A Novel and Non-toxic Immunotherapy Device

Priming the Immune System to Enhance Immunotherapy Response Rates

March 2025

Forward Looking Statement

This presentation contains forward-looking information under applicable securities law. All information that addresses activities or developments that we expect to occur in the future is forward-looking information. Forward-looking statements are based on the estimates and opinions of management on the date the statements are made.

Such forward-looking statements include, but are not limited to, statements regarding the benefits to accrue to Sona from the future development of Targeted Hyperthermia Therapy and the development of diagnostic devices.

Forward-looking statements are necessarily based upon a number of assumptions or estimates that, while considered reasonable, are subject to known and unknown risks, uncertainties, and other factors which may cause the actual results and future events to differ materially from those expressed or implied by such forward-looking statements, including the risk that Sona may not be able to successfully complete the Giacomantonio study, secure animal and human clinical studies, or develop the envisioned device or therapy, and the risk that equity financing may not be available on the anticipated terms or at all.

Actual results may differ materially from those set forth in this presentation due to risks and uncertainties affecting Sona and its products, including the demand for Sona's therapies and tests which may be adversely affected by introduction or success of competing products, the ability for Sona to successfully develop longer-term applications for its technology and other risks detailed from time to time in Sona's ongoing filings and in its most recent annual information form filed with the Canadian regulatory authorities on SEDAR+ at www.sedarplus.ca.

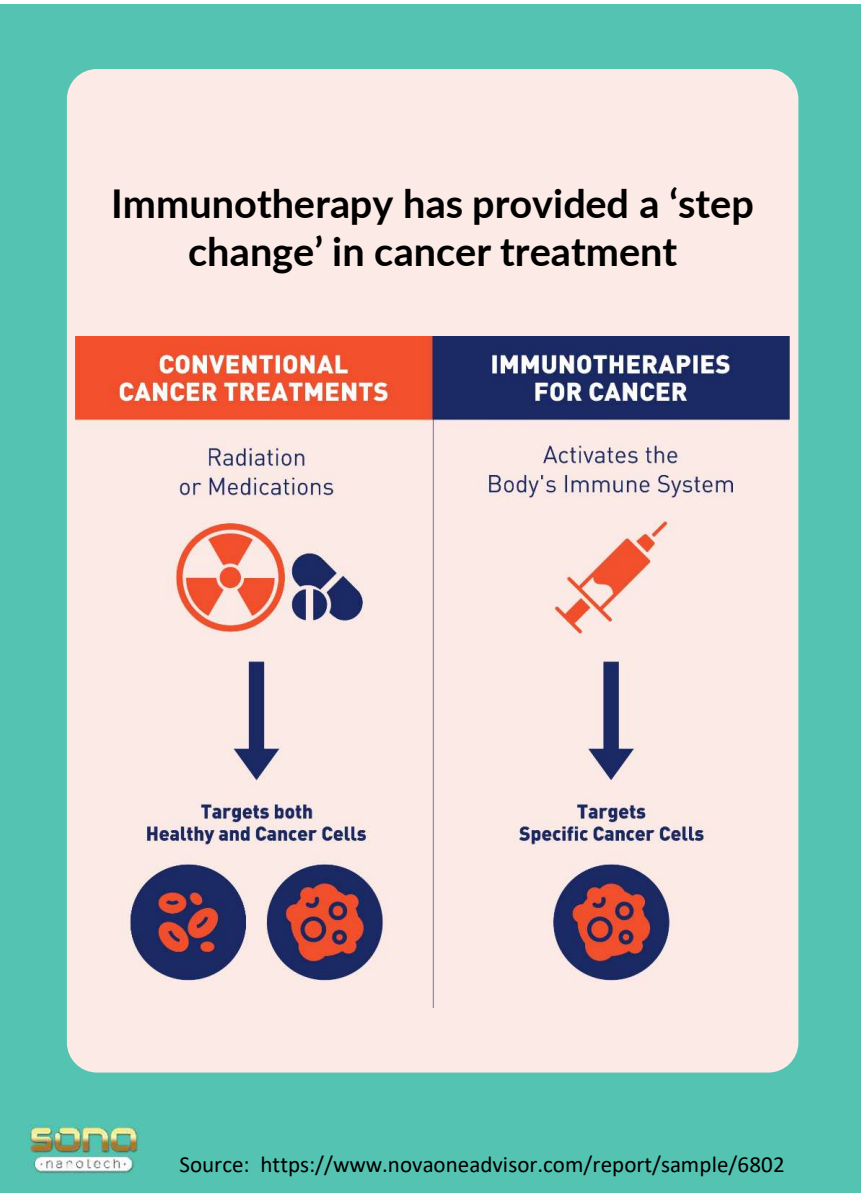
Readers are cautioned not to place undue reliance on these forward-looking statements and are encouraged to read Sona's continuous disclosure documents which are available on SEDAR+. Such statements should not be regarded as a representation that any of the plans, expectations or intentions will be achieved. Sona takes no responsibility to update forward-looking statements in this presentation except as required by law.

Investment Highlights

A New Treatment for Solid Cancer Tumors Leveraging Nanotechnology That Is **Powerful**, **Precise** and **Non-toxic**

- Gentle but powerful therapy – elegant and strong immune system activator
  - Heating tumors from the inside, out to elicit neo-antigens that engage the immune system and enhance immunotherapy drug response rates
- Uniquely biocompatible, patented and vetted nanotechnology platform
  - Ideal nanoparticle for many 'in vivo' applications
- Compelling pre-clinical efficacy data in three cancer models
  - Multiple therapeutic targets in cancers with immunogenically 'cold' tumors
- On the cusp of first-in-human 'Early Feasibility Study'
  - Initial readouts expected this summer
  - FDA-vetted plan for safety studies to support subsequent Pilot Study
- Strong and growing patent portfolio
- Experienced team and connected board

sona nanotech



Source: https://www.novaoneadvisor.com/report/sample/6802

Immunotherapy Checkpoint Inhibitors *Release The Brakes* For The Immune System To More Readily Recognize and Attack Cancer

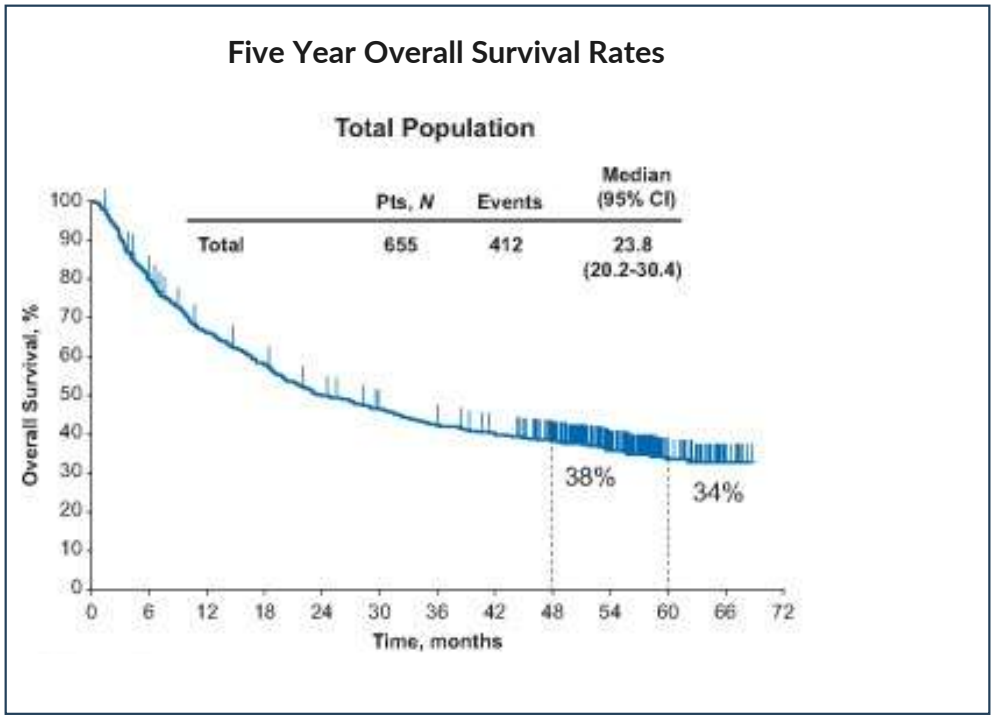
Immunotherapy treatments harness the immune system to fight cancer on its own

