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INITIATION REPORT

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Celsion Corporation (NASDAQ/CLSN)

August 5, 2019

BUY: The Future of Therapeutic Oncology, Optimized Treatment, and a Higher Quality of Life for Cancer Patients.

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Celsion Corporation is a biopharmaceutical company with a focus on development of multiple innovative cancer therapies including directed chemotherapies, DNA-mediated immunotherapy, and RNA-based therapies. Their pipeline products; ThermoDox and GEN-1, are being developed in conjunction with a range of therapeutics for difficult-to-treat forms of cancer, maximizing efficacy while minimizing side effects.

Current Price	**$1.71**
Price Target	**$ 4.00**

Estimates	F2019E	F2020E	F2021E
Expenses ($000s)	$ 22,643	$ 23,775	$ 14,859
1Q January	$ 4,986	$ 5,706	$ 3,566
2Q April	$ 5,661	$ 5,944	$ 3,715
3Q July	$ 5,661	$ 5,944	$ 3,715
4Q October	$ 6,336	$ 6,182	$ 3,863
	F2019E	F2020E	F2021E
EPS (diluted)	$ (0.65)	$ (0.31)	$ (0.07)
1Q January	$ (0.12)	$ (0.07)	$ (0.02)
2Q April	$ (0.16)	$ (0.08)	$ (0.02)
3Q July	$ (0.16)	$ (0.08)	$ (0.02)
4Q October	$ (0.20)	$ (0.08)	$ (0.02)
EBITDA/Share			
EV/EBITDA (x)			

Stock Data	
52-Week Range	$1.35 - $3.10
Shares Outstanding (mil.)	20.5
Market Capitalization (mil.)	$35
Enterprise Value (mil.)	$45
Debt to Capital	27%
Book Value/Share	$1.55
Price/Book	1.3
Average Three Months Trading Volume (K)	69
Insider Ownership	0.8%
Institutional Ownership	5.0%
Short interest (mil.)	1.5%
Dividend / Yield	$0.00/0.0%

Initiation - August 5, 2019 - Buy - Price Target $4.00

Investment Highlights

Two Novel Nanoparticle-Based Technology Platforms. Celsion currently has two nanoparticle-based product candidates in development with their fight against cancer. The first, ThermoDox, takes advantage of LTSL (lysolipid thermally sensitive liposome) technology to encapsulate the commonly used cancer drug doxorubicin. This heat sensitive liposome is able to change its structure when exposed to temperatures between 40-45 degrees Celsius, allowing for openings that release doxorubicin into and around the targeted tumor. With ThermoDox, LTSL for delivery of known chemotherapeutics is the primary objective. The second, GEN-1, takes advantage of Celsion's TheraPlas technology platform to provide localized immunotherapies. GEN-1 consists of an interleukin-12 (IL-12) DNA plasmid vector formed into nanoparticles with a lipopolymeric delivery system.

ThermoDox and GEN-1. Celsion has recently completed enrollment of its Phase 3 OPTIMA study using ThermoDox to treat Primary Liver Cancer (hepatocellular carcinoma). The OPTIMA study is a global Phase 3 trial in HCC with first interim data expected in the second half of 2019. ThermoDox has also shown potential in treating non-muscle invasive bladder cancer and is currently in early development for that indication. Celsion is also currently enrolling the Phase 1/2 OVATION study with GEN-1 in treating Ovarian cancer. Phase 1 data from this trial is expected in the second half of 2019 as well. GEN-1 has also shown potential to treat Glioblastoma. The principal target indications are hepatocellular (HCC) and ovarian cancer, both of which represent large commercial opportunities for these nanoparticle-based platforms, as the need for effective treatments is great. HCC represents a global incidence of over 755,000 people, growing 3% annually. With a median survival time less than three years, and the 5-year survival rate less than 10%, the need for more effective treatment is apparent and Celsion hopes to deliver incremental improvements to the treatment paradigm.

Market Opportunity for Hepatocellular Carcinoma and Ovarian Cancer. Celsion is targeting its efforts towards HCC in the global market. As HCC continues to rise in incidence, it is expected to become the most common type of cancer, surpassing lung cancer by 2020. About half of all new cases arise in China, and almost three quarters of all new cases occur in Asia. Current curative treatment options are almost exclusively limited to surgery, which is only possible in about 20% of patients. RFA remains the therapy of choice for non-surgical candidates and is the current standard of treatment for non-resectable liver cancers. Despite this, the recurrence rate for lesions over three centimeters is about 50%, leaving a highly underserved population. ThermoDox, in combination with RFA, addresses the limitations of the current standard of care by expanding the treatment zone and using a probe placed directly in the tumor, killing tumor cells within its immediate vicinity. The RFA then creates a thermal zone in the margin surrounding the tumor where RFA misses micro-metastases outside the ablation zone. Doxorubicin is then released in the thermal zone, expanding treatment and surrounding areas, killing the metastases outside the ablation zone.

Ovarian Cancer. Celsion's GEN-1 IL-12 is a powerful immune-modulating agent, capable of inducing anti-cancer immunity through multiple mechanisms. With an incidence of 225,000 women worldwide and over 22,280 women in the US, ovarian cancer ranks fifth among the highest cancer mortality rates among women. The five-year survival rate is below 50%, and only about 15% of diagnosed patients with localized cancer are eligible for potentially curative surgery. With an addressable market opportunity over 100,000 patients and a lack of treatment options in advanced ovarian cancer, Using Interleukin 12 (IL-12), Celsion has developed mechanisms that can induce anti-cancer immunity such as activation/proliferation, maturation/proliferation, anti-angiogenesis, and inhibition of immune suppression.

Valuation: Celsion's success as a company is dependent on the clinical outcomes for ThermoDox and GEN-1. For the purposes of our model we project timelines through the year 2030. Our therapeutic models are risk adjusted. For the U.S. for ThermoDox we use just a 75% risk rate (25% probability of success) and in China we reduce this to 50%. For GEN-1 we assume just a 10% probability of success. Our models factor in assumed financings and use a fully diluted out-year (2030) share count. We triangulate FCFF, discounted EPS, and sum-of-the-parts models. We then averaged and equally weighted each model to derive the NPV and round to the nearest whole number to set our target price. Investors should recognize that this modeling exercise, which models out for 10 years, while projected based on the current data and estimates, is limited in its ability to predict a 12-month target. The price of the stock will ultimately be driven near term by factors such as news flow, early trial data, and cyclic concerns of financings (dilution).

Risk Analysis: (1) commercial; (2) regulatory; (3) clinical; (4) manufacturing; (5) financial; (6) liability; and (7) intellectual property. We review these and other risks in the risk section of this report.

A special thanks to Tucker Kolbert - University of Wisconsin -Madison, Ryan Swiezbin- Quinnipiac University, Chase Shea - Georgetown University, Alex Levy - University of Wisconsin-Madison , Jesse Clark - University of Florida, Clayton Berger – Skidmore College, for their research contributions to this report.

Company Background. Celsion is a fully integrated oncology company focused on developing a portfolio of innovative cancer treatments, including directed chemotherapies, immunotherapies, and RNA- or DNA-based therapies. The company has developed elegant therapeutic approaches that deliver high concentrations of widely used anti-cancer agents directly to the tumor site, maximizing efficacy while minimizing the side effects of systemic treatments, with the goal of improving patient outcomes in underserved cancer indications. The foundation for this research is a heat-sensitive liposomal nanoparticle licensed from Duke University.

