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Genome Center for Gotham

November 3, 2011 | *It is fair to say that Nancy Kelley, the executive director of the New York Genome Center (NYGC), did not expect to be leading such an ambitious effort 12 months ago. But convinced of the potential to create a major genomics institute in the center of New York city, Kelley relentlessly lobbied, marshaled and cajoled a consortium of all the major New York institutes and medical centers, along with private philanthropists and corporate partners, that it was time to seize the day.*

Kelley's name may not be widely known in scientific circles because, as she freely admits, she's not a scientist. But this economist, lawyer, and commercial real estate developer has been working in science for more than over 25 years, landing on the Board of the Jackson Laboratory and helping numerous biotech companies grow their business through stints at Spaulding & Slye Colliers and Alexandria Real Estate. Two years ago, she began working with a client building a personalized medicine institute. Those discussions took her to New York, where Kelley, aided by Columbia University molecular biologist Tom Maniatis and others, began fleshing out plans for NYGC.

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For the past year, Kelley has been working as NYGC's executive director, helping to raise some \$120 million in advance of the center's official opening in Manhattan in early 2012.

Prior to the formal announcement of NYGC on November 3 in Manhattan, Kelley gave her first in-depth interview with Bio-IT World editor Kevin Davies and talked about the extraordinary effort to bring a world-class genome center to the Big Apple, and what it means for the New York scientific and medical establishment.

Bio-IT World: Nancy, how has your diverse background led you to your current role as executive director?



Nancy Kelley: I've worked in the private sector, non-profit and public sector at various senior levels throughout my career. I started as a young lawyer at Hale & Dorr as a corporate securities lawyer, representing start-up companies. My standard client was a doctor or scientist who walked out of MIT or Harvard and we'd help build a company around it. I had the good fortune of seeing a lot of life science and healthcare companies develop from infancy, we'd help negotiate IP, raise money, put the management teams together, financing etc. If they were successful they'd grow up to go public and develop their drug.... It not only gave me a really nice education about how organizations grow and develop over time, but it helped me to understand the science. It was my job as the lawyer to sit down with the scientists and write down what they were doing in English for investors, so people buying their securities would actually understand what they were doing!

It was also a wonderful chance to work with some big companies that were babies back then, like Genetics Institute. Eventually, I found myself working with start-ups to raise money and to help run them, whether for profit or non-profit. At the same time, I'd been appointed in the early 1990s to the Board of Trustees of the Jackson Laboratory in Bar Harbor, Maine... I was also appointed to the Board of Overseers for the Beth Israel Deaconess Medical School, where I got a good education of the clinical side of science, and the need to bridge bench to bedside. It is so important to bring discoveries from the bench to the patient, where they'll be most beneficial.

In the last ten years, I became involved in life science real estate development. I helped negotiate a major transaction on behalf of my hometown—Belmont, Mass—with McLean Hospital, which owned a significant portion of the land in Belmont. The Board of Selectmen appointed me to chair a committee that would negotiate a rezoning of the land in town. That was a protracted three years, but at the end of it, the consultants we'd hired asked me to come and lead their life science consulting practice in real estate development. Originally I didn't think I'd do it, but I signed on to write the business plan. It turned out that life science real estate is a technologically very sophisticated product that has to be marketed and developed in a way completely different than other real estate. I thought it was an intriguing challenge so I signed on to do that. I led their group for nearly three years, it grew to over 100 people nationally, and we undertook a lot of very interesting development projects.

Tell us about the origins of the New York Genome Center.

I'd been working in the city for nearly ten years in life sciences with Spaulding & Slye Colliers as well as Alexandria Real Estate. As senior VP of strategic operations for Alexandria, I was responsible for responding for the New York City RFP and creating the development of the East River Science Park, which is 1 million square

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feet in Manhattan... Manhattan isn't an easy place to develop anything in. It was a very large project—three towers, nearly \$1 billion and 1 million square feet.

