



## Applied DNA Sciences, Inc. (NASDAQ: APDN, Target Price: \$5.40)

We initiate coverage on Applied DNA Sciences Inc. ("APDN") with a price target of \$5.40 per share. APDN is a provider of botanical-DNA based security and authentication solutions and services that can help protect products, brands, entire supply chains, and intellectual property of companies, governments and consumers from theft, counterfeiting, fraud and diversion. At the heart of all of APDN's products is SigNature® DNA, an uncopiable double-stranded plant DNA. With ever increasing concerns about global counterfeiting and supply chain security management, more and more manufacturers, retailers and consumers are turning to APDN for its innovative security solutions.

### INVESTMENT HIGHLIGHTS

#### Unique solutions for growing, global counterfeiting crisis

According to the International AntiCounterfeiting Coalition, the projected value of global trade in counterfeit and pirated goods could approach \$1.8 trillion in 2015. According to research from Davis Wright Tremaine LLP, the market for counterfeit goods and pirated property represents approximately 5-7% of global trade. This translates to between \$500 billion and \$600 billion annually. APDN uses the DNA of everyday plants to mark objects in a unique manner that it believes cannot be replicated, and then identify these objects by detecting the absence or presence of the DNA. APDN offers a variety of marking and biosecurity solutions, and looks to seamlessly customize the insertion of its markers into a manufacturer's production process.

#### Wide variety of end market applications for APDN's technology

APDN has been very measured in expanding into its current markets of microelectronics, textiles and security marking solutions. APDN plans to continue to focus its efforts on target vertical markets that are characterized by a high level of vulnerability to counterfeiting, product diversion, piracy, fraud, identity theft, and unauthorized intrusion into physical locations and databases. Future target markets of note include homeland security, law enforcement, identification cards and secure documents, pharmaceuticals, consumer products, fine wine and art and collectibles. APDN's DNA technology can be embedded into a range of host carriers such as ink, varnish, thread, laminates and metal coatings. It can also be incorporated into liquids, plastic, fiber, metals and other composite materials, making the end market potential practically limitless.

#### NASDAQ uplisting and private placement highlight recent events

On October 29, 2014, APDN announced a 1-for-60 reverse split of its common stock. This was done in part to prepare the company for an uplisting to NASDAQ, which was then announced on November 17, 2014. The common stock and warrants of APDN both trade on the NASDAQ under the symbols APDN and APDNW, respectively. On November 17th, APDN also announced the pricing of an underwritten public offering. The offering closed on November 20, 2014 and the gross proceeds to APDN were approximately \$9.1 million before deducting the underwriting discount and other offering expenses. APDN intends to use the net proceeds from the offering to fund working capital, repurchase warrants, and for business development and research and development purposes. The uplisting and capital raise should give APDN increased visibility to a broad new range of investors.

#### Initiate coverage with a price target of \$5.40

Our analysis indicates a fair value estimate of \$5.40 per share (detailed on page 11), implying an upside of 83.7% from the recent price of \$2.94. We view APDN as a very promising investment in the biosecurity space, possessing a unique, proprietary technology.

#### Stock Details (12/08/2014)

NASDAQ:	APDN
Sector / Industry	Technology / Biosecurity
<b>Price target</b>	<b>\$5.40</b>
Recent share price	\$2.94
Shares o/s (mn)	17.3
Market cap (in \$mn)	\$50.9
52-week high/low	\$11.40 / 2.02

Source: Bloomberg, SeeThruEquity Research

#### Key Financials (\$mn unless specified)

	FY13A	FY14A	FY15E
Revenues	2.0	2.7	4.8
EBITDA	(10.0)	(11.8)	(9.7)
EBIT	(10.2)	(12.3)	(10.1)
Net income	(17.7)	(13.1)	(10.1)
EPS (\$)	(1.51)	(0.97)	(0.58)

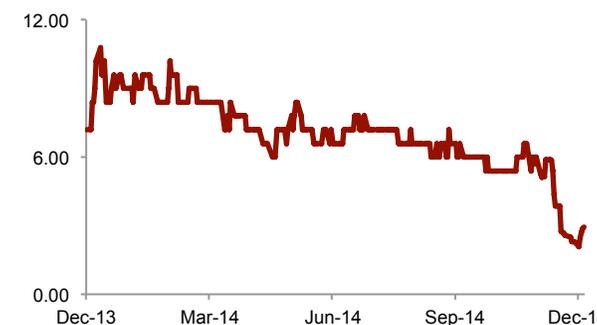
Source: SeeThruEquity Research

#### Key Ratios

	FY13A	FY14A	FY15E
Gross margin (%)	N/A	N/A	N/A
Operating margin (%)	(484.0)	(434.7)	(203.2)
EBITDA margin (%)	(489.6)	(434.7)	(203.2)
Net margin (%)	(868.6)	(480.2)	(213.0)
P/Revenue (x)	25.9	19.4	11.1
EV/EBITDA (x)	(5.3)	(4.5)	(5.5)
EV/Revenue (x)	26.1	19.6	11.2

Source: SeeThruEquity Research

#### Share Price (\$, LTM)



Source: Bloomberg

## SUMMARY TABLE

**Figure 1. Summary Table (As of December 18, 2014)**

Share data		B/S data (As of FY2014)		Key personnel:	
Recent price:	\$2.94	Total assets:	3.5mn	President & CEO:	James A. Hayward
Price target:	\$5.40	Total debt:	1.8mn	CFO:	Karol Kain Gray
52-week range:	11.40 / 2.02	Equity:	(1.5mn)	CIO:	Judy Murrach
Average volume:*	50,298	W/C:	(1.5mn)	Tech Dev. Officer:	Ming-Hwa Benjamin Liang, Ph.D.
Market cap:	\$50.9mn	ROE '14:	-890%		
Book value/share:	(\$0.11)	ROA '14:	-373%		
Cash/share	\$0.10	Current ratio:	0.6		
Dividend yield:	0.00%	Asset turnover:	0.7		
Risk profile:	High / Speculative	Debt/Cap:	5.4		

\* three month average volume (number of shares)

FY September	Estimates				Valuation	
	Rev (\$mn)	EBITDA (\$mn)	EPS (\$)	P/Rev (x)	EV/Rev (x)	P/E (x)
2011A	1.0	(8.1)	(1.67)	50.8x	48.7x	NM
2012A	1.9	(6.2)	(0.74)	26.5x	25.4x	NM
2013A	2.0	(10.0)	(1.51)	6.0x	5.8x	NM
1Q14A	0.6	(3.7)	(0.48)	20.6x	19.7x	NM
2Q14A	0.6	(3.0)	(0.20)	19.3x	18.5x	NM
3Q14A	0.8	(2.4)	(0.14)	14.6x	14.0x	NM
4Q14A	0.6	(2.7)	(0.16)	81.8x	20.6x	NM
2014A	2.7	(11.8)	(0.97)	19.4x	19.6x	NM
2015E	4.8	(9.7)	(0.61)	10.4x	9.9x	NM

Source: SeeThruEquity Research

## INVESTMENT THESIS

Applied DNA Sciences, Inc. ("APDN") is a technology firm which utilizes biotechnology as a forensic foundation to create unique security solutions addressing the challenges of modern commerce. Formed in Florida in 1983 as Datalink Systems, Inc., the company changed its name to Applied DNA Sciences, Inc. in 2002. In 2005, APDN relocated its corporate headquarters from Los Angeles, California to the Long Island High Technology Incubator at Stony Brook University in Stony Brook, New York, where the company established laboratories for the manufacture of DNA markers and product prototypes, and DNA authentication.