The company's lead program is ThermoDox, a proprietary heat-activated liposomal encapsulation of doxorubicin, currently in Phase 3 development for the treatment of primary liver cancer. The pipeline also includes GEN-1, a DNA-based immunotherapy for the localized treatment of ovarian and brain cancers.

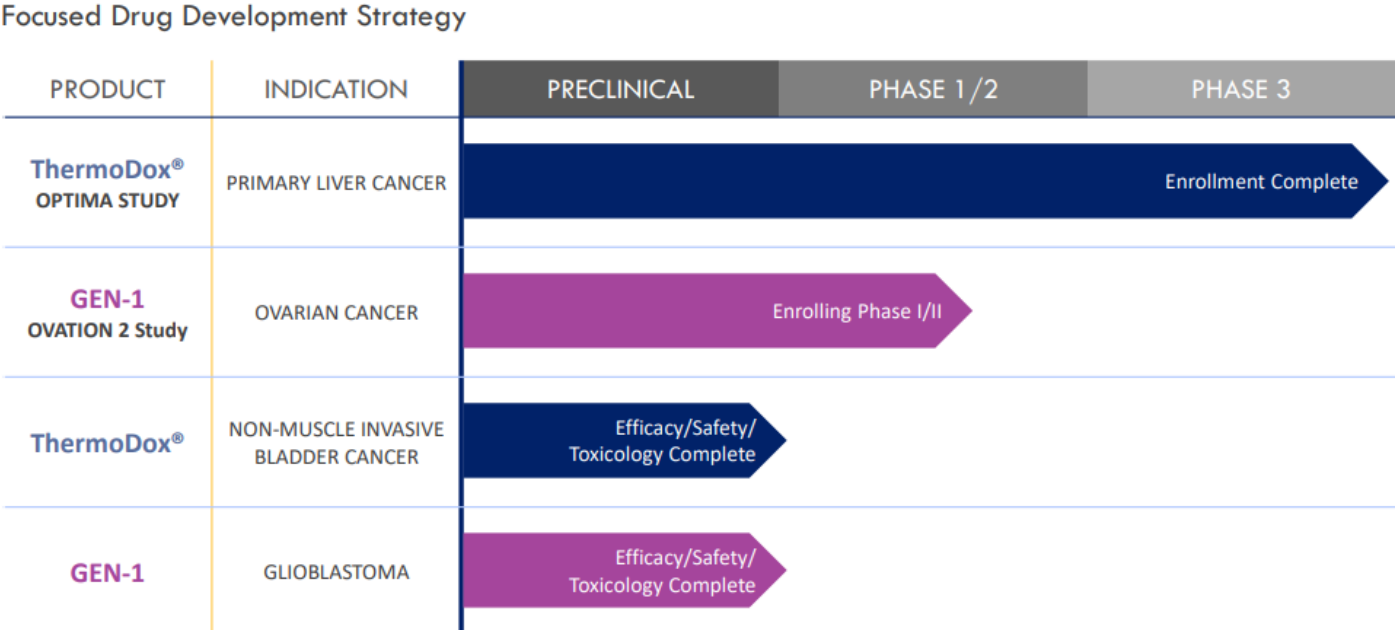
Exhibit 1. Milestones and Upcoming Catalysts

Product	Geography	Indication	Event	Timeline	Impact
Thermodox	Global	Hepatocellular Carcinoma	OPTIMA Study, PHASE III trial in HCC/Primary liver cancer, data expected in second half of 2019	2H 2019	++
Gen-1	Global	Ovarian Cancer	OVATION 2 Study, Phase I/II trial in Ovarian cancer with Phase 1 data expected in second half of 2019	2H 2019	+
Thermodox	U.S.	hepatocellular Carcinoma	File NDA for approval	1Q 2021	+++
Gen-1	Global	Ovarian Cancer	OVATION 2 Study, Phase III trial in Ovarian Cancer	2Q 2021	++
Gen-1	U.S.	Glioblastoma	Start of Phase I trials in Glioblastoma	3Q 2021	+
Thermodox	U.S.	Bladder Cancer	Start of Phase I trials in bladder cancer	4Q 2021	+
Thermodox	Global	hepatocellular Carcinoma	Approval and commercial launch	1Q 2023	+++
Gen-1	U.S.	Ovarian Cancer	File NDA for approval	4Q 2023	++
Gen-1	Global	Ovarian Cancer	Approval and commercial launch	1Q 2025	+++

Stock Significance Scale: + of moderate importance; ++ higher level; +++ highly

Source: Dawson James and Celsion Corporation

Exhibit 2. Celsion Corporation Proposed Pipeline



Source: Celsion Corporation

Bull Case. We believe Celsion has potential to change the oncology market with their innovative nanoparticle-based technology platforms in ThermoDox and GEN-1. Celsion, while involved in a range of oncology therapeutics, is focused on treating primary liver cancer using ThermoDox and treating ovarian cancer using GEN-1. By integrating a new first-line treatment in combination with the current standard of care, we believe Celsion could improve the quality of life for many patients. ThermoDox works in conjunction with RFA as a treatment for patients with tumors or lesions 3-7 cm in size. This is a single treatment using a unique mechanism of action leveraging liposomal encapsulated doxorubicin, which is normally circulated throughout the body and then released locally through RFA. ThermoDox enables more effective treatment by capturing the tumor margins remaining outside of the ablation zone where the current standard of care is surgery and RFA alone almost always fails to treat the micro-metastases. ThermoDox has completed enrollment for a Phase 3 trial and has already demonstrated a two-year improvement in overall survival rate in the Phase 3 HEAT study, (subgroup survival analysis), with standardized dwell time and number of lesions. Their overall findings in evaluated RFA burn time per tumor volume (min/mL) for correlation with clinical outcome found that an increased burn time per tumor volume improved overall survival in patients treated with a combination of ThermoDox and RFA compared to RFA-only patients. The overall survival rate improved by about 20% after a one unit increase in RFA duration per tumor volume. When compared to other locoregional therapies, ThermoDox and RFA showed a significant improvement in overall survival at a median of about 80 months, compared to 57 months in patients treated with RFA alone. Even when compared with surgically resected patients, the three year survival rate stands at about 59% compared to 77% of patients treated with a combination of ThermoDox and RFA. The Phase 3 OPTIMA study consists of 65 clinical sites in 14 countries and we expect a first look at the interim data by the second half of 2019. ThermoDox represents a large commercial opportunity with a highly addressable patient population, a published HEAT study analysis demonstrating meaningful results for early and intermediate stage HCC patients, and progression free survival and overall survival data is on track with Celsion's expectations.

Celsion's other primary focus involves their immune-oncology program with GEN-1 IL-12. GEN-1 is a novel IL-12 DNA plasmid vector encased in a nanoparticle delivery system that can stimulate the production of IL-12 locally. This addresses the chemo-resistant malignant cells by recruiting the patient's own immune system. GEN-1 therapy consists of eight weekly administrations for continuous local deliveries of an immune agent to compensate the limitation of chemotherapy, avoiding serious toxicities and stabilizing the tumor. Interleukin-12's multiple mechanisms can induce anti-cancer immunity in four different ways. GEN-1 specifically addresses upon IL-12 toxicity and poor pharmacokinetics, the current standard of care, which requires high doses that surpass the toxic level. GEN-1 recently completed the Phase 1 OVATION ovarian cancer study to determine dose, efficacy, and biological activity with NAC in stage III/IV patients. The study has shown improved progression-free survival with GEN-1 at about 21 months compared to historical estimated PFS at about 12 months. The company has initiated a follow-on GEN-1 OVATION 2 ovarian cancer study to determine efficacy and biological activity with NAC in stage III/IV patients. GEN-1 allows the body to make further use of the immunological properties of IL-12 and has demonstrated strong efficacy signals in phase I, with its mechanism of action confirmed. We expect to see the completion of the first phase of OVATION 2 by the second half of 2019.

