**7 Reasons for Aptamers over Antibodies**

By [Tim](http://blogs.terrapinn.com/total-biopharma/author/timothy/) / 7 March 2013 / [4 comments](http://blogs.terrapinn.com/total-biopharma/2013/03/07/7-reasons-aptamers-antibodies/#comments)



*A guest post kindly submitted by Bill Jackson Ph.D (Founder and CSO Base Pair Biotechnologies).*

Antibodies have been the workhorses of research and diagnostic s for years; is it time for a racehorse to enter the field? Aptamers are single-stranded DNA or RNA (ssDNA or ssRNA) molecules that can bind to pre-selected targets such as small molecules, proteins, peptides, and even cells, tissues and organisms with high affinity and specificity. The nucleic acid molecules can assume a variety of shapes due to their propensity to form helices and single-stranded loops, explaining their versatility in binding to diverse targets similar to antibodies.

So what’s the difference? Why take the risk? Why not stay with what works? Nucleic acid aptamers have many advantages over antibodies:

· they are synthetically created reducing the cost of production and

· no lot-to-lot variability,

· they are stable at room temperature or at elevated temperatures and are

· smaller than antibody proteins

· lack the large hydrophobic cores of proteins and thus do not aggregate

· toxicity and low immunogenicity of particular antigens do not interfere with the aptamer development

· they can easily be modified chemically

With so many advantages why are there not more examples of their use in commercial applications and research literature? Though aptamers have been around for twenty years or so, their development and use were held under multiple patents. The base patents on aptamer selection (SELEX) have expired opening up the potential for aptamers to replace antibodies in many applications. There is precedent for their use in a commercial therapeutic; Pegaptanib is a pegylated anti-VEGF aptamer for the treatment of neovascular (wet) age-related macular degeneration (AMD) and also in diagnostic testing with kits available for aptamer-based mycotoxin testing.

So what does the future hold? Horse racing is a high risk, high reward activity where, with the right pedigree, opportunity, and support, unknowns can become *Secretariat*, *Seabiscuit*, or *Phar Lap*. Over the next few years, aptamer research has the potential to yield aptamer based therapeutics and diagnostic tests that could become equally legendary; it just takes the right environment and encouragement from those who can embrace the risk. Who will those risk-takers be, and who will reap the rewards?

**Submitted by Bill Jackson Ph.D**

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