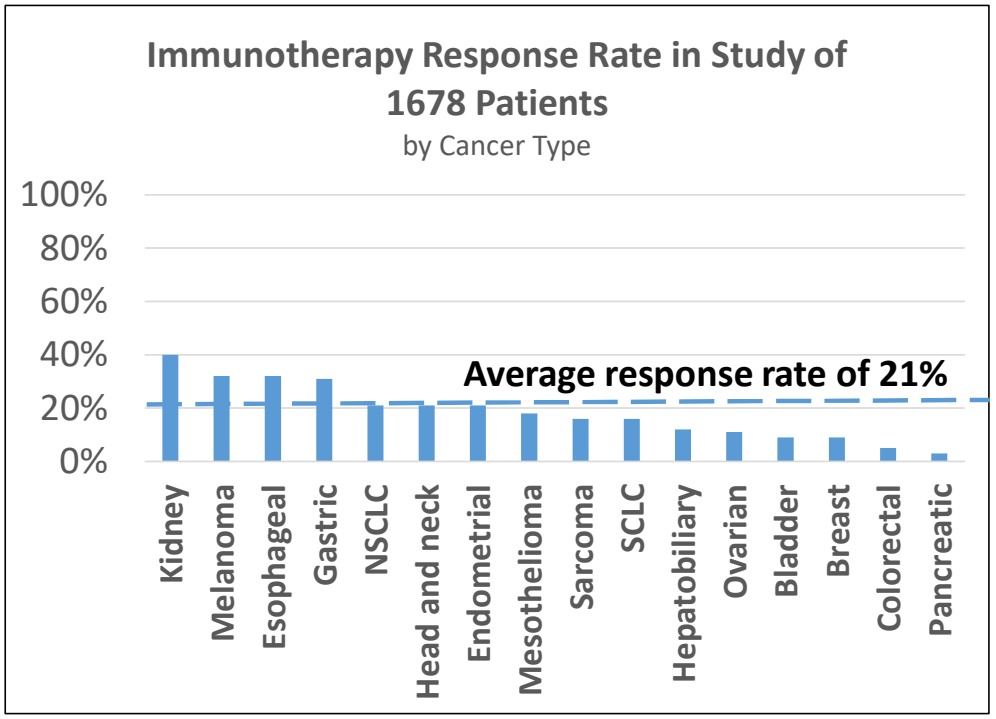
However, immunotherapy still has:

- **Limited response rates**
  - Typical response rate is 15-30%
- **Toxicity**
  - Severe toxicity is experienced in 16% - 20% of patients on an immunotherapy
  - Combining immunotherapies can enhance response rates but also increases toxicity

Sales of immunotherapy drugs were estimated to be USD $284.4 billion in 2024

For Instance, Pembrolizumab's Five-Year Overall Survival And Average Response Rates Were Shown To Be Just 34%(1) and 21%(2), Respectively





Notes: 1) In a study of overall survival in advanced melanoma
2) Patients treated with anti–programmed cell death 1 or programmed cell death ligand-1 immunotherapy

Sources: Melanoma Volume 30, Issue 4 p582-588; CA A Cancer J Clinicians, Volume: 73, Issue: 1, Pages: 17-48, First published: 12 January 2023, DOI: (10.3322/caac.21763)
Response Rates to Anti–PD-1 Immunotherapy in Microsatellite-Stable Solid Tumors With 10 or More Mutations per Megabase
Cristina Valero, MD, PhD,1 et al

A therapy is needed that can increase response rates, without inducing toxicity

Immunotherapy Response Rates Are Low Because Tumor Antigens Presented Are *Too Weak To Elicit An Immune Response*

Sources of Immunotherapy Resistance

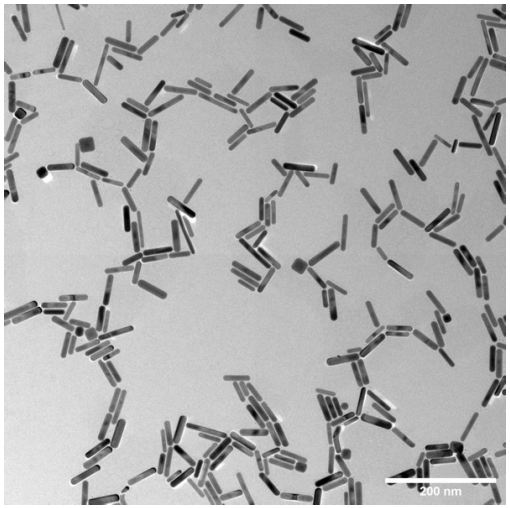
1. ***Weak tumor antigen expression***
2. Upregulation of immune-checkpoint molecules (immune fatigue)
3. Activation of alternative signaling pathways
4. Immunoediting

***More of a good thing isn't necessarily better*:**
Addressing a weak antigen tumor microenvironment with stronger/more IO drugs risks triggering autoimmunity and toxicity

How to reveal fresh and stronger tumor antigens to activate and engage the innate immune system, without toxicity?

Source: Cancer Resistance to Immunotherapy: Comprehensive Insights with Future Perspectives Sawsan Sudqi Said and Wisam Nabeel Ibrahim, in Pharmaceutics, April 2023

Sona's Patented Gold Nanorods Heat Tumors Gently From The Inside, Causing Selective ***Apoptotic Cell Death**** Which Reveals Neoantigens



Sona's Gold Nanorod's ("GNR") Advantages

Functional:
- Optimal nanoparticle for thermal conversion
- Can be 'tuned' to react to set wavelengths
- Can be conjugated to molecules

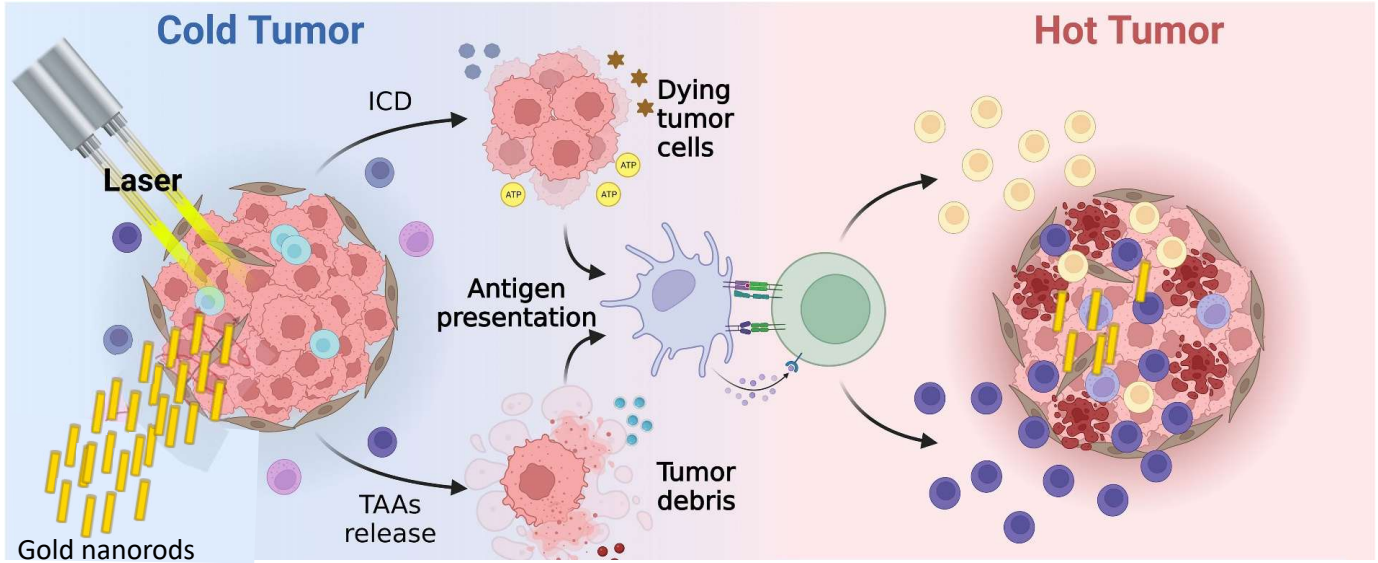
Uniquely Biocompatible:
Sona uniquely uses no toxin to make its 'GNRs'

