservatively estimate a 30% market share (with a 10% yearly ingrowth) of all patients requiring treatment.

A recent study from Robey and David (2016) observed that the median time to peak for a new drug is 6 with the appropriate median S-Curve uptake percentages, without significant differences between biologic and non-biologic drugs

The average phase 3 probability of success for autoimmune/inflammation therapeutic area from DiMasi (2010), Hay (2014), Thomas (2016)

Median CoGS of biosimilars Biotech companies as researched by BCG in a 2019 article on COGS in generic drugs.

Based on H1 2021 actuals but with a 15% annual increase based on company expectations that operating expenses will increase significantly

Based on estimated typical sales force of about 100 sales reps to commercialize a hospital-based product with total costs per sales rep of USD 300,000, as analyzed by Pharmagallan

In accordance with a survey of 181 biopharma marketing professionals and executives performed by Dobrow (2016)

Based on H1 2021 actuals

H1 2021 actuals plus the USD 15m capital raise

Based on H1 2021 actuals

Yahoo Finance outstanding shares 22/08 plus the 2.5 stocks and 2.5 warrants from the recent cap raise

Our estimation based on a publication on discount rates for a four-asset portfolio of different stages

In line with inflation

1. Profit and Loss statement assum	Unit	Value	Value	Remarks	2021	2022	2023	2024	2025	2026	2027	2028	2029
A Revenue	Unit	Value	Value	Remarks	2021	2022	2023	2024	2025	2026	2027	2028	2029
Dupuytren's Diease													
Population assumptions													
US population 2022	#	335,250,000	0.5%		335,250,000	336,926,250	338,610,881	340,303,936	342,005,405	343,715,433	345,434,060	347,161,230	348,897,036
EU population 2022	#		50%		167,625,000	168,463,125	169,305,441	170,151,968	171,002,728	171,857,741	172,717,030	173,580,615	174,448,518
Prevalence													
Prevalence US	#	4%			13,410,000	13,477,050	13,544,435	13,612,157	13,680,218	13,748,619	13,817,362	13,886,449	13,955,881
Prevalence EU	#	4%			6,705,000	6,738,525	6,772,218	6,806,079	6,840,109	6,874,310	6,908,681	6,943,225	6,977,941
Treatment required													
US	#	25%			3,352,500	3,369,263	3,386,109	3,403,039	3,420,055	3,437,155	3,454,341	3,471,612	3,488,970
EU	#	25%			1,676,250	1,684,631	1,693,054	1,701,520	1,710,027	1,718,577	1,727,170	1,735,806	1,744,485
Treatment provided													
Treatment US	#	25%			838,125	842,316	846,527	850,760	855,014	859,289	863,585	867,903	872,243
Treatment EU	#	25%			419,063	421,158	423,264	425,380	427,507	429,644	431,793	433,952	436,121
Market share	%												
Treatment US		30%											261,673
Treatment EU		30%											130,836
Peak sales in years	year	6			0%	0%	11%	31%	58%	76%	89%	100%	100%
Revenue													
US	USD	1,000		Income per treatment	–	–	28,063,988	83,963,483	161,036,001	216,306,110	259,667,417	299,084,347	306,591,356
EU	USD	1,000		Income per treatment	–	–	14,531,994	41,981,741	80,518,001	108,154,555	129,833,708	149,542,174	153,295,682
Total revenue					–	–	42,595,982	125,945,224	241,554,002	324,460,665	389,501,125	448,626,521	459,887,037
Probability of success	%	66.1%											
B Cost of Goods Sold	Unit	Value	Value	Remarks	2021	2022	2023	2024	2025	2026	2027	2028	2029
Dupuytren's Diease													
CoGS to Revenue ratio	%	25%											
D OPEX	Unit	Value	Value	Remarks	2021	2022	2023	2024	2025	2026	2027	2028	2029
Dupuytren's Diease													
SG&A	USD				11,200,048	22,137,656	47,113,752	55,049,365	66,069,134	78,748,867	94,576,869	115,443,432	142,272,322
G&A	USD	11,200,048	15%		11,200,048	13,137,656	15,718,680	19,182,908	23,878,826	30,318,776	39,285,446	51,869,203	69,888,994
Sales	USD	100	300,000		–	9,000,000	30,000,000	31,836,240	34,460,570	38,047,254	42,847,387	49,218,180	57,666,942
Marketing	USD	3.2%			–	–	1,395,071	4,030,247	7,729,738	10,382,837	12,464,036	14,356,049	14,716,385
	USD												
R&D	USD	2,722,896			2,722,896	2,777,354	2,832,901	2,889,559	2,947,350	3,006,297	3,066,423	3,127,752	3,190,307
Other income	USD	0			–	–	–	–	–	–	–	–	–
Net interest income (loss)	USD	306,514			306,514	312,644	318,897	325,275	331,781	338,416	345,185	352,088	359,130
Gain on settlement of liabilities		455,021			455,021	–	–	–	–	–	–	–	–
Tax rate hike	%	5%											
2. Balance sheet assumptions	Unit	Value	Value	Remarks									
Cash	USD	16,835,638											
Debt	USD	1,517,022											
Shares outstanding	#	36,270,000											
WACC	%	17%											
Terminal growth rate	%	2%											