The combination of legal, financial, operational and real estate with the scientific background all came together to create an opportunity in New York. I'd been an independent consultant for two years after Alexandria. I'd been working on another large sequencing project for a client for almost 12 months, which didn't materialize. But it opened up the idea and possibility of introducing the idea of a large sequencing operation in New York. Given the fact I'd been working there for ten years and had many long-standing relationships with scientists there, I brought it to New York to see if there was interest. So we started discussing it and things developed from there.

Obviously there was... a lot of skepticism about this, and it's continued right through until today. But as I say, the only thing you can do is try. After consulting with a few individual scientists, we pulled together a very large meeting with representatives from all the institutions [in August 2010], and asked them to participate in the creation of a center like this. It started with Columbia, went to Sloan Kettering and Rockefeller University... They enthusiastically endorsed it, to the extent that within 30 days, we had eight institutions putting seed money into a feasibility study and agreeing to move forward...

THE MISSION

How would you describe the vision, the mission of NYGC?

The vision for NYGC is really to achieve transformational results for healthcare and research. In the end, our success will be measured by how the center affects medical delivery the way research is being done. For New York in particular, this is a very exciting development. For a long time, they've had the leading global institutions in healthcare, but for whatever reason, haven't always come together to collaborate and leverage that strength. With this enterprise, it will allow them to do that and take their role on the global stage, as they should be.

Have you modeled NYGC on the Broad Institute or BGI?

Obviously we looked at all those examples during the course of our research to put the model and business plan together. But the idea for NYGC was to create something that would be transformative for New York and to position it as a global leader. That would mean it would be something very different than anything that had been built to date.

It will involve a very large high-throughput sequencing center, offering services not only to founding members but to other institutions and companies. It will also have a very strong research element, driving it forward with both genomics and bioinformatics involved. There's also the idea of an innovation center that would introduce new technologies that would be utilized throughout New York and training programs that would be in collaboration with the founding member institutions and other New York institutions. There are a lot of very innovative elements here.

The one thing we clearly understood is that there's a certain scale required to launch an effort like this and to become a global player. There had to be a differentiating characteristic—it couldn't be the Broad or BGI or one of the other institutions operating in the market. It had to offer something very different. I think the combination of the basic research with clinical application—the research universities with the hospitals coming together to do this so that it's truly translational in nature—is very important.

Who else has played a key role in organizing NYGC?

The first and probably most important is Tom Maniatis at Columbia, a renowned and accomplished scientist, someone I've known from the Jackson Lab. He's also a serial entrepreneur, having built some of the best known companies in the life sciences field, including Genetics Institute. He was the first person whom I talked to about this, and has been instrumental at every level in guiding this forward. So we've really done this together.

But I'd also point to other key individuals. Tom Kelly (Sloan Kettering) has been involved from the beginning. New leaders at Sloan Kettering and Rockefeller, Craig Thompson and Marc Tessier-Lavigne respectively, were recruited and understood the need for inter-institutional and private sector collaboration. Russ Carson (founder/chair, Welsh Carson and the New York City Investment Fund) immediately saw the benefits of this to the City. He is now the Chairman of NYGC's Board of Directors. Tony Evnin (senior partner, VenRock) also saw the immediate benefit to New York; he was our first individual philanthropic donor and has also played a critical role. Many, many people throughout the New York community have been instrumental.

We've also had help from scientists such as Rick Myers of the Hudson Alpha Institute and Richard Gibbs from Baylor, who have been incredibly helpful and supportive, showing us their facilities. Harold Swerdlow from Wellcome Trust Sanger Institute, certain individuals from the Broad, everyone has been very generous with information and guidance.

FOUNDING MEMBERS / PARTNERS

Who are the founding members?

We are excited to launch with 11 Institutional Founding Members: Cold Spring Harbor Laboratory, Columbia University, Cornell University/Weill-Cornell Medical College, The Jackson Laboratory, Memorial Sloan-Kettering Cancer Center, Mount Sinai School of Medicine, New York University, New York-Presbyterian Hospital, North Shore-Long Island Jewish Health System, The Rockefeller University, and Stony Brook University. In addition, Hospital for Special Surgery has signed on as an Associate Member.

You have a connection with the Jackson Lab in Maine. Why their interest in NYGC?