Bear Case. Celsion is a company with primary focuses on treatment of HCC and ovarian cancer. The main market for ThermoDox in HCC is South and East Asia, particularly China, where about half of all new cases occur. The regulatory pathway and ability to reliably access these markets and treat patients will pose significant challenges compared to the U.S. market. Despite better accessibility in the U.S. market, GEN-1 in ovarian cancer, more specifically the IL-12 plasmid vector, lacks specificity necessary to directly target cancerous cells. The nature of this treatment ultimately limits its potential to impact the market where immunotherapies are becoming increasingly histologically specific. Furthermore, the immune response the drug seeks to upregulate is questionable in whether it will or will not regulate ovarian cancer tumor growth.

Our Take. We believe that Celsion has true potential in their treatments and immunotherapies. Their pipeline products in ThermoDox and GEN-1 have shown their efficacy in extensive data from the HEAT study, suggesting the potential for higher quality of life and significantly longer overall survival rates. Data from the Phase 3 OPTIMA study is expected soon as well as their Phase 1/2 OVATION study. In terms of GEN-1 and ovarian cancer, we understand that despite a lack of specificity in the desired immune response, even incremental benefit is very valuable for patients faced with platinum-resistant ovarian cancer where overall survival rate is less than six months. We believe GEN-1 has great potential to become the new standard of care as more clinical trials validate its safety and effectivity. Along with HCC and ovarian cancer, Celsion is also working on therapies for bladder cancer and glioblastoma, further enriching their proposed pipeline and providing a number of potential catalysts down the road.

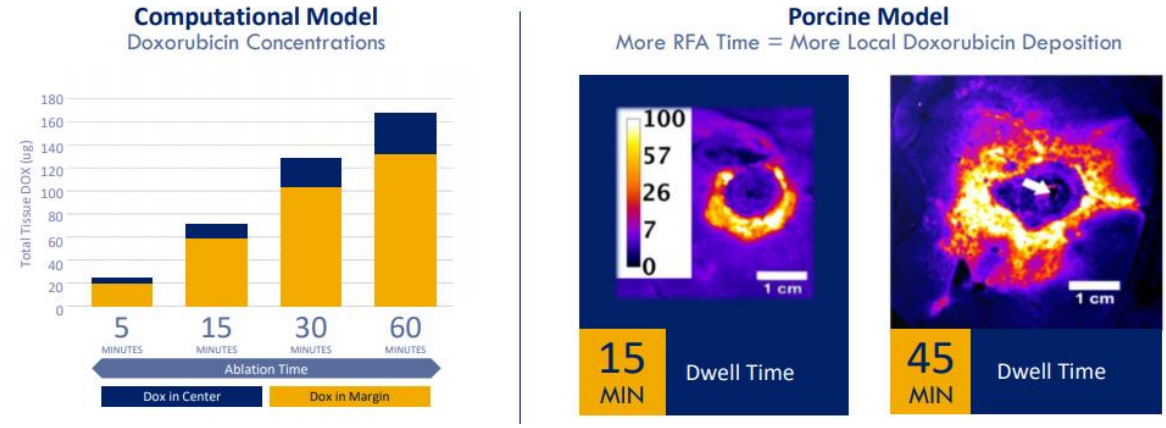
Celsion Financial Overview

Cash & Investments at 3/31/2019	$23.8 million
+ Projected NOL sales in 2019	2.0 million
Total Cash & Investments	$25.8 million
Estimated cash usage per month	$1.5 million
Market Capitalization	~$40 million

Common shares outstanding at 3/31/2019	19.7 million
+ Stock Options	3.6 million
+ Warrants	0.6 million
Fully diluted shares outstanding	23.9 million
Avg Daily Trading Volume	~175,000

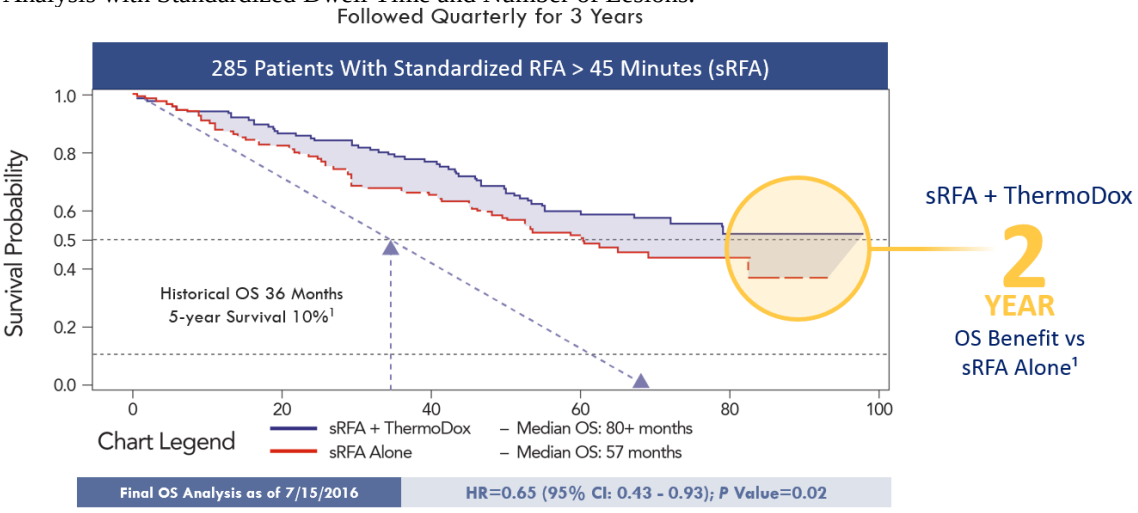
Source: Celsion Corporation

Exhibit 3. HEAT Study: Results Inform Phase III OPTIMA Study Design. Multivariate Analysis Suggests RFA Dwell Time with ThermoDox was the Key Factor Correlating to Significant Improvement in Overall Survival.



