

APPENDIX I

Interview notes

FIRMS INTERVIEWED

Alphabetical Listing

Analytical Sciences, Inc.
Ani Lytics, Inc.
Biomedical Research Institute
Bioreliance
Celera Genomics Corp.
Diagnon
Diagnostic Assay Services, Inc.
DNA Technologies, Inc.
Genetic Therapy, Inc.
Gene Logic, Inc.
Genome Dynamics, Inc.
Genoquest, Inc.
Genvec, Inc.
Human Genome Sciences, Inc.
IGEN, Inc.
InforMax, Inc.
International Genetics Associates, Inc.
Intracel Corporation
Large Scale Biology Corporation
Life Technologies, Inc.
McKesson HBOC Bioservices
MedImmune, Inc.
Molecular Histology Lab, Inc.
NABI
Origene Technologies, Inc.
Primedica Corporation
Shire Laboratories, Inc.
SRA Life Sciences, Inc.
Sitek Research Laboratories
Supertechs, Inc.
The Institute For Genomic Research
TherImmune Research Corporation
Veritas, Inc.
Virion Systems
Westat

Firms by Size

Large Firms (100+ employees):

BioReliance
Celera Genomics Corp.
Diagnon
Genetic Therapy, Inc.
Gene Logic, Inc.
Human Genome Sciences, Inc.
InforMax, Inc.
IGEN, Inc.
Intracel Corporation
Life Technologies, Inc.
McKesson HBOC Bioservices
MedImmune, Inc.
Westat

Medium-Sized Firms (25-99 employees):

Analytical Sciences, Inc.
Biomedical Research Institute
Diagnostic Assay Services, Inc.
Genvec, Inc.
NABI
Primedica Corporation
Shire Laboratories, Inc.
SRA Life Sciences, Inc.
The Institute for Genomic Research, Inc.
TherImmune Research Corporation
Virion Systems

Small-Sized Firms (Less the 25 employees):

Ani Lytics, Inc.
DNA Technologies, Inc.
Genome Dynamics, Inc.
Genoquest, Inc.
International Genetics Associates, Inc.
Large Scale Biology Corporation
Molecular Histology Lab, Inc.
Origene Technologies, Inc.
Sitek Research Laboratories
Supertechs, Inc.

Veritas, Inc.

Appendix I, Summary of Phone Interviews

These interviews were conducted in the fall of 1999.

Large-Size Firms (100+ Employees)

BioReliance

Paul Nevens, Facilities Manager
9900 Blackwell Rd.
Rockville

Local Employees: 430

BioReliance is a leading contract research organization that provides testing, development and manufacturing services for biomedical products to biotechnology and pharmaceutical companies worldwide. The company evaluates products to ensure they are free of disease-causing agents and do not cause adverse effects. It also develops unique production processes and manufactures biologics on behalf of clients for use in clinical trials as well as the commercial market.

This company, which originated in 1947 and is one of the oldest in the biotech industry, has been located in the Life Sciences Center since 1987. It now occupies 170,000 square feet in the Shady Grove Life Sciences Center, the bulk of which is lab space. All of its space on 4 sites within the center is rented. An additional 30,000 square feet of space in one of its buildings has not yet been built out. In addition, it is currently building a 30,000 square feet manufacturing facility on one of these sites. All its sites provide free parking.

The company appears to be well connected with other biotech firms as well as institutions in the SGLSC area. It conducts tests for several other firms in the area and hopes to draw clients from the area for curative products to be supplied by its new manufacturing facility. It also purchases supplies from several companies in the area, with Life Technologies supplying 5 percent of the total. About 20 percent of its revenue is derived from contracts with federal agencies, especially the National Cancer Institute and National Toxicology Program. In addition, several of its scientists participate in seminars sponsored by NIH. Some of its scientists have taught courses at Montgomery College, and the company has hired three or four interns from this school. Furthermore, several employees have taken courses on manufacturing processes taught at the University of Maryland or enrolled in MBA Programs geared toward the sciences offered by JHU.

The company belongs to the High Tech Council, like a lot of its counterparts in the area. It has occasionally rented out lab space on a short-term basis to other firms in the area interested in conducting gene therapy research, but it does not sublet space. The company has also farmed out some of its tests to local labs.

As noted above, the company is able to expand on its current site and has no interest in expanding outside of its present location. Mr. Nevens did express some concern in three areas, however. The company is approaching the full development of its existing sites, and there is no more vacant developable space left in the SGLSC. He also suggested that the County create a transportation link between the Shady Grove Metro Station and the SGLSC, a three-mile distance, in order to encourage greater use of transit. Finally, he complained about the lack of commercial facilities, such as restaurants, within the SGLSC campus area. The nearest restaurants are more than a 15-minute walk away.

Celera Genomics Corp.

Paul Gibson, Director of Policy and Planning
45 West Gude Dr.
Rockville

Local Employees: 500

This company, which began operations a little over a year ago, was formed for the purpose of generating and commercializing genomic information to accelerate the understanding of biological processes. The company is a joint venture between TIGR and Perkin-Elmer, a leading supplier of life science systems and analytical instruments used by the pharmaceutical and biotechnology industries, that will combine the rapid gene sequencing equipment of Perkin-Elmer with TIGR's genomic expertise. Perkin Elmer will retain ownership of about 80 % of the new company, which completed the its draft sequence of the human genome in June 2000. Celera intends to follow-up by interpreting the sequence to make it useful to medicine. Celera has also formed a strategic alliance with Compaq Computer Corporation to ensure it has sufficient computer power to handle the billions of fragments of genomic data for sequencing. The company expects to derive revenues from its information, primarily from access fees from database customers (e.g., pharmaceutical, biotechnology companies, research institutions) who will retain the rights to any discoveries made using Celera databases.

The company occupies 200,000 square feet of space in two whole buildings (which it recently purchased) about two miles from the SGLSC. Former office space was converted into lab space. Parking is adequate and the commercial facilities of downtown Rockville are only one and one-half miles away. It expects to remain in this space for at least two to three years.

The company was capitalized by its parent company (The Institute for Genomic Research) and does not do any contract research. Its primary customers are three pharmaceutical firms headquartered outside of Montgomery County. It does not intend to partner with other biotech firms. The company purchases national brand office and lab supplies from local distributors. It does use a local computer service firm, however.