I've been on the Board there for 20 years, as are Tom Maniatis and Tony Evnin. I think the Jackson Lab has for a long time been trying to identify scientific collaborators it could work closely with. It has an operation on the west coast—but New York is a very obvious place for them to collaborate, not just because of the presence of scientists, business leaders and philanthropists, but they're a natural extension of the entire process. If sequencing identifies a disease gene, then phenotyping can be modeled through the Jackson Lab's research animals and they can help inform whether clinical trials are going to be effective.

Cold Spring Harbor Laboratory has also signed on?

Tom Maniatis and Tom Kelly have long-standing relationships with CSHL. Maniatis was a researcher there at one point. They've been talking to CSHL from the beginning about our progress. When it was clear that we were reaching a critical mass, we had a formal meeting with [director] Bruce Stillman and Mike Wigler. We also met with Dick McCombie, who runs the sequencing center. Even though they've established a great capability on their campus, demand is outstripping their capacity already. They saw this as an opportunity to join an enterprise that would continue to invest, so they'd have access to what they need for their research without having to raise the millions of dollars they've raised to date.

Will there be industrial partners?

We've had discussions with Roche as our initial pharma member and Illumina as our leading technology collaborator, and both have made significant commitments to NYGC. They'll have a presence on the scientific advisory board, and will work with a variety of the scientific working group committees. Furthermore, there will be a well established collaboration agreement that will govern their participation in the Center and will help in the creation of new therapeutics and diagnostics. It's not an exclusive relationship and we're in discussions with several other companies.

Why did you choose Illumina as NYGC's sequencing partner?

We went through a very extensive technology selection process, which involved all the scientists on the scientific advisory committee, and the technology and bioinformatics working group committees. We invited the two leading companies—Illumina and Life Technologies—to come in and make a presentation by their senior management, how they would approach a partnership with a large sequencing center like this. We visited many of the other sequencing centers across the country and listened to advice and opinions of other leaders in the field, working with both technologies. In the end, there's just been enormous progress made by Illumina in their productivity and turnaround times this year, and that proved to be one of the deciding factors – the continuing evolution of their technology and widespread adoption.

We will start with approximately 30 sequencers in year one and build up to a fairly significant number over a 5-year period. There are many terms to the Illumina collaboration, and obviously pricing is one of them. But this will not be an exclusive technology in any way. In the innovation center, we'll be testing new technologies and making them available to the scientists in New York. In fact, we have several exciting collaborations in the works, which we hope to unveil at an appropriate time.

BUILDING THE COALITION

How have you managed to keep all these New York institutions happy during negotiations?

The center was legally incorporated and raised its initial seed financing in August 2010. The original feasibility study was completed last December and underwent extensive review by all the institutions in January 2011. We started a planning process—meaning implementation—which concluded at the end of June. In the weeks that followed, we finalized the governance and closing documents for 9 Institutional Founding Members, now 11, and transitioned to our build-out process. We now are opening a small development office, expanding our launch team, and negotiating the other agreements that will serve as the foundation for our official opening in 2012.

Getting to this point has been very, very challenging! A few things helped a great deal: first, the commitment from the leadership of the various institutions to actually sit down and discuss this, knowing how important this was going to be for New York in general. New York is behind in the genomics area, so these leaders saw NYGC as a real opportunity to catch up. Their commitment to the process was very important and helped overcome some bumps when we met them.

The other thing we established early on was this was going to be an open, participatory and collaborative process. Every institution would have the same information that every other institution had. That helped everyone feel they were part of the process, on the same playing field no matter what their size. We set up an executive committee constituted with one representative from each of the Founding Institutions and myself, which essentially met monthly and approved decisions about the operations of the center. We set up a series of working committees, a scientific working group, a technology selection committee, and made sure that each institution appointed representatives to each committee. That set the tone for a process that helped engender trust.

Now obviously that didn't resolve all the issues we ran into. Many issues came up between institutions about the way the center would be created and governed that had to be resolved. Some institutions stepped back and stepped forward again. Through it all, there was the support of institutional leadership, business leadership within the city that was very critical.