APDN offers biosecurity solutions across a broad spectrum of supply chain security, brand protection and property and business security applications. At the core of all of its biosecurity solutions is APDN's SigNature® DNA, which is based on full, double-stranded plant DNA. SigNature DNA can be incorporated into labeling, packaging and even into products themselves, giving manufacturers a wide range of options. The company recently received a Popular Science Best of What's New 2014 Award in the Security category for SmokeCloak® DNA, and its products and solutions are gaining visibility within many industries looking to enhance product security.

APDN has also taken some significant recent steps to increase visibility in the company and strengthen the balance sheet. These include a 1-for-60 reverse stock split, an uplisting to the NASDAQ and a \$9.1mn public offering. APDN is actively looking to expand the end market potential for its products, and has announced a string of contract wins over the past few quarters. We see the opportunity for significant growth in the upcoming quarters for APDN.

**Global counterfeiting crisis**

According to the International AntiCounterfeiting Coalition (“IACC”), the projected value of global trade in counterfeit and pirated goods could approach \$1.8 trillion in 2015. In 2013, the number of intellectual property rights (“IPR”) seizures increased nearly 7% to 24,361 from 22,848 in 2012. The manufacturers’ suggested retail price of the goods, had they been genuine, increased 38% to \$1.7 billion. According to research from Davis Wright Tremaine LLP, the market for counterfeit goods and pirated property represents approximately 5-7% of global trade. This translates to between \$500 billion and \$600 billion annually. That figure is roughly twice as large as the estimated annual profits from the sale of illegal drugs worldwide (\$321 billion). These statistics likely underrepresent the true problem and its severity, as they do not take into account counterfeited components within products. 10% of global rights holders’ topline revenue is lost to counterfeiters each year, and the number of affected brands is growing. What was once a cottage industry has transformed into a highly sophisticated network of organized crime that has threatens national economies, endangers safety and frequently kills. It harms and devalues corporate reputations, hinders investment, funds terrorism, and costs hundreds of thousands of people their livelihood every year.

FY 2013 Commodity	Estimated MSRP	Percent of Total*
Handbags/Wallets	\$ 700,177,456	40%
Watches/Jewelry	\$ 502,836,275	29%
Consumer Electronics/Parts	\$ 145,866,526	8%
Wearing Apparel/Accessories	\$ 116,150,041	7%
Pharmaceuticals/Personal Care	\$ 79,636,801	5%
Footwear	\$ 54,886,032	3%
Computers/Accessories	\$ 47,731,513	3%
Labels/Tags	\$ 41,768,528	2%
Optical Media	\$ 26,830,902	2%
Other	\$ 10,167,496	Less than 1%
Toys	\$ 8,794,285	Less than 1%
Automotive/Aerospace	\$ 4,139,803	Less than 1%
Sporting Goods	\$ 3,010,296	Less than 1%
Cigarettes	\$ 1,320,365	Less than 1%
Food	\$ 199,263	Less than 1%
<b>Total FY 2013 MSRP</b>	<b>\$ 1,743,515,581</b>	
<b>Number of Seizures</b>		<b>24,361</b>

It is understandable how someone might look at this list of counterfeit goods by product category and downplay the problem, as the average person is not overly concerned with a fake hand bag or knock off Rolex watch. But the problem goes much deeper, as counterfeit pharmaceuticals, electronic components, medical devices and many other products pose a great risk, as these examples highlight:

- A recent article from the Mirror in the UK reported that British authorities had seized £5,000-worth of counterfeit toys and clothes that were supposed to be from Disney’s “Frozen.” According to experts, the unofficial counterfeits were produced with toxic and flammable materials and could pose a significant danger to children.
- Spine Solutions LLC went bankrupt in 2013 after numerous run-ins with the FDA, but their story first began to collapse in 2009. Ortho Sol, a South African company which produced the legitimate screws Spine Solutions was supposed to be selling, discovered its distributor was peddling counterfeits. Ortho Sol had run tests on a repossessed a shipment from Spine Solutions after it failed to pay its bills. While looking nearly identical, Spine Solutions’ screws were not made from medical-grade titanium. The fakes also had laser-etched markings to make them look real, which an Ortho Sol executive said could make the screws toxic. To make matters worse, Spine Solutions mixed its shipments with both counterfeit and legitimate screws. Even now, it’s not clear which patients received medically-safe implants. But it is clear that Spine Solutions supplied hospitals from California to Maryland.
- The National Highway Traffic Safety Administration (“NHTSA”) has become aware of a problem involving the sale of counterfeit air bags for use as replacement parts in vehicles that have been involved in a crash. While these air bags look nearly identical to certified, original equipment parts — including bearing the insignia and branding of major automakers — NHTSA testing showed consistent malfunctioning ranging from non-deployment of the air bag to the expulsion of metal shrapnel during deployment.

Counterfeiting affects manufacturers, buyers, consumers and law enforcement. Brand reputations can be ruined, jobs can be lost and people can be injured or get sick from fake products and even risk death. Many firms are involved in supply chain security, product bar coding and tagging and a host of other solutions to combat this problem. As the counterfeiters have gotten more sophisticated, the response of the manufacturers in securing their supply chains must rise to the challenge.

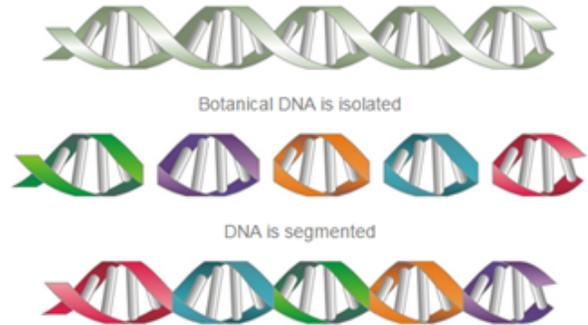
Source: Company filings and investor materials, [www.iacc.org](http://www.iacc.org), [www.dwt.com](http://www.dwt.com), [www.mirror.com.uk](http://www.mirror.com.uk), [beta.cironline.org](http://beta.cironline.org), SeeThruEquity Research

**APDN provides unique biosecurity solutions**

APDN uses the DNA of everyday plants to mark objects in a unique manner that it believes cannot be replicated, and then identify these objects by detecting the absence or presence of the DNA. SigNature DNA is at the core of all of APDN’s security solutions.