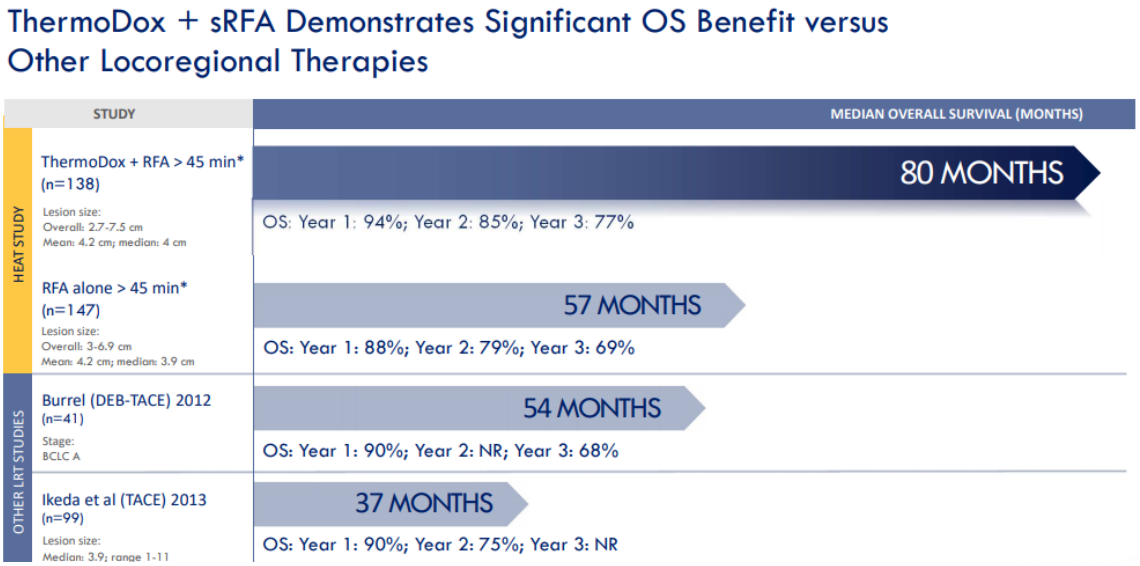
Source: Celsion Corporation

Exhibit 4. ThermodDox and RFA Demonstrated a 2-year Improvement in Overall Survival. HEAT Study Subgroup Survival Analysis with Standardized Dwell Time and Number of Lesions.



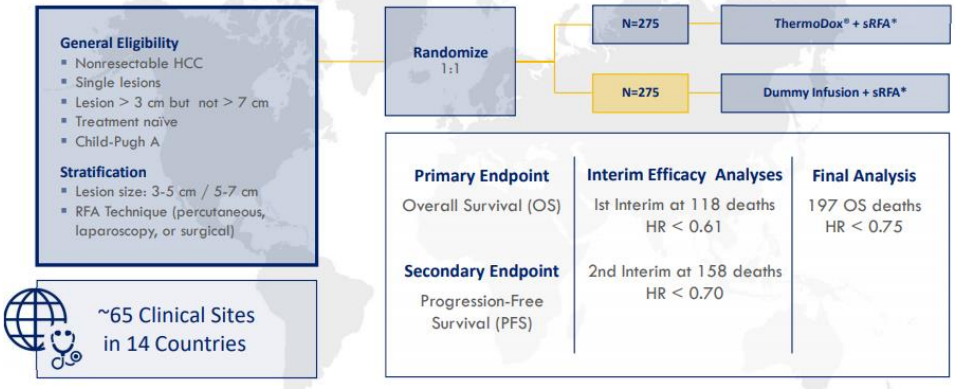
Source: Celsion Corporation

Exhibit 5. HEAT Study Subgroup. Transcends Historic Survival Rates, ThermoDox and sRFA Demonstrates Significant OS Benefit versus other Locoregional Therapies.



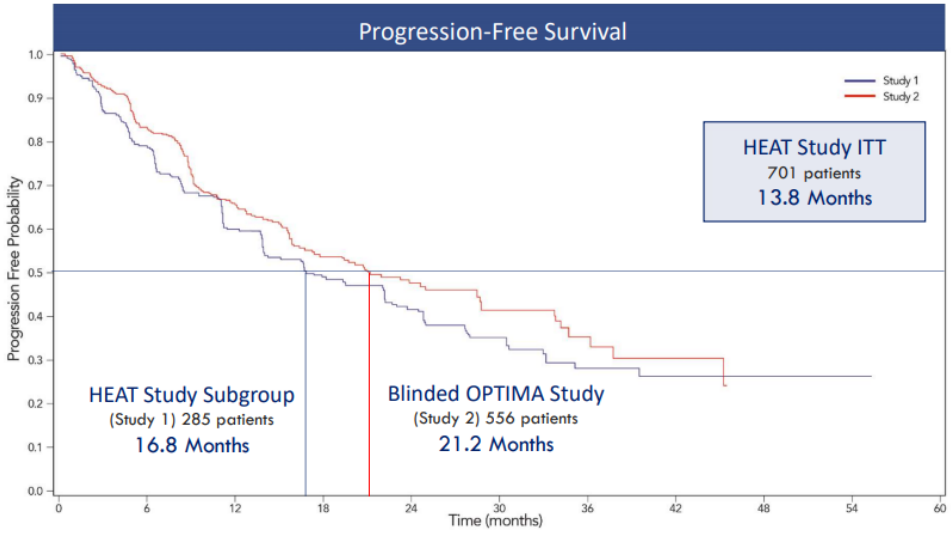
Source: Celsion Corporation

Exhibit 6. Phase III OPTIMA Study Design. Applying Broad-based learnings to OPTIMA Study.



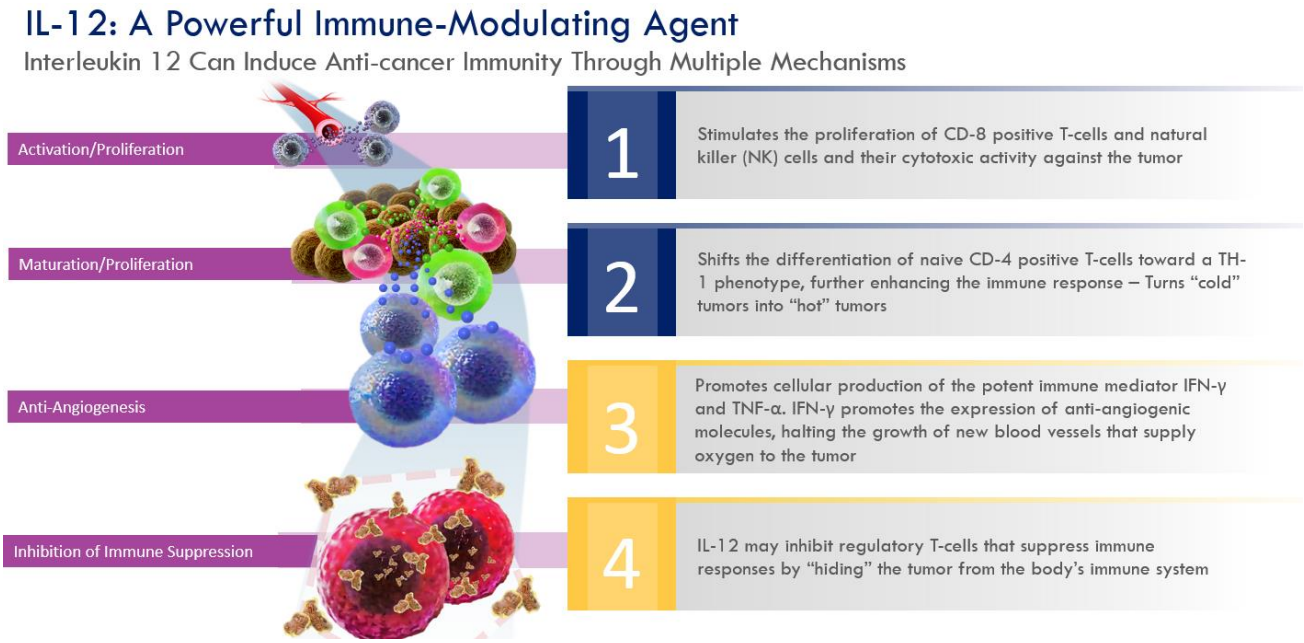
Source: Celsion Corporation

Exhibit 6.5 Blinded PFS Data Consolidated for Both Arms. PFS and OS Tracking with Results of HEAT Study Subgroup.