The reasons for hesitation by some Institutions were more organizational than financial. Some of the institutions are in the midst of major building projects and research programs, so [had to ask] whether spending capital in this area was more important to their ongoing operations? It really comes down to a choice about strategic direction.

What were some of the inevitable concerns and hesitations you heard regarding NYGC?

I think there were three substantive issues. First, would the institutional demand be sufficient to sustain a center of this magnitude and what would be the commitment for those institutions to the center and the commitment of the center to them? Traditionally, New York has lagged behind other areas in sequencing capacity, as have all the institutions we've been speaking to -- although one or two, like Mount Sinai, have been building a large genomics capability in recent years. So that was a big contentious question that continued through the end. Obviously with a start-up, nothing is certain and everyone has a different idea. We had to do as much research as we could and go with our gut. We'll have to adjust as we go along, obviously.

A second major issue was, how would the major institutions participate together? Would there be equal representation or proportional participation with different sizes of institutions? In the end, after enormous debate, a principle of equal representation was chosen. The initial contribution by all the founding members is the same, even though their use of the center may vary dramatically. The idea that won out was that the value of participation in a scientific community and endeavor created by NYGC was worth the small initial investment and that everyone would share in this scientific enterprise equally.

The third issue was, how would this initiative interact with the initiatives going on within each of the institutions? Competitive or supportive? How would that work? This was especially important in defining the research element of the center, because there is a plan and process underway to recruit a world renowned scientist to be the scientific director. There are a lot of questions about how the research portion would interface with the other institutions.

At one point, Richard Gibbs (Director, BCM genome center) said something to me: "You have to be absolutely fearless to do this." He's right—if one stopped to think too much about all the things that could go wrong at any moment, you'd never get up in the morning. So the only thing you can do is to work at it the best you can, manage the issues as they come up. I don't think there was one day this year when I had full confidence we'd actually make it, but I knew it was important to try.

FUNDING AND LOGISTICS

What is it costing to get NYGC off the ground?

The total project cost is about \$120 million. It will come from a variety of sources—the Institutional Founding Members, Associate Members, private philanthropists, founding member companies, technology collaborators, the New York City Economic Development Corporation and the New York City Investment Fund. That's not all inclusive, but there are a number of pieces to the quilt that had to be knit together to be able to put this all

together. I think one of the strengths of this effort is that its success is not dependent upon one funding source, especially a public funding source, which has proved to be a problem in some other large projects like this one.

Who are some of the philanthropists that are backing NYGC?

The Simons Foundation was the first major philanthropic donor, is a Founding Partner of NYGC and will name NYGC's bioinformatics center. They donated a \$20 million matching challenge grant. Since then, we have made progress toward the match with a \$2.5 million donation from the Bloomberg Philanthropies. We are in discussion with a few other foundations and individual philanthropists to close the gap.

The first philanthropic donations came from Tony Evnin of Venrock, who served initially as a financial advisor, made a small philanthropic donation early on and recently stepped forward with the announcement of a very significant commitment to the Center. Russ Carson, who is the founder of Welsh, Carson, Anderson & Stowe, a leader in New York in philanthropic circles, has also pledged a very substantial sum of money.

Have you found a location for NYGC?

There is no final decision as yet. We have two locations that are under serious consideration in Manhattan. We'd be refurbishing existing buildings. We're looking for a building that can house the capabilities we require both on the sequencing and data storage side. Obviously there are some wet labs, so the structure has to be right. In addition, the neighborhood has to be right – being able to attract talented individuals, who want to work at the Center. It must be an exciting place, centrally located for the institutions so it's easy for scientists to go back and forth. Whatever space we occupy, we have detailed plans to make this our own space that reflects both the technological and human aspects of this venture. We want to create an environment where people want to collaborate and have fun.

We went through an extensive site selection process, starting with over 100 sites (including Brooklyn and the Bronx), narrowing the list down. Right now, we're in discussions with landlords. The New York City Economic Development Corporation has been very helpful in the site selection process. We've talked to the City and State at the highest levels about resources.

Is there any relationship between NYGC and Mayor Bloomberg's recent New York initiative?

