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LK-1

AN ADVANCED VERSATILE DRUG FOR CURING HUMAN CANCERS

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FOR CURING HUMAN CANCERS

We have developed a **multi-functional**, **highly-versatile,** drug designed to specifically alter functioning of a variant of the **hCG-B-protein (commonly known as the** human **pregnancy hormone)**. We target the mutant variant of **hCG-B-protein** because of its unique properties underlying human cancers.

Those special properties include:

1. **Mutant-hCG-B-proteins** are present in **all** human cancers.

2. **Mutant-hCG-B-protein**s are the central cause of **all human cancers**.

3. **Mutant-hCG-B-protein** is essential for the viability of **all human cancers**.

OUR CANCER–CURE PROGRAM

Cancers have been a bane on humanity for all of history - with devastating results. Dr. Sid Mukherjeek published a popular book about human cancers: **THE EMPEROR OF ALL MALADIES.** The book makes clear that cancers today are widely regarded as the worst of all diseases from which people suffer.

Until about the **year 1900** most cancer patients were treated surgically - but very few patients survived such treatments.

SIGNIFICANCE OF Mutant hCG-B-protein AND ITS RELATION TO HUMAN CANCER

In the year **1920** a scientist discovered a large very unique protein structure which was identified as playing a major role - in **all human reproduction** (hence the name: **human pregnancy** hormone). Additionally, a variant of this protein has also been found in various **human cancers**; that protein being **Mutant-Human Chorionic Gonadotropin (hCG-B-protein).**

hCG-B-protein is essential to the life of all humans before birth. This unique protein is involved in a vast number of functions crucial to nurturing and protecting the baby, including evading the mother's immune system, protecting the baby from disease, formation of new blood vessels, and increased growth rate. Once the baby has developed to the point of its birth, typically 9 months, it no longer requires the hCG-B-protein so fundamental to its development during gestation. Therefore, the

hCG-B-protein is eliminated along with the mother's placenta as the baby is born, leaving only the belly button as a lasting mark. Because of that, now the mother and the child no longer have access to the hCG-B-protein.

At this point, the baby begins to enter maturity and as a mature human, that takes it into adulthood.

Tutorial on the Cause of Human Cancers:

A. Normal - hCG-B-protein

B. Mutant - hCG-B-protein

The normal DNA that codes for hCG-B-protein in humans is activated when the sperm and the egg join together, which induces the development of human embryos, and is unique to human development only. This normal hCG-B-protein is only expressed during pregnancy and not expressed outside of that.

In sharp contrast, in rare events only **Mutant-hCG-B-protein** is expressed outside of pregnancy due to mutagenic events. Specifically, when the genes in DNA that code for the unique human hCG-B-protein can be mutated by a variety of sources (radiation, high energy UV exposure, toxic chemicals, certain viruses, etc). Once mutated it will begin generating a hCG-B variant protein. When this mutant variant propagates it constitutes a cancer in the patient, and because of the differences between this mutation from the normal hCG-B-protein, typical targeting strategies aren't effective. This random mutagenic event to develop cancer is typically very rare, but with increasing decades there is an increasing probability of this random mutagenic attack developing over time.

Mutagenic events can alter the coding sequence of genes, such as the hCG-B-protein gene, leading to the production of faulty proteins. When these mutations occur, they disrupt normal cellular functions and interfere with the body’s processes, constituting cancer. Once the coding sequence is damaged, the gene no longer functions properly, causing the affected cells to lose their normal regulatory mechanisms. The mutated protein serves no beneficial purpose for the organism, and generally constitutes a detrimental disadvantage, resulting in uncontrolled

cell growth or other malignant changes. If the mutation continues unchecked, it commonly has the detrimental effects of cancer and ultimately threatens the life of the patient.

Structural Information of Normal hCG-B-Protein

The core hCG-B-protein sequence is a 145 amino-acid-long protein.

- This particular hCG-B-protein is synthesized in a ribosome within the cytosol of the cell.
- A smaller hCG-A-protein sequence of a different structure and function is a 92 amino-acid long protein.
- Typically, the larger hCG-B-protein pairs with the smaller hCG-A-protein to form a non-covalently-linked dimeric structure.
- After the dimeric structures have been assembled, a maturing process begins whereby glycosyl groups (a type of sugar) are attached to a wide variety of sites along both the hCG-A and hCG-B proteins. These mature glycosylated structures can enable an amazing variety of very complicated functions.

