Theralase® - Cancer - Healing at the Speed of Light®

The Next Generation Treatment for Non-Muscle Invasive Bladder Cancer

Theralase Technologies Inc. (TSXV: TLT) (OTCQB: TLTFF)
February 2019

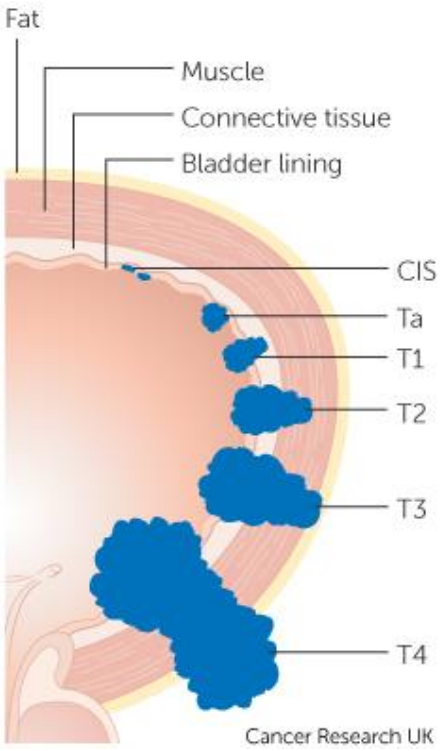
Forward Looking Statements

*Certain statements contained or incorporated in this presentation, which deal with the financial condition and operating results of Theralase Technologies Inc. ("**Theralase**" or the "**Company**"), include information, analyses and projections as to future corporate developments which are currently in the planning stage and reflect the current expectations of management of the Company's future growth, results of operations, performance, business prospects and opportunities. Such forward-looking statements, made with special reference to the Company's ongoing technologically complex healthcare and medical device research and development efforts, which may include in-house and independent preclinical and clinical studies, testing new medical technologies and their applications, involve known and unknown risks and uncertainties that could cause actual events and/or results to differ materially from those estimated and/or anticipated and which may have been implied and/or expressed in such forward-looking statements. No conclusions as to the successful outcome of the ongoing and planned research and development projects in which the Company is involved are intended or implied nor can they be foreseen or predicted prior to definitive corporate announcements as to their outcome. Any statements that refer to expectations, projections, other characterizations of future events or circumstances are forward-looking statements. Although Theralase believes that the expectations reflected in any forward-looking statements made in this presentation are reasonable, such statements are based on a number of assumptions which may prove to be incorrect; including, but not limited to assumptions related to the risks and factors set out in the Company's Annual Information Form, available on SEDAR under the Company's profile at www.sedar.com. Accordingly, no assurances can be given that any of the events or circumstances contemplated by any such forward-looking statements will transpire or occur or, if any of them transpire or occur, what impact they will have on Theralase's results of operations or financial condition.*

Furthermore, the forward-looking statements contained in this presentation are made as of the date hereof. The Company does not undertake any obligation to update publicly or to revise any of the included forward-looking statements, whether as a result of new information, future events, or otherwise, unless required by applicable laws. The forward-looking statements contained in this presentation are expressly qualified by this cautionary statement.

Problem: Non-Muscle Invasive Bladder Cancer ("**NMIBC**")

Cross Section of the Human Bladder



Progressive and highly recurrent neoplastic disorder, which includes: [1]

- Carcinoma In-Situ ("**CIS**") – very early, high grade cancer; cells located only in the innermost layer of the bladder lining
- Ta, T1 – Papillary cancer located in the inner layers of the bladder lining and protruding from the bladder wall
- T2, T3, T4 – Papillary cancer has grown into the muscle wall beneath the bladder lining and is now referred to as Muscle Invasive Bladder Cancer ("**MIBC**")
- "**Standard of Care**" treatment for NMIBC is a Trans-Urethral Resection of the Bladder Tumour ("**TURBT**") procedure followed by a series of intravesical instillations of Bacillus Calmette Guerin ("**BCG**")
- Approximately 30% BCG-Unresponsive failure rate per year
- "**Standard of Care**" treatment for BCG-Unresponsive patients is cystectomy (bladder removal), but some patients are either unfit for cystectomy or desire bladder-preserving therapies, rejecting cystectomy

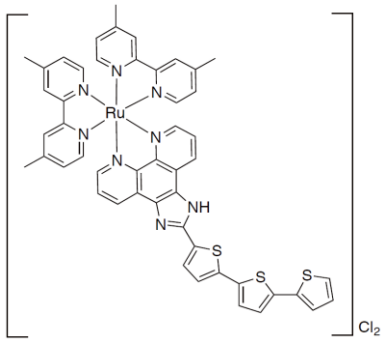
FDA has provided guidance on the design of a NMIBC clinical study for a BCG-Unresponsive population under ***BCG-Unresponsive Nonmuscle Invasive Bladder Cancer: Developing Drugs and Biologics for Treatment - Guidance for Industry*** in February 2018 [2]