SigNature DNA consists of three steps: creating and encapsulating a specific encrypted DNA segment, applying it to a product or other item (which may include derivative chemistries of the SigNature DNA that allow the DNA to permanently bind to the targeted substrate), and detecting the presence or absence of the specific segment

Creating a SigNature DNA Marker



Segments are shuffled and reassembled to form an encrypted, unique, secure DNA marker

(sometimes by the use of specific release agents). SigNature DNA Markers are custom manufactured by APDN to identify a particular class of (or individual) products or items. SigNature DNA markers are based on full, double-stranded plant DNA. These engineered marks have not and cannot be broken. The conventional process used to sequence (“decode”) native DNA is not possible with the engineered mark. Additional layers of protection and complexity are added to the mark in a proprietary manner. This engineering process is shielded by a portfolio of 23 patents and other intellectual property protection. Each individual mark is recorded and stored in a secure database in order that the company can later detect it. The SigNature DNA platform has proven highly resistant to UV radiation, heat, cold, vibration, abrasion and other extreme environmental conditions, and a single SigNature DNA mark will support at least ten authentications in its lifetime. The power of repeated use provides a fully documented audit or evidence trail.

Because DNA is one of the most dense information carriers known, only minute quantities of SigNature DNA are necessary for successful analysis and authentication. As a result, SigNature DNA can fold seamlessly into production and logistics workflows. SigNature DNA can be embedded into a range of host carriers such as ink, varnish, thread, laminates and metal coatings. It can also be incorporated into liquids, plastic, fiber, metals and other composite materials.

SigNature DNA has been subjected to rigorous testing by the Idaho National Laboratory, a US National Laboratory, by CALCE, the largest electronic products and systems research center focused on electronics reliability, and by verified procedures in APDN’s labs. The forensic marker has passed all tests across a broad spectrum of materials and has met key military stability standards. SigNature DNA passed a strenuous “red-team” vetting on behalf of the US Defense Logistics Agency (“DLA”). Hundreds of millions of SigNature DNA marks now exist in the public domain on items ranging from consumer product packaging to microcircuits to guitars; to the company’s knowledge, none has ever been copied.

*Source: Company filings and investor materials SeeThruEquity Research*

**Current end market applications – electronic microcircuits**

In a January 2013 report on a four-year study conducted between 2005 and 2008, the US Department of Commerce revealed that 39% of 387 companies encountered counterfeit electronic components, microcircuits, or circuit boards. Some industry statistics even suggest that counterfeit parts account for 10% of all electronic equipment sold. During the initial research and development vetting project, the DLA successfully marked approximately 20,000 microcircuits with SigNature DNA at a US based manufacturer. Blind samples taken between marked and unmarked microcircuits were distinguishable with 100 percent accuracy. This was followed with a second research and development project phase during which approximately 385,000 microcircuits were successfully marked at a major offshore facility during a full-scale production cycle. The second phase demonstrated the technical and functional viability of marking microcircuits with SigNature DNA. Since this announcement, APDN has signed agreements with the DLA, the Missile Defense Agency (“MDA”), and the Office of the Secretary of Defense (“OSD”). On September 11, 2014, DLA announced that beginning on December 15, 2014, DLA will no longer issue solicitations requiring suppliers to provide DNA marked Federal Supply Class (“FSC”) 5962 microcircuits. Instead, DLA’s Electronic Test Laboratory in Columbus, Ohio will DNA mark all FSC 5962 microcircuits. This change will

create a centralized, streamlined DNA marking process within DLA. On November 13, 2014, APDN was awarded a contract by DLA to provide DLA with SigNature DNA marks and related equipment, services and training. The company is working closely with DLA on a transition plan that may take approximately one year to accomplish.

On December 4, 2014, APDN announced that it had signed an agreement with a fourth government agency, with an initial agreement valued at upwards of \$250,000. On August 28, 2014, APDN was awarded a two-year development contract by the Office of the Secretary of Defense on behalf of the DLA in the amount of \$2.97 million. On July 14, 2014, APDN was awarded a Phase II SBIR contract by the U.S. Missile Defense Agency to perform research and development for avoidance of counterfeit parts by expanding the scope and scale of its existing SigNature DNA technology platform established in its Phase I SBIR contract for Federal Supply Class 5962 electronic components, and by developing an optical reader. The contract provides for monthly payments to the company totaling approximately \$975,000 over a two year period.

DLA is initially targeting microelectronics, but the SigNature DNA technology has broad implications for other DLA products and equipment at risk for counterfeiting. APDN's technology has proved to be quite sticky, as the company has thus far enjoyed a 100% annual renewal of contracts in the Military and Government programs it supports.

Source: Company filings and investor materials, [www.dla.mil](http://www.dla.mil), SeeThruEquity Research

### Textiles solutions

Products containing premium Extra Long Staple (“ELS”) cotton, like Egyptian Giza, Peruvian and American Pima, are recognized by retailers and consumers as being the best cotton in the industry. In order to preserve the quality and performance of premium cotton products, cotton growers and manufacturers are using state-of-the-art technology, known as fiberTyping®, to verify that the original ELS cotton fibers are used in the finished product. fiberTyping is a DNA test, developed in collaboration with Supima (representing American pima cotton growers), that can be used to determine if a cotton product contains G. Barbadosense (ELS), or G.Hirsutum (Upland) or a blend of both. This test works best with greige yarn or fabric (unprocessed fabrics), but can also be tested on finished apparel, bed linen and towels. fiberTyping benefits all the participants of the supply chain so that they can trust the quality of premium ELS cotton products from cotton field to store shelf.

## The Reach of the SigNature® DNA Marking Program for Textiles



Additionally, APDN's scientific team was able to develop genetic based assays and protocols to identify DNA markers that are endogenous to a particular plant in order to differentiate between biological strains of cottons. In addition, in the case of Pima cotton, the company has developed proprietary technologies to differentiate between Pima (G. barbadense) and Non-Pima (G. hirsutum) cotton with absolute certainty. In the process, APDN was also able to develop an approach to attach an exogenous DNA marker to a finished textile product which it calls SigNature® T. SigNature T can withstand a wide range of textile treatment processes and provide DNA authentication at any point within the textile supply and value chains. SigNature T DNA markers can be successfully recovered from samples as small as a single fiber. SigNature T is quickly becoming one of the primary methods for providing fiber to fabric traceability and transparency for textile supply chains, globally. APDN has experience marking fibers at a scale of 50 million kilos, and the company envisions that it has the ability to mark at a scale well into the billions of kilos.