Failed Attempts to Target Mutant-hCG-B-Protein

By the **1970's** the **Mutant-hCG-B-protein** had been widely recognized as causing many different types of human cancers. Then in the year **1979** a research paper was published which, at that time, reported that **Mutant-hCG-B-protein** was the key structural element which instigates human cancers. From about the year 1980 through about the year 2010 the close connection between **Mutant-hCG-B-protein** and a wide range of human cancer types led a great many cancer researchers to attempt to precisely target the **Mutant-hCG-B-protein**. This attempt led to the quite reasonable premise that targeting the cancer-causing component should block the function of the **Mutant** hCG-B-protein and result in defeating the patient's cancer.

Generally, such molecular targeting was attempted by using the newly developed and highly promising precision-targeted monoclonal antibodies, (typically a human monoclonal antibody targeted against a specific protein site in the **Mutant-hCG-B-protein structure**). Alternatively, precision-designed small-molecule drugs were also used to try and block **Mutant-hCG-B-protein** in cancers - but often at greater

cost and complexity.

The hope was to achieve a significant therapeutic effect on multiple cancer types commonly found in association with cancers expressing **Mutant-hCG-B-protein**. Notably, when new more sensitive detection methods were employed, it was reported that human cancers are found to be expressing **Mutant-hCG-B-protein** at quite low levels at some stages and detectable at even trace levels in the cancer's life cycle.

In spite of considerable efforts and large expenditure over the course of three decades, researchers have been unsuccessful in blocking the **Mutant-hCG-B-protein** in human cancers. These attempts did not defeat even a single type of cancer due to **Mutant-hCG-B-protein** (which include unique sugar structures with extensive glycosylation and hyper glycosylation levels, along with an extensive length of the dual dimeric proteins). The sugars from the glycosylation process shields the dimerized **Mutant-hCG-protein** from attack by attempted therapeutic treatments, such as by monoclonal antibodies, or small-molecule-drugs.

The limitations of the past use of these targeting strategies is that they target the **Mutant-hCG-B-protein** after it exits the cell, and only after it has been glycosylated, which obscures the targeted site. These attempted therapeutic efforts are generally **far too little,** and **far too late,** to be of significant therapeutic value, which ultimately led to abandonment as a therapeutic strategy.

These therapeutic strategies consistently failed all attempts to defeat human cancers by failing to block **Mutant-hCG-B-protein**. Even monoclonal antibodies, which were revolutionary at the time, were unable to overcome the targeting challenges. This led the researchers to conclude that **Mutant-hCG-B-protein** is far too complicated to target and therefore **un-druggable** with the capabilities of the then-current technology.

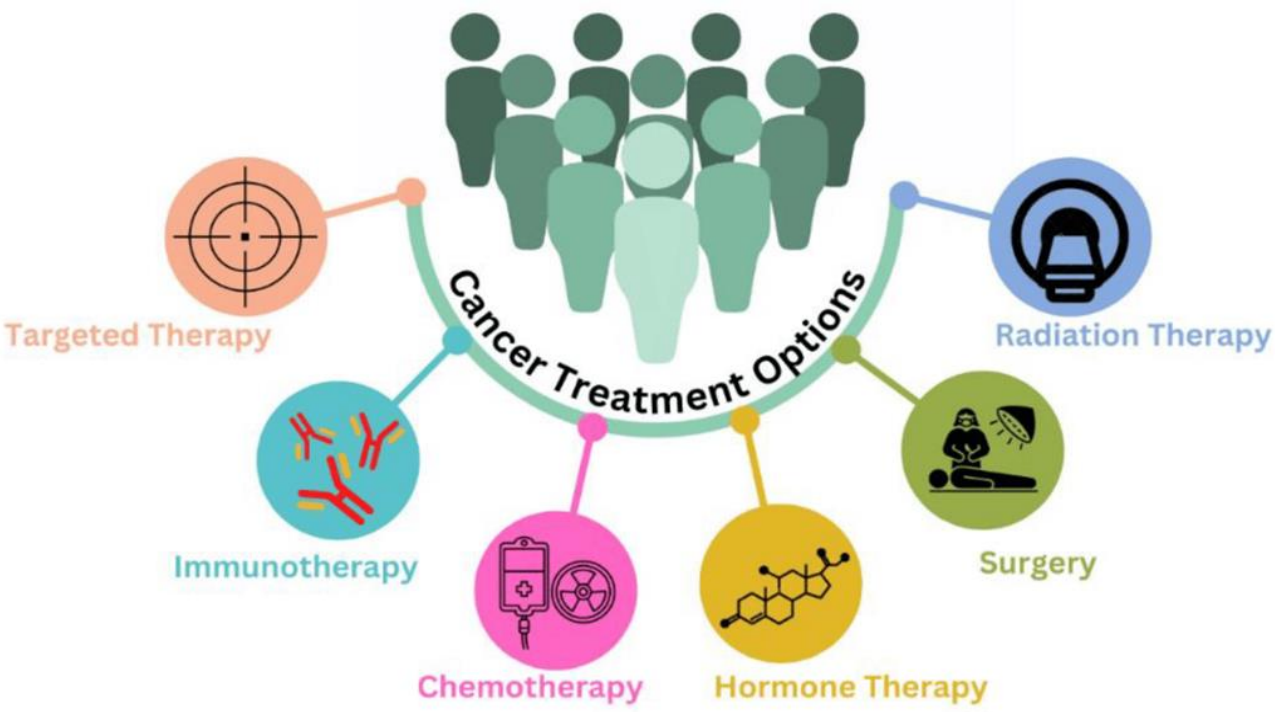
That **un-druggable label** led to a near-universal skepticism throughout virtually all of the cancer-research community in regard to the feasibility of targeting the **Mutant-hCG-B-protein**. Consequently, targeting **Mutant-hCG-B-protein** has almost entirely been abandoned by those in the cancer research community.

