Wake County, North Carolina home to the capital city of Raleigh and the Research T riangle Park has experienced explosive growth over the past 30 years. Driven by an in ux of talented people and innovative businesses, this economic expansion is projected to accelerate over the next several decades.

During the same time period, growth in the life sciences industry has out - paced almost every other sector of our economy. The region s impressive critical mass of companies and the myriad resources supporting them ensure our leadership position will strengthen over the coming years.

The Research Triangle Region boasts industry giants such as GlaxoSmithKline, Quintiles, BD Technologies and Syngenta, representing all major sectors of the life sciences industry.

OPPORTUNITIES ABOUND

With more than 525 life science companies, the state of North Carolina has the third largest biotechnology cluster in the nation behind only California and Massachusetts. These companies, the majority of which are concentrated in Wake County and the Research Triangle region, collectively employ 57,000 people at an average wage of close to $75,000 per year.

Wake County offers businesses in the life sciences industry many advantages including access to research, customers, suppliers, a skilled workforce, and both technical and professional support services. But the most compelling advantage is related to the trend of converging technologies. As the development and adoption of combination devices and products grow, companies with access to a wide range of technologies and industry expertise are the most likely to bene t.

Close collaboration among industry, academia and government is frequently cited as one of Wake County s competitive advantages.

Agricultural Biotechnology

It should be no surprise that North Carolina s rich history in agriculture and leadership position in biotechnology have combined to create a global leader in the eld of ag biotech. Industry giants like BASF, Bayer CropScience, Monsanto and Syngenta operate major research centers alongside mid-sized companies and promising startups each taking advantage of regional assets to improve crop yield, cultivate therapeutics and develop new products and technologies.

Drug Research, Development and Manufacturing

One of the largest components of the local life science cluster revolves around human health and the discovery, analysis and manufacturing of novel drug therapies. Firms focused on research and product development draw on our large supply of Ph.D. and M.D. scientists. Those with promising new compounds that need to test for safety and ef cacy have access to research hospitals and a large, diverse patient population. And companies with approved products can rest assured that our well-trained manufacturing workforce will produce their products following all speci ed practices and procedures.

Medical Devices and Diagnostics

The region s medical device and diagnostic sector has gained signi cant momentum over the past 10 years. Entrepreneurial companies taking advantage of university-based technology and talent led much of the early growth. Their success has resulted in a growing number of global players entering our market through corporate acquisitions the total value of which is now nearing $1 billion.

Contract Research Organizations

Contract research organizations (CROs) are a critical component to any well-rounded life sciences cluster. Many offer a wide range of services including product development and the ability to help companies shepherd products through all phases of the rigorous FDA process. The Triangle has the nation s largest concentration of CROs including corporate headquarters of industry giants Quintiles, INC Research, and PRA International.

With 350 companies employing more than 36,000 people, drug research, development and manufacturing accounts for two-thirds of the state s life sciences industry.

NURTURING AN INDUSTRY

The growth and development of the life sciences industry in Wake County and the Research Triangle region didn t happen by accident, and it certainly didn t occur overnight. The North Carolina Biotechnology Center was created in 1981, becoming the rst state-sponsored initiative promoting the development of the biotech industry. North Carolina s commitment to this industry has remained strong over the last 30 years, and with the creation of programs like the Biotechnology Training and Education Center, its leadership position is rmly intact.

During the last decade North Carolina has invested more than $1.2 billion in the life sciences industry.

PREPARING OUR WORKFORCE

The Research Triangle boasts three tier-one research universities and a nationally recognized community college system that have developed curriculum and customized programs speci cally for the life sciences industry.

North Carolina State University is a national leader in life sciences research and education. In FY 2011, research expenditures exceeded $380 million, ranking NC State among the nation's highest for universities without a medical school. Many of its innovation-inducing partnerships occur at Centennial Campus, a 1,120-acre complex of academic buildings, labs and corporate of ces. Nearby, the Centennial Biomedical Campus — anchored by the renowned College of Veterinary Medicine — is in the midst of a 20 year effort to construct 1.6 million square feet of wet-lab space, of ces and animal care facilities.

NC State is a powerhouse in industry-sponsored research, ranking third in the nation among universities without medical schools.

