

Kinexus Bioinformatics

Written by Elizabeth Huh

Core Business

Health and Wellness: Proteomic testing and a strategy for personalized medicine

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Ownership: Private. Founder is President and CSO. Founded in 1999.

What do people in the company say?

"Our President has an open door policy but beside his desk lies his pet wolf."

~ Mira Karia, Controller and HR Director

"Even though our President has 2 jobs as President and as a University professor, he always takes the time to listen to his employees or students when they request his help. Even when I know he is under considerable pressure to meet tight deadlines, I have never seen him turn anyone away. Since working with him, I have adopted the same philosophy because he has taught me that sometimes you only have that one opportunity to positively affect an individual's life."

~ Catherine Sutter, Director of Sales & Marketing, Corporate Secretary

"We can choose our own hours and the work is exciting."

~ Hong Zhang, Senior R&D Manager

"Every aspect of Kinexus is focused on providing innovative solutions. Our workplace is constantly improving."

~ Michael Patrick, Senior IT Manager

What does Kinexus Bioinformatics do?

Kinexus Bioinformatics Corporation maps and tracks the molecular communication systems that control the cells and tissues of the human body. This pioneering activity is fundamental to the development of personalized medicine for future health care delivery.

Cancer, heart disease, stroke, and diabetes are the leading fatal diseases today. These are just some of the 400+ human diseases that arise from the malfunction of cell signalling systems from defects in an important group of proteins called kinases. Protein kinases are responsible for directing communication and overseeing the multitude of activities within cells. There are over 500 different protein kinases in humans, and they directly affect over 10,000 other types of proteins inside of our cells. When communication between kinases and their targets goes awry, bad things happen like uncontrolled cell division leading to diseases like cancer.

Kinexus has a unique 3-step business model. In the first step, Kinexus offers inexpensive, reliable, and fast proteomics (proteomics = study of proteins) test services to hundreds of scientific researchers working on kinase-based diseases. Kinexus performs its service by unleashing specific antibody-based probes to track down protein kinases and their targets in cell and tissue samples that are provided by clients. Those proteins that the antibodies lock onto are the ones of the most interest to the researchers (i.e. disease diagnostic makers and therapeutic drug targets).

In the second step of its business model, Kinexus incorporates the proteomics test results from step #1 into a database, which permits the offer of bioinformatics services to clients. This unique database contains thousands of test results, enabling researchers to see what combinations of drugs and specific kinase interactions have already been tried and it permits them to identify new research leads. Researchers use this service to mitigate the time and effort required to find best drug targets and the therapeutic compounds that can inhibit these proteins from perpetuating the disease.

As the third step, Kinexus mines the proteomics database to map the composition and architecture of cell communication systems in the human body and animal models of disease. By collecting and assembling all the pieces of the puzzle, Kinexus seeks to unlock the secrets of which drugs can cure kinase-based diseases, such as cancer and diabetes. According to Kinexus, detailed guide maps are less than 5 years away.

What makes them cool?

Proteome leader: Kinexus is the only company in the world to offer commercial screening of hundreds of cell signalling proteins, and to leverage this unique service into its 3-step business model.

Holy Grail of pharmaceutical industry: Kinexus' third step of its business model – the creation of a comprehensive atlas of cell communications maps – can profoundly impact the pharmaceutical industry: It could accelerate drug development (it currently takes more than 10 years), reduce drug cost (it currently takes over US\$750,000), and decrease investment risk (presently over 90% of drug companies fail their human clinical trials). It should lead to the discovery of new more effective drugs, and improved disease diagnosis.

Personalized medicine: Understanding how cell communication works will give Kinexus and humankind the ability to match the right drug to the right patient. Personalized medicine means that one day soon, a person with cancer will be cured by taking a drug cocktail directly targeted to their unique genetic and proteomic makeup.

Revenue distribution for 2005

By product: 100% services: ???% proteomics test analysis services and ???% subscriptions to proteomics database

By geography: 70% US, 15% Canada, 15% Europe and Asia

By channel: 100% direct

Revenue growth: ???% per year for last 5 years or ??? from 2004 to 2005

Cool technology used

Linux, Macs, Open source software, Quantity 1 software, Pathfinder analysis, and KiNET database.

Scientific research interests

Proprietary systems biology approaches for the detection of cell signalling proteins in all types of model systems, focus on human ailments such as cancer, cardiovascular, ALS, MS, Parkinsons, and Alzheimers Disease, database mining and bioinformatics, antibody microarrays, discovery of novel proteins by mass spectrometry, diagnostic kits for personalized medicine.

