



**IBC Advanced
Technologies, Inc.
American Fork, UT**

Efficient Low-Cost Manufacture of Oligonucleotides Using Non-Chromatographic Purification

Technologies:
Biochemistry

Project length:
3 years

ATP funds:
\$2,000 K

Cost-shared funds (est.):
\$846 K

Total project funds (est.):
\$2,846 K

Antisense therapies, in which synthetic agents interfere with the body's genetically driven production of disease-related proteins, show great promise for combating many diseases, including AIDS, cancer, and rheumatoid arthritis. However, the synthesis and production of antisense agents are very expensive. IBC Advanced Technologies plans to reduce these costs by developing new chemistries for separating and purifying medically important oligonucleotides, which will bind to certain types of genetic material that make key proteins, acting as antisense agents. The company will apply modeling tools and rapid, highly selective molecular-recognition technology to design and synthesize molecules that recognize both short and long oligonucleotides based on the type, number, and arrangement of chemical units. A major technical challenge will be to extend the current ability to purify individual chemical units to make molecules that differentiate among complex oligonucleotides. The knowledge gained then will be applied to develop generic analytical and processing approaches that can be extended to design, model, and synthesize a wide range of new chemical purification systems as needed. Because separation and purification constitute a high proportion of manufacturing costs, the new technology, if successfully developed, will enable significant reductions in the costs of manufacturing oligonucleotides over conventional chromatographic systems. The new systems also will increase product purity from about 95 percent to 99 percent. These advances, if commercialized, will shorten time to market and increase production of oligonucleotides, making it possible to satisfy growing demand in therapeutic, diagnostic, agrichemical, and biotechnology research markets. The resulting increases in sales of low-cost therapeutics, gene-based diagnostic systems, and purification technology are expected to be worth \$4 billion to the U.S. economy over the next 10 years.

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