The company has not developed any relationships with local universities yet. It has no internships, and its staff has not taken many courses offered by these schools. Employees do attend

government-sponsored seminars, and the company is a member of the High Tech Council.

Diagnon

Kevin O'Neill, Corporate Counsel
9600 Medical Center Drive, Suite 200
Rockville

Local Employees: 120

Diagnon Corporation was founded in 1981 to develop, produce and sell diagnostic test kits incorporating monoclonal antibodies to diagnose certain anemias, infections, and parasitic diseases. In 1988, the company discontinued the diagnostic test kit segment of its business to concentrate on its contract research base with NIH. In 1990, the company moved to its present location in the SGLSC in order to be near NIH, which is the biggest client for its services. At least 80% of its contracts are with government agencies. It was able to move into a building built by Rickman Construction to its specifications, where it leases space. It has a CRADA with NIH but does not have any relationships with the colleges and universities in the area, although it has supplied primates to GWU for testing purposes.

The company is housed in two facilities. It leases about 62,000 square feet of space consisting of offices and labs in the SGLSC, the primary location. There are a few other tenants in the building, but Diagnon occupies the bulk of the space. The building has free parking. The company also leases 30,000 square feet of space on Research Boulevard about one-half mile away for primate storage.

Diagnon also does some contract research (involving animal tests) for EntreMed and other biotech firms in the area. It is a member of the High Tech Council, which provides a forum for sharing information and discussing common problems and concerns. It does not share research facilities with other firms.

Kevin O'Neil, company corporate counsel, noted that the company has had problems in expanding their primate storage facility. He stated that landlords are reluctant to rent space for this purpose in multi-tenant buildings because other tenants tend to be leery of their presence. Special air handling equipment is required as well as autoclaves, which produce odor.

O'Neil stated that Diagnon would want to remain close to NIH if it were to expand and would also prefer to lease. He complained of the difficulty in attracting and keeping technical workers in this highly competitive area. He also noted that animal care-takers, who earn \$8 to \$10 an hour, are also difficult to find. Workforce problems encountered by the company have not been sufficiently serious to cause it to want to leave the metropolitan area, however.

Genetic Therapy, Inc.

Ed Otto, Site Head
938 Clopper Rd.
Gaithersburg

Local Employees: 225

A large Swiss pharmaceutical company, Novartis, acquired this company, which was founded in 1986, three years ago. It rents about 100,000 square feet of space in four different buildings within five blocks of each other and has free parking. The company is currently building 85,000 square feet of new space across the street for labs that will permit it to consolidate its workforce.

The company has several CRADAs with NIH and has also collaborated with local universities in conducting research, although it rarely use interns. It has purchased some supplies from Life Technologies, Inc., a local firm. The company is a member of the High Tech Council and local Chamber of Commerce. It has not co-developed products or partnered with other local firms in bidding on contracts.

Gene Logic, Inc.

Stephen Push, VP, Corporate Communications
708 Quince Orchard Rd.
Gaithersburg

Local Employees: 220

Gene Logic offers pharmaceutical companies ways to speed up development of new drugs. Its products identify changes in genes associated with a disease and allow drug makers to gear a drug's development to address those changes. Its purchase of OncorMed gives it expertise in cancer discovery and treatment using gene technology. The company is developing a database of gene expressions to serve as a reference to predict the effectiveness of test drugs.

This company, which was incorporated in 1994, began commercial operations in 1996. It was originally located in Columbia, but moved to its present location on Quince Orchard Road to be near NIH, JHU, and other companies in the biotech industry. The company also has some office/lab space on Perry Parkway, which was the former site of OncorMed, Inc., a company acquired by Gene Logic in November 1998. Its total space amounts to 69,000 square feet, all of which is leased. Parking is adequate and free.

Another reason for the company's move into the area was the existence of a quality potential workforce with first-rate training in biology. JHU has a very strong reputation in the sciences. The

company's relationships with JHU and government agencies are informal. Although it does not have any internship programs, many of its employees have taken courses offered by JHU. Its employees have also attended conferences sponsored by JHU. In addition, its scientists have attended meetings with their counterparts at NIH.

The company does not appear to have established any formal business ties with other firms in the County. Its major customers are large pharmaceutical companies headquartered in other states. It also orders a substantial amount of office and lab equipment from catalogues rather than local suppliers. It is also large enough to service its own computers using in-house staff.

The company does not belong to the High Tech Council. Although it does not have formal business relationships with other firms in the County at present, Gene Logic is attempting to develop them, according to Stephen Push, company vice president. It has recently had discussions with local genome companies to develop complementary technologies. For instance, it is looking for a partner to develop supporting software for a database it has developed of gene expressions to serve as a reference to predict the effectiveness of test drugs. The company has not engaged in lab sharing or partnering with other firms to bid on contracts.

Gene Logic has doubled its staff in the past year, largely with the help of its acquisition of OncorMed. It expects to add another 25 employees by yearend. The company plans to consolidate its two facilities in the near future and has been investigating the real estate market in the County. Push indicated that the company has identified a few existing buildings near its present location that appear to be good candidates. It has not found parking limitations at potential buildings to be a common problem. Similarly, Push indicated that adequate vacant land exists in the surrounding area in the event the company decided to build a facility, an unlikely possibility given its preference for leasing.

Human Genome Sciences, Inc.

Alan Capaluti, Comptroller
9410 Key West Ave.
Rockville

Local Employees: 460

This company, which was formed in 1992, researches and develops new gene- and protein-based drugs and diagnostic products. The company was the first to discover a great majority of human genes and to create an integrated, genomics-based drug discovery and development capability. As of June 1999, the company had filed patent applications that describe the medical uses of more than 6,300 newly discovered human genes.

Human Genome Sciences, which was formed in September 1992, rents about 300,000 square feet (mainly lab space) in five buildings near the intersection of Key West Drive and Shady Grove Road.

In addition, the company recently built a pilot manufacturing plant (80,000 square feet) on land leased from JHU (Belward Campus). The company has CRADAs with JHU and UMD, but does not consult for any federal agencies.

The company also has a CRADA with MedImmune, which is also included in this survey. Capaluti stated that the company acquires about one-third of its office and lab supplies from vendors in Montgomery County, including Life Technologies and Benjamin office supplies.

Capaluti indicated that the company would build another manufacturing facility in a few years. They have an option on 17 acres of County-owned land in the SGLSC area. The company has no interest in expanding outside of the area, which it likes because of its closeness the universities and federal government health-related agencies.