[1] Bladder Cancer – Cancer Research UK

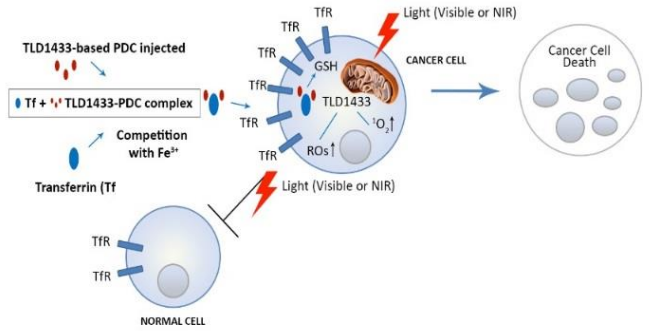
[2] BCG-Unresponsive Nonmuscle Invasive Bladder Cancer: Developing Drugs and Biologics for Treatment Guidance for Industry, U.S. Department of Health and Human Services Food and Drug Administration Center for Drug Evaluation and Research (CDER) Center for Biologics Evaluation and Research (CBER), February 2018, https://www.fda.gov/ucm/groups/fdagov-public/@fdagov-drugs-gen/documents/document/ucm529600.pdf

Solution: Study Drug: TLD-1433

TLD-1433 Chemical Structural Formula



TLD-1433 + Transferrin Potential Mechanism of Action



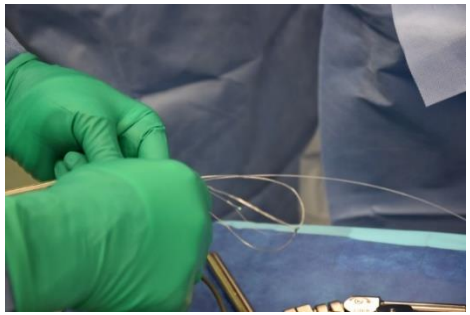
- Theralase's Study Drug, TLD-1433, is a Photo Dynamic Compound ("**PDC**") that is soluble and stable in water for at least 72 hours [3]
- TLD-1433 is able to bind with endogenous transferrin, a human glycoprotein [4]
- Combined molecule is able to localize to cancer cells, which have more transferrin receptors versus healthy cells [5]
- Combined molecule is laser light activated and destroys cancer cells through the production of singlet oxygen and/or reactive oxygen species [6, 7, 8]
- Patented technology (7 issued patents, 34 patents pending in US, Canada and internationally) [9]

[3] Theralase Scientific Research – 2015
[4] Theralase Scientific Research – 2015
[5] Reference: Urol Res. 1987;15(6):341-4. Transferrin receptor expression by human bladder transitional cell carcinomas. Seymour GJ1, Walsh MD, Lavin MF, Strutton G, Gardiner RA.
[6] Ru(II) dyads derived from oligothiophenes: A new class of potent and versatile photosensitizers for PDT. Ge Shia et al, http://dx.doi.org/10.1016/j.ccr.2014.04.012 0010-8545/© 2014, Elsevier, B.V.
[7] Theoretical Exploration of Type I/Type II Dual Photoreactivity of Promising Ru(II) Dyads for PDT Approach. Marta Erminia Alberto et al, DOI:10.1021/acs.inorgchem.6b01782 Inorg. Chem. 2016, 55, 11185−11192
[8] A ruthenium(II) based photosensitizer and transferrin complexes enhance photo-physical properties, cell uptake, and photodynamic therapy safety and efficacy, Pavel Kaspler et al, 2016, Photochem. Photobiol. Sci.
[9] See Annual Information Form on www.sedar.com for additional details

Solution: Study Device: TLC-3200

- Study Device ("**TLC-3200**") emits green laser light (525 nm) through Laser Emitter and monitored by Dosimetry Cage to deliver laser light energy to the bladder wall
- Laser Emitter and Dosimetry Cage positioned in the bladder allows the surgeon to control and monitor the laser energy delivered to the bladder wall as a function of: bladder shape, volume and diffuse reflectance

Preparing the Laser Emitter and Dosimetry Cage



Testing the Laser Emitter

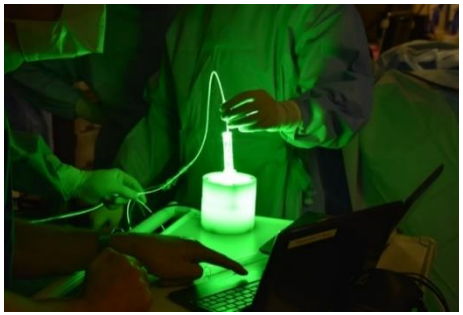
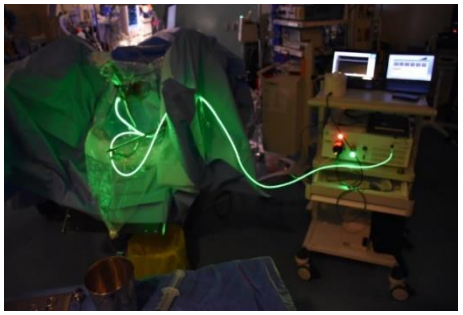


