

BioBusiness Asia 2009

Company Name	Primorigen Biosciences LLC		
Presenter	Chuck Oehler	Title	President
Address	510 Charmany Drive, Madison, WI 53719		
Website	www.primorigen.com		
No. of employee	7	Year of foundation	2005
Company Categories	<input type="checkbox"/> Novel Therapeutics <input type="checkbox"/> Genomics <input type="checkbox"/> Pharmaceuticals <input type="checkbox"/> R&D Service <input type="checkbox"/> Medical Devices Other <u>research products</u>		
Paid-in Capital			
Company Stage	<input type="checkbox"/> Seed Start up <input type="checkbox"/> Expansion <input type="checkbox"/> Mezzanine		
Company Overview	Closed series A round of venture capital, institutional funding and angel funding: 10/5/06.		

<p>Company History</p>	<p>Primorigen Biosciences is an emerging leader in developing high quality protein detection research products for customers engaged in breakthrough cell therapy and proteomics research. These products are used by researchers to confirm cell function and accelerate development of new regenerative medicines to treat such afflictions as Alzheimer’s disease, diabetes, heart disease and others.</p> <p>Following is a brief chronology of major milestones in Primorigen’s history.</p> <table border="1"> <thead> <tr> <th><u>Date</u></th> <th><u>Milestone</u></th> </tr> </thead> <tbody> <tr> <td>11/29/05</td> <td>Company established as a Wisconsin LLC.</td> </tr> <tr> <td>5/16/06</td> <td>Laboratories opened and general operation began.</td> </tr> <tr> <td>07/06</td> <td>Patent Filed: increasing specificity of protein detection in microarrays.</td> </tr> <tr> <td>8/06</td> <td>Laboratory space doubled.</td> </tr> <tr> <td>8/06</td> <td>Acquired assets and rapid antibody development trade secrets from Protoprobe</td> </tr> <tr> <td>10/5/06</td> <td>Closed Series A financing round, 80% from institutional and VC investors.</td> </tr> <tr> <td>12/06</td> <td>Booked 1st contract sales.</td> </tr> <tr> <td>2/07</td> <td>Began development of in-house baculovirus (insect) expression system for full length protein production to complement bacterial and mammalian systems.</td> </tr> <tr> <td>10/07</td> <td>Booked first product sale.</td> </tr> <tr> <td>10/07</td> <td>NIH OLAW approval and assurance number for in-house mouse facilities.</td> </tr> <tr> <td>10/07</td> <td>Patent filed—composition of matter: Spots on Dots™ frameless microarrays.</td> </tr> <tr> <td>11/07</td> <td>Patent filed—methods of use: Spots on Dots™ frameless microarrays.</td> </tr> <tr> <td>11/07</td> <td>Trademarks allowed: Primorigen Biosciences LLC, Primorigen.</td> </tr> <tr> <td>12/07</td> <td>Expanded laboratories to exceed 3,000 s.f. for cell culture, antibody and protein production/purification, animal husbandry (mice), manufacturing and shipping.</td> </tr> <tr> <td>12/07</td> <td>Achieved ongoing sales throughout 2007.</td> </tr> <tr> <td>3/08</td> <td>Won “Best Poster” award at CHI Molecular and Cell Biology TriConference,</td> </tr> <tr> <td>8/08</td> <td>Received \$364,000 Phase I SBIR grant award from United States National Institutes of Health to develop Type 1 Diabetes multiplexed microarrays on the Spots on Dots™ platform. This award would qualify Primorigen to pursue a follow-on \$1.6 M. Phase II grant.</td> </tr> <tr> <td>12/08</td> <td>Achieved ongoing revenues throughout 2008.</td> </tr> <tr> <td>1/09</td> <td>Received \$185,000 Phase I SBIR grant award from United States National Institutes of Health to develop multiplexed antibody microarrays for detection of pluripotent cell protein biomarkers. This award qualifies Primorigen to pursue a follow-on \$1.25M+ Phase II grant.</td> </tr> <tr> <td>6/09</td> <td>Received proposal and terms for pending commitment of investment funding.</td> </tr> </tbody> </table>	<u>Date</u>	<u>Milestone</u>	11/29/05	Company established as a Wisconsin LLC.	5/16/06	Laboratories opened and general operation began.	07/06	Patent Filed: increasing specificity of protein detection in microarrays.	8/06	Laboratory space doubled.	8/06	Acquired assets and rapid antibody development trade secrets from Protoprobe	10/5/06	Closed Series A financing round, 80% from institutional and VC investors.	12/06	Booked 1 st contract sales.	2/07	Began development of in-house baculovirus (insect) expression system for full length protein production to complement bacterial and mammalian systems.	10/07	Booked first product sale.	10/07	NIH OLAW approval and assurance number for in-house mouse facilities.	10/07	Patent filed—composition of matter: Spots on Dots™ frameless microarrays.	11/07	Patent filed—methods of use: Spots on Dots™ frameless microarrays.	11/07	Trademarks allowed: Primorigen Biosciences LLC, Primorigen.	12/07	Expanded laboratories to exceed 3,000 s.f. for cell culture, antibody and protein production/purification, animal husbandry (mice), manufacturing and shipping.	12/07	Achieved ongoing sales throughout 2007.	3/08	Won “Best Poster” award at CHI Molecular and Cell Biology TriConference,	8/08	Received \$364,000 Phase I SBIR grant award from United States National Institutes of Health to develop Type 1 Diabetes multiplexed microarrays on the Spots on Dots™ platform. This award would qualify Primorigen to pursue a follow-on \$1.6 M. Phase II grant.	12/08	Achieved ongoing revenues throughout 2008.	1/09	Received \$185,000 Phase I SBIR grant award from United States National Institutes of Health to develop multiplexed antibody microarrays for detection of pluripotent cell protein biomarkers. This award qualifies Primorigen to pursue a follow-on \$1.25M+ Phase II grant.	6/09	Received proposal and terms for pending commitment of investment funding.
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<p>Main Products/ Service & Niche of Products/ Service</p>	<p>Primorigen’s products include well-characterized antibodies, purified target proteins, and quantitative immunoassays for cell characterization and other applications, including antibody and protein detection in serum samples. Primorigen’s immediate target market is cell therapy research, with several multiplexed sandwich immunoassay products that include the Primorigen Plurometer™ for detection of protein biomarkers for pluripotency, Determ-A-Derm™, for detection of markers associated with early germ layer differentiation, Spots on Dots™ for early and high throughput antibody characterization, a new antibody microarray for detection of developmental pancreatic beta cell markers, and an antibody microarray for detection of protein biomarkers in hepatocyte cells, including a possible screening assay for toxicology applications.</p>																																										