IGEN, Inc.

George Semerjian, Director of Facilities
16020 Industrial Drive
Gaithersburg

Local Employees: 200

This company develops, manufactures, and markets diagnostic tests using a patented technology which enhances speed, sensitivity, flexibility, and cost effectiveness. The company is designing its diagnostic systems to become the industry standard for multiple segments of the \$20 billion worldwide market, from hospitals to in-home testing.

The company has been at its present location on Industrial Drive in Gaithersburg since 1995. It occupies 84,000 square feet of office/lab space in an industrial park geared toward light manufacturing and research and development. Free parking is available. A few of its park neighbors supply products to it.

There is some interaction with JHU and UMSG. The company also sells some of its products to government agencies, but this is a small part of its overall business. It also shares labs with other firms in the area, but only to a limited extent.

The company currently lacks adequate space and has been looking for other potential sites in the County over the last few years. George Semerjian noted that there are quite a few potential opportunities (i.e., vacant land) within a 10-mile radius of its current location and that the company would move if a good deal came along.

Semerjian complained that the minimum parking space requirement, which is based on square feet rather than number of employees, has limited the ability of the company to expand the space it

currently occupies. There is simply not enough land at its site to handle the additional parking that would be required. The company has a relatively low ratio of employees to space, which appears to be characteristic of companies utilizing large amounts of lab space. He recommended a public parking policy.

InforMax, INC.

Sandy Terry, Senior Director of Operations
6010 Executive Blvd.
North Bethesda

Local Employees: 170

This company, which has been in business for six years, develops information systems for pharmaceutical/biotech companies. It had no problem finding space to rent several years ago, on Executive Blvd. in North Bethesda where it now occupies three floors of an office building. The company is satisfied with the area (e.g., parking, commercial facilities) but is in a rapid expansion mode that will last at least three more years and has experienced serious problems finding additional space to rent. It is expanding to two more floors in a new Class A office building in Bethesda. InforMax has contracts with government agencies (mainly NIH) and with many other biotech companies inside and outside the County. It has also provided software to some pharmaceutical companies (outside County) and Johns Hopkins University.

Intracel Corporation

Leslie Ivy, Manager Of Human Resources
1330 Piccard Dr.
Rockville

Local Employees: 175

This company, which has been operating since 1982, develops and commercializes cancer vaccines, as well as immunotherapeutic and diagnostic products for cancers and infectious diseases. Most of its products are in clinical trials. The company rents a total of 130,000 square feet, 30,000 of which it sublets to other biotech firms. All of this space, which is used for corporate headquarters, R & D, and manufacturing, is located in one building. Leslie Ivy, company manager of human resources, expressed satisfaction with building amenities and location, noting that parking is adequate and that delis are within walking distance. It intends to stay in this area because of the proximity of government health-related agencies and other biotech firms.

The firm's primary market is national in scope, made up of hospitals, physicians, and pharmaceuticals, to a lesser extent. Less than 10 percent of its business is derived from Montgomery County. The company has had contracts with NIH in the past to conduct R & D, however. The firm

uses local suppliers for office supplies, including computers and copying machines. About 50 percent of its lab supplies are provided by local vendors, although the equipment is not manufactured in this County.

The firm has developed a close association with Johns Hopkins University, sharing laboratories and exchanging information. It does not have a formal intern program with the school, however. It has used interns from Montgomery College and the UMD in the past. The company does subsidize employee training at these schools. Ivy noted that many of the company's employees have completed the JHU MBA Program. The company has also encouraged its foreign employees (Latin America, China) to take English courses.

The firm has developed some good working relationships with other major biotech firms, including Human Genome Sciences, MedImmune, and BioReliance. It has in the past subcontracted for some of these firms. It has not formed a joint venture with any other companies, however. It is an active participant in seminars sponsored by local universities and the federal government, and is a member of the High Tech Council.

Life Technologies, Inc.

Del Tucker, Director of Facilities and Administration Local Employees: 1,586
9800 Medical Center Drive
Rockville

Life Technologies manufactures and supplies more than 3,000 products that are used to perform hundreds of routine molecular and cell biology experiments involving the manipulation of genetic material and the study of how cells grow, differentiate and function. The company offers technical expertise, technology licensing, research services, and large-scale production services. The company has more than 20,000 customers from around the world from universities, public and private research institutes, and the biotechnology and pharmaceutical manufacturing industries. Applications of technologies developed by the company include the study of the cellular and genetic bases of diseases, including cancer, diabetes, AIDS, Cystic Fibrosis, and Down's Syndrome.

The company was founded 11 years ago and has been at its current site in the SGLSC for three years. It moved to the SGLSC in order to consolidate its three separate facilities and be near NIH, JHU, and other companies in the industry with which it has partnered. In addition, the company has a cell and molecular biology manufacturing facility in Frederick.

Its main facility in the SGLSC is divided into corporate headquarters (60,000 square feet), research and development (143,000 sq. ft.), and common areas (47,000 square feet). The company

owns all of its land (18 acres) and the improvements. Parking adequacy is not a problem, and it is free to employees. The company has additional space to move into within its current buildings as well as an additional pad. Within 3-5 years, it will probably build another building. Mr. Tucker did not foresee a need for structured parking, an indication that sufficient vacant space exists at its current site for this building.

The company appears to have strong relationships with other biotech firms as well as educational institutions in the County, and is a supplier of lab services to other firms both within and outside of Montgomery County. In addition, NIH is a major purchaser of its enzyme products. The company also has an intern program with JHU, and many of its employees have enrolled in evening education programs in the biological sciences offered there. JHU offers the company the use of their facilities (i.e., meeting rooms) on weekends. In addition, the company has shared information with the Center for Advanced Research in Biotechnology (CARB) operated by the UMD. The company doesn't have any ties to Montgomery College, although it has hired a few of its grads. The existence of many local universities in the area offering Ph.D. programs in the biosciences was also a major factor in its decision to locate in the County. The majority of the company's R&D employees have PhD Degrees.

The company does not share lab space with other firms because of confidentiality agreements with its customers, who are concerned about protecting their intellectual property. The company belongs to the High Tech Council and has established informal contacts with other biotech firms with whom it does not do business. It has not bid on contracts with other firms, however.