Education wanted of new grads

For technical support positions, the Company requires individuals to have a B.Sc. or the equivalent degree. (Co-op = YES)

Awards: In 2004, Kinexus was a winner of Red Herring's TOP 100 MOST INNOVATIVE COMPANIES IN THE WORLD, and, in 2005, was one of Red Herring Magazine's TOP 100 PRIVATE COMPANIES IN NORTH AMERICA. Kinexus has also received support from the National Research Council of Canada's INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP).

History and name: Kinexus is a spin off of the University of British Columbia (UBC). Its founder, President and CEO, Dr. Steven Pelech is a professor of medicine at UBC's Brain Research Centre. The idea for Kinexus evolved from his experience with his first company which made many of the world's first antibody probes that target protein kinases. "Kine" derives from the Greek word "to move" and "nexus" is defined as the means for connections of things linked in series.

What are their plans for the future?

More clients: Kinexus would like more researchers to benefit from its services.

Probes partners: Kinexus wants to help companies that produce antibody probes by helping them create better probes and expanded markets.

Increased analysis: Currently, Kinexus performs 40 tests at once per tissue sample. In early 2006, it hopes to increase this number to over 600 tests, which would increase the rate of accumulation of test results into their databases and permit the accelerated discovery of disease biomarkers and therapeutic drug targets.

What kind of people work there?

Team / Departments	Positions	Current Employees	Employees Needed
R&D Technical Support	Senior R&D Manager (1), Lab Supervisor (1) Research Technicians (5), Technical Sales Representatives (2½)	9.5	4
Sales	Director of Sales & Marketing (1), Sales Support (1)	2	1
Info Technology	Senior Manager of IT (1)	1	2
Graphic Design	Graphic Design (1)	1	1
Administrative	Administrative Assistant (1), Webmaster (½)	1.5	1
Finance/Accounting	Controller & Director of Human Resources (1), Accountant (1)	2	0
Senior Management	President & Chief Scientific Officer (1)	1	0
	Total (Number of employees expected to double in 2006)	18	9



Kinexus has a descriptive tagline "Listening to cells to silence disease". Its lab test service helps researchers understand communication between cells. Kinexus is also using the results of the lab tests to map out cell communications for the entire human body, a map which might be the secret to developing personalized medicine.

Experiences

It's all about communication and control.

Dr. Steven Pelech, President and CSO of Kinexus Bioinformatics Corporation

Most biotechnology companies are started by university professors, and remarkably many of the most successful are managed by their original scientific founders during their greatest periods of growth. These entrepreneurial scientists have the intelligence, commitment and vision to navigate their enterprises through the myriad of obstacles that invariably confront and all too often capsize fledgling companies. I have been fortunate to benefit from sage guidance by some exceptional individuals that have successfully straddled the separate worlds of academia and industry. They have inspired me to rise through the academic ranks to become a full professor, in parallel with my corporate career.

The first company that I founded about 14 years ago was Kinetek Pharmaceuticals, Inc. Just months prior to the launch of Kinetek, I really had no inclination nor foresight that I would start a biotech company. I did, simply because I needed funding to support my research interests, and this was not so easily procured from academic granting agencies. In my University of British Columbia (UBC) laboratory at the Biomedical Research Centre, we were producing some of the first antibody probes that could be used to track extremely rare but important proteins involved cell regulation. In particular, we studied a group of enzymes called protein kinases that serve as the master control and communication proteins inside of cells. Word spread through the scientific community that we had these antibody probes and we were contacted by a new company from Lake Placid, New York called Upstate that was keen to market and distribute these research reagents for us. The annual royalties from the sale of these antibodies almost matched the peer-reviewed grant funding that I received from the Canadian government, the National Cancer Institute of Canada, and the Heart and Stroke Foundation of Canada. However, other scientists within the Biomedical Research Centre felt that the production of these antibody probes, even though it utilized a miniscule amount of the resources at the Biomedical Research Centre, was not the sort of thing that should be conducted at a scholarly institution. I was given no option but to continue these activities elsewhere. This is what really led to the germination of Kinetek. A suitable arrangement was struck with the UBC Industrial Liaison Office in which the university was able to share in the revenues generated from the sales of about one hundred antibodies through Upstate, and Kinetek was able to begin its growth. Incidentally, Upstate underwent meteoric expansion, and last year this company was sold to Serologicals Corporation for US\$ 205 million.

