

Revolutionary Aptamer-Based Pathogen Technology from Zentek Unveils Rapid and Inexpensive Pathogen Detection Capabilities

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A Canadian company and their laboratory partner have developed a low cost simple and much faster way to better detect pathogens causing infections in our bodies. In recent weeks the team found a way to dramatically improve the effectiveness of this technology, which is really a medical breakthrough you won't likely see on the news, at least not just yet. Their technology uses 'aptamer' based diagnostics from a simple saliva test.

What is an aptamer?

Aptamers are short sequences of artificial DNA, RNA, XNA, or peptide that bind a specific target molecule or family of target molecules. In the case of today's company, they are using single-stranded DNA molecules capable of binding specifically with target proteins on the surface of pathogens such as SARS-CoV-2 to detect if a person has COVID-19 or potentially other pathogens.

Zentek Ltd.

[Zentek Ltd.](#) (NASDAQ: ZTEK | TSXV: ZEN) ("Zentek") is a certified graphene technology company focused on the research, development and commercialization of graphene-based novel products,

typically using nanotechnology.

Zentek's aptamer-enabled [Pathogen Detection Technology](#) is a low-cost, rapid, saliva testing, scalable technology initially to be used for COVID-19 testing, but can be adapted to detect other pathogens. Zentek has [exclusive worldwide rights to commercialize](#) their COVID-19 antigen testing aptamer-enabled technology. The technology is being developed by Zentek and their technology partners at McMaster University Li Lab, led by Dr. Yingfu Li.

Zentek's collaboration with McMaster University extends beyond its exclusive license and now encompasses all aptamer and DNAzyme uses, including diagnostics, therapeutics, and neutralization agents, not limited solely to SARS-CoV-2 applications.

Aptamer technology breakthrough, up to 250 times increase

Zentek recently announced a breakthrough in the team's aptamer-enabled technology, [stating](#):

"Dr. Yingfu Li and his team at the Li Lab have developed a novel aptamer technology that increases the binding affinity of aptamers by up to 250 times. The increased binding affinity enhances the limits of detection for aptamer-based diagnostics. In addition, the enhanced binding affinity may lead to the successful adaptation of these same aptamers for new therapeutic and prophylactic treatments. Binding affinity is a key metric in both diagnostic and therapeutic applications."

Understandably most people will not understand the implications of what is going on here, so I will spell it out. Effective

Aptamer-based pathogen technology opens up a whole new potential to 'rapidly and cheaply' detect pathogens. In time this can be expanded to potentially detect other markers of disease in the body. Furthermore, it has the potential to more effectively treat diseases. But that's the next chapter, best discussed another time and assuming Zentek continues down that pathway.

Dr. Yingfu Li recently [stated](#):

*"The novel aptamer technology platform developed in my lab at McMaster University is demonstrating a robust increase in binding affinity to every aptamer we have tried so far. Combining this technology with aptamers that have high specificity **has created a very exciting potential for new therapeutics and diagnostics**. The enhanced binding affinity from these new aptamers has led to **consistent and successful in vitro testing** in my lab and the lab of Dr. Leyla Soleymani for diagnostic applications, and more recently, with in vivo testing in the lab of Dr. Matthew Miller for therapeutic applications. These early results are very exciting, and we look forward to future work that applies the technology to other potential therapeutic and diagnostic targets."*

Note: Bold emphasis by the author.

The advantages of Zentek's aptamer technology for detecting Covid-19 or potentially other pathogens



The advantages of Zentek's aptamer technology are:

- **Simplicity & Comfort** – uses saliva rather than a nasal swab reducing aversion to testing and risk of error in the sampling process
- **Accuracy** – electrochemical sensing technology rather than lateral flow allows for sensitivity equivalent to a 36 count RT PCR
- **Mobility** – simple hardware lends itself to easy transport and high throughput, point-of-care testing
- **Speed** – results in under 10 minutes
- **Low Cost** – aptamers can be developed more quickly and cost effectively compared to antibodies allowing us to be highly competitive compared to currently available rapid detection tests now and into the future
- **Scalability** – new aptamers can be developed to detect numerous other pathogens giving our technology the ability to enhance safety and empower businesses, governments and our healthcare providers well beyond COVID

Source: [Zentek website](#)

The potential for aptamer-based disease detection is truly remarkable. There is also potential one day that aptamers can be used to much more precisely target disease treatment or prevention in the body.

Greg Fenton, CEO of Zentek [commented](#):

“Initially, we were working to develop aptamers for diagnostic purposes.....Dr Li’s initial breakthrough was important for diagnostic purposes, and now early testing points to the potential to create new therapeutics and prophylactics. I can’t emphasize enough how unexpected these results were to our team and how significant this development is if it is confirmed through future testing.”

For more details, investors can watch the recent Zentek CEO interview [here](#).

Zentek is now at the stage of commercializing their aptamer-enabled technology [stating](#) that they are “commercial prototyping

readiness, and working with [Halteres Associates](#), a world-leading bioscience consultancy, to assist us in our commercialization process.”