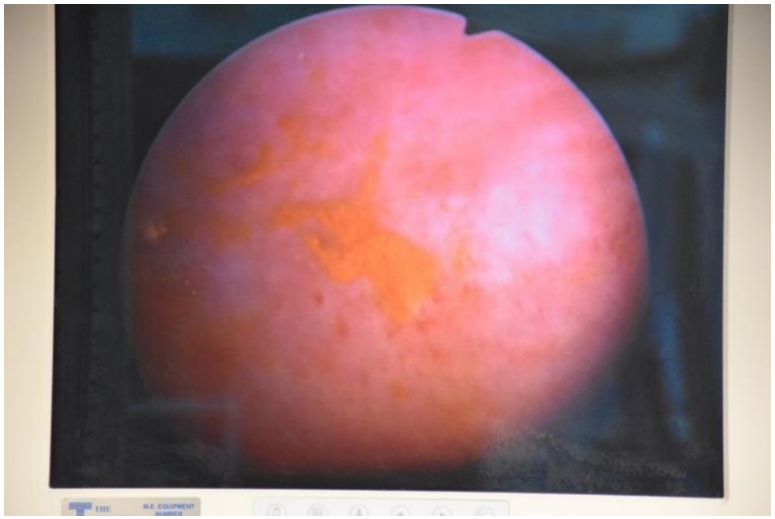
Photo Dynamic Therapy Treatment Procedure



Solution: PDT Treatment Procedure [10]

- Study Drug reconstituted in pharmacy up to 24 hours prior to treatment procedure
- Catheter inserted through urethra and Study Drug instilled intravesically into bladder for approximately 60 minutes
- Patient taken to operating room, where patient undergoes general anesthetic and bladder voided
- Cystoscope inserted through urethra into bladder
- Bladder rinsed with sterile water via cystoscope to remove excess PDC
- Bladder distended using instillation of sterile water to prevent folds that prevent uniform light illumination
- Emitter Laser and Dosimetry Cage inserted through working channel of cystoscope and positioned in bladder with the aid of diagnostic ultrasound
- Bladder illuminated with low level green laser light to ensure placement and then full power initiated
- TLC-3200 measures light delivery in real time, allowing for treatment interruptions (i.e.: bladder irrigations, fiber positioning) while ensuring that the laser light dose delivered to the bladder is approximately 90 J/cm^2

Human Bladder Post Rinse Showing TLD-1433 Localized to Bladder Cancer Tumours



Preferential accumulation of Study Drug in the NMIBC tumour regions of the bladder wall post wash [11]

Transferrin receptors were not detected on normal urothelium. Positive staining was found to increase with increasing pathological grade and stage of the tumours [12]

[10] Clinical Data collected by Princess Margaret Cancer Centre, University Health Network from Phase Ib NMIBC Clinical Study, 2017-2018
[11] Phase Ib NMIBC Clinical Study patient cystoscopy photograph, after instillation of Study Drug, prior to TLC-3200 Light Activation
[12] Reference: Urol Res. 1987;15(6):341-4.Transferrin receptor expression by human bladder transitional cell carcinomas, Seymour GJ, Walsh MD, Lavin MF, Strutton G, Gardiner RA

Bladder Cancer is the 10th Most Common Cancer Worldwide [13]

Bladder cancer is the sixth most commonly occurring cancer in men and the 17th most commonly occurring cancer in women. There were almost 550,000 new cases in 2018 worldwide [13]

Estimates for Bladder Cancer:

United States: Approximately 81,190 new cases of bladder cancer annually [14]
Canada: Approximately 8,900 new cases of bladder cancer annually [15]
Europe: Approximately 151,000 new cases of bladder cancer annually [16]
Total (Canada, United States and Europe): Approximately **241,090** new cases of bladder cancer annually

Approximately **70%** of all new cases of bladder cancer are classified as NMIBC [17]

Standard of care for patients with High-Grade NMIBC remains intravesical Bacillus Calmette-Guérin ("**BCG**") following Trans Urethral Resection of the Bladder Tumour ("**TURBT**"). Unfortunately, up to 75% will develop tumor recurrence and 20% will progress within 5 years despite intravesical therapy [18]

Approximately **30%** of these NMIBC patients treated with standard of care (TURBT and BCG) become BCG-Unresponsive [19]

Assuming **50%** of BCG-Unresponsive patients choose radical cystectomy, this leaves **50%** of these patients, who are unfit for cystectomy or desire bladder-preserving therapies

Target Market Potential Population Size (Canada, United States and Europe) = **241,090** x **70%** x **30%** x **50%** = **25,314** patients with BCG-Unresponsive NMIBC annually, who are unfit for cystectomy or desire bladder-preserving therapies

[13] World Cancer Research Fund- American Institute for Cancer Research (2018)
[14] Key Statistics for Bladder Cancer – American Cancer Society (2018)
[15] Canadian Cancer Society (2017)
[16] Bladder Cancer Incidence Statistics – Cancer Research UK
[17] https://www.uptodate.com/contents/bladder-cancer-treatment-non-muscle-invasive-superficial-cancer-beyond-the-basics#!
[18] Developments in the Management of BCG-Unresponsive NMIBC, Mohit Gupta, MD and Trinity J. Bivalacqua, MD, PhD, May 17, 2018
[19] The management of BCG failure in non-muscle-invasive bladder cancer: an update, Alexandre R. Zlotta, MD, FRCSC,*†‡ Neil E. Fleshner, MD, FRCSC,*‡ and Michael A. Jewett, MD, FRCSC, Can Urol Assoc J. 2009 Dec; 3(6 Suppl 4): S199–S205

