



Certificate



Aptagen Labs

Fast-Tracking Breakthroughs in Drug Discovery with Aptamers



G. Thomas Caltagirone,
President and CEO

Today, aptamers are beginning to overshadow the long-held dominance of antibodies in the drug discovery industry by offering a more efficient path to therapeutic breakthroughs. Researchers, biotech companies, major pharmaceutical firms, and government organizations are increasingly turning to aptamers when antibodies fail to provide the specificity, stability, or binding affinity required for complex diagnostic and therapeutic applications. Aptamers, being sequence-defined and chemically synthesized, are cost-effective to produce, highly consistent, and easily modifiable, making them a valuable alternative to antibodies.

Over the past 20 years, the research community and pharmaceutical companies have invested significant efforts into developing aptamer technology. Among

them, Aptagen Labs stands as one of the top three global CROs of DNA-based antibodies—aptamers—for diagnostics, therapeutics, and bio-industrial applications. In its 30 years in the industry, Aptagen Labs has served a wide variety of clients, including the Centers for Disease Control and Prevention (CDC), Pfizer, Merck, and Genentech.

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Aptamers for Specific Drug Discovery

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Aptamer technology offers a shorter development time compared to traditional methods and can be used to increase the specificity and improve the delivery of existing drug compounds, resulting in the next generation of pharmaceuticals with enhanced pharmacodynamics and pharmacokinetics. Manufacturing costs and time are also lower compared to monoclonal antibody production. Once the aptamer (nucleic acid) sequence is known, the aptamer (synthetic antibody) can be produced on-demand using an oligo synthesizer to meet immediate needs.

Aptagen’s services are neatly compartmentalized into distinct categories, such as a DIY discovery kit for

researchers with technical resources. This kit allows researchers to develop aptamers independently in their own labs, enhancing their lab capabilities. It contains sufficient reagents for 12 rounds of selection and PCR amplification, including an instruction sheet, DNA library, biotinylated capture probe, magnetic beads, wash buffer, and PCR Master Mix. The lab also offers complimentary consulting services to support this process.



Leading the Way in Custom Aptamer Development

Several years ago, a company contracted Aptagen Labs to develop an aptamer against a virus. The resulting solution successfully detected the virus with high specificity and sensitivity. Later, the client filed a patent for the aptamer. Aptagen’s model is distinct in that clients pay for the development of aptamers and retain all patent rights, differentiating the lab in the market by relinquishing IP rights.

Aptagen has achieved similar success stories with other clients, boasting a high success rate in the field. Over the years, it has published numerous papers on its internal research, including the development of an aptamer against SARS-CoV-2, which was subsequently published. It has also published research on creatinine kinase, which is available on its innovative Aptamer Beacon Technology, a platform for detecting any analyte in a matrix without using the traditional sandwich-based enzyme-linked immunosorbent assay (ELISA) method.

Cell-Targeting Aptamer Ligands

Drug candidates that show promising results in laboratory tests, known as “in vitro” assays, often encounter significant challenges when tested in

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animals, a required step before human clinical trials. These challenges include issues with absorption, distribution, metabolism, excretion, and potential toxicity.

Aptagen's new drug discovery technique using aptamers addresses the limitations of traditional pharmaceutical methods. Unlike typical drugs, aptamers have a unique chemical structure that allows scientists to test drug candidates directly in animal models, bypassing the initial 'test tube' stage. This approach accelerates the drug development process, bringing it closer to human clinical trials. Additionally, testing in animals that already exhibit the disease of interest means researchers don't need detailed knowledge of the disease itself, significantly reducing the number of animals required for drug testing before proceeding to human trials.

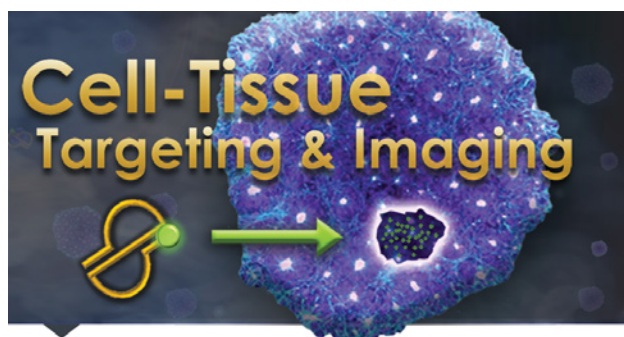
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Soon enough, we will develop our own diagnostic and therapeutic products, unlike the aptamers we create for our clients, who hold the patent rights to those specific developments,” says Caltagirone

Driving Innovation with Focused Development

From its humble beginnings as a one-man operation, Aptagen Labs has evolved into a leader in the aptamer niche. In 2011, the Central Penn Business Journal recognized Aptagen as a finalist for the “Top Emerging

Business of the Year.” This success has been made possible by its world-class, tight-knit team of fewer than 20 members. Approximately half of the staff are full-time professionals, including research scientists and office personnel, while the remaining half are trainees. The workplace embodies an academic atmosphere where Aptagen nurtures talent from interns and bachelor's and master's students to Ph.D. candidates, offering a comprehensive learning experience in aptamer development through its internship and mini-postdoctoral programs.



This combination of an academic environment with the dynamic, fast-paced demands of a business allows Aptagen to effectively meet deadlines while fostering a culture of innovation and learning.

Currently, Aptagen is collaborating with a diverse range of clients, focusing on expanding both its business and client base. Aptamers offer capabilities that traditional antibodies cannot, particularly in the field of biomarker discovery. They enable Aptagen to identify new and unique biomarkers, which is a significant advantage and an area of growing interest. The goal is to grow the business globally and expand its services worldwide.

“Our commitment to pioneering aptamer technology underscores our mission to revolutionize diagnostics and drug discovery, bringing precise and impactful solutions,” says Caltagirone. [LS](#)