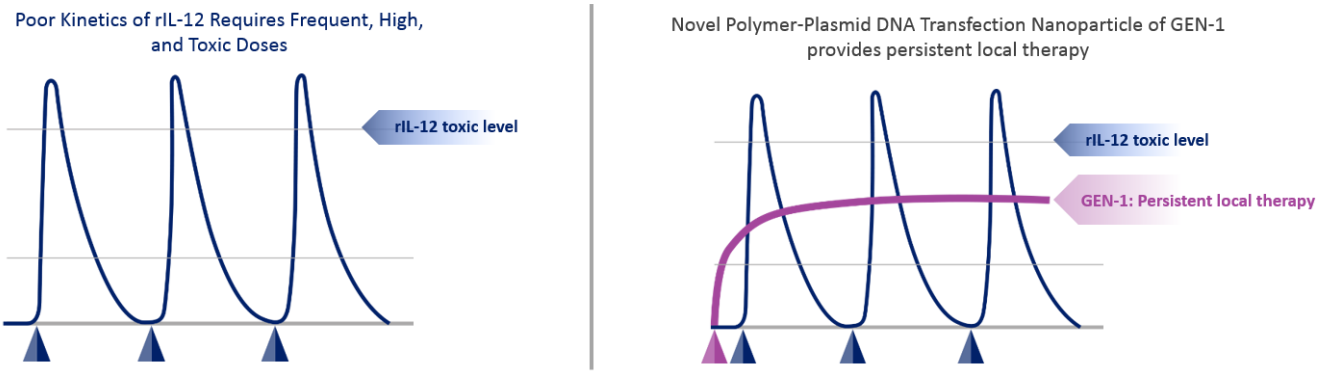
Source: Celsion Corporation

Exhibit 7. IL-12: A Powerful Immune-Modulating Agent. Interleukin 12 Can Induce Anti-Cancer Immunity Through Multiple Mechanisms.



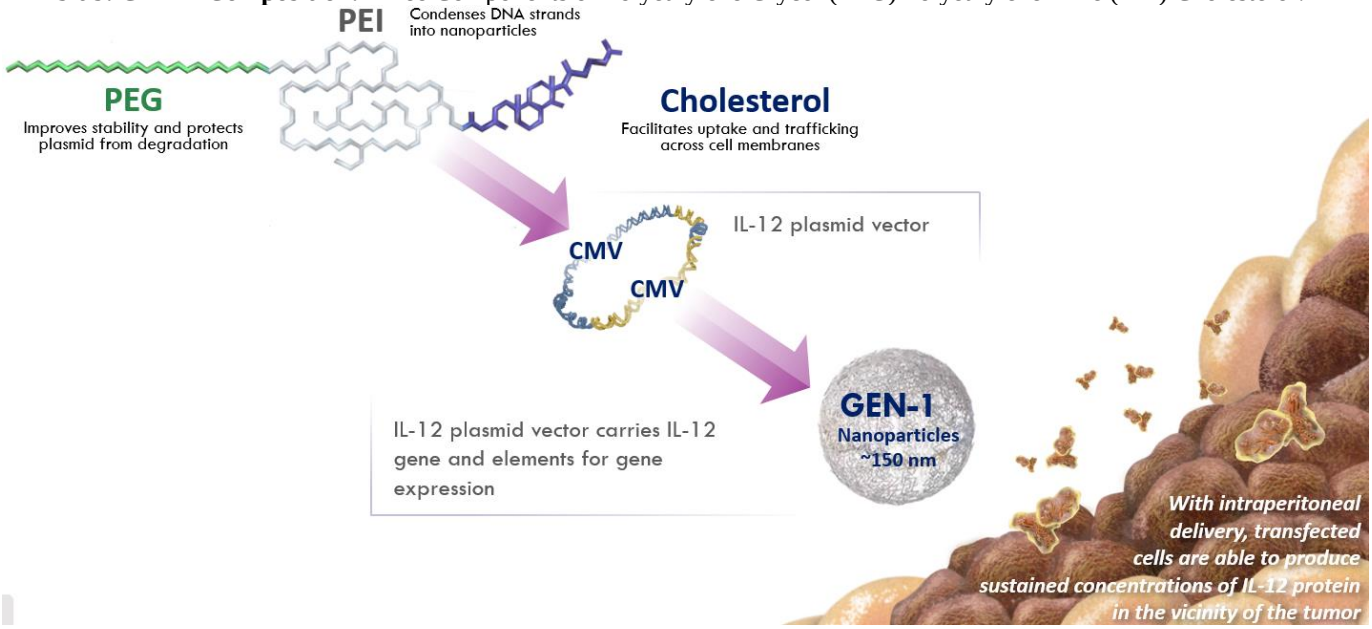
Source: Celsion Corporation

Exhibit 8. GEN-1 Addresses IL-12 Toxicity and Poor Pharmacokinetics (pK). First-in-class IL-12 Novel Delivery.



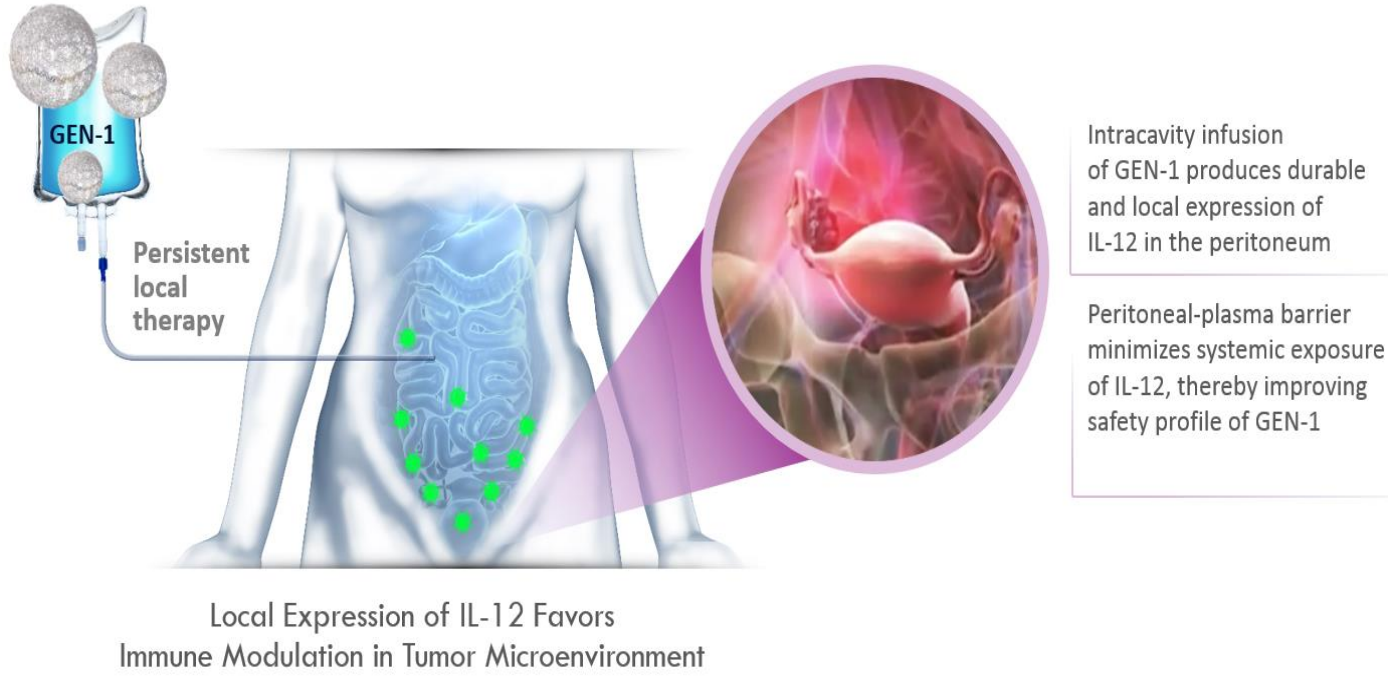
Locoregional production avoids toxicities and poor pK associated with systemic recombinant protein IL-12 (rIL-12). Persistent local delivery lasts up to one week, with the ability for repeat dosing. Potential for long-term maintenance therapy.
Source: Celsion Corporation

Exhibit 9. GEN-1 Composition. Three Components of Polyethylene Glycol (PEG) Polyethyleneimine (PEI) Cholesterol.