HOWEVER, this abandonment of **Mutant-hCG-B-protein** as a key target for cancer treatments was a dire misstep that has led to the stalling in the development of more effective treatments for cancer. This is because the hCG-B protein is the most **universal vulnerability** in human cancers, and without a plan to deal with the mutated variants, eventual remission is all but certain. **We contend that any treatment intended to be effective, broadly applicable, and long lasting must tackle the Mutant-hCG-B-protein in some fashion.**

Following the abandonment of earlier approaches, multiple other researchers explored alternative targets and pathways to develop new anticancer therapies. As a result, several FDA-approved conventional treatments are now available for cancer care.

Conventional Cancer Treatments

Currently, there are multiple other therapeutic strategies being pursued to kill cancer. Some with more success than others.



Targeted Therapy

Targeted therapy is a type of cancer treatment that targets proteins that control how cancer cells grow, divide, and spread. It was the foundation of precision medicine. As researchers learned more about the DNA changes and proteins that drive cancer, they were better able to design treatments that target these proteins.

Most targeted therapies are either small-molecule-drugs or monoclonal antibodies.

Small-molecule-drugs are small enough to enter cells easily, so they are used for targets that are inside cells. These drugs are used routinely, though monoclonal antibodies have become the dominant choice.

Monoclonal antibodies are proteins produced in the lab. These proteins are designed to attach to specific targets found on

cancer cells. Some monoclonal antibodies mark cancer cells so that they will be better seen and destroyed by the immune system. Other monoclonal antibodies directly stop cancer cells from growing or cause them to self-destruct. Still others carry toxins to cancer cells.

Targeted therapy does have some drawbacks.

Cancer cells can become resistant to targeted therapy. Resistance can happen when the target itself changes, and the targeted therapy is not able to interact with it. Or it can happen when cancer cells find new ways to grow that do not depend on the target. Because of resistance, targeted therapy may work best when used with more than one type of targeted therapy or with other cancer treatments, such as chemotherapy and radiation. When targeted therapy was first developed, scientists thought that it would be less toxic than chemotherapy. But they have learned that targeted therapy can also cause serious side effects.

Hormone Therapy

Hormone therapy is a cancer treatment that slows or stops the growth of cancer that uses hormones to grow. Because hormone therapy blocks the body's ability to produce hormones or interferes with how hormones behave, it can cause unwanted side effects.

Immunotherapy

Immunotherapy is a type of cancer treatment that helps the immune system fight cancer and there are several types of

immunotherapies used to treat cancer. Immunotherapies can share problems found in other therapeutic approaches.