Validated by:
NCL Nanotechnology Characterization Laboratory | NCI Alliance for Nanotechnology in Cancer

Apoptotic Cell Death:
When a cell actively self-destructs in a controlled manner. In so doing, the dying cells become more "visible" to immune cells due to the altered antigen presentation which can cause the immune system to engage and attack the cancer

Sona's 'Targeted Hyperthermia Therapy' ("THT") primes the innate immune system to engage without toxicity

Sona's THT Heats Tumors With Near-infrared-activated GNRs Turning Immunogenetically 'Cold' Tumors*, 'Hot'



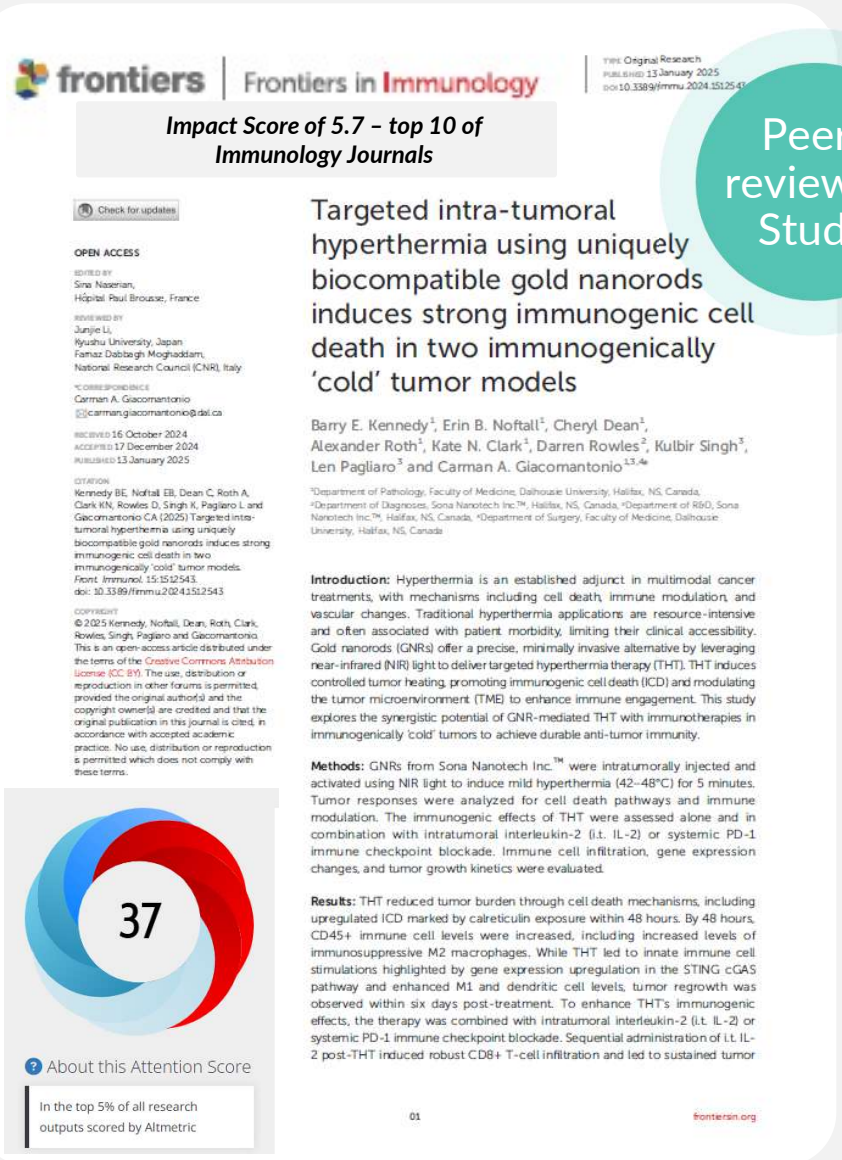
Cold Tumors:
Describes a tumor that is not likely to trigger a strong immune response. Cold tumors tend to be surrounded by cells that are able to suppress the immune response and keep T cells (a type of immune cell) from attacking the tumor cells and killing them. Cold tumors usually do not respond to immunotherapy. Most cancers of the breast, ovary, prostate, pancreas, and brain (glioblastoma) are considered cold tumors.

Converting tumors 'hot' enables immunotherapies to work more often thereby achieving higher response rates

Sources: Frontiers In Immunology; https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cold-tumor

Recent Study Demonstrates Sona's THT's Ability To Shrink Tumors, Engage The Immune System And Enable Immunotherapy

*Recent Preclinical Study Shows THT's Strong Efficacy in Melanoma and Triple Negative Breast Cancer, With Pronounced **Abscopal Effect***



frontiers | Frontiers in Immunology

TYPE: Original Research
PUBLISHED 13 January 2025
DOI 10.3389/fimmu.2024.1512543

Impact Score of 5.7 – top 10 of Immunology Journals

Peer-reviewed Study

Check for updates

OPEN ACCESS

EDITED BY
Sina Naserian,
Hôpital Paul Brousse, France

REVIEWED BY
Junjie Li,
Kyushu University, Japan
Famaz Dabbagh Moghaddam,
National Research Council (CNR), Italy

*CORRESPONDENCE
Carman A. Giacomantonio
carman.giacomantonio@dal.ca

RECEIVED 16 October 2024
ACCEPTED 17 December 2024
PUBLISHED 13 January 2025

CITATION
Kennedy BE, Noftall EB, Dean C, Roth A, Clark KN, Rowles D, Singh K, Pagliaro L and Giacomantonio CA (2025) Targeted intra-tumoral hyperthermia using uniquely biocompatible gold nanorods induces strong immunogenic cell death in two immunogenically 'cold' tumor models.
Front. Immunol. 15:1512543.
doi: 10.3389/fimmu.2024.1512543

COPYRIGHT
© 2025 Kennedy, Noftall, Dean, Roth, Clark, Rowles, Singh, Pagliaro and Giacomantonio. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Targeted intra-tumoral hyperthermia using uniquely biocompatible gold nanorods induces strong immunogenic cell death in two immunogenically 'cold' tumor models

Barry E. Kennedy[1], Erin B. Noftall[1], Cheryl Dean[1], Alexander Roth[1], Kate N. Clark[1], Darren Rowles[2], Kulbir Singh[3], Len Pagliaro[3] and Carman A. Giacomantonio[1,3,4]*

[1]Department of Pathology, Faculty of Medicine, Dalhousie University, Halifax, NS, Canada, [2]Department of Diagnoses, Sona Nanotech Inc.™, Halifax, NS, Canada, [3]Department of R&D, Sona Nanotech Inc.™, Halifax, NS, Canada, [4]Department of Surgery, Faculty of Medicine, Dalhousie University, Halifax, NS, Canada

Introduction: Hyperthermia is an established adjunct in multimodal cancer treatments, with mechanisms including cell death, immune modulation, and vascular changes. Traditional hyperthermia applications are resource-intensive and often associated with patient morbidity, limiting their clinical accessibility. Gold nanorods (GNRs) offer a precise, minimally invasive alternative by leveraging near-infrared (NIR) light to deliver targeted hyperthermia therapy (THT). THT induces controlled tumor heating, promoting immunogenic cell death (ICD) and modulating the tumor microenvironment (TME) to enhance immune engagement. This study explores the synergistic potential of GNR-mediated THT with immunotherapies in immunogenically 'cold' tumors to achieve durable anti-tumor immunity.

Methods: GNRs from Sona Nanotech Inc.™ were intratumorally injected and activated using NIR light to induce mild hyperthermia (42–48°C) for 5 minutes. Tumor responses were analyzed for cell death pathways and immune modulation. The immunogenic effects of THT were assessed alone and in combination with intratumoral interleukin-2 (i.t. IL-2) or systemic PD-1 immune checkpoint blockade. Immune cell infiltration, gene expression changes, and tumor growth kinetics were evaluated.