Market Opportunity

Potential of **25,314** patients (Canada, United States and Europe) with BCG-Unresponsive NMIBC annually, who are unfit for cystectomy or desire bladder-preserving therapies

Willingness to Pay for One (1) Quality Adjusted Life Year in the United States is $USD 50,000 to $USD 150,000 [20]

Average Cost: $USD 100,000

25,314 patients annually x **$USD 100,000** per patient = **$USD 2.53 billion**

Bladder cancer market size will increase to over **$1.1 billion** in US, France, Germany, Italy, Spain, United Kingdom and Japan by 2025 [21]

Target Market Potential is estimated between **$1.1 billion** to **$USD 2.53 billion** annually

[20] Cost-effectiveness of Pembrolizumab in Second-line Advanced Bladder Cancer, Michal Sarfatya, Peter S. Hall, Kelvin K.W. Chand, Kiran Virik, Moshe Leshnoh, Noa Gordona, Assaf Moorea, Victoria Neimana, Eli Rosenbauma, Daniel A. Goldstein, https://doi.org/10.1016/j.eururo.2018.03.006 0302-2838/© 2018 European Association of Urology

[21] Bladder cancer market size to more than triple to over $1.1 billion by 2025, April 19, 2017, GlobalData Healthcare

Competition [22]

Drug	Efficacy (CR = 30% at 12 months)	Safety (Adverse Events ("AEs")) (> 2)	Cost < $USD 150,000	FDA Approval Status	Pivotal Clinical Study Completed	Viable Treatment Option
Doxorubicin / Epirubicin	Complete Response ("CR") = 35% at 14 to 31 days	Yes	Unknown	Approved / Not used in clinical practice	2007	No
Gemcitabine and Cisplatin	10% CR at 12 months	Yes	Unknown	Approved / Not used in clinical practice	2011	No
Mitomycin	CR = 31% at 6 months	Yes	$USD 4,000	Approved / Not used in clinical practice	2012	No
Thiotepa	CR = 52% at 4.2 months	Yes	Unknown	Approved / Not used in clinical practice	2014	No
Mycobacterium phlei cell wall-nucleic acid complex ("MCNA")	Disease Free Survival ("DFS") = 26.5% at 12 months	Yes	Unknown	Not Approved	2015	No
Valrubicin	10 to 13% CR at 12 months	Yes	Unknown	Approved / Not used in clinical practice	2017	No
Oncolytic adenovirus (CG0070 virus)	27% CR at 12 months	No	Unknown	Phase II study underway	2019	No
Vicinium (VB4-845)	16% CR at 12 months	No	Unknown	Phase III study underway	2019	No
Theralase (TLD-1433)	**CR = 33% at 9 months CR = 33% at 12 months**	**No**	**Estimated $USD 100,000**	**Phase II study to commence 1Q2019**	**2021**	Maybe
PD-1 / PD-L1 checkpoint inhibitors (atezolizumab, durvalumab, avelumab, nivolumab, and pembrolizumab)	Overall Response Rate ("ORR") = 28% in patients who have PD-L1 expression	Yes	Up to $USD 300,000	Approved for patients with metastatic and locally-advanced bladder cancer. Not approved for NMIBC. FDA halted 2 studies for decreased patient survival with low expression levels of PD-L1 versus platinum-based chemotherapy.	2023	No
Recombinant adenovirus (Interferon-α2b (rAd-IFN))	35% Relapse-Free Survival ("RFS") at 12 months for high grade tumours (CIS population ?)	Yes	Unknown	Phase III study to commence	Unknown	Maybe

= Does not meet specified criteria

= May meet specified criteria

= Meets specified criteria

[22] 2018 Review of available published clinical studies and US FDA information by Theralase

Approximate Timing

Health Canada Clinical Trial Authorization ("**CTA**"), Investigational Testing Authorization ("**ITA**") and Clinical Site Review Ethics Board ("**REB**") Approval to Commence Enrolling and Treating Patients in Canada	1Q2019
FDA Investigational New Drug ("**IND**") and European IND Approval to Commence Enrolling and Treating Patients in the United States and Europe	2Q2019
Enroll, Treat and Follow-Up Approximately 100 NMIBC Patients in Canada, the United States and Europe	2Q2019 to 4Q2021

Phase IB NMIBC RESULTS

Phase Ib NMIBC Clinical Study Results

3 Patients Evaluated at Maximum Recommended Starting Dose ("**MRSD**") (0.35 mg / cm^2)

3 Patients Evaluated at Therapeutic Dose (0.70 mg / cm^2)

Primary

Safety and tolerability

Achieved in 3 patients treated at MRSD at 90 and 180 days, 1 patient treated at Therapeutic Dose at 90 and 180 days, 1 patient treated at Therapeutic Dose at 90 and 180 and 270 days and 1 patient treated at Therapeutic Dose at 90, 180, 270 and 360 days

Secondary

Pharmacokinetics (Movement and exit of drug within tissue)