The University of North Carolina at Chapel Hill is also one of the nation's premier research universities. Its schools of medicine and pharmacy consistently produce top-notch practitioners, and have a rich tradition of creating new products and successful companies. The Carolina Center for Genome Sciences combines faculty strengths across a range of disciplines to advance basic genomic research, and translate discoveries into technologies that improve healthcare, education and society. In 2013, research contracts and grants university-wide exceeded $777 million.

Duke University is a major player in the life sciences. Its School of Medicine, which is focused on both clinical and translational research, is consistently rated as one of the top programs in the country. And its Medical Scientist Training Program, one of the oldest M.D./Ph.D. programs in the nation, prepares physician-scientists for high-level biomedical research careers. The Fitzpatrick Center for Interdisciplinary Engineering, Medicine and Applied Sciences is focused on making major advancements in the elds of bioengineering, materials science and engineering. And the Duke Institute for Genome Sciences & Policy works to address genome discovery and the translation of those discoveries into useful advancements for society. Research expenditures for 2010, the most recent data available, were just shy of $1 billion.

Wake Technical Community College, part of the state's community college system, has an annual enrollment of more than 65,000 students. A key focus of the college is preparing students for careers in the life sciences industry. The college offers certi cate programs, biotech boot camps, and an AAS degree in biopharmaceutical technology.

NCBioImpact combines the resources of North Carolina's 2-year community college system and 4-year universities to create a unique training consortium for the biotechnology and pharmaceutical industries. This consortium was catalyzed by over $100 Million in GoldenLEAF Foundation support, donations of employee time and equipment from industry, and state government funding. www.ncbioimpact.org

BTEC (GoldenLEAF Biomanufacturing Training and Education Center) at North Carolina State University is an 82,500 gross square foot facility featuring high-tech classrooms and laboratories with bench-scale and multi-scale bioprocessing equipment. www.btec.ncsu.edu

BioNetwork is the North Carolina Community College System's statewide initiative with seven centers providing support to all 58 community colleges. BioNetwork trains at all levels, upgrading the skills of incumbent workers, from entry level to management. www.ncbionetwork.org

BRITE (Biomanufacturing Research Institute and Technology Enterprise) at North Carolina Central University provides Bachelor's and graduate degree programs in Pharmaceutical Science. BRITE has a strong research focus, particularly in the areas of drug discovery and manufacturing technology. www.brite.nccu.edu

Both Wake County Economic Development and the NC Biotechnology Center have active Talent Attraction efforts designed to recruit and retain life science professionals to the region. Learn more at www.WorkintheTriangle.com and www.ncbiotech.org

RESOURCES AT EVERY TURN

Since 1981, the **North Carolina Biotechnology Center** (www.ncbiotech.org) has been promoting the development of the life sciences industry in North Carolina. It pursues its mission in a number of ways, including investing in promising new technologies and creating initiatives designed to grow the sector statewide. Examples of initiatives launched by the NC Biotech Center include:

COIN is a center of innovation for nanobiotechnology and nanomedicine and works to accelerate new product development in the life sciences and medical product sectors. www.nccoin.org

The **Marine Biotechnology Center of Innovation** focuses on the growth of this industry statewide, and promotes North Carolina's numerous resources. www.mbcoi.net

The **North Carolina AgBiotech Initiative** stimulates the growth of agricultural biotechnology in the state of North Carolina to create new opportunities that generate jobs, strengthen the economy and produce the technologies and products that help meet the global demand for food, fuel, medicine and sustainable materials.

The Hamner Institutes for Health Sciences conducts research in environmental health sciences, chemical risk assessment and translational research in biotechnology and pharmaceutical safety, metabolic disorders, respiratory disease, oncology, and drug delivery/nanomedicine. www.thehamner.org

The **SBTDC** was the first small business development center in the nation to be officially recognized as providing specialized services to businesses looking to advance, protect, and commercialize their research, innovations, and new technology. The SBTDC's technology unit has helped North Carolina become a leader in US SBIR/STTR awards—generating tens of millions of dollars in R&D support annually for their clients. www.sbtdc.org

CED is the largest entrepreneurial support organization in the United States with more than 5,500 active members representing more than 1,100 companies. It has dozens of programs in place to enable and accelerate the growth of life sciences and technology companies in RTP and across North Carolina. www.cednc.org

"There was a strategic advantage to build the Novartis facility in Holly Springs. We have access to an experienced talent pool due to our close proximity to many biotech companies and local universities. Our location gives us a strong advantage to hire top talent."