Results: THT reduced tumor burden through cell death mechanisms, including upregulated ICD marked by calreticulin exposure within 48 hours. By 48 hours, CD45+ immune cell levels were increased, including increased levels of immunosuppressive M2 macrophages. While THT led to innate immune cell stimulations highlighted by gene expression upregulation in the STING cGAS pathway and enhanced M1 and dendritic cell levels, tumor regrowth was observed within six days post-treatment. To enhance THT's immunogenic effects, the therapy was combined with intratumoral interleukin-2 (i.t. IL-2) or systemic PD-1 immune checkpoint blockade. Sequential administration of i.t. IL-2 post-THT induced robust CD8+ T-cell infiltration and led to sustained tumor

37

About this Attention Score

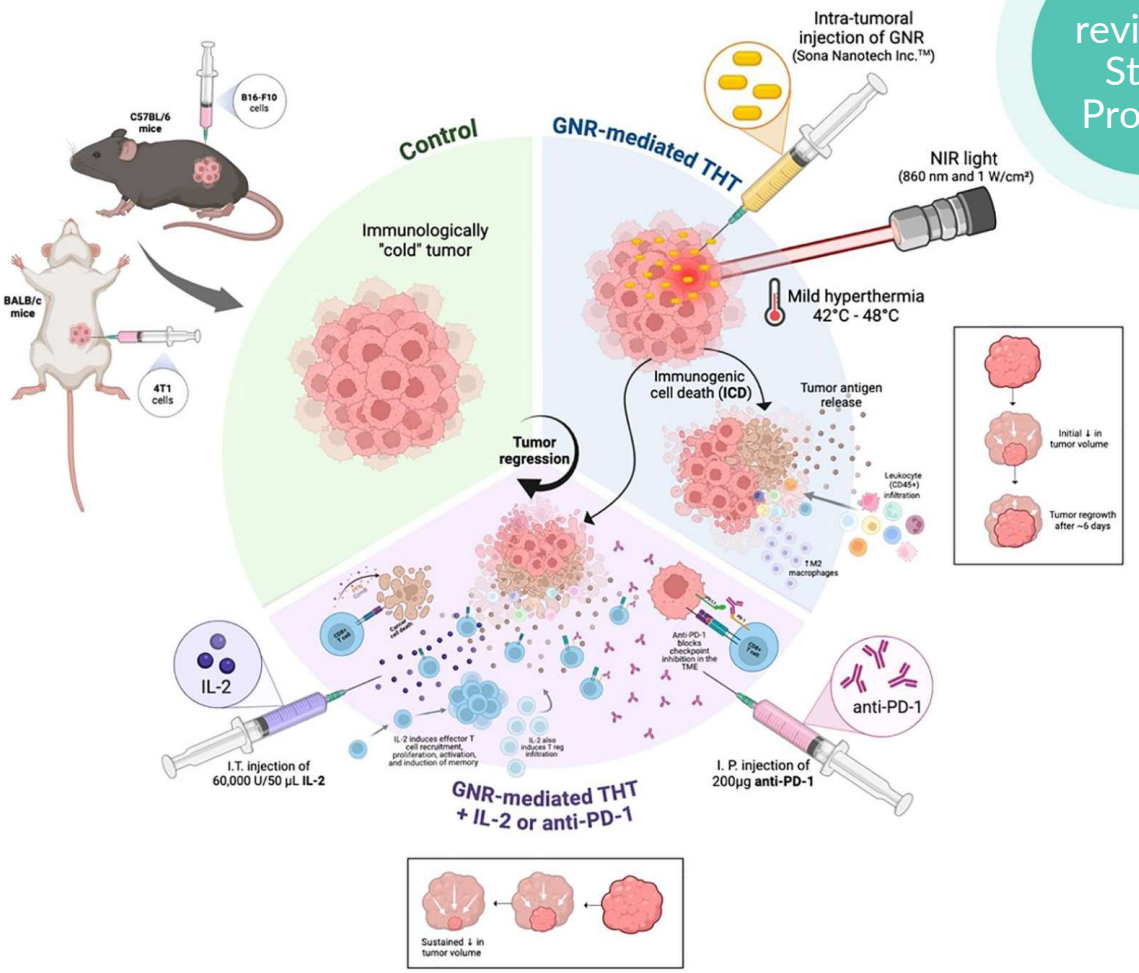
In the top 5% of all research outputs scored by Altmetric

Source: Frontiers in Immunology

Sona's Studies Examined The Impact Of Causing Hyperthermic Heat In Tumors With And Without Standard Of Care Immunotherapy

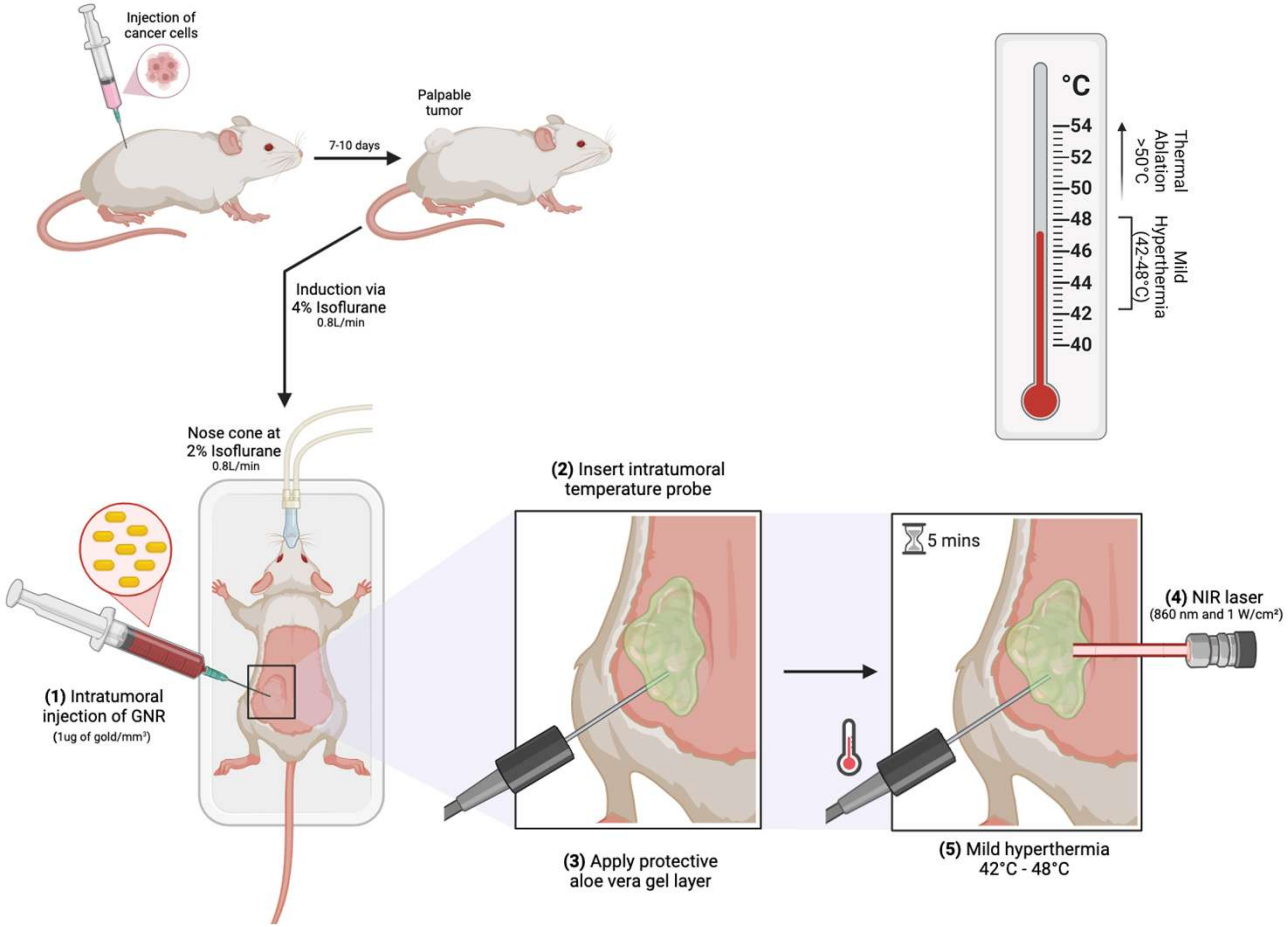
Sona used three different treatment groups in its peer-reviewed study:

1. Control
2. THT alone
3. THT + immunotherapy



Source: Frontiers in Immunology

Sona's THT Involves Two Injections Of GNRs Followed By ~5 Minutes Of Sona's Near-infrared Laser Energy Which GNRs Convert To Heat