Source: Celsion Corporation

Exhibit 9.5 GEN-1 Targets Ovarian Cancer Metastases Throughout the Peritoneal Cavity.



Source: Celsion Corporation

Modeling Assumptions:

1. **Price & Timing for ThermoDox**. We assume a price of $40,000 for ThermoDox in Hepatocellular Carcinoma in both the United States and China with commercialization by 2023 which could prove conservative. We apply a 75% risk cut, or 25% probability of success in our U.S. model and 50% in our China model for conservatism. Clinical success suggests our valuation could be too low. We assume a modest market penetration that ramps up over five years as the patient population grows and these numbers also, could prove to be too conservative.
2. **Incidence and Prevalence of HCC:** Hepatocellular Carcinoma has the fourth highest mortality rate of all cancers with a median survival from time of diagnosis at less than three years. The five-year survival rate is less than ten percent, and less than twenty percent of early and intermediate stage patients are eligible for curative surgery. HCC has a global incidence of about 755,000 growing at 3% annually. The U.S. incidence is about 35,000 and the EU incidence is about 65,000 while China remains the largest market with an incidence over 375,000.
3. **Price & Timing for Gen-1**. We also assume a price of $40,000 for GEN-1 in Ovarian Cancer with commercialization by 2025. We apply a 90% risk cut, or 10% probability of success in our model and assume a modest market penetration.
4. **Incidence and Prevalence of Ovarian Cancer:** Ovarian Cancer hold the fifth highest mortality rate of all cancers among women with a five-year survival rate for all stages less than 50%. Over 70% of Women are diagnosed in advanced stages (III/IV), and only 15% of those diagnosed with localized cancer are eligible for potentially curative surgery. The survival rate is significantly reduced in non-localized cancer, and the most common site of recurrence is the abdomen. Intraperitoneal-administered therapy is an important clinical strategy. Ovarian Cancer remains the 8th most diagnosed cancer among women with a global incidence rate of 225,000. The incidence rate in the US is about 22,280 and 100,000 in developed countries.
5. **Patient Eligibility:** For the Phase 3 OPTIMA Study Design, patient's eligibility includes having nonresectable HCC, singles lesions, lesion > 3cm but not > 7cm, treatment naïve, and child-pugh A. In ovarian cancer, over 75% of incidence is within stage III/IV, and we assume that only the platinum-resistant proportion of ovarian cancer patients will be eligible for treatment.

Exhibit 9.5 Therapeutic Models

Hepatocellular Carcinoma; (US) (ThermoDox)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Incidence	30,000	31,200	32,448	33,746	35,096	36,500	37,960	39,478	41,057	42,699	44,407	46,184	48,031	49,952
Increase in incidence	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Patients with single lesion receiving RFA only (20%)	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540	8,881	9,237	9,606	9,990
Patients with 3-7cm lesion meeting Thermodox criteria (20%)	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540	8,881	9,237	9,606	9,990
Total RFA patients that could benefit from Thermodox	12,000	12,480	12,979	13,498	14,038	14,600	15,184	15,791	16,423	17080	17,763	18,473	19,212	19,981
% Market share	0%	0%	0%	0%	0%	0%	1%	2%	3%	4%	5%	5%	5%	5%
Total patients receiving Thermodox	0	0	0	0	0	0	151.84	316	493	683	888	924	961	999
Cost of therapy	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,400	$ 40,804	$ 41,212	$ 41,624	$ 42,040	$ 42,461	$ 42,885
Change in cost of therapy							0%	1%	1%	1%	1%	1%	1%	1%
Sales	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,074	$ 12,759	$ 20,104	$ 28,156	$ 36,968	$ 38,832	$ 40,789	$ 42,844
Risk Adjusted							75%	75%	75%	75%	75%	75%	75%	75%
Total Revenue (Millions)					-	-	1,518	3,190	5,026	7,039	9,242	9,708	10,197	10,711

Hepatocellular Carcinoma; (China) (ThermoDox)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Incidence	378,000	389,340	401,020	413,051	425,442	438,206	451,352	464,892	478,839	493,204	508,000	523,240	538,938	555,106
Increase in incidence	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Patients with single lesion receiving RF only (20%)	75,600	77,868	80,204	82,610	85,088	87,641	90,270	92,978	95,768	98,641	101,600	104,648	107,788	111,021
Patients with 3-7cm lesion meeting Thermodox criteria (20%)	75,600	77,868	80,204	82,610	85,088	87,641	90,270	92,978	95,768	98,641	101,600	104,648	107,788	111,021
Total RF patients that could benefit from treatment	200,000	202,000	204,020	206,060	208,121	210,202	212,304	214,427	216,571	218,737	220,924	223,134	225,365	227,619
% Market share	0%	0%	0%	0%	0.00%	0.00%	0.5%	0.5%	1%	1%	1.5%	2%	2.5%	3%
Total patients receiving treatment	-	-	-	-	-	-	1,062	1,072	2,166	2,187	3,314	4,463	5,634	6,829
Cost of therapy	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,400	$ 40,804	$ 41,212	$ 41,624	$ 42,040	$ 42,461	$ 42,885
Change in cost of therapy							0%	1%	1%	1%	1%	1%	1%	1%
Sales					-	-	42,461	44,181	88,370	90,146	137,937	187,613	239,229	292,846
Risk Adjusted							50%	50%	50%	50%	50%	50%	50%	50%
Total Revenue (Millions)					-	-	21,230	22,090	44,185	45,073	68,968	93,806	119,615	146,423

Ovarian Cancer (Gen-1)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Incidence	225,000	227,250	229,523	231,818	234,136	236,477	238,842	241,230	243,643	246,079	248,540	251,025	253,536	256,071
Change in incidence	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Patient Population in US and developed countries	122,280	123,503	124,738	125,985	127,245	128,518	129,803	131,101	132,412	133,736	135,073	136,424	137,788	139,166
Platinum resistant population in Europe and US	30,570	30,876	31,184	31,496	31,811	32,129	32,451	32,775	33,103	33,434	33,768	34,106	34,447	34,792
% Market share	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	8%	10%	11%	12%
Total patients receiving treatment	-	-	-	-	-	-	-	-	662	1,337	2,701	3,411	3,789	4,175
Cost of therapy	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,400	$ 40,804	$ 41,212	$ 41,624	$ 42,040
Change in cost of therapy	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%
Sales									$ 26,482	$ 54,029	$ 110,231	$ 140,558	$ 157,721	$ 175,518
Risk adjustment									90%	90%	90%	90%	90%	90%
Total Revenue (Millions)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,648	$ 5,403	$ 11,023	$ 14,056	$ 15,772	$ 17,552

