Zentek and McMaster Announce Positive Results for Aptamer-Based Technology with Therapeutic Potential

written by Raj Shah | July 20, 2023

July 20, 2023 (Source) – **Zentek Ltd.** ("**Zentek**" or the "**Company**") (NASDAQ:ZTEK)(TSXV:ZEN), a technology development and commercialization company, is pleased to announce, further to its press release dated May 19, 2022, that its aptamer platform under global exclusive license from McMaster University ("**McMaster**") has been successfully tested as a potential prophylactic or therapeutic for SARS-CoV-2 in pre-clinical animal models. In repeat trials, the aptamers developed by Dr. Yingfu Li demonstrated similar efficacy against SARS-CoV-2 when benchmarked against a commercial monoclonal antibody.

This new aptamer, based on a novel approach, was developed under the exclusive worldwide 20-year license agreement between Dr. Li's lab at McMaster and Zentek first announced on June 17, 2021.

Pre-Clinical Trials

Dr. Yingfu Li's team developed a series of aptamers with high-binding affinity with the SARS-CoV-2 spike protein. In February 2023, the best performing aptamer against all variants of SARS-CoV-2 was tested *in vitro* to assess the neutralizing of the virus by the aptamer in Vero cells. With strong results, Zentek was motivated to move into *in vivo* trials.

Dr. Matthew Miller, the Canada Research Chair in Viral Pandemics

and the director of the Michael G. DeGroote Institute of Infectious Disease Research designed and supervised all of the pre-clinical trials. The first pre-clinical trial included three groups of mice: (i) Group A, which was a control group and received no prophylactic treatment, (ii) Group B, which received a commercial monoclonal antibody that was a leading antibody for the original SARS-CoV-2 strain until it was rendered ineffective due to antigenic changes in Omicron sublineages,and (iii) Group C, which received an aptamer designed by Dr. Li's team. All groups were infected with SARS-CoV-2. After four days, the mice that received the antibody and aptamer treatment had minimal weight loss, while the control group had a 10% body weight decline. In addition, the viral burden of the control group was measured at 10,000 PFU per lung. Significantly, the viral burden was undetectable in the lungs of the mice treated with the antibodies or the aptamer.

Based on these promising results, an additional trial was completed following the same procedure with a lethal challenge dose of SARS-CoV-2 where the mice were once again divided into three groups: control, antibody, and aptamer treatment. The control or untreated group lost 20% of their body weight after four days and all mice reached humane endpoints. The groups receiving either the aptamer or antibody treatment had less than a 5% reduction in bodyweight after the four days. The gross pathological assessment of these lungs at day 4 post-infection indicated that the aptamer, like the antibody, completely protected the lungs from any observable tissue damage. The control group's lungs on the other hand had evidence of significant hemorrhaging. In addition, the antibody and aptamer prophylactic provided sterilizing protection where no detectible viral titers were measurable, demonstrating similar performance between the commercial monoclonal antibody and the Li Lab aptamer.

Dr. Yingfu Li stated, “the binding affinity of our aptamers has translated exceptionally well to neutralizing the virus in both *in vitro* and more importantly in *in vivo* animal tests. Since the neutralization of the virus occurs because our universal spike-binding aptamer binds to the spike protein and prevents the virus from binding and infecting the ACE2 receptors, I believe this aptamer may be a potential prophylactic or therapeutic for all current and possibly future variants of SARS-CoV-2 including XBB 1.5. Having the *in vivo* pre-clinical results strongly correlating to the earlier *in vitro* results from my lab was not only very exciting but will be very helpful as a predictive model as we study new targets.

Dr. Matthew Miller commented, “Our lab has been at the forefront of COVID-19 research and vaccine development in Canada. Since the outbreak, we have been looking for therapeutics that are effective, safe and can be rapidly developed for current and future pandemic outbreaks. The results we observed with the Li Lab aptamers are incredibly exciting! I see great potential for these aptamers to be used to develop treatments and prophylactics for other potential targets. This is a significant first step in the pathway to prevent and treat COVID disease with aptamers.”

Aptamers: Safety Profile

Aptamers are synthetic single stranded DNA or RNA type molecules that are built from the same building blocks of human DNA or RNA; hence offering a significant positive safety profile and have already demonstrated such safety. The 2018 article entitled “Pharmacokinetics, Pharmacodynamics, and Safety of Aptamers” by Kovacevic et al. stated that aptamers are considered to be generally safe based on multiple studies of aptamers for therapeutic use. Reference to toxicology studies and off-target side effects also lead to the concluding statement that

generally, the safety of aptamers is very good.

Next Steps

Given the significance of these results and based on the importance of this opportunity, a pre-clinical plan is being formulated for the development of a COVID-19 therapeutic/prophylactic based on the Dr. Li aptamers. Dr. Li is also working on other targets for aptamer treatments, and these are under early investigation.

Greg Fenton, CEO of Zentek commented: “The results of this testing conducted by the Miller Lab, has exceeded our expectations. The potential of these aptamers to play a role in the prevention, detection, and treatment of Covid and potentially other diseases is significant. Additionally, what we understand about the safety profile of aptamer-based therapeutics also de-risks this project and could potentially lead to a shorter pathway to commercialization. We are currently focusing on this opportunity and the continued development of aptamers, for both therapeutic and diagnostic uses and this is now a high priority for Zentek.”

Amendment to McMaster License Agreement

Pursuant to a license agreement dated June 11, 2021 (the “**License Agreement**“), McMaster University granted to the Company, for a twenty-year term, a worldwide exclusive royalty-bearing license to use and practice certain aptamer-based rapid detection technologies to detect SARS-CoV-2. Effective June 23, 2023, The License Agreement was amended to broaden the scope of the worldwide exclusive license to apply to all aptamer and DNAzyme uses, including, but not limited to, diagnostics, therapeutics, and as neutralization agents, and not limited to SARS-CoV-2.

The Company is not making any express or implied claims that its product has the ability to eliminate, cure or contain the Covid-19 (or SARS-2 Coronavirus) at this time

About Zentek Ltd.

Zentek is an ISO 13485:2016 certified graphene technology company focused on the research, development and commercialization of graphene-based novel products seeking to give the Company's commercial partners a competitive advantage by making their products better, safer, and greener.

Zentek's patented technology platform ZenGUARD™, is shown to have 99% anti-microbial activity and to significantly increase the bacterial and viral filtration efficiency of both surgical masks and HVAC (heating, ventilation, and air conditioning) systems. Zentek's ZenGUARD™ production facility is located in Guelph, Ontario. Zentek's patent pending ZenARMOR™ technology platform is focused on corrosion protection applications.

For further information:

investorrelations@zentek.com

or

Greg Fenton, CEO Zentek: gfenton@zentek.com

To find out more about Zentek, please visit our website at www.Zentek.com. A copy of this news release and all material documents in respect of the Company may be obtained on Zentek's SEDAR profile at http://www.sedar.com/.

Forward-Looking Statements

This news release contains forward-looking statements. Since forward-looking statements address future events and conditions,

by their very nature they involve inherent risks and uncertainties. Although Zentek believes that the assumptions and factors used in preparing the forward-looking information in this news release are reasonable, undue reliance should not be placed on such information, which only applies as of the date of this news release, and no assurance can be given that such events will occur in the disclosed time frames or at all. Zentek disclaims any intention or obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, other than as required by law.

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SOURCE: Zentek