McKesson HBOC Bioservices

Chuck Gambrell, Director of Facility Operations
14665 Rothgeb Drive
Rockville

Local Employees: 180

This company is a provider of biomedical research and development services including repository, analytical laboratory, packaging/labeling and regulation support services. The company, a wholly owned subsidiary of McKesson Corp., a health care supplier, is 13 years old and has seven facilities in the County. Its main facility, which it owns, is located on Rothgeb Drive and occupies 80,000 square feet. In addition, it rents about 100,000 square feet of space (mainly storage facilities) in the remaining six facilities. It only has about 6,000 to 7,000 square feet of lab space. Chuck Gambrell told me that he had difficulty in discovering appropriate warehouse space in the County. Parking, which is free to employees, has not been a problem at any of the facilities nor is there any lack of nearby commercial facilities.

The company's major customers are pharmaceutical companies and a few biotech firms in the

County, which Gambrell was reluctant to identify. The company has worked closely with NIH and National Cancer Institute in testing products. The company does not appear to rely much on other firms in the County for supplies, getting its packaging products and lab supplies from national companies. The company belongs to the High Tech Council and has bid with other firms in the County for contracts. Gambrell did indicate that there is not much informal communications between the company's scientists and their counterparts in other firms.

The company recently built a 10,000 square foot addition to its main building for storage purposes. Gambrell believed that the company would also be looking at expansion possibilities in September either in the County or in Frederick. The company is currently leaning toward Frederick County because of the availability of larger lots and cheaper land. In addition, he thought that utility rates may be cheaper in Frederick and it may be less difficult to obtain permits there. The company is a big user of electricity because it must store its biological products under controlled environmental conditions.

MedImmune, Inc.

Will Roberts, Investor Relations
35 West Watkins Mill Rd.
Gaithersburg

Local Employees: 630

The company is focused on using advances in immunology and other biological sciences to develop important new products that address significant medical needs in the areas of infectious diseases, transplantation medicine, autoimmune diseases and cancer. The company produces Synagis, which is the first monoclonal antibody approved for an infectious disease and has become an important new pediatric product for the prevention of respiratory syncytial virus, the leading cause of pneumonia and bronchiolitis in children. The company markets two other products and has five new product candidates undergoing clinical trials.

This company, which was formed in 1989, leases 90,000 square feet of space in three buildings on the same site near the intersection of Clopper Road and West Watkins Mill Road. It also recently opened a manufacturing facility in Frederick, MD, where land costs less than in Montgomery County. This space is equally divided between office and research/lab space. Most of the space had originally been designed for lab purposes. Free parking is provided for employees. The main factor influencing its decision to locate in the I-270 Corridor was the proximity to several federal agencies (including FDA, especially) interested in the products of biotech research, as well as the major universities located in the area. Its top officers had formerly worked at the Walter Reed Army Institute of Research. In addition, the local universities have been a source of employees for the company. Montgomery College has not served this purpose in the past, but the company is interested in developing a closer relationship with the school.

The company is a member of the High Tech Council. Life Technologies, Inc. is a major supplier of its lab equipment. Its customers are mainly pediatric hospitals around the world. It has not shared lab space with other companies or institutions in the area for the past five years. The company does not appear to have close relationships with other companies in the area, with the exception of Human Genome Sciences, from which it gets information regarding potential new opportunities for developing products.

Westat

Frank Henry, Facilities Manager
1650 Research Blvd.
Rockville

Local Employees: 1,200

Westat is a leading statistical survey research organization serving agencies of the U.S. Government, as well as businesses, foundations, and state and local governments. Westat has developed a leadership position among contract research organizations in the country by focusing on computer systems technology and the biomedical science field, including clinical trials. The company is over 35 years old.

This company is quartered in five locations in the County, most within walking distance of the others. Its main campus consists of 310,000 square feet in three buildings on Research Boulevard. In addition, it has an 80,000 square foot annex in Gaithersburg and 3,000 square feet in a Rockville location. It leases all of its space. The firm conducts social science as well as medical research (i.e., effectiveness of new cancer treatments).

The company has a fair amount of contact with other firms and institutions in the area. Two-thirds of its business is with government agencies. NIH is a major client. The company buys a substantial amount of office equipment (including computers) from local firms. Some of its staff regularly take computer and other classes at the local universities. There are no internship programs, however.

The company has access to free parking, but lack of it is a big problem. It has had to build two parking decks. The company is outgrowing its current space and plans to add 80,000 square feet by 2002. Lack of space on its site will force it to build on its parking lot, which will necessitate the construction of another parking deck. It may attempt to get additional space in the King Farm while expanding its quarters. Lack of convenient retail facilities at its current location is somewhat of a problem, but it is alleviated to some extent by the presence of two on-site cafeterias run by Marriott.

Center by the County, provides lab/office space at below market rates. It offers 40,000 square feet of lab space and presently has six tenants. One of the firms covered by this survey, Sitek Research Labs, graduated from this facility in 1994. Another firm covered by this survey, GenVec will soon graduate.

The overall company leases a total of 60,000 square feet of primarily lab space in three neighboring facilities on Parklawn Dr. The space, which was originally intended for warehouses, was modified for lab use at the company's expense. The company is in the process of acquiring more space in a building next door. James Leef, facility director, expressed general satisfaction with the company's physical plant but noted that adequate parking space (which is free to employees) could become a problem if the company were to add to its staff because of the lack of available land to extend the lot.

The company has CRADA's with the companies that occupy its incubator. It has also had several basic research grants and contracts with federal agencies, mainly NIH. It has consulted for both JHU and UMD but has no current contracts with these institutions. Although the company has not had any internship programs with the local schools, Leef indicated that several of the companies occupying space in its incubator had these programs. Some of the staff at these companies have also taught science courses at these universities.

Leef indicated that the company has purchased most of its lab equipment and office supplies from local firms, including Life Technologies and Biocon. It does not manufacture a product but rather provides R&D services, although the companies in its incubator sell their products mainly to large pharmaceutical firms located outside the County.

Diagnostic Assay Services, Inc.

Delores Novak, Chief Executive Officer
9290 Gaither Rd.
Gaithersburg

Local Employees: 49

This company has been operating since 1974 and has been at its current address on Gaither Rd. for about 10 years. Delores Novak, company chief executive officer, was satisfied with all aspects of its physical facility with the exception of traffic congestion during the lunch period and afternoon rush that results from the dead-ending of Gaither Rd. She did not foresee any expansion in the company.