Achieved in 3 patients treated at MRSD at 90 and 180 days, 1 patient treated at Therapeutic Dose at 90 and 180 days, 1 patient treated at Therapeutic Dose at 90 and 180 and 270 days and 1 patient treated at Therapeutic Dose at 90, 180, 270 and 360 days

Exploratory

Efficacy (Evaluated primarily at 90 days, secondarily at 180 days)

Achieved in 3 patients treated at MRSD at 90 days
Achieved in 3 patients treated at Therapeutic Dose at 90 days

Achieved in 0 patients treated at MRSD at 180 days
Achieved in 1 patient treated at Therapeutic Dose at 180 and 270 days
Achieved in 1 patient treated at Therapeutic Dose at 180, 270 and 360 days
1 patient treated at Therapeutic Dose withdrawn from Study due to metastatic disease

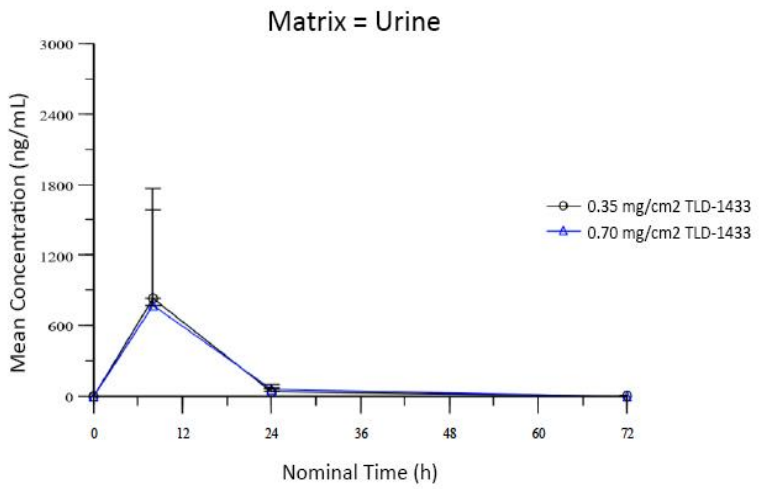
Primary Objective Results: Adverse Events (Patients 001-006) [23]

Condition / Patient	001-001	001-002	001-003	001-004	001-005	001-006
Bladder Spasms	2 – Moderate (resolved @ day 6); 1 – Mild on day 91 (resolved @ day 91)	2 – Moderate (ongoing @ end of study)	nil	nil	1 – Mild (resolved @ day 2)	nil
Constipation	1 – Mild (resolved @ day 5)	1 – Mild (resolved @ day 6)	nil	1 – Mild (resolved @ day 3)	nil	nil
Urge Incontinence	2 – Moderate (resolved @ day 6)	nil	nil	nil	2 – Moderate (resolved @ day 17)	2 – Moderate (ongoing @ day 90)
Fatigue	2 – Moderate (onset day 11, ongoing at end of study)	1 – Mild (ongoing @ end of study)	nil	nil	nil	1 – Mild (ongoing @ day 60)
Urinary Frequency	nil	1 – Mild (resolved @ day 22)	1 – Mild (resolved @ day 6)	2 – Moderate (ongoing at end of study)	2 – Moderate (resolved @ day 17)	2 – Moderate (ongoing @ day 60)
Hematuria	nil	1 – Mild (onset @ day 61, resolved @ day 168)	nil	1 – Mild (ongoing at end of study)	1 – Mild (resolved @ day 17)	1 – Mild (resolved @ day 26)
Pain	Pelvic: 1 – Mild (ongoing @ End of study)	Joint: 2 – Moderate (onset @ day 13, resolved @ day 57) Low back: 1 – Mild (onset @ day 61, ongoing end of study) Pelvic: 2 – Moderate (resolved @ day 6)	Eye: 1 – Mild (resolved @ day 1)	Right flank pain: 1 – Mild (onset @ day 2, resolved @ day 14) Back pain: 2 – Moderate (onset @ day 127, ongoing at end of study) Urinary Tract: 1 – Mild (ongoing at end of study)	Urinary Tract: 1 – Mild (resolved @ day 17)	Urinary Tract: 2 – Moderate (resolved @ day 35)
Penile discomfort	1 – Mild (onset @ day 79, resolved @ day 84)	nil	1 – Mild (resolved @ day 5)	nil	nil	nil
Urinary Urgency	nil	nil	nil	2 – Moderate (ongoing at end of study)	2 – Moderate (resolved @ day 17) 1 – Mild (onset @ day 38, resolved @ day 40)	nil
Other	nil	nil	Nocturia: 1 – Mild (onset @ day 170, ongoing at end of study)	nil	Dry skin: 1 – Mild (onset @ day 79), 2 - Moderate (ongoing @ Day 180)	Diarrhea: 1 – Mild (onset @ day 43, resolved @ day 57)