Chemotherapy

Chemotherapy is a drug treatment that uses powerful chemicals to kill fast-growing cells in the patient's body. These are typically **small-molecule cytotoxic drugs.**

Many different chemotherapy drugs are available. Chemotherapy drugs can be used alone or in combination to treat a wide variety of cancers.

Though chemotherapy can be an effective way to treat many types of cancer, chemotherapy treatment also carries a risk of severe side effects. Some chemotherapy side effects are mild and treatable, while others can cause serious complications.

Famed cancer researcher **Dr. Vincent DeVita's** superb book "The Death of Cancer" describes the first major advance in chemotherapy: "high-dose multi-cocktail chemotherapy". Of particular value, DeVita also describes a variety of concepts and principles that help organize the massive complexity of cancer. Also, in his book DeVita suggests jointly targeting multiple cancer hallmarks as a promoting therapeutic strategy. DeVita and his colleagues' advances increased the **overall survival rate of cancer patients an unprecedented leap from 25% to 62%.**

Nonetheless, these treatments can often fail to provide effective cures, particularly for aggressive metastatic cancers.

The Inception of Innovative Therapeutic Technologies

The promise of **Mutant-hCG-B-protein** as a universal cancer target was undeniably compelling, but it was ultimately abandoned prematurely due to the technological limitations of the time. While targeting **Mutant-hCG-protein** made sense in theory, the available methods for therapeutic implementation were not advanced enough to realize its potential. Even though new high-tech monoclonal antibodies were a dramatic improvement at the time, new technology was required to overcome the failures of monoclonal antibodies.

Summerton and his new collaborator (soon to be Dr. Kinion) were unsatisfied with the current treatment options. With the determination to re-evaluate the supposed impossibility of tackling **Mutant-hCG-B-Protein**, we invited the two world experts on the hCG-B-protein, Dr. Larry Cole and Dr. Stephen Butler (who jointly authored the most publications on the subject). The goal was to discuss possible alternatives to the conventional targeting strategies. Although the experts were confident about the benefits

of blocking **Mutant-hCG-B-protein**, this meeting ultimately failed to come up with better alternatives and did not result in a suitable advance.

Figure 1. Labeled left to right: James Summerton, Lena Kinion, Larry Cole, Donald Moss, Stephen Butler.

Subsequentially, Summerton and Kinion at Morpholino Therapeutics, LLC later devised and developed a mixture of highly un-conventional strategies and our newly developed technology to target the **Mutant-hCG-B-protein**.

In sharp contrast to the conventional strategies, our ultra -precision-targeted **LK-1 drug** decisively and very specifically

enables blocking of the function of the **Mutant-hCG-B-protein**, thereby achieving the central goal of destroying human cancers. This novel and innovative therapeutic strategy works by targeting directly **inside the cytosol** of the cancer cell and before the dimerization and/or addition of the glycosyl groups of the **Mutant-hCG-B-protein**. This strategy prevents the ribosome from making the final protein structure of **Mutant-hCG-B-protein**, which the cancer cells rely on to propagate.

Can Our LK-1 Drug Block All Human Cancers?

Yes, our **LK-1 drug** can cure all human cancers by leveraging our affordable unique 3-component drug structure to effectively target a crucial weakness shared by every known human cancer type. Each of the three components provides a vital mechanism missing from other anti-cancer strategies.

The first component is our advanced targeting

technology, which is selective to block the function of **Mutant-<u>hCG-B</u>-protein**.

<u>The second component</u> delivers the targeting component from the site of injection into the patient, then penetrates the cell and ends its journey where the **Mutant-hCG-B-protein** is synthesized; inside the cytosol of the cancer cell. This allows the first component to prevent the maturation of **Mutant-hCG-B-protein** by blocking its function. This allows the drug to eliminate cancers regardless of the type of cancer.

<u>The third component</u> of the LK-1 drug is our unique multi-functional structural agents. These components protect our drug from degradation in both the body, and in the cell. These special structures even shield the drug from lysosomal degradation. These multifunctional agents also avert immune responses common to other therapeutics. Furthermore, these allow highly predictable targeting, and provide several important logistical benefits, such as good aqueous solubility and stability sufficient to persist unharmed through autoclave temperatures. Finally, it is affordable due to its efficient assembly and easy

workup.