The company is in the business of testing body fluids (e.g., detect presence of illicit drugs, fertility levels) for doctors, health clinics, and hospitals. Most of its clients are in the regional area. The company does not have any relationship with NIH or other federal health agencies. It receives about 10 percent of its lab supplies from Montgomery County vendors, mainly reagents.

GenVec, Inc.

Jeffrey Church, CFO
12111 Parklawn Dr.
Rockville

Local Employees: 86

This company, which was formed in the early 1990's, is strictly a research and development firm that is focused on developing cures for pulmonary diseases, cancer, cardiovascular diseases, and neurological diseases. The company has developed a gene therapy designed to induce new blood vessel formation in human hearts and other tissue with inadequate blood flow. The company, which is currently located in the Biomedical Research Institute's incubator (also included in this survey), will soon move to flex space in the Bennington Corporate Park (West Watkins Mill Rd.), which will add 19,000 square feet to the 24,000 it currently leases. This space will be in a newly constructed shell building. The new space will offer free parking and nearby commercial facilities. Mr. Church stated that the company was able to find this space without much difficulty.

The company formerly had a CRADA with NIH, but currently does not have any business relationships with federal agencies. Its major customer is a pharmaceutical company located out of state. The company also has consulting agreements with JHU and UMD and has recruited employees from these schools. It also has an intern program with Montgomery College. The company is a member of the High Tech Council, and its employees attend university- and FDA-sponsored seminars.

NABI

Peter Maracell, Director of Operations
12280 Wilkins Ave.
Rockville

Local Employees: 60

NABI is a vertically integrated biopharmaceutical company that supplies human blood plasma and develops and commercializes therapeutic products for the prevention and treatment of infectious diseases and immunological disorders. The company has products on the market that prevent hepatitis B and treat hemophilia. It is one of the world's largest suppliers of blood plasma, which is sold to pharmaceutical and diagnostic companies or used in its own products.

This company, which is headquartered in Boca Raton, Florida, has been in the County (Rockville) since 1992. The company's Rockville operation, which is housed in 72,000 square feet of rented older flex space in four buildings on Wilkins Ave., is its research and development arm. These buildings were originally warehouses that the company converted into lab/office space. Peter Maracell, company director of operations, expressed satisfaction with the parking situation and proximity of retail

facilities.

The major reason for locating in Montgomery County was to be near Walter Reed, NIH, and the FDA. It has joint research agreements with NIH and UMD. The company does not have any significant business relationships (i.e., suppliers, customers, partners) with other biotech companies in Montgomery County. It obtains most of its lab supplies from national companies and has an in-house computer support staff. Most of its customers are hospitals and clinics located around the country.

The company has developed some ties to the local universities. It subsidizes staff interested in taking courses and has supported post-doctoral candidates from UMD and JHU. The staff has also attended seminars sponsored by the High Tech Council as well as UMD.

Primedica Corporation (formerly known as Washington Laboratories)

Alan Moore, Vice President,
Biomedical Pharmaceutical Services
2 Taft Court
Rockville

Local Employees: 65

This facility is one of five laboratories operated by the company, which is headquartered in Massachusetts. The company is a provider of laboratory-based professional services, including chemical synthesis. The main reason for locating in the County in 1992 was the proximity to the FDA as well as a highly trained workforce (UMD grads, JHU MBAs). This facility is housed in two adjacent buildings on Taft Court, involving a total of 32,000 leased square feet. Three-quarters of the space is manufacturing/lab space.

Alan Moore, company vice president, indicated that, although the parking situation was adequate for now, a 5% increase in staff size would cause problems. In fact, the company has plans to expand into 7,000 square feet of additional space in one of its buildings. In addition, the firm recently had a contingency study performed by a real estate firm analyzing the feasibility of building a new manufacturing facility vs. buying and converting an existing building within a 10 mile radius of their current location. This hypothetical facility would occupy 60,000 to 100,000 square feet divided 60/40 into manufacturing/lab space. The real estate consultant concluded that the Seneca Meadows Corporate Center (near the intersection of Route 27 and Route 118), a 160 acre business park near I-270, presented the best opportunity for a new plant requiring a total of 12 acres of land. Two other potential sites in the County were also located. The study also found that a few flex buildings (located both within and outside business parks) in the County could be renovated so as to satisfy the needs of the firm.

Moore indicated that Life Technologies, Inc. was a major supplier of the company. The

company has had contracts with NIH and FDA. The bulk of its business is derived from major pharmaceuticals as well as biotech companies, mainly outside of the County. The company has done a small amount of partnering with other firms, which were not named. Although it is a High Tech Council member, its main business focus has been on companies outside of the County.

Moore indicated that the company has used temporary help from students trained in lab procedures at Montgomery College and actually hired some of them. They have less interest in grad students and consequently have not developed any programs with JHU or UMD. However, some of the company's staff have taken courses at UMD.

Shire Laboratories, Inc.

Krystyna Belanduik, Senior Vice-President,
Business Development
1550 East Gude Drive
Rockville

Local Employees: 84

The original company was financed by a venture capital company, Health Care Investment Corp., in 1990. It was later acquired by Shire Pharmaceuticals Group, a British firm which seeks new uses for old drugs. The company reformulates existing compounds to develop new treatments for central nervous system ailments (including Alzheimer's Disease and chronic fatigue syndrome) and metabolic bone diseases (including osteoporosis). The company has about 45,000 square feet of leased office and lab space on East Gude Drive. Parking and lack of commercial facilities are not a problem. The company's customers are large pharmaceutical and biotech firms around the world (not much in Montgomery County).

The company originally chose its location to be close to FDA and NIH. It has attracted the active participation of NIH scientists on its advisory boards. The company also received small business innovation grants from NIH when it was a start-up firm, but eventually found the process too burdensome. Krystyna Belanduik, company senior vice president, criticized the slowness of the award process in a fast-changing industry and also noted the difficulty in gaining acceptance for innovative ideas. As a result, the company became more dependent on venture capital firms.

It recruits its staff from the Univ. of MD and JHU mainly. It also has a summer internship program with UMD. The company also has an active continuing education program, supporting its employees who take science courses (i.e., tuition payments).

Belanduik stated that the company has a long-term growth plan but is not currently pursuing any new sites. The company had been subleasing space from MedImmune prior to 1997, when it purchased its present space, which required extensive renovation. She complained that lab space in the

50,000 square feet range was scarce in the County. It took two to three years to locate its present space.