Yes! The EDC's idea was to attract another educational institution that was very strong in engineering and applied sciences to locate in New York or partner with a New York institution and create educational programs... We saw this as an opportunity to provide the city with a slightly different take on what they were doing, because the bioinformatics area of NYGC is going to be so important... We submitted a response to the City's Request for Expressions of Interest early this year, and we just turned in a response to the RFP. We are already collaborating with some of the academic institutions that also are applying. Our vision is that we will be an integral part of the Applied Sciences Initiative, and we will be able to have something in place ahead of Bloomberg's schedule. We look forward to the increased exposure and awareness in New York that will result from this effort.

Who else is involved in the development team?

We've been working on a virtual basis, with a strong financial consulting team, TGG Capital. WilmerHale provided pro bono legal services. Dave Whelan, a business consultant with Bespoke Strategy, played the lead operational role. He brought in Buffalo Biosciences, a consulting group that has worked in the sequencing area.

We have an entire real estate development team led by Yasmeen Ahmed Pattie, previously with the New York City Economic Development Fund. Elkus-Manfredi is designing NYGC. The team includes Newmark Knight Frank, Hunter Roberts, Jaros Baum & Bowles, Thornton Tomasetti, Fried Frank, and Joel M. Silverman & Associates. We have between 20-25 people working in various areas of this—all the best in the city, and all whom have worked together and with the institutions in the past.

BUSINESS MODEL

What is NYGC's operating structure?

We've built up the business model with seven operational units. We start with the sequencing service center, which will serve not only the institutional founding members and pharma collaborators, but also hospitals on the clinical side...

That will be coupled with a very robust bioinformatics presence. We're looking to recruit Ph.D.s—mathematicians, and computational biologists, to interpret the sequencing data and to assist researchers on a consulting basis.

Third, the center will have its own internal research, led by a world-class scientific director. We'll also make another senior investigator appointment in the first year.

The Innovation Center is a cost center where we're investing a lot of capital and operational resources to allow scientists from throughout New York and beyond to use these instruments, to publish early and establish thought leadership. Finally, we hope there will be commercial activities from these efforts to create new jobs and products to enhance medical treatments.

Training will take place in conjunction with Cold Spring Harbor's wonderful programs, and possibly with Stony Brook and CUNY, with whom we've talked about creating some degree programs to help train people in this area. And finally, we'll have a small philanthropic unit.

To start, we'll have two research groups with about 15 people each, so the internal research will have about 30 people.

What about a clinical component? Is that a revolution that NYGC aims to be a part of?

Absolutely! There will be a CLIA-certified portion of the facility and we'll be interacting very closely with the hospitals like New York-Presbyterian Hospital and North Shore-LIJ, two of our Institutional Founding Members, to create some innovative programs. Obviously there are a lot of regulatory and other issues that need to be overcome, but we do think the clinical component of this endeavor will be part of the future of medicine and healthcare.

When do you expect to recruit the scientific director?

An international search effort is underway, led by a committee comprised of representatives of all the Institutional Founding Members and myself, chaired by Tony Evnin. Obviously, this leadership group has a lot of established relationships in the industry, so we're also seeking recommendations as to people who should be considered. I think it will take [several] months to recruit someone who has the right scientific, leadership and administrative attributes.

And what will your future role be after that?

Well obviously there's an enormous amount of work to be done to make this successful. The first step in creating

the strategic plan and raising the money is only a small component of making this successful. There's a huge ongoing financial, executive and operational role that has to be put together with a large organization, and I'd expect to play a key role in doing that as the Executive Director or Deputy Director.

You have to be both proud and relieved to have come this far?

I recently had a 3-hour discussion with the CFO of one of the founding institutions. Upon finishing her review, she said, 'Oh my God, this is the most exciting thing I've heard about in years. To bring all these institutions together in New York in 12 months with less than \$1 million in seed financing is amazing!'

In truth, when I first talked to Tom Maniatis and Tom Kelly about this, we were operating with a cell phone and a hotmail account! 12 months later, to have raised \$120 million and brought this number of institutions together is really quite extraordinary.

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