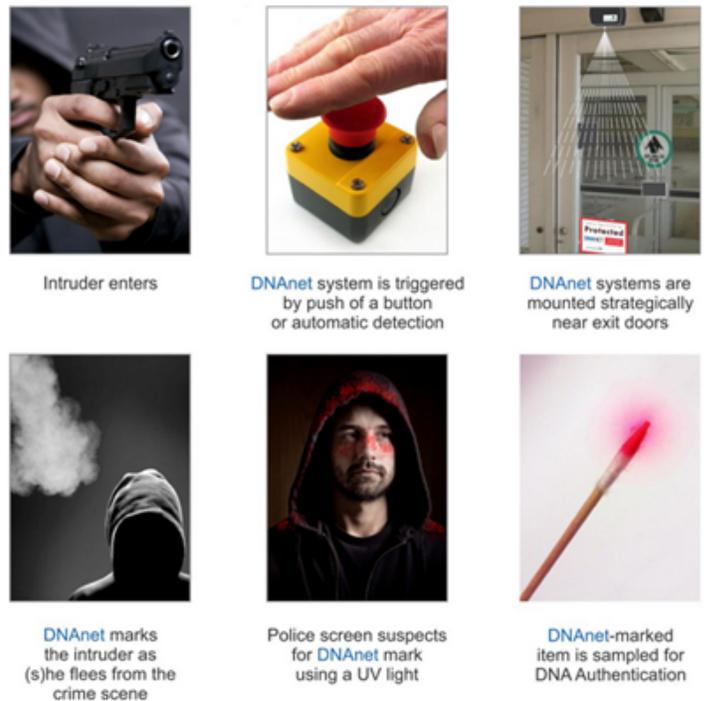
According to Havocscope and the Coalition Against Counterfeiting and Piracy, the market value of counterfeit clothing is \$12 billion. In recent years, apparel accounted for 14% of the total counterfeit goods seized by U.S. agencies. Cass Johnson, with the National Council of Textile Organizations says counterfeit fabrics cost a billion dollars every year in lost tariffs to the US. Britain's fashion industry is worth around \$57 million to the economy, but counterfeit clothing and footwear is estimated to cost designer brands and retailers around \$5.4 billion each year. On September 16, 2014, APDN announced today that its DNA authentication technology was recently used to interdict a shipment of mislabeled textiles resulting in over \$1 million of inventory held in quarantine. The products in question could have easily been mislabeled, and subsequently, marketed and sold in retail outlets in the US and around the world.

Source: Company filings and investor materials, [www.havocscope.com](http://www.havocscope.com), SeeThruEquity Research

### Crime prevention and asset marking

APDN offers consumers and businesses the ability to use its unique DNA marking technology to protect and mark assets and facilities. DNAet® is a forensic tagging system which sprays a fleeing intruder with an indelible, fluorescing DNA mark. The DNAet system is triggered automatically or by the push of a button, marking the intruder at the scene of the crime. DNAet products contain a fluorescing marker that glows bright red under UV light, plus a unique botanical DNA code that links criminals to the crime scene. The fluorescing DNA mark can assist police in linking the offender and stolen items to a specific crime scene, creating a greater ability to identify and convict. The installation of a DNAet system could benefit a wide variety of commercial/retail establishments. Areas of use such as banks, ATMs, pharmacies, jewelry stores, convenience stores, pawn brokers and gun shops are ideal venues to deploy the technology. DNAet can be run as a stand-alone system or can easily be integrated into an existing security system. DNAet also has a line of transferable and permanent tactical markers. Transferable markers leave a lubricant film that is contact transferable once applied on the marked object. Permanent markers are ideal for inventory marking and protection for high value property. The DNAet system can also be used to protect residences, mark automobiles and other valuable items such as artwork and luxury products. In one actual client application, the usage of DNAet on copper assets at energy stations in Sweden cut theft by 85%.

#### intruder tagging/identification process



### Cash and valuables in transit

APDN has applied its technology to the Cash and Valuables in Transit ("CViT") business in the UK. Cash-in-transit businesses transport and store cash and ATM cassettes. In the UK alone, there is an estimated £500 billion being transported each year, or £1.5 billion per day. Currently, a system of cash degradation, using a liquid dye to permanently mark and essentially destroy stolen cash, is used. For APDN customers, SigNature DNA is included in the transport devices that discharge an intense liquid dye onto currency when the transport box is illegally accessed or moved outside of a predetermined location. The dye renders the currency easily recognized as stolen in a process known as cash degradation. Prior to the use of SigNature DNA, when banks identify dye-degraded currency, it was simply removed from circulation without attribution to its original owner. SigNature DNA markers allow attribution of the cash, since each transport box using APDN's system has an individualized SigNature DNA sequence. APDN has protected approximately 1,200

CViT boxes. The return on investment for clients has been profound, as the elimination of just one CViT attack pays for the cost of the entire DNA protection program. 88 convictions have been obtained with a 100% success rate using the DNAnet technology.

*Source: Company filings and investor materials, SeeThruEquity Research*

**digitalDNA®**

digitalDNA® is a cloud-based security platform that utilizes the flexibility of mobile communications, the instant accessibility of data, and the absolute certainty of DNA as a backstop to make item tracking and authentication fast, easy and definitive.

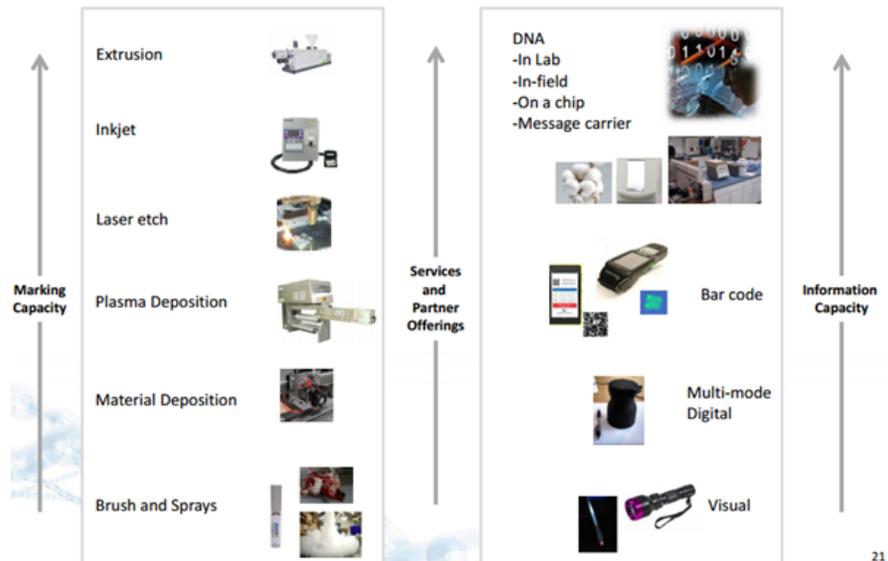
Using a bar code or other automatic identification technology, goods are marked uniquely or to batch level or other characteristic determined by the customer. A cloud database stores codes and enables checks via smartphone or enterprise-level mobile computers. Separately, forensic botanical DNA markers can be physically included within the ink used to print the bar code. Should there ever be a question about the validity of a digitalDNA code, a laboratory-based analysis can be conducted to determine authenticity. Applications may include chain of custody tracking with geo-location option, authenticity check through a supply chain or consumer scan to check article information.

**Significant opportunity to expand technology to new markets**

APDN can utilize its technology on virtually any asset or material. From microelectronics to textiles, plastics and other materials, artworks and collectibles, documents (including passports and visas), retail items and pharmaceuticals, the potential for the company is endless.