SRA Life Sciences, Inc.

Lawrence Glass, Chief Executive Officer
4 Research Court
Rockville

Local Employees: 70

This company is a contract research and development organization providing scientific and management services to the pharmaceutical and biotech industry, government agencies, and health care organizations. The company offers support in drug discovery, preclinical research and development, clinical development, and disease management. Its clients range from solo physicians to Fortune 500 pharmaceutical firms.

Although the headquarters of the company is located in Falls Church, its labs have always been located in Rockville. It chose this location for its proximity to clients and a high quality workforce. It leases 50,000 square feet (predominantly lab) in Rockville. Adequate parking has not been a problem. NIH and Army are its major government clients. One local company, Life Technologies, is a supplier, but not to a substantial extent. Lawrence Glass, company chief executive officer, would not disclose his company's private sector customers. Although the company has recruited from JHU and UMD (College Park), it does not have any intern programs or contacts with Montgomery College. Some of its employees have also taken courses at JHU.

The company has partnered with other firms occasionally in bidding on contracts, but does not appear to be very interested in establishing informal contacts with other local companies. Mr. Glass informed me the company recently dropped out of the High Tech Council because it "wasn't getting anything out of it."

When I asked what the County could do to help his company, Mr. Glass suggested lower property taxes and state income taxes. He has no plans to expand his company at present.

The Institute for Genomic Research

Damar Hawkins, VP for Administration
9712 Medical Center Drive
Rockville

Local Employees: 75

The Institute For Genomic Research (TIGR) was founded in July 1992 under an agreement which granted TIGR \$85 million over 10 years in return for the intellectual property rights to TIGR's discoveries. That agreement was dissolved in June 1997. TIGR currently funds its research from government and private grants. Using a new approach, TIGR identified over half the estimated 70,000 human genes within a year. The Institute is now engaged in chromosome sequencing as part of the Human Genome Project. TIGR identified the full DNA sequence of the first three microbial genomes in history and is currently sequencing many more.

The company moved to its present location in the SGLSC in September 1995. The CEO, Dr. J. Craig Venter, came from NIH, which was the primary factor in the decision to locate in the County. The company was also attracted to its present location by the proximity of JHU in addition to receiving an attractive offer from the County to locate in the center. The company doesn't have any formal relationship with Montgomery College (e.g., internship program), but it has hired a few students who had formerly been interns. It has a desire to take better advantage of this institution for training purposes in the future, however.

The company, which is located on a 12 acre site in the LSC, occupies and owns two buildings (80,000 square feet) and is in the process of building two more (45,000 square feet). These buildings house a mixture of offices and labs. This site should provide plenty of room for future expansion, and the company has no interest in leaving the County.

This company has established strong ties with some firms and institutions (JHU, NIH) in the area. It uses local firms for lab supplies and has contracted with a number of federal agencies (DOE, NIH, NSF, DOD) to conduct basic research. Although TIGR has not shared facilities, such as labs, with other firms in the industry, it has used labs at JHU. JHU faculty have at times collaborated with the company in conducting research, and the company has sent students to the school. The company has not collaborated much in general with other firms in the area.

TherImmune Research Corporation

Joe Angle, Comptroller
555 Quince Orchard Road
Gaithersburg

Local Employees: 85

This company is a contract research operation that provides early stage drug and vaccine research and development services to biotech companies, pharmaceuticals, and the federal government. The company, which was incorporated in December 1998, was formed when a group of former employees of R.O.W. Sciences purchased a substantial portion of the company's assets (mainly lab space). This lab space is located near the intersection of Clopper Rd. and Quince Orchard. It recently moved its corporate headquarters into 4,500 square feet of subleased space located within easy walking distance of its labs. In addition, the company recently leased two labs (1,000 to 1,500 square feet each) in the new County-state incubator on Great Seneca Highway. Joe Angle, company comptroller, expressed satisfaction with the physical amenities of the space, the parking situation, and proximity of retail facilities. He was also satisfied with the financial arrangements, but did complain about a lack of logistical support (e.g., phone service problems, frequent absence of building engineer).

The company's major customer is NIH. It has no CRADAs or contracts with other biotech companies or educational institutions in the area, although Angle expressed interest in developing these relationships as well as joint development agreements with other companies as the company matures. The company is affiliated with the High Tech Council.

Angle indicated the company will soon be expanding its lab space. It has found that entire buildings are much more available than one or two floors of a building, in which it is primarily interested.

Virion Systems

Greg Prince, President
9610 Medical Center Drive
Rockville

Local Employees: 25

This company, which was incorporated in 1987, has been at its present location in the SGLSC for six years. It occupies 16,000 square feet of space in two buildings within one mile of each other. Its office and lab facilities occupy 11,000 square feet in a building in which NIH is the primary tenant. The remaining space is used to house rodents used for tests. The company, which was formed by three scientists who left the NIH and Uniformed Services University of Health Services, has access to free parking.

A major factor in the decision to locate in the County was the proximity of FDA and the Uniformed Services University. Several of its scientists were formerly affiliated with the Uniformed

Services University. In addition, the company has significant interaction with the universities in the area. For example, it has provided post-residency training to some pediatricians from these universities. It does not have any formal intern programs with these schools, however.

The company develops its own technologies and then licenses them to other companies. For example, it helped MedImmune develop a major drug. It currently has contracts with that company as well as some major pharmaceutical companies.

The company has not formed any close relationships with other firms in the industry, with the exception of MedImmune, and does not belong to the High Tech Council. Greg Prince, company president, was interested in developing closer ties with other local firms in the industry, however, and has been active in a coffee house colloquium program started about a year ago by JHU. JHU offers its facility for once a month meetings of scientists from the biotech industry. Prince believes that such meetings should be encouraged and was critical of the lack of any neutral area (i.e., not associated with a particular firm) meeting rooms in the SGLSC campus. He also criticized the lack of nearby restaurants.

The company has plans to expand its operations by forming a public subsidiary company. It intends to rent space in a new building, preferably not too far from its present location. He noted the lack of additional space in the SGLSC and thought it should be expanded into some of the nearby farms.

SMALL-SIZED FIRMS (Under 25 employees)

Ani Lytics, Inc.

