

April 2, 2019



OncoSec Presents Promising Preclinical Data with New Product Candidate and Improved Electroporation Generator at AACR Annual Meeting

Data Shows New Product Candidate, using both CXCL9 and anti-CD3 with Enhanced IL-12, Drives Strong Immune Response to Shrink Tumors

Data Shows Improved Electroporation Generator Greatly Enhances DNA-Plasmid-based Anti-tumor Regression in a Difficult to Treat Preclinical Melanoma Model

SAN DIEGO and PENNINGTON, N.J., April 2, 2019 /PRNewswire/ -- OncoSec Medical Incorporated (OncoSec) (NASDAQ: ONCS), a company developing novel cancer immunotherapies, today presented pre-clinical data highlighting its novel anti-tumor product candidate, SPARK™, and its improved electroporation generator, "APOLLO™," during a poster presentation at the 2019 American Association for Cancer Research (AACR) Annual Meeting in Atlanta, Georgia.

The poster, entitled, *"Intratumoral electroporation of plasmid IL-12 and CXCL9 with membrane-bound anti-CD3 elicits robust anti-tumor immunity,"* provides new preclinical data demonstrating robust anti-tumor responses driven by significant enhancements made to OncoSec's proprietary cancer immunotherapy platform.

"The data presented at AACR highlight OncoSec's potentially game-changing approach to drug development. With this data, we show the ability to not only identify the right genes to have anti-cancer effect, but, importantly, that we can deliver those genes directly into tumor cells. We are able to do this with any gene that is identified as having an anti-cancer effect, without having to expose the patient to a systemic therapy, in an expeditious and cost-effective manner. In doing so, these cells convert immunologically cold tumors into inflamed immunogenic lesions, which is fundamental to generating objective responses in both treated and untreated distant tumors," said Daniel J. O'Connor, President and CEO of OncoSec. "Many immunotherapies are stalled for serious toxicity issues associated with treatment, including cytokine release syndrome. In contrast, our clinical studies, in more than 180 patients with several different tumor types, have demonstrated that TAVO has broad clinical activity without the toxicity commonly associated with IL-12. The foundation of our DNA-based immunotherapy relies on electroporation, which bypasses the pitfalls associated with viral vectors or systemic cytokines."

The Company's research laboratory discovered complimentary anti-tumor immunological pathways related to IL-12 derived from samples of previously treated TAVO patients. These

discoveries resulted in the selection of two new genes, CXCL9 and aCD3 (expressing membrane-bound anti-CD3), to further drive a now enhanced version of IL-12, utilizing P2A in place IRES (TAVO^{PLUS}). In parallel, OncoSec's researchers reengineered the Company's existing electroporation generator. The new generator, APOLLO™, greatly increases DNA-plasmid cellular transfection rates in order to deliver more anti-cancer fighting genes directly into tumor cells. These independent evolutions of both components of OncoSec's proprietary cancer immunotherapy platform converged in the design of its new product candidate, SPARK.

Highlights of the data presented at AACR regarding SPARK and APOLLO demonstrate that:

- APOLLO, using lower voltage and a longer pulse width, greatly increased DNA-plasmid cellular transfection rates to deliver more anti-cancer fighting genes directly into tumor cells;
- TAVO^{PLUS}, OncoSec's new proprietary IL-12 enhanced DNA-plasmid, which expresses full-length IL-12 via bicistronic expression of both the p35 and p40 subunits, coupled with APOLLO, meaningfully improves anti-cancer responses;
- SPARK, OncoSec's new proprietary product candidate, drives strong anti-tumor immune responses by combining two novel anti-cancer genes, CXCL9 and aCD3, with TAVO^{PLUS}
 - CXCL9 with TAVO^{PLUS}
 - Productively modulates immune/tumor microenvironment
 - Significantly increases antigen-specific CD8⁺ CTL
 - Augments abscopal response of TAVO^{PLUS}
 - aCD3, expressing membrane bound anti-CD3, with TAVO^{PLUS}
 - Drives polyclonal T cell expansion and antigen-specific killing *in vivo*
 - Augments abscopal response when combined with TAVO^{PLUS}
- aCD3 complements CXCL9 by strongly increasing cytotoxic anti-cancer tumor inflammation; and
- SPARK, when delivered via APOLLO, significantly improves regression of untreated (distant) tumors in a difficult to treat preclinical melanoma model

"The encouraging data presented at AACR demonstrate the potential of SPARK to integrate three key immunotherapeutic elements, IL-12, CXCL9 and anti-CD3 complementary, into a single novel, multi-gene expression platform that we believe will have broad applicability across numerous tumor types," said Christopher G. Twitty, Chief Scientific Officer of OncoSec. "Importantly, SPARK builds upon our plasmid-based cancer immunotherapy platform by amplifying the power of intratumoral IL-12 through the sequenced addition of both CXCL9, a critical T cell chemokine and anti-CD3, a membrane-bound strong pan T cell stimulator. We look forward to filing an Investigational New Drug (IND) application for SPARK."

A copy of the poster can be found on OncoSec's website, www.oncosec.com.

About OncoSec Medical Incorporated and TAVO™

OncoSec is a clinical-stage biotechnology company focused on developing cytokine-based intratumoral immunotherapies to stimulate the body's immune system to target and attack

cancer. OncoSec's lead immunotherapy investigational product candidate – TAVO™ (tavokinogene telseplasmid) – enables the intratumoral delivery of DNA-based interleukin-12 (IL-12), a naturally occurring protein with immune-stimulating functions. The technology, which employs electroporation, is designed to produce a controlled, localized expression of IL-12 in the tumor microenvironment, enabling the immune system to target and attack tumors throughout the body. OncoSec has built a deep and diverse clinical pipeline utilizing TAVO™ as a potential treatment for multiple cancer indications either as a monotherapy or in combination with leading checkpoint inhibitors; with the latter potentially enabling OncoSec to address a great unmet medical need in oncology: anti-PD-1 non-responders.

Results from recently completed clinical studies of TAVO™ have demonstrated a local immune response, and subsequently, a systemic effect as either a monotherapy or combination treatment approach. In addition to TAVO™, OncoSec is identifying and developing new DNA-encoded therapeutic candidates and tumor indications for use with its ImmunoPulse® platform. For more information, please visit www.oncosec.com.

KEYTRUDA® is a registered trademark of Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc.

OPDIVO® is a registered trademark of Bristol-Myers Squibb.

ImmunoPulse® is a registered trademark of OncoSec Medical Incorporated.

TAVO™ and APOLLO™ trademarks of OncoSec Medical Incorporated.

CONTACT

Investor Relations:

Will O'Connor

Stern Investor Relations

(212) 362-1200

will@sternir.com

Media Relations:


Katie Dodge

JPA Health Communications

(617) 657-1304

kdodge@jpa.com



 View original content to download multimedia <http://www.prnewswire.com/news-releases/oncosec-presents-promising-preclinical-data-with-new-product-candidate-and-improved-electroporation-generator-at-aacr-annual-meeting-300822616.html>

SOURCE OncoSec Medical Incorporated