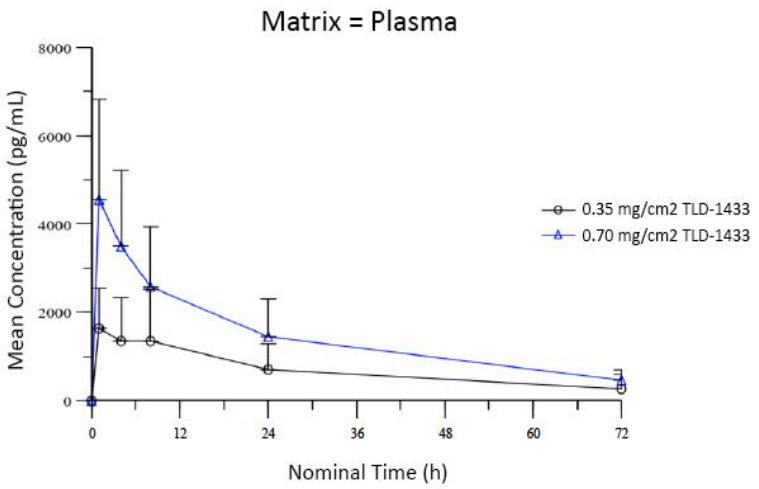
[23] Clinical Data collected by Princess Margaret Cancer Centre, University Health Network from Phase Ib NMIBC Clinical Study, 2017-2018

Secondary Objective Results: Pharmacokinetics of TLD-1433 (Patients 001-006) [23]

Concentration of TLD-1433 in Urine Versus Time



Concentration of TLD-1433 in Plasma Versus Time



Data points represent average TLD-1433 concentrations per ml of samples (mean +/- standard deviations)

TLD-1433 is predominantly removed from the body via urine within 24 hours and via plasma within 72 hours

[23] Clinical Data collected by Princess Margaret Cancer Centre, University Health Network from Phase Ib NMIBC Clinical Study, 2017-2018

Exploratory Efficacy Results (180 Day Cystoscopy Analysis) (Patients 001-006) [23]

Subject	001-001	001-002	001-003	001-004	001-005	001-006
Pathology (180 Days)	T1 HG w/ Cis	T1 HG w/Cis	Cis	T1 HG w/ Cis (indeterminate for involvement of muscularis propria)	No clinical evidence of bladder tumour	No clinical evidence of bladder tumour
Imaging (180 Days)	Increased lymphadenopathy Generalized bladder wall thickening, and dilation of the right greater than left ureter again seen. Again noted is an area of ureteric thickening and narrowing on the right side	Solid mass in the right renal pelvis has enlarged in the interval	No definite evidence for abdominal pelvic disease. Plaque-like areas of calcification in the posterior bladder wall grossly similar	1) Recurrence of bladder cancer with worsening bilateral hydroureteronephrosis 2) Vertebral metastases 3) Focus of density within the left upper pole renal calyx is likely intra -pelvis urothelial malignancy	No evidence of metastatic disease in the abdomen or pelvis. **360 Day Cystoscopy:** No clinical evidence of bladder tumour	No evidence of metastatic disease in the abdomen or pelvis. **270 Day Cystoscopy:** No clinical evidence of bladder tumour

[23] Clinical Data collected by Princess Margaret Cancer Centre, University Health Network from Phase Ib NMIBC Clinical Study, 2017-2018

Phase II NMIBC Clinical Study Objectives

Phase II NMIBC Clinical Study Objectives [24]

PDT using Laser Light Activated TLD-1433 in BCG-Unresponsive Patient Population

100 Patients Evaluated at Therapeutic Dose (0.70 mg / cm^2)

Primary Efficacy

Evaluated by Complete Response ("**CR**") in patients with Cis with or without resected papillary disease at 90 days post-treatment and duration of CR evaluated at 360 days (12 months) post-treatment.

Patient CR is defined as at least one of the following:

- Negative cystoscopy and negative (including atypical) urine cytology
- Positive cystoscopy with biopsy-proven benign or low-grade NMIBC and negative cytology
- Negative cystoscopy with malignant urine cytology if cancer is found in the upper tract or prostatic urethra and random bladder biopsies are negative