Seena Polivy, Senior Technical Associate
200 Girard Ave.
Gaithersburg

Local Employees: 7

This company, which is primarily a research and development company that performs hematology and clinical chemistry testing, has been at its current location for five years, where it rents 5,000 square feet of mainly lab space. It recently expanded its space by 2,500 square feet in the same building. The building had originally been designed as an empty office shell, which required substantial fitting out by this company.

The company's clients are major universities, pharmaceutical companies, and biotech firms. In addition, the company has done some contract research for NIH, FDA, and EPA. Its customer market area is national in scope, and less than 10 percent of its overall business is derived from entities in Montgomery County. It also derives only a small proportion of its supplies from local vendors.

The company, which is a member of the High Tech Council, has not developed any relationships with the local universities.

DNA Technologies, Inc.

Alan Salyards, Research Associate
7860 Beechcraft Ave.
Gaithersburg

Local Employees: 10

This company, which is primarily a R&D firm that also manufactures reagents and antibiotics used in performing experiments and was formed in 1992, rents 3,500 square feet of lab/manufacturing space near Montgomery County Airpark. Parking is free but at times inadequate. The company had been located at Taft Court.

The company's major customer is NIH, but it also sells its products to educational institutions throughout the world. Alan Salyards, company research associate estimated that about 25 percent of the company's sales are in-County, with NIH accounting for about 90 percent of this share. A majority of its lab supplies are purchased from outside the County. Office equipment and computers are purchased from local vendors, however. The company has collaborated with Georgetown University in product development more than other universities because of its president's previous affiliation with the school.

Genome Dynamics, Inc.

Richard Feldman, Vice President
P.O. Box 2168
Germantown

Local Employees: 3

This company, which was formed just 2 1/2 years ago, designs special proteins for gene expression regulation. It presently rents about 1,600 square feet of space in a business park close to Montgomery County Airpark. The company expects to move in two months to some space recently vacated by Life Technologies in the Oakmont Industrial Park. Mr. Feldman started the company in his home after a long tenure at NIH. He thought of moving into the state-funded incubator at SGLSC but decided against it because of the equity requirement. The company supplies its proteins mainly to pharmaceutical firms located outside of the County, but is interested in beginning a business relationship with Celera. It has contracts with Walter Reed and the Naval Research Institute. Its desire to be near federal agencies was a major factor in its choice of the new location. Parking and nearby commercial facilities will be adequate there.

Mr. Feldman complained that the needs of companies in the start-up or slightly larger size class (<10,000 sq. ft.) are not adequately addressed by the County. The County's Department of Economic Development was interested in helping companies locate space in the 10,000 to 50,000 square foot size range at a minimum. The incubator was not good for space needs exceeding 1,000 square feet. He indicated that he had difficulty in finding his present space near the airpark, which was not an ideal location. He noted that there were only a few appropriate spaces south of NIST in the I-270 Corridor.

GenoQuest, Inc.

Dr. William Wong, President
9700 Great Seneca Highway
Rockville

Local Employees: 3

This eight month old company occupies space in the state/County incubator at 9700 Great Seneca Hwy. In Rockville. The company has two lines of business. It develops gene products for companies doing research, such as pharmaceutical firms. It also does some contract research for NIH.

The company picked the incubator because of the access to expensive lab equipment, such as autoclaves. Another major factor was a big meeting room located in the facility. They find no lack of commercial facilities or parking space.

A majority of its supplies (much of it is plastic ware) are from other companies in the County. It uses the UMD facility in the SGLSC for lab space, but does not have any contacts with JHU. It belongs to the High Technology Council.

International Genetics Associates, Inc.

Kenneth Carter, President
11601 Brandy Hall Lane
Gaithersburg

Local Employees: 2

This company, presently located in a residence, began operations in January 1999 and recently signed a lease to sublet space on Taft Court from Human Genome Sciences. This company is a research and development organization devoted to the discovery of genes that are defective in cancers. The major customers are expected to be large pharmaceutical companies. The principals are former NIH scientists who desired to remain in the area when they formed the company. Mr. Carter did not believe that parking would be a problem at the new location but was concerned about the lack of nearby commercial establishments. The company chose not to locate in the new Maryland Technology Development Center on Great Seneca Highway because it thought the space was overpriced for the amenities offered.

The company has Collaborative Research and Development Agreements with the Uniformed Services University and Johns Hopkins University. Mr. Carter appears to be interested in developing ties with other firms and institutions in the industry in the County. The company has joined the High Tech Council and would be amenable to establishing internships with Montgomery College and Johns Hopkins University.

Large Scale Biology Corporation

Constance Seniff, VP, Operations
9620 Medical Center Dr.
Rockville

Local Employees: 20

This company was started in 1985 and was one of the first tenants of the SGLSC. This company is focused on the discovery of protein-level changes underlying pharmaceutical mechanisms and disease processes. Identification of the proteins involved in these effects will have a far-reaching impact on the development of improved therapeutics accurately targeted on the reversal of disease processes and the development of diagnostics that better differentiate complex diseases. It has occupied a 7,200 square foot

building on the site since 1990. The company expects to double its staff by the end of 1999 and is currently negotiating the lease terms for a building in the 25,000 square foot range that will be able to accommodate its increased staff. Constance Seniff, company vice president, complained about the lack of available lab space in this size range, a theme sounded by other participants in the survey. The firm has been using the largest real estate firm in the area specializing in bioscience space, Alexandria Real Estate. The company likes its current location but was unable to locate appropriate space closer than about seven miles away. It did not want to inconvenience many of its current employees by going too far north. Seniff noted that the company also explored the build-to-suit option, but concluded that this alternative would not be economically viable for such a small building. It was not interested in becoming a landlord.

Other than space limitations, the company is basically satisfied with its current location in the SGLSC. Seniff did note two problems, however, related to the infrastructure. She complained about intermittent power fluctuations as well as problems in installing fiber optic cable. She also was not satisfied with the services provided by CARB, which was either not geared or inclined to handle the needs of many of the biotech firms in the area. She did not elaborate on this however.

The company originally chose this location because it was equidistant from major pharmaceutical companies in Europe and a concentration of biotech companies on the West Coast as well as its proximity to government agencies in the health field. In fact, the company has received several Small Business Innovative Research Grants from NIH, the Naval Medical Research Institute, and the National Institute for Science and Technology (Advanced Technology Program).

About one-half of the company's business is with government agencies (mainly NIH). Major pharmaceutical and biotech firms account for the remainder. The company specializes in bioinformatics, and has developed a unique relational database that can be used to assess the potential biological effects (including toxicity) of selected proteins.