There are many motivated actors who would benefit from seeing wider spread adoption of APDN products. Manufacturers are motivated to use the product to maintain brand reputation, command premium pricing and to avoid litigation. Purchasers, particularly large scale purchasers, are motivated to ensure the quality of the goods they are receiving in a cost effective manner. Much like the DLA

**A Solutions Portfolio to Seize Market Opportunity**



rolled out mandatory product marking requirements for its vendors, it would be easy to envision a scenario where a big box retailer made the same demands of its suppliers. Law enforcement organizations are always seeking a system they can use which will provide absolute proof of authentication. Governments are increasingly vulnerable to counterfeiting, terrorism and other security threats at least in part because currencies, identity and security cards and other official documents can be counterfeited with relative ease. Havocscope reports that the value of counterfeit identification and passports is currently \$100 million. Governments must also enforce the various anti-counterfeiting and anti-piracy regimes of their respective jurisdictions which becomes increasingly difficult with the continued expansion of global trade. To highlight the size of the problem, in April 2012 the European Parliament estimated that of the 6.5 million biometric passports in circulation in France between 500,000 and one million are 'false' having been obtained using counterfeit documents.

APDN plans to continue to focus its efforts on target vertical markets that are characterized by a high level of vulnerability to counterfeiting, product diversion, piracy, fraud, identity theft, and unauthorized intrusion into physical locations and databases. Future target markets of note include homeland security, law

enforcement, identification cards and secure documents, pharmaceuticals, consumer products, fine wine and art and collectibles. APDN currently works with C.F. Martin & Company, a renowned US guitar manufacturer. Products such as these demand the sort of security solutions that speak to the strength of APDN's technology.

*Source: Company filings and investor materials, [www.havocscope.com](http://www.havocscope.com), SeeThruEquity Research*

### **Reverse stock split, NASDAQ uplisting and capital raise highlight recent corporate events**

On October 29, 2014, APDN announced a 1-for-60 reverse split of its common stock. This was done in part to prepare the company for an uplisting to NASDAQ, which was then announced on November 17, 2014. The common stock and warrants of APDN both trade on the NASDAQ under the symbols APDN and APDNW, respectively.

On November 17<sup>th</sup>, APDN also announced the pricing of an underwritten public offering of 2,800,000 shares of common stock, and warrants to purchase up to an aggregate of 2,800,000 shares of common stock, at an offering price of \$3.24 per share and \$0.01 per warrant. The warrants have a per share exercise price of \$3.50, are exercisable immediately, and expire five years from the date of issuance. The offering closed on November 20, 2014 and the gross proceeds to APDN are approximately \$9.1 million before deducting the underwriting discount and other offering expenses. Maxim Group LLC acted as the Sole Book Running Manager with Dawson James Securities acted as co-manager in the offering. APDN intends to use the net proceeds from the offering to fund working capital, repurchase warrants, and for business development and research and development purposes. The uplisting and capital raise should give APDN increased visibility to a broad new range of investors. The stock will begin showing up on screens for technology, biotechnology and even business services and we feel it will pique investor interest as APDN represents a very unique investment story.

*Source: Company filings and investor materials, SeeThruEquity Research*

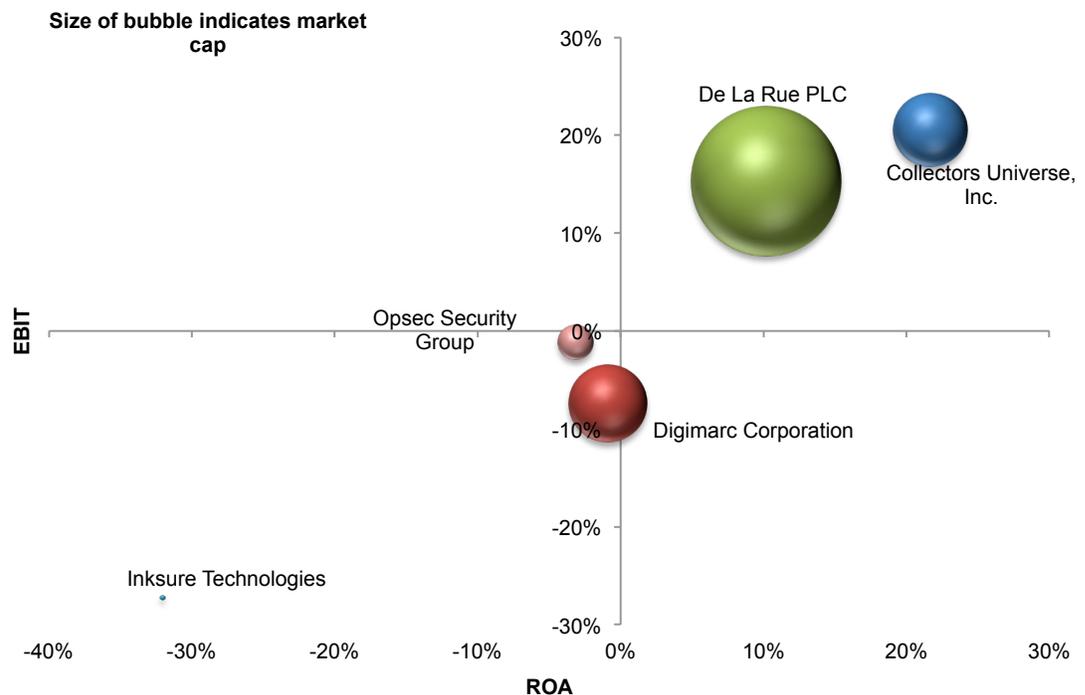
## COMPETITIVE LANDSCAPE

APDN competes in an intensely competitive market, with many existing suppliers and a steady stream of new competitors entering the space. Some notable competitors that operate in the anti-counterfeiting and fraud prevention markets include: American Bank Note Holographics, Inc., Applied Optical Technologies, Authentix, ChromoLogic LLC, Collectors Universe Inc. (NASDAQ: CLCT), Collotype, Data Dot Technology, De La Rue Plc.(OTC: DELRF), Digimarc Corp. (NASDAQ: DMRC), DNA Technologies, Inc., ID Global, Informium AG, Inksure Technologies (OTC: INKS.PK), L-1 Identity Solutions, Media Sec Technologies, Nanotech Security Corp (TSX: NTS.V), Nokomis, Inc. opSec Security Group plc. (OTC: OSGFF), SmartWater Technology, Inc., Sun Chemical Corp, Tracetag, Prooftag SAS and Yottamark.

Competing security products include fingerprint scanners, voice recognition software, cornea and face scanners, integrated circuit chips, optically variable microstructures (including holograms), elemental taggants and fluorescence and radioactivity and rare molecules. APDN competes with its proprietary SigNature DNA based products. The company looks to continuously improve and expand its product offerings by testing the incorporation of its technologies into different media, such as newly configured labels, inks or packing elements, for use in new applications. Each prospective customer has specific needs and employs varying levels of existing security technologies with which the APDN solution must be integrated. The company uses customization as a competitive strategy. APDN holds 23 patents, 47 patents pending, 27 registered trademarks, and 1 registered trademark pending. Its trade secrets, copyrights and other intellectual property rights are important assets for the company. APDN's patents will expire at various times between 2021 and 2025.