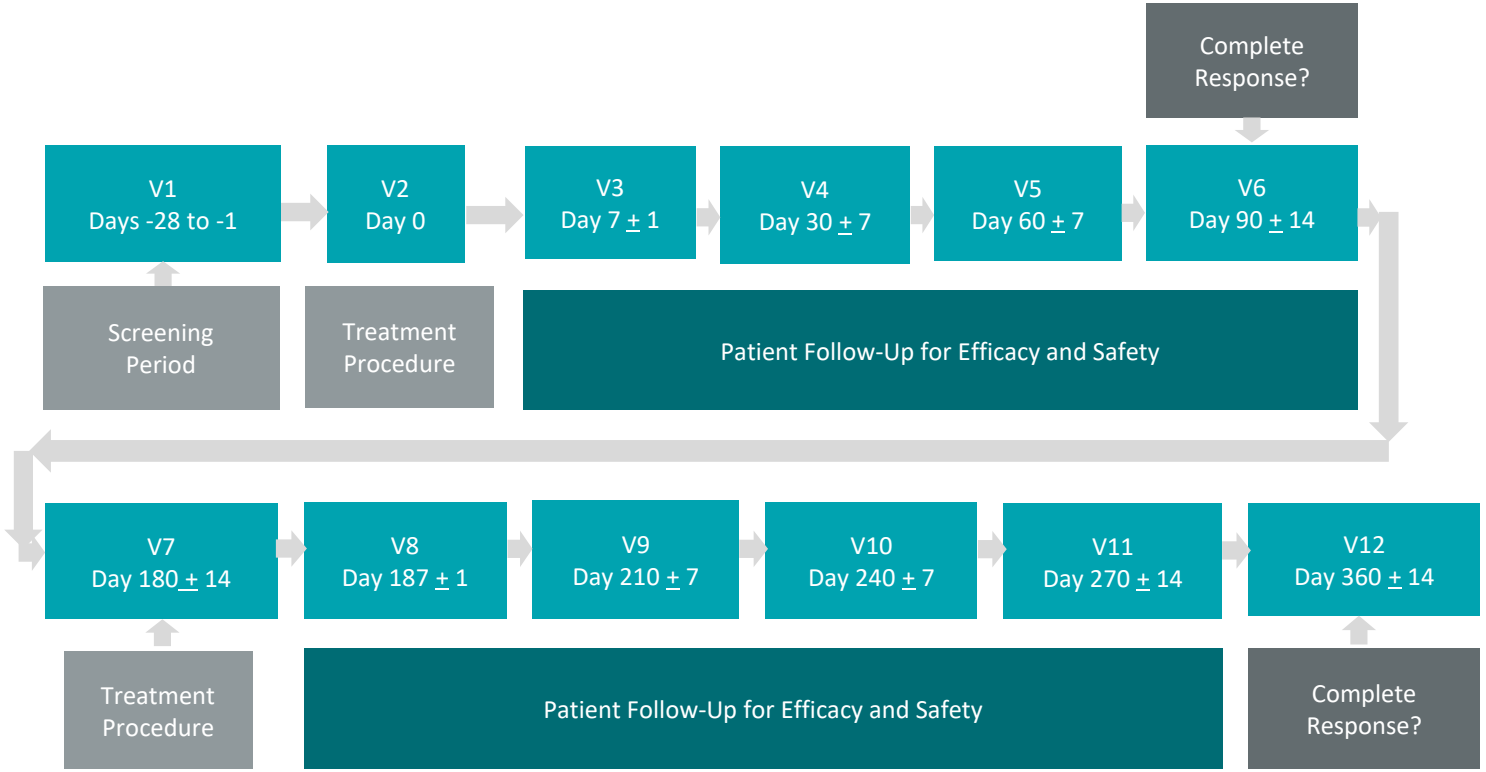
Secondary Safety

Evaluated by the incidence and severity of Adverse Events ("**AEs**") Grade 4 or higher that do not resolve within 360 days post-treatment; whereby:

- Grade 1 = Mild
- Grade 2 = Moderate
- Grade 3 = Severe
- Grade 4 = Life-threatening or disabling
- Grade 5 = Death

[24] Theralase Phase II NMIBC Clinical Study design submitted to Health Canada in 3Q2018 and to be submitted to the FDA for regulatory approval in 4Q2018

Overall Study Design and Plan [24]



[24] Theralase Phase II NMIBC Clinical Study design submitted to Health Canada in 3Q2018 and to be submitted to the FDA for regulatory approval in 4Q2018

Approximate Costs

Description	Cost
	($CDN M)
Phase II NMIBC Study Drug Manufacture and Packaging	3.0
Phase II NMIBC Study Device Manufacture and Packaging	3.0
Clinical Research Organization / Regulatory Approval	2.5
Phase II NMIBC Clinical Study	6.5
Working Capital	5.0
Total	**20.0**

Common Share Purchase Warrants Outstanding			
Quantity	**Exercise Price**	**Value**	**Expiry Date**
19,071,940	$0.54	$10,298,848	07-Mar-20
10,538,599	$0.375	$3,951,975	06-Nov-21
5,113,300	$0.30	$1,533,990	14-May-20
3,157,059	$0.50	$1,578,530	03-Oct-20
Total		**$17,363,342**	

Common Shares	
Undiluted	138,972,742
Fully Diluted	182,688,640

Summary

Significant Annual Revenue Potential on Successful Canadian, American and/or European Regulatory Approval

Estimated 3 Year Time Horizon to Complete Phase II NMIBC Clinical Study

Potential to Expand into Other Cancer Conditions

Appendix

Sponsor Representatives

Arkady Mandel, M.D., Ph.D., D.Sc. – Interim Chief Executive Officer and Chief Scientific Officer

- One of the key founders of the therapeutic use of lasers in dermatology and other areas of clinical medicine
- Over 100 original papers and scientific monographs to his name, combined with over 200 international patents
- Earned his designation as a medical doctor from the Moscow State Medical University
- Doctor of Science accreditation majoring in: biochemistry, microbiology, immunology, biophysics and photobiology

Kristina Hachey, P.G.A. – Chief Financial Officer

- 17+ years of experience in finance and financing for public and private companies
- Chief Financial Officer of Theralase and Theralase Technologies Inc. since May 2004
- VP Finance of Kensington Capital Partners from April 1998 to May 2004
- Graduated from Ryerson University (Toronto, Ontario) with a bachelor degree in Business Management and Administration (1996), majoring in Accounting and Finance, minoring in International Business