Valuation

★★★★★

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Concluding remarks

Our opinion

Taking into consideration all the different aspects from our analysis brings us to a very bullish outlook on 180 Life Sciences. While early stage biotech companies like $ATNF are risky bets, we believe the fundamentals are strong with a very bright outlook. In line with our other investments, we are in this company for long-term growth.

$ATNF's adalimumab approach is the only early-stage preventive approach to DD, and from experience in our close circles, likely to be a better approach than the current therapeutic practises. As this drug has been proven to have a solid safety profile we believe that it is unlikely that additional side-effects will surface during the current studies. Furthermore, the science behind the therapy is sound and based on Phase 2a data we believe it is likely that the primary measures will be achieved.

While the stand-alone DD market already presents enormous opportunities, the market for their Frozen Shoulder therapy could even double this. To remain conservative in our valuation we have not included the Frozen Shoulder therapy in our DCF model. However, as the Frozen Shoulder therapy is very similar to the DD therapy we do not foresee any hiccups in the approval if the DD therapy gets approved. This offers a significant upside to our already bullish case.

We believe that we've taken a very conservative approach in our DCF valuation, where we only assume a 30% market share, do not include the Frozen Shoulders market, and include significant operational expenses growth. Nevertheless, our price target still presents a ~300% upside.

Recently the $ATNF share experienced a significant drop as a result of the announced USD 15m capital raise, where their cash balance increased to USD 17m. Considering that the company indicated in the recent S-1 that their monthly cash spend is approximately $500.000, we think $ATNF should be able to run towards FDA approval. Nevertheless, further dilution as a result of additional capital raises is still a risk to be taken into account.

On August 23rd, at the request of Prof. Nanchahal, the company agreed to issue Prof. Nanchahal 61,535 shares of common stock. Interestingly, he could also have opted for a bonus in cash, but it shows great confidence from the leader of the DD trials to rather have the bonus paid out in common stock instead. On September 9th, Prof. Nanchahal will present an overview of the company's "breakthrough scientific research in defining the molecular pathways of the fibrotic process in DD"[1]. We think this can be considered a small indicator for successful trials.

On August 30th, the company issued a letter to shareholders in which the CEO explains that in the entire DD trial, which contains 181 patients, there were no adverse events and that over 85% of patients have received 3 or more injections. In addition, it was mentioned in the shareholder letter that they are planning to transition the trials to the US in September, which again shows great confidence of succesful DD trails as this would only be relevant if the trials in the UK met their primary endpoints.

We took a starting position of 1000 shares at an average of $5.44 and we intend to accumulate more shares and hold this investment for the longer-term.

1.https://www.biospace.com/article/chairman-of-the-180-life-sciences-clinical-advisory-board-professor-jagdeep-nanchahal-has-been-invited-to-present-a-keynote-talk-at-the-british-society-for-surgery-of-the-hand-/?s=89

Conclusion