Market Potentials

Several indicators suggest that the market will grow rapidly over the next 5-10 years for Primorigen's "first to market" products. First, the total market for cell-based therapies is projected to grow dramatically from \$26 B. in 2005 to \$56 B. by 2010 and \$96 B. by 2015. Second, the global market for all biochips (DNA/protein microarrays, lab-on-a-chip, etc.) is projected to increase from \$1.64 B. in 2006 to \$3.8 B. by 2013, with protein and emerging microarrays—the segment occupied by Primorigen—expected to comprise at least 25% of the total market.² Third, within the \$16 B. antibody market, the niche for supplying specialized content for microarrays is expected to grow from \$120 M. in 2005 to \$331 M. in 2012.

Sources: a) BCC Research, Report ID: Bio0498B, Published: Sept. 2007, Analyst: John Bergin. b) Cell Therapy-Technologies, Market and Companies, Jain PHarmaBiotech, Dec. 2005. c) Market Opportunities and Challenges for Antibody Arrays and Beads—A Market Research Study for 2005", D&MD Publications.

Company Core Competence or Competitive Advantage

Primorigen's current proprietary technology and points of market differentiation are:

1) antibody and protein content that a) is not available on the market but confirmed by customers as needed, including matched pair antibodies validated for ELISA and multiplexed microarray detection of both native and recombinant proteins, and b) can be used not just in Primorigen's proprietary new "Spots on Dots" microarray platform, but in others that customers are using, increasing the potential for rapid market uptake. A partial list of markers and proprietary antibody content in development include:

Pluripotent	Ectoderm	Mesoderm	Endoderm	F
Sox 2	Beta-Tubulin III	Brachyury	GATA 4	
Oct 3/4	TP63/TP73L	Cryptic	Alpha-Fetoprotein	
Nanog	Sox 1	Smooth Muscle Actin	Fox A2 (HNF3B)	
Rex 1				

2) its patent-pending Spots on Dots™ platform that changes the way multiplexed assays are done by:

- 10-20 fold reductions in sample requirements to 5 ul (vs. 50-100 ul) via miniaturization of tests;
- 6-16 fold increase in throughput over current 16-24 well microarray formats;
- 300+ fold reduction in reagents (capture ab for one ELISA test allows 300+ Spots on Dots™ tests);
- 70+ fold reduction in capital expenses (uses \$500 scanner vs. \$35,000 array reader for readout)
- substantially greater versatility of assay design by eliminating need for \$200-300 frame;
- reduction of cumbersome cell preparation/staining steps & 4 fold reduction in costs per 96 spot array.

Estimated cost per data point for antibody screening using Spots on Dots™ is .01 versus .14 for Elisa, with substantially greater throughput. The intellectual property on the Spots on Dots™ platform includes fluorescence detection capabilities, providing flexibility to develop both highly quantitative assays with minimal background noise and excellent dynamic range, and colorimetric assays possible with the existing Spots on Dots™ platform.

Partnering Objectives	<p>Primorigen has four key partnering objectives:</p> <ol style="list-style-type: none">1) Identify and secure new sources of investment funding.2) Identify and secure new sources of technology and products for OEM, distribution or other commercialization options, including but not limited to novel protein quantitation systems, novel targets, matched pair antibodies, and others.3) Identify collaborators for joint R&D efforts, particularly those with sufficient scientific merit to qualify for grant funding of corporate alliances.4) Identify overseas sales opportunities, including key accounts, and distributors.
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