Roger Dumoulin-White, P. Eng. – Director of Business Development

- Director of Business Development of Theralase Technologies Inc., since 2018
- President and CEO of Theralase Technologies Inc. 2004 to 2018 (Theralase Inc. 1994 to 2018)
- Before Founding Theralase Inc., from 1986 to 1994, served as a Product Team Manager with Ford Electronics Manufacturing Corporation, from a division of Ford Motor Corporation (NYSE:F), where he managed a $40 million a year business (subset of $400 million annual business), with approximately 400 direct and indirect employees reporting to him (subset of 2,500 total employees)
- Graduated from the University of Western (London, Ontario) with a bachelor degree in Electrical Engineering in 1986

Medical and Scientific Advisory Board ("**MSAB**")

Michael Jewett, M.D.: (UHN) (Chair of MSAB)

- Professor of Surgery (Urology) at the University of Toronto, Surgical Oncology at Princess Margaret Cancer Centre, University Health Network ("**UHN**")
- Clinical practice is in urologic oncology with research interests in testicular cancer and superficial bladder cancer

Lothar Lilge, Ph.D.: (UHN)

- Professor in the Department of Medical Biophysics, University of Toronto and Senior Scientist at the Ontario Cancer Institute, UHN
- Research is focused on Photo Dynamic Therapy, optical diagnostics, destruction of cancer and bacteria by light activated PDCs and the use of light as a microscopic tool for biomedical research

Ashish Kamat, M.D.: (MD Anderson)

- Internationally recognized expert in urologic oncology and authority in the management of urologic cancers
- Expertise in bladder cancer, organ sparing and minimally invasive techniques. Maintains an active research portfolio with focus on efforts to develop novel therapies and identify predictors of response to therapy (i.e.: intravesical immunotherapy), as a first step towards personalized cancer therapeutics.
- Initiated, led and active in several large studies including multinational trials in bladder cancer, findings published in high impact journals

Medical and Scientific Advisory Board(Cont'd)

Michael O'Donnell, M.D.: (University of Iowa)

- Uro-oncologist
- Long history of focusing on bladder immunology and bladder cancer immunotherapy, particularly the anti-cancer mechanisms of bacillus Calmette-Guerin ("BCG") and its enhancement with combination therapies
- Recently headed a national trial of bladder cancer treatment utilizing BCG plus interferon (a natural protein which induces healthy cells to combat disease) comprised of over 1,000 patients and holds several U.S. patents for his work

Brian Wilson, Ph.D.: (UHN)

- Senior Scientist and Head of the Applied Biophotonics group at UHN
- Professor in the Department of Medical Biophysics at the University of Toronto
- Research focus of the Applied Biophotonics group is the development and application of new therapeutic and diagnostic techniques based on the use of lasers and other optical technologies

Publications to Date

Kalinina, Sviatlana; Breymayer, Jasmin; Reess, Kirsten; et al. Correlation of intracellular oxygen and cell metabolism by simultaneous PLIM of phosphorescent TLD1433 and FLIM of NAD(P)H Journal of biophotonics Pages: e201800085: 2018

Citations: 0

Kaspler, Pavel; Lazic, Savo; Forward, Sarah; et al. A ruthenium(II) based photosensitizer and transferrin complexes enhance photo-physical properties, cell uptake, and photodynamic therapy safety and efficacy PHOTOCHEMICAL & PHOTOBIOLOGICAL SCIENCES 15:481-495: 2016

Citations: 24

Fong, Jamie; Kasimova, Kamola; Arenas, Yaxal; et al. A novel class of ruthenium-based photosensitizers effectively kills in vitro cancer cells and in vivo tumors PHOTOCHEMICAL & PHOTOBIOLOGICAL SCIENCES 14:2014-2023: 2015

Citations: 25

Shi, Ge; Monro, Susan; Hennigar, Robie; et al. Ru(II) dyads derived from alpha-oligothiophenes: A new class of potent and versatile photosensitizers for PDT COORDINATION CHEMISTRY REVIEWS 282:127-138: 2015

Citations: 69

Reichardt, Christian, Mitch Pinto, Maria Wächtler, Mat Stephenson, Stephan Kupfer, Tariq Sainuddin, Julien Guthmuller, Sherri A. McFarland, and Benjamin Dietzek. 2015. "Photophysics of Ru(II) Dyads Derived from Pyrenyl-Substitued Imidazo[4,5-f][1,10]phenanthroline Ligands" *The Journal of Physical Chemistry. A* 119 (17): 3986–94. doi:10.1021/acs.jpca.5b01737.

Citations: 14

Yin, Huimin, Mat Stephenson, Jordan Gibson, Eric Sampson, Ge Shi, Tariq Sainuddin, Susan Monro, and Sherri A. McFarland. 2014. "In Vitro Multiwavelength PDT with 3IL States: Teaching Old Molecules New Tricks" *Inorganic Chemistry* 53 (9): 4548–59. doi:10.1021/ic5002368.

Citations: 46

Capitalization Table*

Basic Shares Outstanding	138,972,742
Warrants	37,880,898
Options	5,835,000
Fully Diluted Shares Outstanding	182,688,640
Insider Ownership	7.4% (8.7% fully diluted)

* As of February 1, 2019