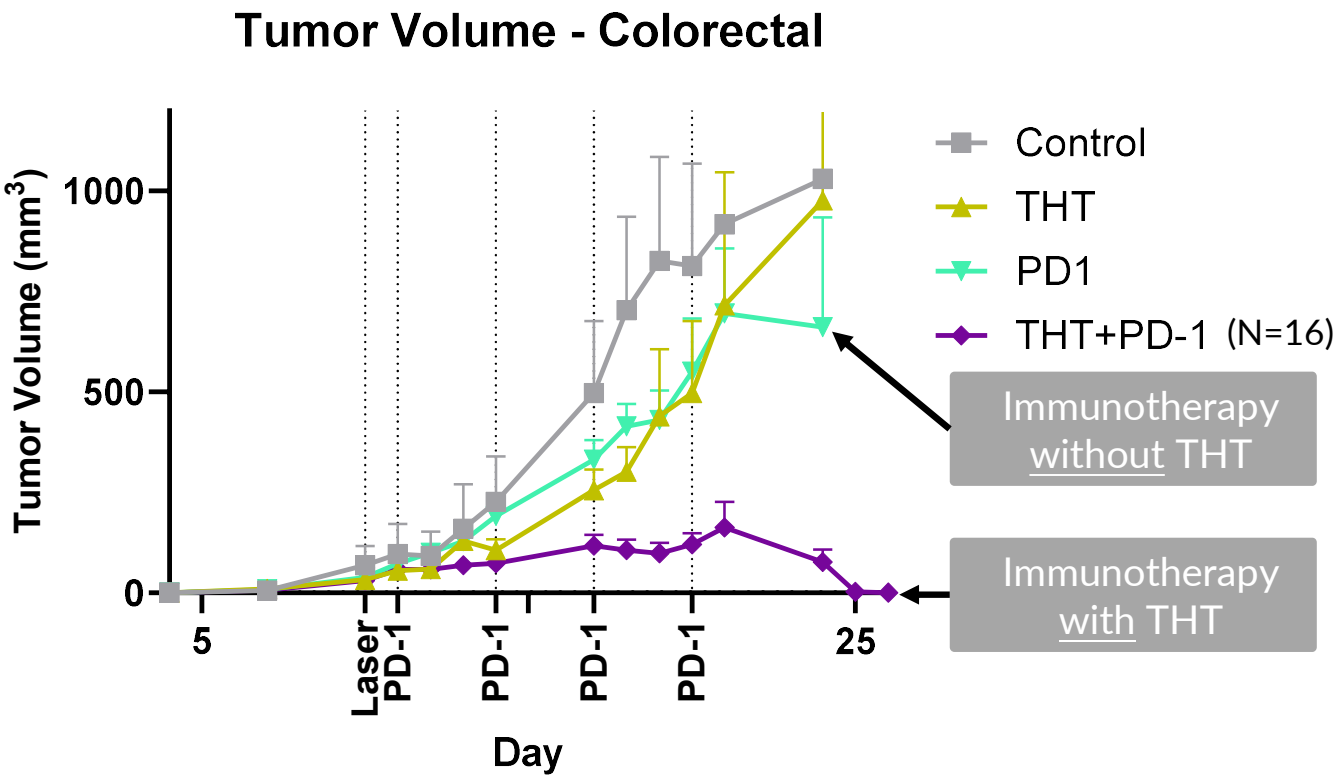
Maintaining 'hyperthermic' heat (42-48C) destroys cancer cells, which have a lower tolerance to heat, while not harming healthy cells

The laser energy passes harmlessly through tissue and into the tumor where the GNRs convert that non-thermal energy into heat

Source: Frontiers in Immunology

Sona's Studies Demonstrated THT's Ability To Make Immunotherapies Work In Colorectal 'Cold' Tumors....

New Data

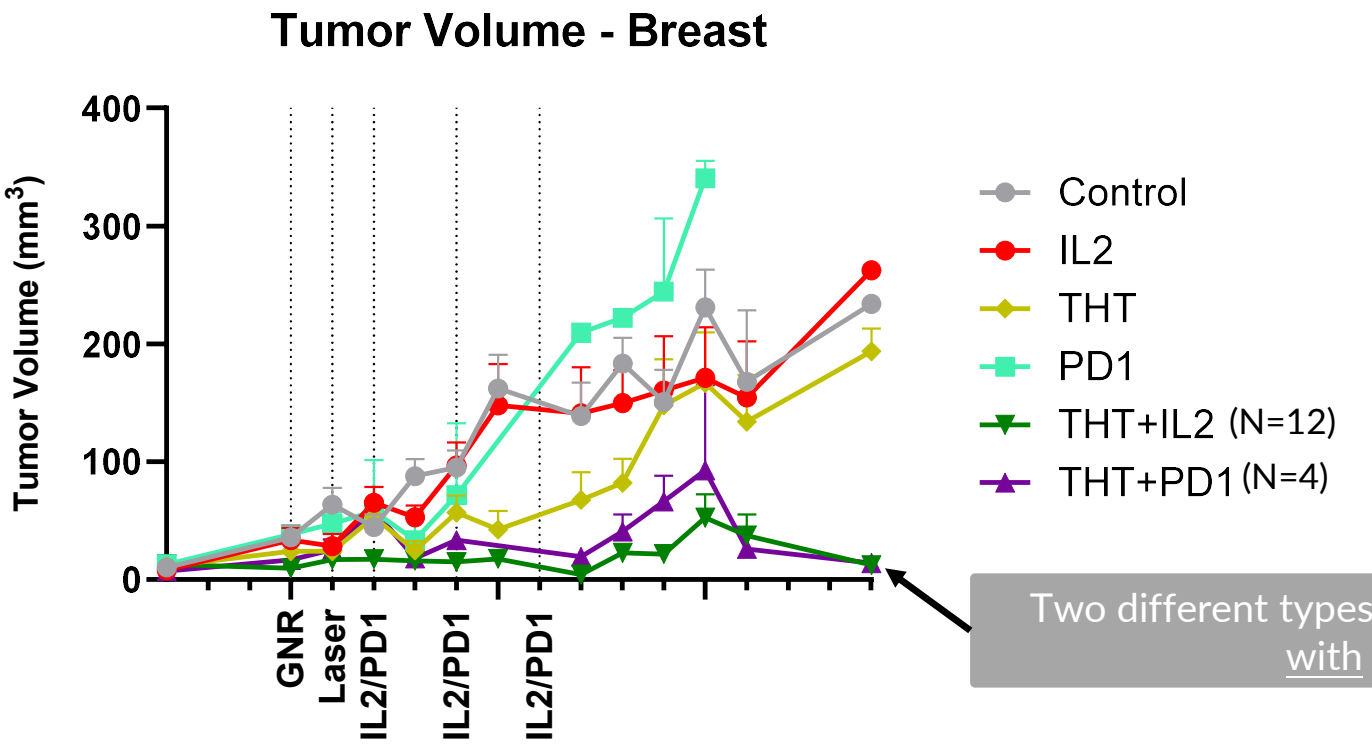


Sona's THT enabled tumor elimination by 26 days (n=4) with world class immunotherapy which had little effect on its own