APDN is on the smaller end of the market capitalization range when compared to the peer group. We feel that APDN has the potential to achieve EBIT in the 30-35% range and ROA in the 25-35% range, putting it in the top of the peer group.

Figure 2. ROA vs. EBIT– APDN Peers



Source: Company filings, SeeThruEquity Research

## FINANCIALS AND FUTURE OUTLOOK

### Revenue/Drivers

APDN grew revenues 9.8% in FY2013 (ended September 30, 2013) compared to FY2012 and is on pace for over 40% year over year growth in FY2014. The company is working to expand its current markets and also has a handful of funded trials which should be completed in FY 2015 and lead to the commencement of new market opportunities for APDN. APDN charges clients in the \$50,000 range to create a customized DNA code and mark a batch of product. Individual product testing can be in the \$500-1000 per sample range. We envision that both new engagements and the growth of sample testing will increase rapidly for APDN as it expands its end markets.

We have modeled in \$4.75mn in revenues for FY2015E, representing 62.4% year over year growth, growing to \$29.7mn in 2020E. APDN has to refresh the markings it provides clients at different intervals depending on the amount of product that is marked, creating an attractive recurring revenue stream. By FY2016/2017, we envision APDN having customers in plastics, composites, pharmaceuticals and a handful of other industries. With the global value of counterfeited goods projected to be \$1.8 trillion in 2015, we see significant growth demand for APDN's technology occurring in the upcoming years.

### Margins/Expenses

APDN does not report gross margins. The company has averaged approximately \$3.1mn in SG&A and \$250k in R&D over the past eight quarters. We are modeling \$13mn and \$1.4mn in SG&A and R&D, respectively, for FY2015E. In its S-1 filing on November 12, 2014, APDN said it planned to use \$2.1mn of its public offering for working capital, \$4.1mn to repurchase warrants, \$1mn for business development and \$650k for R&D expense. Over the course of the past 12 months, APDN grew headcount from 44 to 59, due to increased work in the production, sales, information technology and finance sectors of the company and to meet the anticipated future demand for sales. We would not anticipate a large increase in headcount in the next 12 months.

APDN had CAPEX spending of \$636k in FY2013 and \$229k in FY2014. We are not assuming any material increase in CAPEX spending in the near future and have modeled in \$150-275k per year for FY2015-2020E.

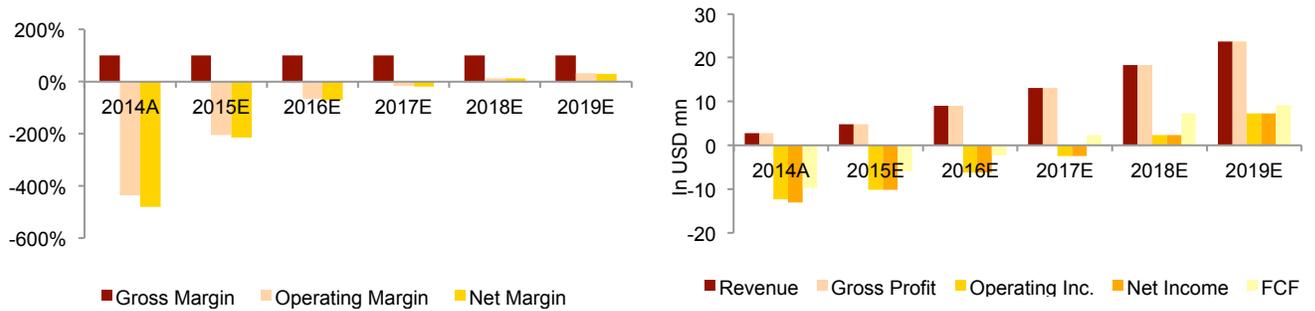
We have modeled in a net loss of (\$10.1mn), or (\$0.61) per share in FY2015. We believe APDN will record net income of \$2.3mn, or \$0.13 per share, in FY2018E.

### Balance Sheet & Financial Liquidity

APDN ended FY2014 with \$1.4mn in cash and \$1.8mn in debt. The debt of \$1.8mn represents notes payable to the company's CEO, Dr. James A. Hayward. The notes have a ten month maturity and bear interest at a rate of 12.5% per annum. On November 20, 2014, APDN announced the closing of an underwritten public offering of 2,800,000 shares of common stock, and warrants to purchase up to an aggregate of 2,800,000 shares of common stock, at an offering price of \$3.24 per share and \$0.01 per warrant. The warrants have a per share exercise price of \$3.50, are exercisable immediately, and expire five years from the date of issuance. APDN has granted the underwriters a 45-day option to purchase up to an aggregate of 420,000 additional shares of common stock and/or up to 420,000 additional warrants to cover over-allotments, if any. On November 11, 2014, Dr. Hayward and the other individual agreed to exchange for cancellation their respective notes (including principal and accrued interest thereon) for 315,171 shares of common stock and warrants to purchase 315,171 shares of common stock, in the case of Dr. Hayward, and 252,137 shares of common stock and warrants to purchase 252,137 shares of common stock, in the case of the other individual, at \$3.25 per share, the aggregate public offering price per share and warrant of our underwritten public offering, which closed on November 20, 2014.

As of December 11, 2014 APDN had 17.3mn shares outstanding and outstanding options and warrants to purchase 6,917,232 shares of common stock. APDN has stated the intention of using roughly \$4mn of its public offering proceeds to purchase warrants. It is likely that APDN will need to raise capital again in late FY2015 or FY2016.

Figure 3. Key Performance Indicators of APDN, FY14–19E



Source: Company filings, SeeThruEquity Research

## VALUATION

We have valued APDN using a Peer Group Valuation. Our valuation yields a fair value of \$5.40 per share, representing an upside of 83.7% from the recent price of \$2.94 as of December 8, 2014.

### Peer Group Valuation

We compared APDN with product security/anti-counterfeiting firms Collectors Universe, Inc., De La Rue PLC and Nanotech Security Corp, among others. Unfortunately, most of APDN’s peer group does not have analyst coverage or estimates, so we looked at trailing twelve month revenues (“TTM”) and for those companies with no 2015 estimates, we grew revenues by 5% to derive a 2015 multiple.

We arrived at a fair value range of \$4.84 to \$5.96 per share based on EV/Revenue and P/Revenue multiples of selected peers. We considered a target multiple of 8.8x for the EV/Revenue multiple and our FY2016E revenue of \$9mn to arrive at a fair value of \$4.84 per share. Similarly, we used a P/Revenue multiple of 11.1x our 2016E revenue forecast to arrive at a fair value of \$5.96 per share. APDN currently trades at a premium to the peer group on an EV/Revenue and P/Revenue basis. We feel that a 50% premium is justified, and we applied that premium to 2015 group EV/Revenue and P/Revenue averages to our FY2016 estimates.

APDN presents a unique case, as it can be considered a technology, a biotechnology or a business services company and an investor can come up with a wide range of comparative metrics.