Kris Weidling // Director of Human Resources
Novartis Vaccines // Holly Springs, NC

RTI International is a world-leading research institute dedicated to improving the human condition by turning knowledge into practice. Areas of expertise include: health and pharmaceuticals, education and training, surveys and statistics, advanced technology, international development, economic and social policy, energy and the environment, and laboratory and chemistry services. www.rti.org

NCBIO is North Carolina's state-level af liate of the national Biotechnology Industry Organization. Together, the two groups advocate federal, state and local public policies designed to help the bioscience industry ful ll its extraordinary promise as a source of economic opportunity and improved life quality. www.ncbioscience.net

The Triangle has three maj **health care systems**— Duke University Health System, UNC Health Care and WakeMed Health & Hospitals. These outstanding institutions play a signi cant role in the local life sciences industry through the analysis of new products, procedures and technologies —always with an eye on providing the very best patient care.

Our region is home to two of the world's most successful research parks. The **Research Triangle Park** (www.rtp.org) spans 7,000 acres and is home to more than 170 companies employing north of 42,000 people. At 1,120 acres, NC State's **Centennial Campus** (www.centennial.ncsu.edu) is smaller in size but makes up for it in density and dynamism. Both parks are home to global corporations and innovative start-ups, many of which are engaged in the life sciences.

There are a number of **incubators and accelerators** in the Triangle that help small companies test and advance promising new technologies. A partial list includes:

BD BioVenture Center
First Flight Venture Center
Southeast Techinventures
Synecor
American Underground
HQ Raleigh

In addition to their roles preparing our workforce, area colleges and universities can be exceptional resources for technology transfer, research services, business assistance and much more.

SUPPORT AT EVERY STAGE

No matter where you may fall in the product life cycle, you'll nd resources and expertise in Wake County that can help your business keep moving forward.

Concept
As a land grant institution, one of NC State University's responsibilities is to transfer technology from the university across the state of North Carolina. Because of this, NC State is an excellent place to go if you need access to specialized knowledge and facilities. Programs and infrastructure are in place in areas like industrial design, biomedical engineering, advanced materials and robotics to help companies develop —and prove—new technologies.

Product Development, Design and Prototyping
Transforming your concept into a product able to stand the strains of clinical trials is incredibly important. The best ideas may fail due to poor execution in this stage of the process. Luckily there are dozens of rms in the Triangle with the necessary expertise to assist no matter if you're developing a drug, a device or a diagnostic.

Pre-Clinical Trials, Testing and Analysis
The division of toxicology and preclinical services at the Hamner Institutes for Health Sciences provides multi-disci plinary in vitro and in vivo research to support toxicology and risk assessment, preclinical ef cacy screening, biomarker and therapeutics targeting, and development/validation of new drug delivery technologies.

Clinical Trials
With one of the largest concentrations of contract research organizations in the world, you won't have to look far to nd an expert in clinical trial management. And our large and growing community combined with renowned specialists in almost every area of medicine results in a large, diverse patient population.

Manufacturing/Commercialization
Local contract manufacturers have the facilities and expertise to manufacture devices, pharmaceuticals and biologics at various quantities and always according to your exact speci cations.

For rms ready to move into the manufacturing space for themselves, experienced engineering, design and construc tion rms are here to help build new facilities or renovate existing spaces. And thanks to an abundance of specialized training and education programs, nding a skilled workforce to carry out your mission will be a breeze.

"Access and proximity to world-class academic and research facilities have fostered a culture of innovation in this region. This culture is highly valued at INC Research, and we are proud to grow our corporate headquarters in Raleigh."

Jim Ogle // CEO // INC Research

CONCEPT // Do you have an idea that warrants further study? Take advantage of faculty and equipment at one of our research universities. You may even qualify for a tax credit.

PRODUCT DEVELOPMENT // Wake County and RTP are home to several rms with extensive expertise in product design and development for drugs, devices and diagnostics.

COMMERCIALIZATION // Area contract manufacturers can help with production until you're ready to build your own manufacturing plant.

