Defence's Pipeline Advances to Multiple Phase I Clinical Trials

Vancouver, British Columbia--(Newsfile Corp. - February 27, 2023) - Defence Therapeutics Inc. (CSE: DTC) (FSE: DTC) (OTC Pink: DTCFF) ("**Defence**" or the "**Company**"), a Canadian biopharmaceutical company specialized in the development of immune-oncology vaccines and drug delivery technologies, is pleased to update its stakeholders on its completed achievements as well as outlining the future milestones set for 2023.

Over the last three years, Defence has been heavily active in developing its Accum™-based platform pipeline. The Defence team's strategy and priority is to prove and exploit the versatility of the Accum™ technology demonstrating that it can be used in multiple verticals including: **i)** the development of a cell-based anti-cancer vaccine targeting solid tumors, **ii)** the use of AccuTOX™, a small variant molecule derived from Accum™ backbone, as an anti-cancer injectable for solid tumors, **iii)** the design of an intranasal AccuTOX™ formulation to treat lung cancer using a non-invasive approach, **iv)** the development of a protein-based anti-cervical cancer vaccine with dual functions (prophylactic and therapeutic), **v)** advancing our breast-cancer specific antibody-drug conjugate (ADC) program with the goal to initiate a GLP study, and finally **vi)** investigating the boosting potency of Accum™ applied to the mRNA vaccination platform.

Figure 1

To view an enhanced version of this graphic, please visit:
https://images.newsfilecorp.com/files/8000/156207_7d208daa34e3581e_002bfull.jpg

The work conducted on each of the listed program's below are briefly described with much more news and updates to be released as development and advancement takes place. The Company will also entertain and evaluate the possibilities of partnerships, licensing of the technology and strategic joint development opportunities.

Development of a cell-based anti-cancer ARM vaccine

Defence used a variant of the Accum™ (the A1) to reprogram innate mesenchymal stromal cells into antigen presenting cells. This "off-the-shelf" universal vaccine (e.g. allogeneic to the recipient) is capable of curing animals with pre-established lymphoma and melanoma, and the observed therapeutic effects synergised with the use of the anti-PD-1 immune-checkpoint blocker. The vaccinated animals survived, and the great majority rejected the established tumour and remained tumour-free for over 3 months. Defence initiated the manufacturing of its ARM vaccine in Q1 of 2023 with the objective to start treating patients with solid tumors in a Phase I clinical trial by Q4 of 2023.

AccuTOX™ as an anti-cancer injectable

Cancer can be generally described as a state of uncontrolled cell proliferation. This is mainly due to losses in the ability of a given cell to activate its own cell death via a specific set of proteins known to sense unusual activities. Although it is difficult to reactivate these specific pathways to elicit cancer cell death, AccuTOX™ can address this challenge. AccuTOX™, an Accum™ variant, can control cancer growth when injected directly in tumors. The use of AccuTOX™ in combination with multiple immune-checkpoints results in a survival rate ranging between 60% and 100%, based on the pre-clinical tumor models studied in mice. As for the AccuTOX™ mode of action, a non-biased transcriptomic analysis revealed that the compound impairs pathways crucial to cellular function including DNA replication, cell division, nuclear integrity, and multiple modifications affecting DNA activity. The accumulation of exhaustive cell repair mechanisms triggered by AccuTOX™ combined to the build-up of misfolded proteins and generation of free radicals induce irreversible DNA damages leading to a general collapse in several cellular pathways resulting in effective cancer cell death.

The Defence team completed all preclinical and GLP studies related to the AccuTOX™ molecule as an injectable for solid tumors. The results showed that the drug can halt tumor growth and synergize with multiple immune-checkpoint inhibitors. Defence also demonstrated, in GLP toxicity studies, that the compound is safe and well tolerated using both rodents and canine animal models. Defence is currently working with City of Hope (Los Angeles, CA, USA) to prepare the IND package filing to initiate a Phase I clinical trial in melanoma patients.