After Kinetek was about 4 years young, I decided that there was an opportunity to transition it into a drug discovery company. Frankly, I was caught up in the euphoria about the prospects of the biotechnology industry to revolutionize health care. There were plenty of investment funds that were seeking out promising early stage biotechnology

companies with pie in the sky dreams that some of these companies would discover and develop the next blockbuster drugs. In retrospect, I recall finding the whole proposition quite incredulous. Nevertheless, a lot of people were convinced that the biotechnology industry had this tremendous potential, and the fund managers persuaded their clients to invest heavily in this sector. Over the next two years, I raised about 8 million dollars from investors, and recruited an outstanding management team for the company. Kinetek really underwent an incredible transformation, and at the end of it, my major investors convinced me that what the company really needed now was an experienced president and CEO from the pharmaceutical industry at the helm. Their arguments seemed compelling at the time, and after a 9 month search with a head hunting firm out of New York, we finally found our man. About 3 months prior to this, my investors also persuaded me to step aside from the company so that the new executive could do his job unfettered by the founder, a major shareholder, the former president and CEO, and a member of the Board of Directors of Kinetek. Regrettably, six years later, Kinetek was sold to Vancouver-based QLT Inc. for only \$3.6 million. This was about 5% of what was invested by stakeholders in building Kinetek over a 12 year period, and the final common share price at its acquisition was about 6% of the last price at which I raised funds for the company as its president and CEO 7 years before.

The fate of Kinetek was actually pretty typical of most biotechnology companies. There are more than 5000 biotech companies world-wide, with the vast majority fixated on health care, and of these only about two dozen are truly profitable. The average successful drug costs over US\$750 million and takes often over a decade from its initial discovery to come to market. Only about 1 in a 100 drugs that are promising in early animal trials ever make it. Most biotech companies only have one or two candidates in their drug discovery pipelines. It comes as no surprise then that most biotech companies are doomed to failure, and most of their investors are fated to suffer large financial losses.

One of the biggest challenges in the drug discovery process is ensuring that a company is fishing for these elusive therapeutic compounds with the right bait in the right place. Billions of dollars are wasted by biopharmaceutical companies going after drugs for the wrong targets, with the consequence that the nasty side effects of these therapeutics precludes them from receiving regulatory drug approval.

In the formulation of my second company Kinexus Bioinformatics over 6 years ago, I remained convinced that protein kinases would be excellent drug targets. But with over 500 different protein kinases to choose from, more information about these proteins was needed. In fact, less than 5% of the known protein kinases have been pursued as drug targets in clinical human trials, even though about 25% of all pharmaceutical R&D activity is now devoted to protein kinases. Kinexus' initial objectives have been to amass detailed knowledge about these proteins to assist the biopharmaceutical industry. Our business model is unique – essentially, the clients pay us to provide them with the results from assays that we perform to analyze specific proteins in their cell/tissue samples from humans and animal disease models. We are also able to retain and integrate this information into a massive database that generates additional subscription revenues from other clients, and which we can mine ourselves for the identification of protein kinase

drug targets and disease diagnostic biomarkers. This sort of information is essential for the development of personalized medicine so that an appropriate treatment can be specifically tailored to each patient. Kinexus is developing the capability where it can essentially eavesdrop on the molecular communications systems in the patient's cells, so that they can instruct us how best to fight the disease in that patient. This is the meaning behind our tagline, "listening to cells to silence disease."

My greatest fear is not whether Kinexus is on the right track with our R&D activities and commercial services, but if we can survive long enough to ride the impending wave of sweeping change in the biomedical research community as it adopts system biology approaches to solve medical problems. The biopharmaceutical industry is rapidly approaching the cusp of this profound paradigm shift, and Kinexus is extremely well positioned at the forefront of this. Fortunately, after 6 years, our operations are sustainable without the requirement for further equity investment. We have performed work for more than 600 universities, hospitals and companies, and we have created a valuable functional proteomics database that is unmatched anywhere in the world. Kinexus will ultimately transition itself into a drug discovery company as it continues to mature.

At this stage I have no intention of relinquishing control of Kinexus. My biggest mistakes have come when I have ignored my gut instincts and for the sake of harmony succumbed to the whims of others when I knew better. I have learned that great and lasting companies emerge only from long term vision and adherence to a well developed and sustainable plan. Clear communication of that plan to the shareholders, employees and clients of the company is critical so that it is not easily derailed from misunderstanding or unrealistic expectations. Many environmental factors are beyond a company's control, and proper strategic planning must include various contingencies. While there must be flexibility in the route that a company may take, the ultimate destination should be clearly in view.