Source: Frontiers in Immunology

…And Breast Cancer 'Cold' Tumors

New Data

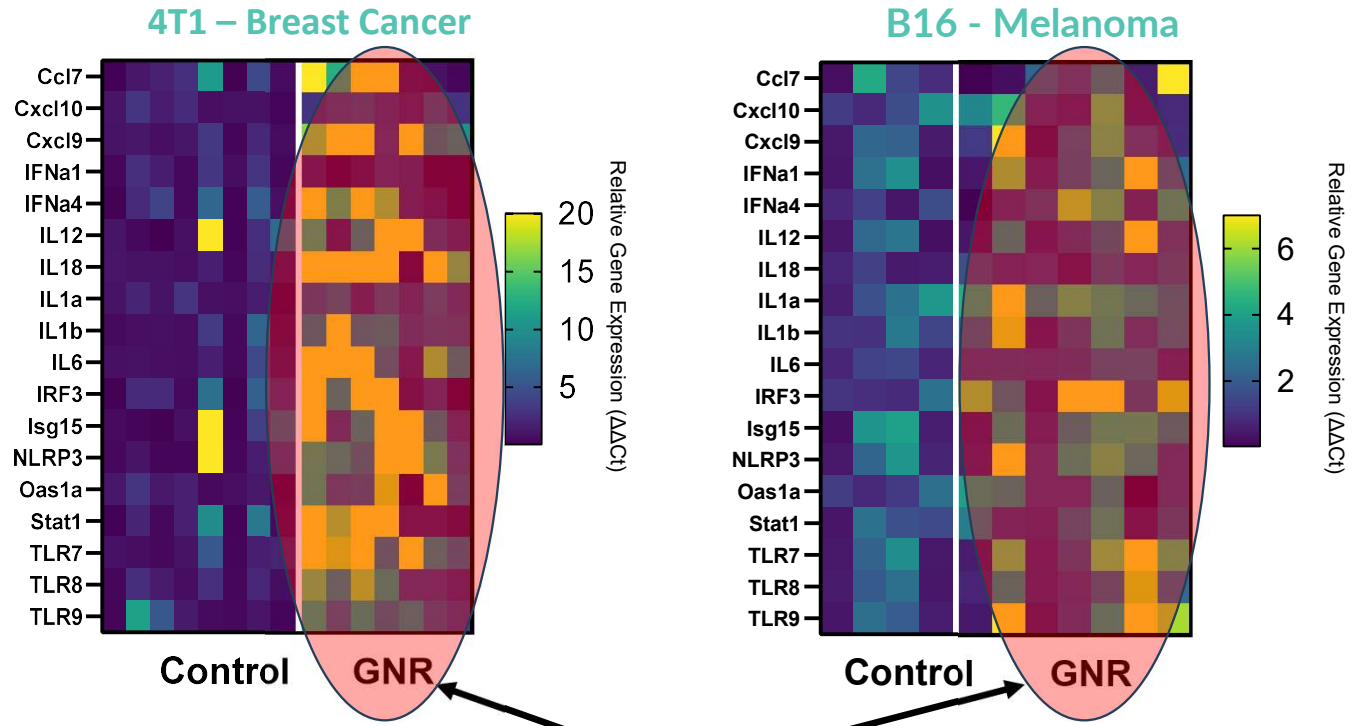


Two different types of immunotherapy with THT

Sona's THT enabled tumor near elimination with world class immunotherapies which had little effect on their own

Source: Frontiers in Immunology

Gene Expression Analysis Provides Strong Evidence That THT Alone Causes Innate Immune System Stimulation



Post-THT biopsies show greater infiltration of immune cells, meaning the immune system is actively attacking it

Notes: 1) Upregulation of Inflammatory Gene Expression in STING/cGAS/TLR Pathway Following GNR-Induced Hyperthermia in 4T1 and B16 Tumors
Source: The Giacomantonio Immuno-Oncology Research Group at Dalhousie University

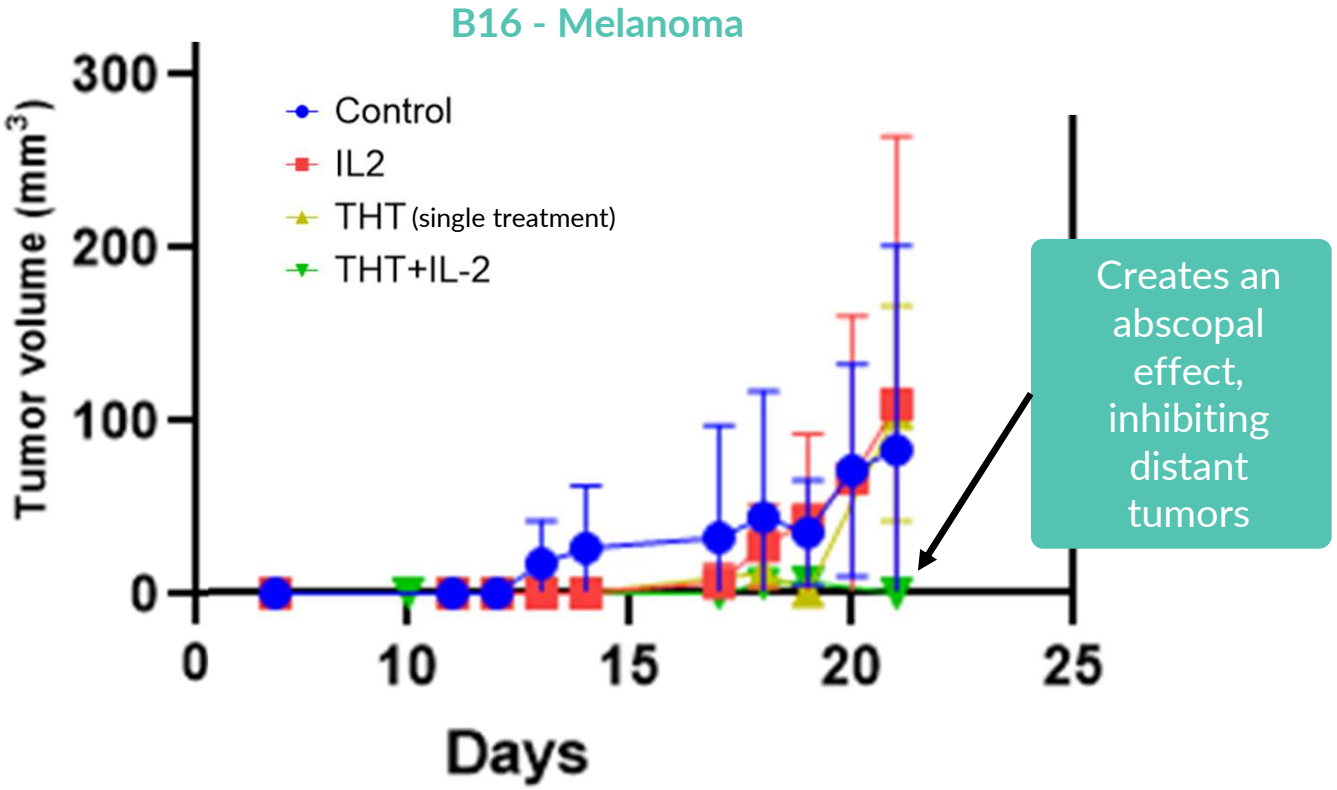
Most Remarkably, THT With Immunotherapy Prevented Growth In Distant, Untreated Tumors In The Melanoma Model

THT Showed A Vaccine-like Effect

In mice with one tumor treated with THT and IL-2, an abscopal effect was seen whereby distant, untreated tumors shrunk.

Further, newly implanted tumors did not grow, evidence of a vaccine-like effect.

Gene expression data suggests that this immunity **is lasting** and can provide for **future protection**.



*"This type of abscopal effect is **rare and highly sought after in cancer treatment protocols**."*
Dr. Carman Giacomantonio, Principal Investigator and Sona CMO

Preclinical Studies Have Established Efficacy, Safety And Potential Applicability To Three Solid Cancer Types, So Far

Conclusions From Sona's Preclinical THT Efficacy And Safety Studies

1. When immunotherapies haven't worked, THT has made it work
2. THT causes apoptotic cancer cell death, resulting in 'neoantigen' expression
   - New antigen expression 'wakes up' the immune system
3. Safety profile is enhanced as only inert gold is injected directly into tumors
4. Gene expression analysis supports THT as causing a strong immunogenic response, creating a lasting change to the immune system
5. THT created an ***abscopal effect*** whereby distant, untreated tumors shrunk

Sufficient preclinical data now exists to support a human clinical study

First-in-human, Early Feasibility Study Start Targeted For Q2

Early Feasibility Study Objectives

Primary: Evaluate the safety of THT treatment in patients with late-stage metastatic melanoma who have failed/partially responded to current standard of care melanoma immunotherapy.

Secondary: Evaluate the efficacy (tumor response rates) of THT treatment in melanoma patients.

Exploratory: To explore changes in immune cell infiltration and impact of THT GNR-induced hyperthermia on cytokine production.

Key Protocol Elements

- Two applications of THT, on day one and day eight, to create hyperthermia in superficial tumors, up to 2.5 cm in diameter, as an adjunctive treatment.
- Quantification and characterization of tumor-infiltrating immune cell populations in tumor biopsies pre- and post-treatment, and measurement of serum cytokine levels pre- and post-treatment.