Figure 4. Comparable Valuation (Data as of 12/08/14)

Company	Mkt cap (\$ mn)	EV/Revenue(x)		Price/Revenue(x)	
		TTM	FY15E	TTM	FY15E
Collectors Universe, Inc.	195	2.9x	2.8x	3.1x	3.0x
De La Rue PLC	823	1.3x	1.3x	1.1x	1.0x
Digimarc Corporation	222	6.9x	6.6x	8.3x	7.9x
Inksure Technologies	1	1.1x	1.0x	1.6x	1.5x
Nanotech Security Corp	70	24.0x	22.8x	32.0x	30.4x
Opsec Security Group	44	0.7x	0.7x	0.5x	0.5x
<b>Average</b>		<b>6.1x</b>	<b>5.9x</b>	<b>7.8x</b>	<b>7.4x</b>
Applied DNA Sciences Inc	49	16.8x	9.9x	17.6x	10.4x
Premium (discount)		174.2%	69.7%	126.5%	40.2%

Source: Bloomberg, SeeThruEquity Research

## RISK CONSIDERATIONS

### Competition

The principal markets for APDN's anti-counterfeiting and product authentication solutions are intensely competitive. Many of the company's competitors, both in the United States and elsewhere, are major pharmaceutical, chemical and biotechnology companies, or have strategic alliances with such companies, and many of them have substantially greater capital resources, marketing experience, research and development staff, and facilities than APDN does.

### Customer concentration

APDN derives a significant amount of revenues from a few customers. No customers represented greater than 10% of the company's total revenues for the year ended September 30, 2014. APDN's revenues earned from sale of products and services for the year ended September 30, 2012 included an aggregate of 54% from two customers of total revenues. Generally APDN's customers do not have an obligation to make purchases from the company and may stop ordering its products and services or may terminate existing orders or contracts at any time with little or no financial penalty.

### Intellectual property

APDN's patents, trademarks, trade secrets, copyrights and all of its other intellectual property rights are important assets for the company. There are events that are outside of APDN's control that pose a threat to its intellectual property rights as well as to its products and services. For example, effective intellectual property protection may not be available in every country in which APDN's products and services are distributed. The efforts that the company has taken to protect its proprietary rights may not be sufficient or effective. Any significant impairment of its intellectual property rights could harm APDN's business or its ability to compete. Protecting intellectual property rights is costly and time consuming. Any increase in the unauthorized use of APDN's intellectual property could make it more expensive to do business and harm operating results. Although APDN seeks to obtain patent protection for its innovations, it is possible the company may not be able to protect some of these innovations.

### Key personnel

APDN's success depends to a significant extent upon the continued service of Dr. James A. Hayward, the company's Chairman, Chief Executive Officer and President, Dr. Benjamin Liang, Secretary and Strategic Technology Development Officer, Karol Kain Gray, Chief Financial Officer and Judy Murrah Chief Information Officer. APDN entered into an employment agreement with Dr. Hayward dated July 11, 2011. It does not have employment agreements with Dr. Liang, Ms. Gray or Ms. Murrah. The loss of the services of Drs. Hayward or Liang or Ms. Gray or Ms. Murrah could significantly harm APDN's business, results of operations and financial condition.

### Share liquidity

APDN common (ADPN) and warrants (APDNW) are listed on the NASDAQ. The stock has averaged approximately 50,298 shares traded a day over the past three months. At the recent price of \$2.94, this comes out to roughly \$147,877 in daily traded volume. Getting into or out of a position in APDN may be difficult depending on the market environment.

## Management Team

### **James A. Hayward, Ph.D., Sc.D. Chairman of the Board, President and Chief Executive Officer**

Dr. James A. Hayward is Chairman, President, and CEO of Applied DNA Sciences. With over 20 years of experience in the biotechnology, pharmaceutical, life science and consumer product industries, Dr. Hayward is actively involved in the global effort to ensure the authenticity of products and the protection of global supply chains from counterfeiting and diversion. Patented and applied in over a billion products throughout the world, the Company's SigNature® DNA markers are unique, botanical, "green" DNA sequences that can help preserve the quality and integrity of products from pharmaceuticals to cosmetics. Dr. Hayward received his Bachelor's degree in Biology and Chemistry from the State University of New York at Oneonta in 1976, his Ph.D. in Molecular Biology from the State University of New York at Stony Brook in 1983, and an honorary Doctor of Science from the same institution in 2000. He was one of the founding principals and research director of Europe's first liposome company, Biocompatibles Ltd. From 1984 to 1989, he was responsible for product development at Estée Lauder Companies. In 1990, Dr. Hayward founded The Collaborative Group, a provider of products and services to the biotechnology, pharmaceutical and consumer-product industries based in Stony Brook. For 14 years, he served as Chairman, President and CEO of Collaborative, spawning multiple businesses including The Collaborative BioAlliance, a contract developer and manufacturer of human gene products, that was sold to Dow Chemical in 2002, and Collaborative Labs, a service provider and manufacturer of ingredients for skincare and dermatology was sold to Engelhard (now BASF) in 2004. Dr. Hayward has been twice named "Entrepreneur of the Year;" in 2002 by Inc. Magazine and in 2009 by the Long Island Technology Hall of Fame. In January 2014, Dr. Hayward was given the David Award by Networking Magazine as one of eight of Long Island's most accomplished individuals. Dr. Hayward has been a General Partner of Double D Venture Fund, a venture capital firm based in New York, New York. Dr. Hayward has served on the boards of many companies, the Stony Brook Foundation, the Research Foundation of the State of New York, the Long Island Association, the New York Biotechnology Association, the Long Island Life Sciences Initiative and the Ward Melville Heritage Foundation.

### **Karol Kain Gray, Chief Financial Officer**

Karol Kain Gray is Chief Financial Officer, responsible for strategic and tactical matters as they relate to budget management, forecasting needs, and establishing and maintaining contacts with stockholders, financial institutions, Wall Street and the investor community. Ms. Gray comes to the company from the University of North Carolina, Chapel Hill, where she was Vice Chancellor for Finance and Administration overseeing financial planning and budgeting; treasury and risk management; facilities planning, construction and operations; purchases and stores; public safety, environmental health and safety; and auxiliary enterprises. The University's financial budget for fiscal year 2012-2013 is \$3.4 billion. Ms. Gray served as the Executive Vice President/Treasurer of the Chapel Hill Foundation Real Estate Holdings, Inc., Treasurer of The University of North Carolina at Chapel Hill Investment Fund, Inc. (CHIF), Treasurer of The University of North Carolina at Chapel Hill Foundation, Inc., and Secretary/Treasurer of UNC Management Company. Ms. Gray also sits on the Board of Directors of Chapel Hill/Carrboro Chamber of Commerce, MBA @UBC LLC, UNC Press Board of Governors, and UNC Health Care System. Ms. Gray has 35 years of financial, organizational and management experience. Her previous position was at the University at Stony Brook, where she worked her way up steadily as a financial analyst, chief accountant, controller, Vice President for Finance and Administration and the Chief Financial Officer. As Chief Financial Officer for the Stony Brook Foundation, she provided financial direction and support for the budget, investment and realty committees and was responsible for the management of an endowment of approximately \$120 million with net assets of \$200 million. Ms. Gray is a graduate of Hofstra University with a bachelor's degree in business administration. In 2011 Ms. Gray was named one of Long Island's Top 50 Most Influential Women in Business. Since August 2011, Ms. Gray has been a Director, Chairman of the Audit Committee and Member of the Compensation Committee, for APDN.