Glioblastoma (Gen-1)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Incidence	22,850	22,850	23,079	23,309	23,542	23,778	24,016	24,256	24,498	24,743	24,991	25,241	25,493	25,748
Change in incidence	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Patients elligible for treatment, insurance coverage, 75%									30%	30%	30%	30%	30%	30%
% Market share	0%	0%	0%	0%	0%	0%	0%	0%	5%	10%	15%	15%	15%	15%
Total patients receiving treatment	-	-	-	-	-	-	-	-	367	742	1,125	1,136	1,147	1,159
Annual cost of treatment	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,400	$ 40,804	$ 41,212	$ 41,624	$ 42,040
increase in price									0%	1%	1%	1%	1%	1%
Sales									$ 14,699	$ 29,989	$ 45,867	$ 46,810	$ 47,751	$ 48,710
Risk adjustment									100%	100%	100%	100%	100%	100%
Total Revenue (Millions)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Bladder (ThermoDox)	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Incidence	80,470	82,079	83,721	85,395	87,103	88,845	90,622	92,435	94,283	96,169	98,092	100,054	102,055	104,097
Change in incidence	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Patient Population in US	700,000	714,000	728,280	742,846	757,703	772,857	788,314	804,080	820,162	836,565	853,296	870,362	887,769	905,525
Patients elligible for treatment	70,000	71,400	72,828	74,285	75,770	77,286	78,831	80,408	82,016	83,656	85,330	87,036	88,777	90,552
% Market share	0%	0%	0%	0%	0%	0%	0%	0%	5%	10%	15%	15%	15%	15%
Total patients receiving treatment	-	-	-	-	-	-	-	-	4,100.81	8,366	12,799	13,055	13,317	13,583
Cost of therapy	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 30,000	$ 30,300	$ 30,603	$ 30,909	$ 31,218	$ 31,530
Increase in price									0%	1%	1%	1%	1%	1%
Sales									$ 123,024	$ 253,479	$ 391,701	$ 403,531	$ 415,717	$ 428,272
Risk adjustment									100%	100%	100%	100%	100%	100%
Total Revenue (Millions)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Source: Dawson James

VALUATION

Our valuation is derived by our revenue projections for ThermoDox and GEN-1 in their respective indications of Hepatocellular carcinoma and ovarian cancer. We do not model any potential revenues from these programs until at least 2023 and project our model through the year 2030. Our therapeutic models are risk adjusted. For the U.S. for ThermoDox we use just a 75% risk rate (25% probability of success) and in China we reduce this to 50%. For GEN-1 we assume just a 10% probability of success. Our models factor in assumed financings and use a fully diluted out-year (2030) share count. We triangulate FCFF, discounted EPS, and sum-of-the-parts models. We then averaged and equally weighted each model to derive the NPV and round to the nearest whole number to set our target price. Investors should recognize that this modeling exercise, which models out for 10 years, while projected based on the current data and estimates, is limited in its ability to predict a 12-month target. The price of the stock will ultimately be driven near term by factors such as news flow, early trial data, and cyclic concerns of financings (dilution).

Exhibit 4. Free Cash Flow Model

Average	$	3.76

Price Target	$	3.78
Year		2019

DCF Valuation Using FCF (mln):

units ('000)	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
EBIT	(12,546)	(13,803)	(4,886)	(5,629)	12,927	14,512	37,029	41,621	70,370	98,405	126,324	152,873
Tax Rate	0%	0%	0%	0%	0%	5%	10%	15%	20%	25%	26%	27%
EBIT(1-t)	(12,546)	(13,803)	(4,886)	(5,629)	12,927	13,787	33,326	35,378	56,296	73,804	93,480	111,597
CapEx	-											
Depreciation	-											
Change in NWC	-											
FCF	(12,546)	(13,803)	(4,886)	(5,629)	12,927	13,787	33,326	35,378	56,296	73,804	93,480	111,597
PV of FCF	(12,546)	(12,003)	(3,695)	(3,701)	7,391	6,854	14,408	13,300	18,403	20,980	23,107	23,987
Discount Rate	15%											
Long Term Growth Rate	1%											
Terminal Cash Flow	805,095											
Terminal Value YE2030	173,050											
NPV	269,535											
NPV-Debt												
Shares out (thousands)	71,212	2030E										
NPV Per Share	$ 3.78											

Source: Dawson James Estimates

Source: Dawson James

Exhibit 5. Discounted EPS Model

Current Year		2019
Year of EPS		2030
Earnings Multiple		10
Discount Factor		15%
Selected Year EPS	$	1.54
NPV	$	3.31

Source: Dawson James Estimates

Earnings Multiple	Discount Rate and Earnings Multiple Varies, Year is Constant 2030 EPS					
	5%	10%	15%	20%	25%	30%
1	$0.90	$0.54	$0.33	$0.21	$0.13	$ 0.09
5	$4.51	$2.70	$1.66	$1.04	$0.66	$ 0.43
10	$9.01	$5.40	$3.31	$2.07	$1.32	$ 0.86
15	$13.52	$8.10	$4.97	$3.11	$1.99	$ 1.29
20	$18.03	$10.81	$6.63	$4.15	$2.65	$ 1.72
25	$22.53	$13.51	$8.28	$5.19	$3.31	$ 2.15
30	$27.04	$16.21	$9.94	$6.22	$3.97	$ 2.58
35	$31.54	$18.91	$11.60	$7.26	$4.63	$ 3.01

Source: Dawson James

Exhibit 6. Sum of the Parts Model

	LT Gr	Discount Rate	Yrs. to Mkt	% Success	Peak Sales MM's	Term Val
ThermoDox/HCC (US)	1%	15%	4	65%	$11	$76.51
NPV						$0.26
Thermodox/HCC (China)	1%	15%	4	65%	$146	$1,046
NPV						$3.60
Gen1/Ovarian Cancer (US)	1%	15%	6	65%	$18	$125
NPV						$0.33
Net Margin						65%
MM Shrs OS (2030E)						70
Total						$4.19

Source: Dawson James

Risk Analysis

Investment Risk: The company faces multiple investment risks from product management, market share adoption and commercialization to regulatory and competitive environment associated risks.

Clinical and regulatory risk: Celsion is currently in the process of completing their FDA clinical trials. There is no assurance that their product will be approved by the FDA and that even if approved, if it will be reimbursed by insurance or successfully commercialized.

Commercial risk: The focus of the company is on successfully developing their products and eventually bring them to the mass market. We can make no assurances that the company will be able to achieve a critical level of market share to become profitable in this indication and or in additional planned indications.

Employee risk: Celsion's core management team is experienced and has clear expectations for the future of the company. Atossa plans to bring their proposed products to market as efficiently as possible and their success will depend heavily upon the experience, abilities, and continued services of its senior officers, sales staff, and key scientific personnel.

Financial risk: Celsion may need to raise additional capital in the marketplace to continue to fund operations through more trials and eventually an NDA and possible commercial launch. There can be no assurances that the company will be able to successfully raise capital and do so on favorable terms.

Intellectual property risk: Celsion may have to defend its patents and technical know-how, and there can be no assurances that the patents will not be infringed or will be held as valid if challenged, and the company may infringe on third party's patents.

Reimbursement and insurance payment risk: Insurance payment for products may be an additional hurdle for adoption.