Key Enrolment Criteria

- Up to 10 participants with stable or progressive cutaneous and/or subcutaneous skin lesions at stages 3C/3D/4M1
- All sites with visible/palpable otherwise unresectable melanoma, mucosal melanoma, and regions with extensive cutaneous and subcutaneous metastasis *e.g.* numerous in-transit lesions.

Sona's THT Therapy is Proprietary And Benefits From IP Protection

Sona's Four Sources of IP Advantage

Patents:

- **Method for Manufacture of Biocompatible Gold Nanorods**
  - Issued: USA, Canada and South Korea. Pending: PCT, EU.
- **Photothermal Near-Infrared LED Light Device**
  - Issued on Dec. 11, 2014, as US patent #10,064,940
- **Gold Nanoparticle Conjugates and Uses Thereof**
  - US patent #9,175,015 filed Aug. 22, 2008
- **Provisional Filings:**
  - Photothermal Near-Infrared Laser Light Device
  - Combination therapies for treating cancer
  - A gold nanorod conjugation concept for targeted drug delivery

Time Advantage:

- Moving quickly to maintain Sona's lead to be the first to be approved by regulators

Trade Secrets:

- Techniques for delivery of GNRs in vivo and application of laser
- Protocols for immunotherapy agent combinations

THT Theragnostic concept:

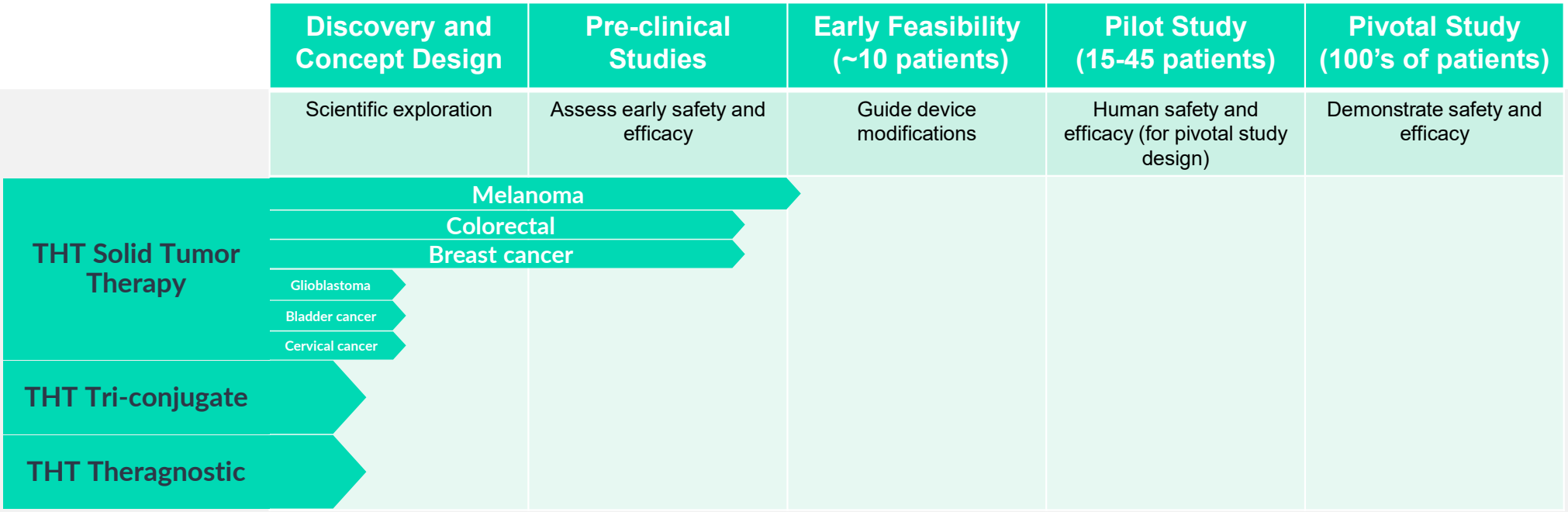
- ***Leveraging both the biocompatibility and functionality of Sona's GNRs to develop an antibody-GNR conjugate with radiology to detect and then treat specific cancers with near-infrared light***

THT Tri-conjugate concept:

- ***Leveraging both the biocompatibility and functionality of Sona's GNRs to develop an antibody-drug-GNR conjugate to direct drugs directly to a specific cancer and activity it with near-infrared light***

Sona Is Leveraging On Its Uniquely Biocompatible GNR Platform Technology To Develop Further Applications

Sona's Product Pipeline



Sona Is Investing In Building On Its Uniquely Biocompatible GNR Platform Technology

Sona's Product Pipeline

	2025			2026	
Program	Q2	Q3	Q4	H1	H2
THT Therapy (as adjuvant to immunotherapies)		Biocompatibility Feasibility Study Results Verified Second Laser Device EFS First-in-human Study First Dosing (1) THT Vaccine Effect Study Initial Results	EFS Initial Readouts (1)	Pilot Study First Dosing (1)	Pilot Study Initial Readouts (1)
THT Tri-conjugate			Internal Enablement Experiment Results		
THT Theragnostic				Internal Enablement Experiment Results	

Note: 1) Target timing assuming timely regulatory and ethics review board approvals and patient enrolment

A Team That Hits Above The Company's Market Capitalization Weight

Board

Mark Lievonen
Chairman
- Led vaccine maker Sanofi-Pasteur to a billion-dollar value

Walter Strapps PhD
Director
- CEO of Khosla Ventures CRISPR/Cas13 biotech

Neil Fraser
Director
- Led Medtronic Canada for ~20 years

Jim Megann
Director
- 25 years of experience in capital markets

Wayne Myles, KC
Director
- Senior M&A lawyer and entrepreneur

Management

David Regan, MBA
Chief Executive Officer
- Capital markets professional
- Former strategy consultant

Dr. Carman Giacomantonio
Chief Medical Officer
- Surgical oncologist & researcher

Len Pagliaro, PhD
Chief Scientific Officer
- Developer of Targeted Hyperthermia Therapy

Kulbir Singh, PhD
Head of R&D
- Co-Developer of CTAB-free gold nanorods

Darren Rowles, MBA
Head of Diagnostics
- 17 years' experience with nanoparticle diagnostics

Robert Randall, CPA
Chief Financial Officer
- Extensive public company experience

Advisors

Dr. Catherine J. Murphy
- Inventor of gold nanorods

Dr. Gerry Marangoni
- Co-developer of CTAB-free gold nanorods

Capitalization Table

As of March 7, 2025

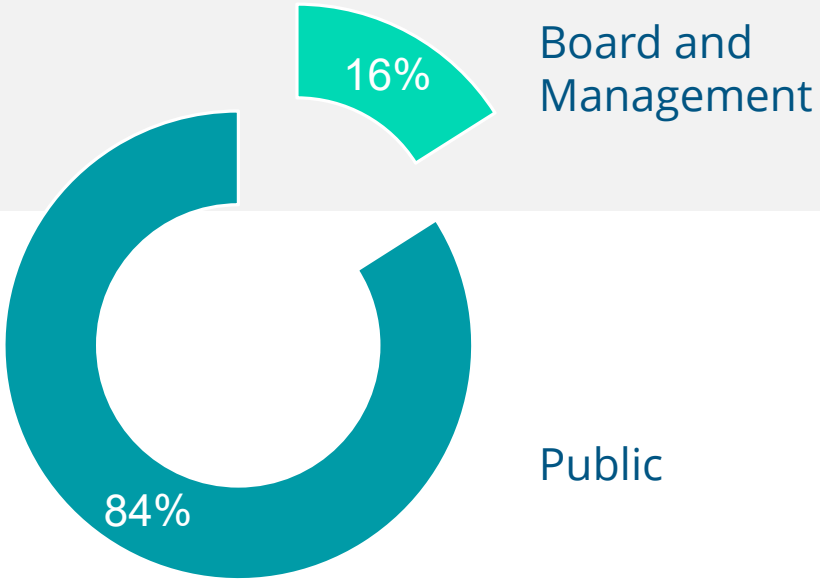
Market Capitalization

Share Price	C$0.30
Market Cap.	C$34M
52 Week High/Low	$0.56/$0.235

Capital Structure

Issued & Outstanding	112.5M
Options	5.9M
Warrants	3.0M

Ownership



Thank you

David Regan

CEO

Sona Nanotech Inc.