**Judy Murrah, Chief Information Officer**

Judy Murrah is Chief Information Officer, responsible for information technology strategy and implementation, including operations support, customer-facing applications and development of the company's underlying technology infrastructure. Murrah comes to APDN from Motorola Solutions, which had acquired her former firm, Symbol Technologies. At Motorola, Murrah was Senior Director of Information Technology, overseeing financial operations, quality assurance, and IT governance of thousands of resources globally. At the data capture and wireless mobility pioneer, Symbol, Murrah established and led the IT Portfolio and Project Management Office and the company's first cross-functional business Portfolio Review Board for governing investment spend and programs. Ms. Murrah holds a Master of Business Administration (MBA) from Harvard Business School, and a Bachelor of Science (BS) in Industrial Engineering from the University of Rhode Island. She is the author of eleven U.S. patents. In addition to the business world, Ms. Murrah has taken her expertise to the non-profit sector. She is co-founder and President of ConnectToTech, a recognized leader in programs to engage students in science, technology, engineering and math, known as the STEM disciplines. Recently, ConnectToTech was named a recipient in Computerworld's 2013 Laureate Honors Program. Laureates were recognized at an awards gala in Washington, D.C. Ms. Murrah and her organization were presented with a medallion inscribed with the program's mission: "A Search for New Heroes." Murrah was named to the 2005 and 2006 Top 50 Women of Long Island and received the inaugural 2001 Diamond Award for Women Leaders in Technology.

**Ming-Hwa Benjamin Liang, Ph.D., Secretary and Strategic Technology Development Officer**

Ming-Hwa Benjamin Liang is Corporate Secretary and Strategic Technology Development Officer. Between May 1999 and September 2005, Dr. Liang was the director of research and development at Biowell Technology Inc. Dr. Liang received a B.S. in Bio-Agriculture from Colorado State University in 1989, a M.S. in Horticulture from the University of Missouri at Columbia in 1991, his Ph.D. in Plant Science from the University of Missouri at Columbia in 1997 and his LL.M. in Intellectual Property Law from Shih Hsin University, Taiwan in 2004.

## FINANCIAL SUMMARY

**Figure 5. Income Statement**

Figures in \$mn unless specified	FY11A	FY12A	FY13A	FY14A	FY15E	FY16E
<b>Revenue</b>	<b>1.0</b>	<b>1.9</b>	<b>2.0</b>	<b>2.7</b>	<b>4.8</b>	<b>9.0</b>
YoY growth		91.4%	9.8%	33.6%	62.4%	89.5%
Cost of sales	0.0	0.0	0.0	0.0	0.0	0.0
<b>Gross Profit</b>	<b>1.0</b>	<b>1.9</b>	<b>2.0</b>	<b>2.7</b>	<b>4.8</b>	<b>9.0</b>
Margin	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Operating expenses	9.0	8.4	12.2	15.0	14.9	15.2
EBIT	(8.1)	(6.5)	(10.2)	(12.3)	(10.1)	(6.2)
Margin	(831.6%)	(350.9%)	(499.7%)	(451.0%)	(212.8%)	(69.0%)
<b>EBITDA</b>	<b>(8.1)</b>	<b>(6.2)</b>	<b>(10.0)</b>	<b>(11.8)</b>	<b>(9.7)</b>	<b>(5.8)</b>
Margin	(831.6%)	(333.9%)	(489.6%)	(434.7%)	(203.2%)	(64.8%)
Other income/ (expense)	(2.5)	(0.6)	(7.5)	(0.8)	0.0	0.0
Profit before tax	(10.5)	(7.2)	(17.7)	(13.1)	(10.1)	(6.2)
Tax	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net income</b>	<b>(10.5)</b>	<b>(7.2)</b>	<b>(17.7)</b>	<b>(13.1)</b>	<b>(10.1)</b>	<b>(6.2)</b>
Margin	(1085.3%)	(385.5%)	(868.6%)	(480.2%)	(212.8%)	(69.0%)
<b>EPS (per share)</b>	<b>(1.67)</b>	<b>(0.74)</b>	<b>(1.51)</b>	<b>(0.97)</b>	<b>(0.61)</b>	<b>(0.36)</b>

Source: SeeThruEquity Research

**Figure 6. Balance Sheet**

Figures in \$mn, unless specified	FY11A	FY12A	FY13A	FY14A	FY15E	FY16E
Current assets	3.0	1.1	7.2	2.4	2.6	2.9
Intangibles	0.0	0.0	0.1	0.1	0.1	0.1
Other assets	0.5	0.2	1.1	1.1	0.6	0.4
<b>Total assets</b>	<b>3.5</b>	<b>1.3</b>	<b>8.4</b>	<b>3.5</b>	<b>3.2</b>	<b>3.3</b>
Current liabilities	4.5	0.6	1.1	3.9	3.5	3.5
Other liabilities	0.0	0.0	2.6	1.1	1.9	1.9
Shareholders' equity	(1.0)	0.8	4.6	(1.5)	(2.1)	(2.1)
<b>Total liab and shareholder equity</b>	<b>3.5</b>	<b>1.3</b>	<b>8.4</b>	<b>3.5</b>	<b>3.2</b>	<b>3.3</b>

Source: SeeThruEquity Research

**Figure 7. Cash Flow Statement**

Figures in \$mn, unless specified	FY11A	FY12A	FY13A	FY14A	FY15E	FY16E
Cash from operating activities	(3.8)	(4.0)	(7.9)	(8.5)	(7.5)	(3.6)
Cash from investing activities	(0.1)	(0.2)	(1.2)	(0.2)	(0.2)	(0.2)
Cash from financing activities	6.6	2.1	14.7	3.8	7.8	4.0
<b>Net inc/(dec) in cash</b>	<b>2.7</b>	<b>(2.0)</b>	<b>5.6</b>	<b>(4.9)</b>	<b>0.2</b>	<b>0.2</b>
Cash at beginning of the year	0.0	2.7	0.7	6.4	1.4	1.5
<b>Cash at the end of the year</b>	<b>2.7</b>	<b>0.7</b>	<b>6.4</b>	<b>1.4</b>	<b>1.5</b>	<b>1.7</b>

Source: SeeThruEquity Research



## About Applied DNA Sciences Inc.

APDN is a provider of botanical-DNA based security and authentication solutions and services that can help protect products, brands, entire supply chains, and intellectual property of companies, governments and consumers from theft, counterfeiting, fraud and diversion. SigNature® DNA describes the uncopyable marker that is at the heart of all of our security and authentication solutions. SigNature DNA is at the core of a family of products such as DNAnet®, our anti-theft product, SigNature® T, targeted toward textiles, and digitalDNA®, providing powerful track and trace. All provide a forensic chain of evidence and can be used to prosecute perpetrators.

For more information, please visit the company's website at [www.adnas.com](http://www.adnas.com).



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