Zentek’s product pipeline

Graphene Pipeline: What We’re Working On

zentek



We know graphene: a key building block for a healthier and more sustainable future

Source: [Zentek company presentation](#)

Closing remarks

There is no more exciting company than Zentek. Apart from their aptamer technology Zentek has many other applications for their graphene nanotechnology including: [ZENGuard™](#) (a graphene coating applied to PPE to prevent Covid and other infections; also used for air filtration (HVAC) systems), [icephobics](#) (to prevent ice build up on planes etc), ZENArmor (corrosion resistance), [fuel additives](#) (helping reduce carbon emissions), [Graphene-wrapped silicon anodes](#), [conductive inks](#), [intumescent coatings](#), and [anti-inflammatory therapies](#).

Furthermore, Zentek makes their own graphene oxide at their Guelph facility and owns the Albany Graphite Deposit ([planned to be spun out](#)).

Zentek Ltd. trades on a market cap of [C\\$216 million](#). With commercialization of ZENGuard™ underway and Zentek's aptamer technology potentially to follow soon, Zentek is at a great stage to rapidly grow from here. Stay tuned in 2023 to see how Zentek performs and if they can successfully start to monetize their technology.

Zentek's Breakthrough Aptamer Platform Shows Promise in Fighting COVID-19

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In a recent interview conducted by Tracy Weslosky of InvestorIntel, Greg Fenton, the CEO & Director of Zentek Ltd. (NASDAQ: ZTEK | TSXV: ZEN), unveiled some thrilling developments surrounding the company's revolutionary aptamer platform. With an exclusive global license from McMaster University, this groundbreaking platform has demonstrated remarkable success in pre-clinical animal model tests as a potential prophylactic or therapeutic for SARS-CoV-2, the virus responsible for the ongoing COVID-19 pandemic. Spearheaded by Dr. Yingfu Li's team at McMaster, this platform harnesses a series of synthetic molecules known as aptamers, exhibiting a high affinity for the SARS-CoV-2 spike protein.

Will Sixth Wave help prevent a fourth wave?

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[Sixth Wave Innovations Inc.](#) (CSE: SIXW | OTCQB: ATURF) is a nanotechnology company focused on extraction and detection of target substances at the molecular level. Their products can be very cost effective and potentially eliminate human error from the testing or measurement process. These advantages are derived from the application of patented technologies in the highly specialized field of [molecularly imprinted polymers](#) (MIPs).

Sounds pretty technical so what does that mean to you and me? As we battle a third wave of COVID-19 we are crossing our fingers and hoping vaccines will save the day. Especially given, that for all the talk about rapid testing, we have yet to see an effective, accurate test used in a broad setting to help identify or track the spread of the SARS-CoV-2 virus. And who knows if all the variants that are popping up will continue to be effectively subdued by existing vaccines.

Enter Sixth Wave and their patent pending Accelerated Molecular Imprinted Polymers (AMIPs™) technology. Last week the company [announced](#) it has successfully demonstrated colorimetric detection of SARS-CoV-2. Colorimetric detection is a method of identifying the presence of a target substance within a test sample by means of color. For example, Green = COVID-19, Blue = Influenza, Red = Rhinovirus. And yes, the test could potentially identify multiple viruses in a single pass with different colors for each. Even better, the AMIPs™ test does not require the use of biological materials which have the potential to result in

errors (false positive or false negative). As well, the methodology utilized by AMIPs™ should be more robust in its ability to detect variants because the mechanism used to capture and immobilize the virus is not keyed to a specific Antigen-Antibody relationship. Lastly, this robust, reliable product should result in a lower cost, either to an individual requiring a test or a government trying to get a handle on this annoyingly resilient virus.

Imagine kids going back to school and they all have a mask utilizing Sixth Wave technology. All you need to do is check each student's mask and if it's green the child gets sent home otherwise they are good to go until the next day. Now what if everyone had a mask, or some other device with AMIPs™ technology, then everyone could get back to going to sporting events, concerts or weddings. Even air travel and cruise ships would be able to operate relatively seamlessly based on the individual not being green, so to speak. This could be the solution that gets us back to a semblance of normal.

Unfortunately, as good as this all sounds, Sixth Wave isn't the answer to all our problems just yet. Next steps include building on this initial validation toward the development of a colorimetric sensor for a potentially wide range of rapid Virus detection devices using AMIPs™. As well, the Company is proposing to create a comprehensive library of molecular imprints for other viral pathogens and variants. This AMIP library will be capable of being licensed for all manner of rapid detection test (RDT) devices and wearables, such as a smart mask, smart clothing and PPE applications, airborne sensors, Breathalyzers, and others. The groundwork has been laid but it remains to be seen if the company can capitalize on its efforts.

Nevertheless, the company has its Affinity™ System which uses

MIPs to deliver an innovative purification solution to the cannabis market. First revenue from cannabinoid extraction is expected in Q1/21. As well there is the IXOS product, a line of extraction polymers formulated for deployment in the gold mining industry for the extraction of gold from cyanide leach solutions. Sixth Wave is undertaking pilot plant testing of IXOS technology at a major gold producer (Kinross Gold Corporation). The company recently [raised \\$6M via a private placement](#) which should give them enough cash to continue developing and innovating its product base for another 6 months, give or take. It will be interesting to see if the company can start generating revenue to reduce the cash burn and advance all these exciting prospects.