Exhibit 7. Income Statement

Celsion Corporation.: Income Statement ($000)																				
.: YE December 31	1Q18A	2Q18A	3Q18A	4Q18A	2018A	1Q19A	2Q19E	3Q19E	4Q19E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Product sales																					
Hepatocellular Carcinoma; (US) (ThermoDox)				0	-					-	-	-	-	1,518	3,190	5,026	7,039	9,242	9,708	10,197	10,711
Hepatocellular Carcinoma; (China) (ThermoDox)					-					-	-	-	-	21,230	22,090	44,185	45,073	68,968	93,806	119,615	146,423
Ovarian Cancer (Gen-1)					-					-	-	-	-	-	-	2,648	5,403	11,023	14,056	15,772	17,552
Glioblastoma (pre-clinical)					-					-	-	-	-	-	-	-	-	-	-	-	-
Non-Muscle Invasice bladder cancer (Pre-clinical)					-					-	-	-	-	-	-	-	-	-	-	-	-
Licensing Revenue	125	125	125	125	500	125															
Total Product Sales	**125**	**125**	**125**	**125**	**500**	**125**	**-**	**-**	**-**					**22,749**	**25,280**	**51,859**	**57,515**	**89,234**	**117,570**	**145,584**	**174,686**
Operating Expenses																					
Cost of Goods Sold														3,412	3,539	6,742	6,902	8,923	8,230	7,279	8,734
%COGS														15%	14%	13%	12%	10%	7%	5%	5%
Research and Development	2,741	4,594	2,187	2,344	11,866	2,768	3,115	3,115	3,462	12,459	13,082	13,736	14,423	15,144	15,901	16,696	17,531	18,407	19,328	20,294	21,309
%R&D																					
General and Administrative	1,665	3,543	1,960	2,532	9,700	2,218	2,546	2,546	2,874	10,184	10,694	1,123	1,179	1,238	1,300	1,365	1,433	1,505	1,580	1,659	1,742
%SG&A														5%							
Acquistion Costs																					
Total expenses	**4,406**	**8,136**	**4,147**	**4,875**	**21,565**	**4,986**	**5,661**	**5,661**	**6,336**	**22,643**	**23,775**	**14,859**	**15,602**	**19,794**	**20,740**	**24,802**	**25,866**	**28,835**	**29,138**	**29,232**	**31,785**
Operating Income (Loss)	(4,281)	(8,011)	(4,022)	(4,750)	(21,065)	(4,861)	(5,661)	(5,661)	(6,336)	(22,643)	(23,775)	(14,859)	(15,602)	2,955	4,540	27,057	31,649	60,398	88,432	116,352	142,901
Investment income, net	74	73	107	100	354	114	114	114	114	455	455	455	455	455	455	455	455	455	455	455	455
Interest expense	-	(15)	(346)	(351)	(712)	(351)	(351)	(351)	(351)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)	(1,403)
Gain (loss) from change in valuation of common stock warrant liability																					
Loss from impairment of in-process research and development			(4,510)	-	(4,510)																
Other income (expense)	1	(1)	0	(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loss from valuation of earn-out milestone liability	(270)	(277)	4,115	63	3,631	3,130	3,130	3,130	3,130	12,520	12,520	12,520	12,520	12,520	12,520	12,520	12,520	12,520	12,520	12,520	12,520
Fair value of warrants issued in connection with amendment						(400)	(400)	(400)	(400)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)	(1,600)
Total other income	**(196)**	**(219)**	**(634)**	**(188)**	**(1,237)**	**2,493**	**2,493**	**2,493**	**2,493**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**	**9,972**
Pretax Income	**(4,477)**	**(8,231)**	**(4,656)**	**(4,939)**	**(22,302)**	**(2,367)**	**(3,168)**	**(3,168)**	**(3,843)**	**(12,546)**	**(13,803)**	**(4,886)**	**(5,629)**	**12,927**	**14,512**	**37,029**	**41,621**	**70,370**	**98,405**	**126,324**	**152,873**
Income Tax Benefit (Provision)					10,419									-	726	3,703	6,243	14,074	24,601	32,844	41,276
Tax Rate														0%	5%	10%	15%	20%	25%	26%	27%
GAAP Net Income (loss)	**(4,477)**	**(8,231)**	**(4,656)**	**(4,939)**	**(11,883)**	**(2,367)**	**(3,168)**	**(3,168)**	**(3,843)**	**(12,546)**	**(13,803)**	**(4,886)**	**(5,629)**	**12,927**	**13,787**	**33,326**	**35,378**	**56,296**	**73,804**	**93,480**	**111,597**
Deemed dividend related to warrant modification																					
Net Income attributable to common shareholders(loss)					**(11,883)**																
Basic and Diluted	0.25	(0.46)	(0.26)	(0.21)	(0.68)	(0.12)															
GAAP-EPS	**(0.25)**	**(0.46)**	**(0.26)**	**(0.28)**	**(0.68)**	**(0.12)**	**(0.16)**	**(0.16)**	**(0.20)**	**(0.65)**	**(0.31)**	**(0.07)**	**(0.08)**	**0.2**	**0.2**	**0.5**	**0.5**	**0.8**	**1.0**	**1.3**	**1.5**
GAAP EPS (dil)						(0.12)	(0.16)	(0.16)	(0.20)	(0.65)	(0.31)	(0.07)	(0.08)	0.2	0.2	0.5	0.5	0.8	1.0	1.3	1.5
Wgtd Avg Shrs (Bas) - '000s	17,684	17,743	17,801	17,801	17,583	19,105	19,296	19,489	19,684	19,393	44,479	69,628	69,802	69,977	70,152	70,328	70,504	70,680	70,857	71,034	71,212
Wgtd Avg Shrs (Dil) - '000s					17,583	19,105	19,296	19,489	19,684	19,393	44,479	69,628	69,802	69,977	70,152	70,328	70,504	70,680	70,857	71,034	71,212

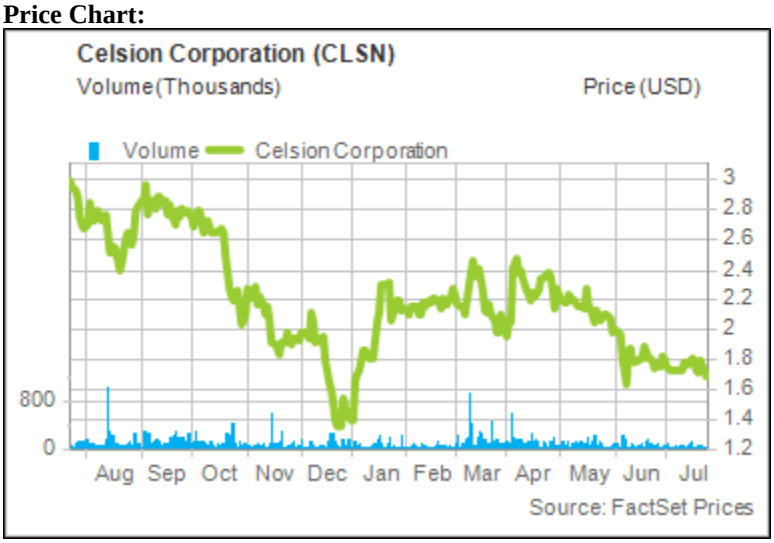
Source: Dawson James estimates

Companies mentioned in this report

Celsion Corporation

Important Disclosures:

Price Chart:



Price target and rating changes over the past three years:
Initiated – Buy – August 5, 2019 – Price Target $4.00

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	Company Coverage		Investment Banking	
Ratings Distribution	# of Companies	% of Total	# of Companies	% of Totals
Market Outperform (Buy)	43	86%	13	30%
Market Perform (Neutral)	7	14%	0	0%
Market Underperform (Sell)	0	0%	0	0%
Total	50	100%	13	26%

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