An intranasal AccuTOX™ formulation for lung cancer

The previous success obtained with AccuTOX™ prompt the company to test an intranasal formulation in animals with pre-established lung cancer. Following completion of MTD studies to identify the best dosing regimen, AccuTOX™ administration was shown to decrease by over 50% the number of cancer nodules especially when combined with the anti-PD1 immune-checkpoint inhibitor. Defence is currently working with a US-based company to identify the best medical device for its AccuTOX™ delivery. GLP tox studies in dogs and rats has begun with the objective of measuring the safety of the formulation using a medical spray device. This milestone shall be followed by IND package filing to obtain approval for initiating a Phase I clinical trial against lung cancer. By demonstrating great safety and tolerability profiles in patients, AccuTOX™ can become the next generation anti-cancer treatment for a wide range of indications.

An engineered protein-based vaccine targeting cervical cancer

Cervical cancer is caused by the human papillomavirus (HPV), a sexually transmitted infection. Following epithelial cell exposure to this virus, various viral-derived proteins initiate a series of transformational events leading to cell immortalization and tumor development. Despite efforts used to reduce cervical cancer prevalence, there is currently no cure for this cancer besides standard of care (surgery). Defence used its proprietary Accum™ platform to engineer the AccuVAC-PT007, a protein-based vaccine targeting the E7 oncoprotein of the HPV virus. Defence's AccuVAC-PT007 provides complete protection against cervical cancer (prophylactic vaccination) despite multiple challenges. The vaccine was also effective at controlling pre-established cervical cancer growth, which was further amplified when combined with various immune-checkpoint inhibitors. For instance, AccuVAC-PT007 leads to 70% survival in rodents when used with either anti-PD-1 or anti-CTLA4. The use of the anti-CD47 antibody, a blocker of cancer-mediated inhibition of efferocytosis by phagocytic cell, amplifies the anti-tumoral response boosting survival to 100%. Defence completed GLP studies on rodents and is currently looking to either begin a Phase I clinical trial by its own or to establish a partnership with a Pharma for this program to initiate a Phase I clinical trial.

Advancing the Accum™-ADC program

The main clinical focus of ADCs companies has been in the field of breast cancer. However, the treatment regimen is long (numerous cycles), requires large doses, and the therapeutic response is

limited. By re-engineering these ADCs to contain Accum™ moieties, Defence has demonstrated that it is indeed possible to improve the potency of commercially-available ADCs by more than 100 folds. This approach applies to commercially available ADCs, and Defence is currently working in parallel on developing its *in-house* product using its proprietary antibody and payloads. Defence is also optimizing its formulation and evaluating different Accum™ variants to find the best combination for an optimal efficacy. The objective is to begin GLP studies in 2023 prior to IND package filing for initiating a Phase I clinical trial against breast cancer.

Accum™ to boost the therapeutic potency of mRNA vaccines

The mRNA vaccination approach offers tremendous advantages over the use of peptide- or protein-based vaccines. Unlike other biomolecules, mRNA is extremely sensitive to harsh conditions such as high acidity and enzymatic reactions, which would directly impede their therapeutic potency. In addition, mRNA molecules need to reach the cytoplasm where they can be efficiently translated into full proteins. This is where Accum™ may add stability and potency. Defence is therefore working with a private European company to synthesize mRNA vaccine coupled with its Accum™. Defence has now completed the first part of its Accum™-mRNA vaccine development by achieving the synthesis and the Quality Control of the amino-modified polyA tail mRNA. The company is currently working on the second step, which consists of coupling different Accum™ variants to amino-modified mRNA as well as testing and analyzing: i) the effect of Accum™ and linkers on mRNA stability, ii) the linker coupling onto amino-modified mRNA, iii) the Accum™ coupling onto linker-amino modified mRNA, and finally iv) the purification and analysis of the Accum™-linker-amino-modified mRNA. The third and last step of this Accum™-mRNA vaccine development, scheduled in Q2 od 2023, will be the production of a small vaccine batch to conduct *in vivo* studies in animals as a head-to-head comparison between Accum™-linked and "naked" mRNA vaccines for their potential to generate an immune response capable of eradicating and controlling established tumors.

About Defence:

Defence Therapeutics is a publicly-traded biotechnology company working on engineering the next generation vaccines and ADC products using its proprietary platform. The core of Defence Therapeutics platform is the ACCUM™ technology, which enables precision delivery of vaccine antigens or ADCs in their intact form to target cells. As a result, increased efficacy and potency can be reached against catastrophic illness such as cancer and infectious diseases.

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