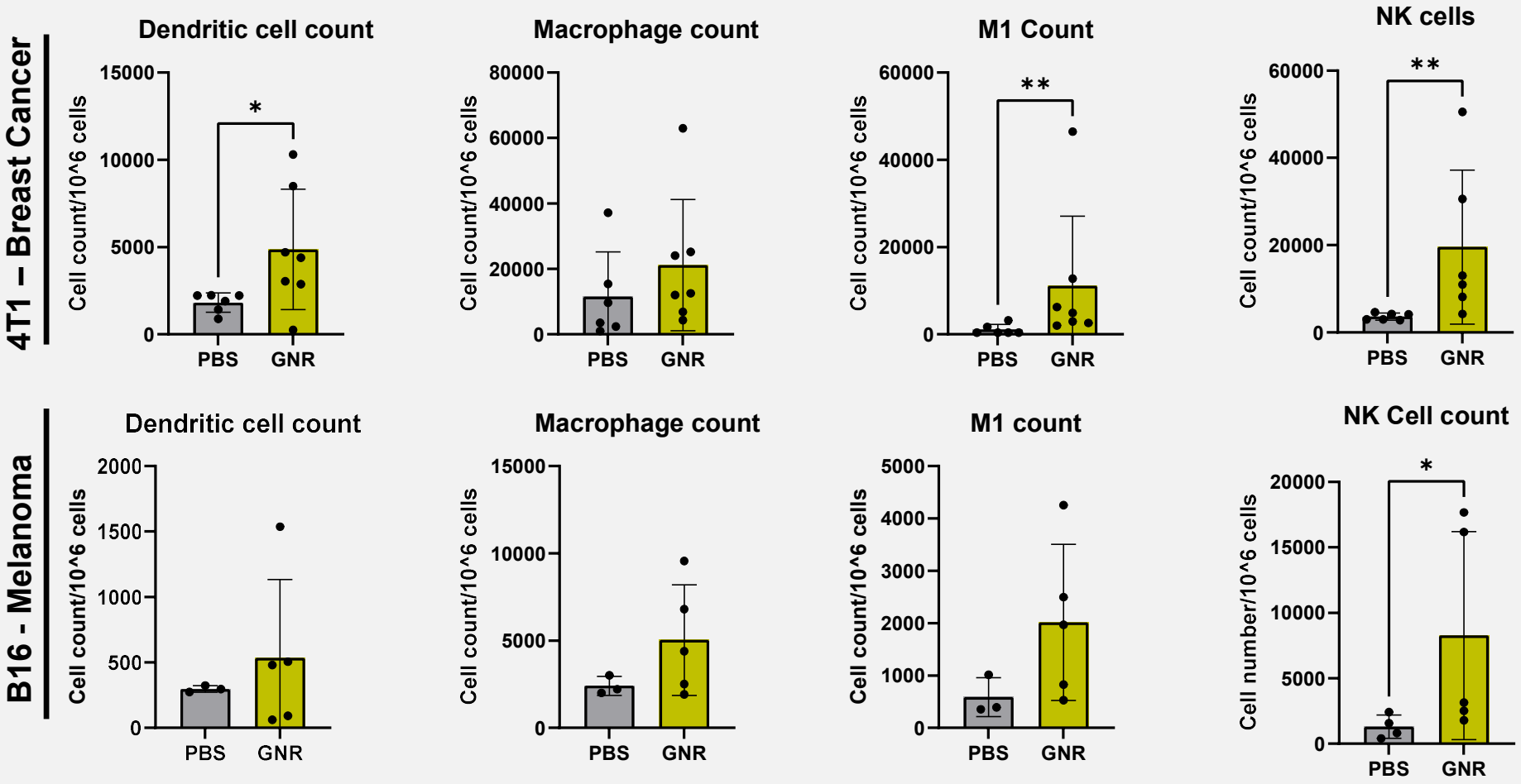
david@sonanano.com

+1 902 448 1416

Appendix

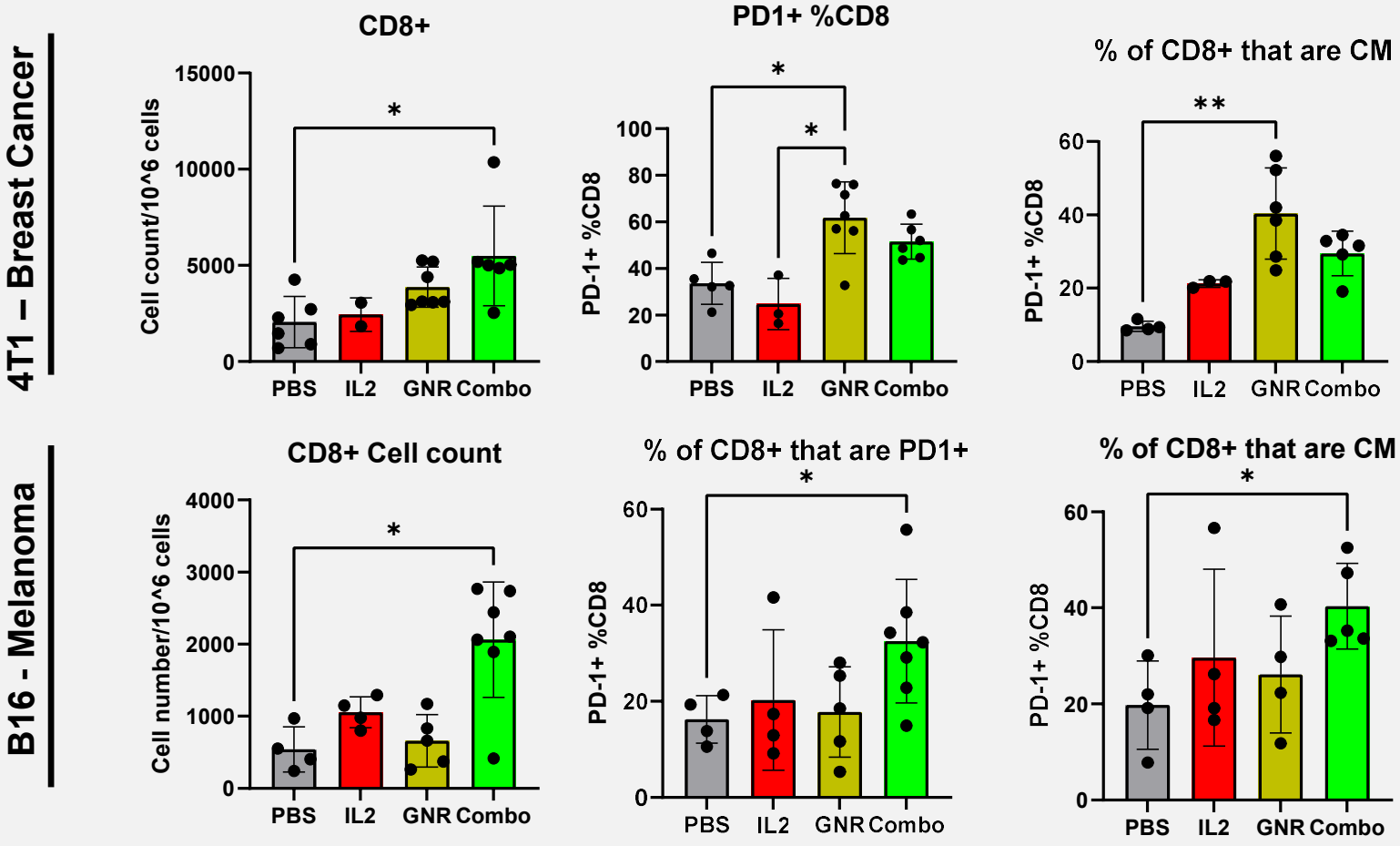
Biomarker data indicating impact and longevity of immune system modulation

GNR-Induced Hyperthermia Upregulates Innate Immune Cells in 4T1 and B16 Tumors



Source: The Giacomantonio Immuno-Oncology Research Group at Dalhousie University

Enhanced infiltration of CD8+ T cells into Tumors Treated with Combination Therapy



Source: The Giacomantonio Immuno-Oncology Research Group at Dalhousie University