Treating Brain Cancers

Brain cancer makes up about 25% of all cancer cases. Since LK-1 is too large to pass through the blood brain barrier on its own, we collaborated with Dr. Edward Neuwalt at the Oregon Health and Science University. Dr. Neuwalt pioneered a system which involves introducing a high-osmolarity solution to temporarily permeabilize the blood brain barrier allowing LK-1 to effectively treat brain tumors. This allows treatment with our technology in what would otherwise be a very difficult attempted treatment strategy.

Contributors to our LK-1 drug development

1. Lena Kinion, B.S., and nearing a Ph.D.

Lena completed her Bachelor of Science in chemistry in 2017, and soon thereafter joined GENE TOOLS where she assisted Summerton in his research. Because of her high competence, Lena was persuaded to pursue a Ph.D. in Biochemistry with

Summerton's full support and while also working at GENE TOOLS. By late 2021 she was well along in her doctoral course work, had passed her prelims, and had settled on, and carried out preliminary planning for her intended extremely challenging dissertation project titled: "Development of a broad-spectrum cure for human cancers". The company Morpholino Therapeutics, LLC then set Lena up with her own well-equipped research lab optimal for starting her dissertation project – which she began 02 Jan. 2022 - by taking a 1-year leave of absence from her doctoral program to spend a full 12 months highly focused exclusively on her dissertation project. By the end of 2022 she had completed design and synthesized the sophisticated LK-1 drug, plus she had obtained compelling proof-of-principle results showing that the drug was indeed a broad range treatment for human cancers; that it destroys the cancers; and, that it does not harm normal cells because mutant hCG-B-protein is not expressed in normal cells.

We have named this new drug "LK-1" in honor of **L**ena **K**inion having been the first to Design, Synthesize, and Test a drug expected to defeat all human cancers.

Additionally, after confirmation studies are completed, those very impressive research results are to be submitted for patenting and subsequentially publication.

- Designed, Synthesized, and Tested the first functional LK-1

drug.

- Continues to optimize functions and expand applications.

2. Dr. Donald Moss, Ph.D.

- Carried out key studies of the **hCG** component that clarified the steps involved in destroying the cancers upon deletion of hCG.

- Provided, and continues to provide a variety of technical skills, scientific insights, and a broad knowledge base in biology, and particularly in neurology, which he picked up in the course of his many decades spent in inventing, developing, and testing of the most effective, safest, and least expensive of all drugs for treating Alzheimer's disease.

3. Dr. James Summerton, Ph.D.

- **Conceived and implemented the <u>first antisense drug strategy</u> (November 1969). This was a new and novel break-through targeting genetic strategy to effectively**

and precisely block the coding RNA sequence (ie. "The *sense* RNA genetic sequence of a selected gene target).

- Submitted the first antisense publication (J. Theoretical Biol. 1973 – rejected by reviewer as a "**pipe-dream**")

- Subsequently published an expanded version of that first **antisense** paper finally published in 1979 - after completing proof-of-principle experiments demonstrating the feasibility of the **antisense concept -** based on his postdoc work carried out at UC Berkeley (funded by NIH).

- Filed first **antisense** patent application (US Patent 4,123,610, issued October 1978), assigned to NIH in thanks for NIH funding his postdoc fellowship at UC Berkeley.

- Founded first **antisense** company **(ANTIVIRALS Inc.)**

- Invented a radically re-designed **antisense** technology resulting in the **Morpholino structural type** with dramatically improved structural properties particularly in regard to the use for constructing novel products for special uses (6 issued patents).

<u>For more information:</u>

<u>See Morpholino Therapeutics addendum 1</u>

- Founded (and self-funded) another antisense company (**GENE TOOLS, LLC**) focused on providing custom-sequence antisense tools for modulating the function of any genetic sequences a researcher (from anywhere around the world) might wish to study. Note that GENE TOOLS offers free access to abstracts and citations of the over **12,280** published scientific papers reporting on results of experiments with **GENE TOOLS'** custom products ordered by their customers over the decades.

- Over the course of more than two decades GENE TOOLS' crew of gene-targeting-experts, and our crew of experts in producing precision-targeted antisense oligos, have produced a wide variety of research tools. The following are of particular note:

    1. A large family of practical research tools for use in the very demanding Developmental Biology Field. (Think zebrafish, and a whole class of custom research tools **not plagued by off-target problems**.)

2. One of our components was used successfully in the first experiment to treat progeria (a rapid-aging disorder with a patient life-expectancy of 15 years).