A significant amount of the company's lab and office supplies come from Montgomery County vendors, including Office Depot and Staples. Most of its lab equipment is obtained from national firms, such as Sigma and Fisher, although two Montgomery County vendors, Halpro and Deperini, supply some of its prototype lab equipment.

The company has established close ties to the universities in the area. It has done contract research and collaborated with JHU and has hired lab technicians trained at the UMD. The company also encourages its technical workers to take courses at the graduate and post-graduate level at the local universities by paying one-half of the tuition. The company has not partnered with other biotech firms in the area. Ms. Seniff noted that there is in general little collaboration between scientists in the gene and protein exploration fields. The company is a member of the High Tech Council, however.

Molecular Histology Lab, Inc.

Shelly Hoover, Vice President
18536 Office Park Drive
Gaithersburg

Local Employees: 5

This seven-year-old company rents space near Lake Forest Mall. It moved into this space, which had to be converted from office into lab space, about five years ago. It investigated the possibility of moving into a state-sponsored incubator at this time, but did not meet some of the requirements, although the company was a start-up and had no debt at the time. According to Shelly Hoover, Vice President, the company is satisfied with its current location, which provides free parking.

NIH is the primary customer for the services of this company, which provides services in molecular histology and pathology. Other major customers are JHU and UMD-Baltimore. The company acquires its equipment and materials from around the nation. Employees of the company attend seminars at the local universities and NIH. Ms. Hoover spoke highly of the monthly seminars on biotech topics sponsored by JHU, echoing a comment offered by another company contacted in this survey. She noted that these seminars attract an average of 25-30 people.

Origene Technologies, Inc.

Tom Curtis, Marketing Director
13 Taft Court
Rockville

Local Employees: 20

This company, which is a manufacturer of molecular biology products focused on helping scientists clone genes faster, easier, and less expensively, was formed in 1995. It occupies 9,000 sq. ft. in a building on Taft Court. It was located in a smaller facility on the same street until about one year ago. It did not have to modify its present space, which had previously been occupied by a biotech firm. Mr. Curtis indicated that parking is adequate and free and that commercial facilities in the neighborhood were adequate. The president of the company came from Human Genome Sciences (HGS) and desired to remain in close proximity to NIH.

The company's sales are divided about equally among three groups of customers: NIH, other biotech companies (mainly located in Montgomery County, such as HGS), and the UMD and JHU. It acquires its supplies (enzymes, instruments) from an area considerably greater than the County.

Some of the company's staff have taken courses at JHU and UMD, but the company does not have an intern program with either of these universities. Staff occasionally attend seminars at NIH.

Sitek Research Laboratories

Paul Kirby, President
12111 Parklawn Drive
Rockville

Local Employees: 20

This company was formed 15 years ago and has been at its present location on Parklawn Dr. for five years. It leases about 10,000 square feet in a building that was developed by Rickman Construction, the largest builder of lab space in the County. Parking is not a problem. The company is a contract lab that researches and develops new therapeutic drugs for large pharmaceutical companies and sells biologic products to other research labs.

The company does not have much contact with other firms in Montgomery County, getting most of its lab supplies from outside the County. It has occasionally offered its lab facilities to them. The security issue does tend to limit this activity, however. It has also on occasion sub-contracted lab work to Analytical Sciences, a local firm. The company does not have any contact with the universities in the area and does not have any internship programs.

The company is in the process of merging with an engineering company to form a new company that will develop robotic systems to do lab work. It will need to expand its site and prefers to remain near its current location, which is not far from the SGLSC.

Supertechs, Inc.

Fred Bollum, President
9610 Medical Center Drive
Rockville

Local Employees: 7

This company, which was founded in 1990, moved to its present location in the LSC in 1993. The company produces monoclonal and polyclonal antibodies, proteins, polynucleotides and enzymes for use in research of diseases such as leukemia. The company leases 2,800 square feet of office/lab space in a building it shares with three or four other tenants. It is satisfied with this location and has no plans to move in the foreseeable future.

This company has not developed business ties with other companies or government agencies in the County. Its customers tend to be hospitals located outside the County, some of which are located in the Boston area. The company has developed some informal relationships with other local firms and educational institutions, however. Some of its employees have taken courses at JHU. Although it does not have any intern programs, it occasionally calls Montgomery College for part-time technical help. The company belongs to the

High Tech Council, and the Mr. Bollum told me his scientists have daily contact with their counterparts in other firms (three of which are located in the same building).

Bollum suggested that space for meetings (e.g., coffee shop, meeting room) at JHU would be a good idea. He was the second person in the survey to make this suggestion.

Veritas, Inc.

Randall Kincaid, President
679 Southlawn Lane
Rockville

Local Employees: 6

This company, which is a research and development firm specializing in DNA sequencing and gene constructions began operations in May 1995. The company is renting 2,400 square feet of warehouse space that it converted into laboratories. Randall Kinkaid had been a scientist at NIH and did not wish to leave the area. He looked into several other options for acquiring space before settling on a warehouse. The first option he explored was renting lab space in an existing building. This option was not too appealing because of the market rent of \$15-\$18 per square foot at the time, the scarcity of any contiguous space amounting to less than 3,000 square feet, and the universal requirement for a minimum lease term of at least two years. He was mainly interested in the 1,000 to 1,200 square feet range.

Another option he examined was subletting space or sharing it with another biotech company. Although he found some interest on the part of more established firms in this kind of arrangement, he had reservations relating to issues of control over use of the space. Another option was to move into one of the state operated incubators (College Park, Baltimore). He was put off by the high equity requirement and believed that this arrangement was geared more toward firms with ready access to financing.

Randall Kinkaid expressed satisfaction with the company's current space, the rent on which is less than \$7.00 per square foot, and location. Parking is not a problem nor is the proximity of retail establishments. The major client for contract research services is NIH. In addition, it has several private company clients in the local area, including Edge Biosystems (product testing), Biocon (R & D), EntreMed, Life Technologies (provide subculture reagents), and BioReliance (R & D). The firm has also done contract research for Walter Reed and the UMD (Baltimore and College Park Campuses). The firm's suppliers are generally not local firms, although Kirkegaard and Perry, a local company, supplies it with antibodies.

The company has hired part-time help from Montgomery College with good results. It is also a member of the High Tech Council, which has been a good vehicle for networking.