3. This component was also developed into the first ever FDA-approved treatment for Duchenne muscular dystrophy. Now followed by three additional FDA-approvals using this strategy to target other variants of Duchenne muscular dystrophy.

4. This component was successfully developed into a treatment for the childhood disease of spinal muscular atrophy - the major killer of children.

4. James Patrick Summerton

- Organization of information, focus on requirements still needed to complete the defeat of all human cancers.
- Substantial contributions in providing advice and assistance in drafting this letter.

5. Patricia Ann Summerton

- Patience and considerable assistance in making this presentation clean and compelling, and keeping James's computer-swearing to a minimum.
- Also serviced as an accountant for decades to support the development of new technologies through various companies.

6. Michael McAllister

- Validated LK-1's elimination of cancerous cells through in-vitro testing in 17 different human cancer cell lines. These cancer cell lines were composed of many different cancer types including: triple-negative breast cancer, ovarian cancer, choriocarcinoma, cervical cancer, lung cancer, colon cancer, gastric cancer, melanoma, glioblastoma, pancreatic cancer, and leukemia - which is a major cancer that devastates children.

7. Alan Schwartzman

- Business operations, public outreach, and assistance with organization of information.

Where Do We Go From Here?

We are looking for your help in collaborating with us in pursuing further confirmation of the efficacy of the LK-1 drug. We propose to provide quantities of the drug to interested collaborators and consultants to join us in validating the remarkable cancer killing effects of the LK-1 drug. In addition to seeking collaborations, we will pursue support from various institutions and foundations including the Biden-Harris cancer moonshot program, to provide advisement and logistical assistance in optimizing the drug for use in humans.

While pursuing this assistance we are also working to gain approval to treat no hope cancer patients. These cancer patients are those who have been deemed terminal ("no hope patients") and are under hospice care. Since these patients have exhausted all other cancer therapies and treatments, treating no hope patients will provide a clear opportunity to evaluate the LK-1 drug's effectiveness and provide true hope to otherwise terminal patients. If any no hope patients reading this paper would like to assist in the human testing of LK-1, please reach out to the email address on the front page.

We believe we have developed the capability to cure all human cancers. Due to the randomness of the mutagenic events that cause cancer, properties of these cancers may widely vary. While every cancer should be susceptible to our LK-1 drug (because hCG-B-Protein is the sole trigger for all human cancers), it will still need optimization of the treatment conditions to tackle the different cancer types. We ask that organizations dedicated to defeating cancer join us to bring this cure to no hope cancer patients.

You may enjoy the following addendums that provides further information and support for our cancer - cure program

Addendum

1

Morpholino

Precise And Efficient Targeting Tools

(**Morpholino antisense oligos**)

From 1985 through 1989 **Dr. James Summerton** pursued a project to radically re-design RNA (ribonucleic acids) with the explicit objective of incorporating special properties expected to be of value for pharmaceutical, therapeutic, and research applications, as well as avoiding properties expected to be detrimental for those applications. In 1989 that project culminated in a new class of products named: "**Morpholino Antisense Oligos**", or just: "**Morpholinos**". Each Morpholino is designed to very specifically bind and block a complementary single-stranded RNA sequence under physiological conditions.

The unique structure of such Morpholinos is radically different from conventional nucleic-acid-based antisense agents. Specifically, most conventional antisense oligos contain

5-membered ribose or deoxyribose backbone ring structures joined by **negatively charged intersubunit linkages.**

In sharp contrast, **Morpholinos uniquely contain 6-membered morpholine backbone ring structures** joined by **neutral linkages to provide versatile utility.**

The unique structural properties of Morpholinos (replacement of ribose backbones with **morpholine backbones**, and replacement of negatively charged intersubunit linkages with **non-ionic intersubunit linkages**) provide a host of advantages over more conventional antisense oligos, including the following **advantages of Morpholinos**:

a) resistant to enzymatic degradation (including within lysosomes);

b) does not generate an immune response;

c) by far the greatest sequence specificity for their complementary RNA;

d) essentially free of off-target effects;

e) highly predictable targeting;

f) free passage between cytosol and nucleus of cells;

g) can alter splicing in the nucleus;

h) can block protein translation in the cytosol;

i) can block binding of regulatory proteins and non-coding RNAs;

j) stable at autoclave temperatures;

k) good aqueous solubility;

l) affordable due to: cheap precursors; efficient assembly; and, easy workup.