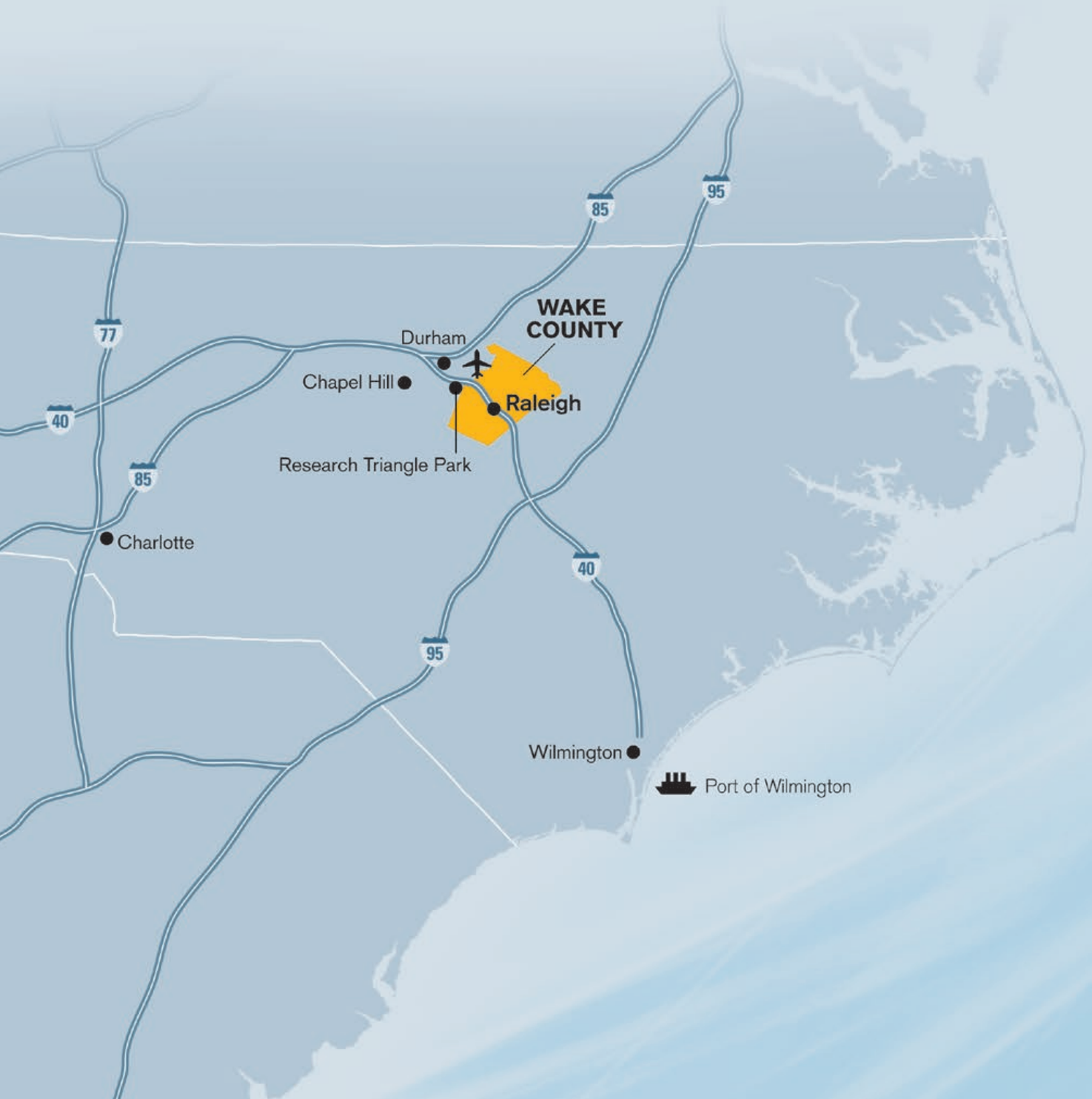
CLINICAL TRIALS // Having one of the largest concentrations of CROs in the world means there is plenty of help for companies navigating the rigorous clinical trials process.

PRE-CLINICAL TRIALS // Local expertise in the preclinical process will get you ready for clinical trials.

In addition to the 400+ life science companies in the Wake County area, there are more than 1,150 companies that are closely related to the bioscience industry. This includes patent attorneys, staffing firms, consultants, surgical instrument manufacturers and lab equipment or medical device distributors.

AN UPWARD SPIRAL

Three decades of focused investment has transformed Wake County and the Research Triangle region into a world-leading center for the life sciences industry. In recent years, as our cluster has grown more mature, its rate of expansion has accelerated significantly. We invite you to join the more than 400 companies already here and take advantage of all this exciting region has to offer.



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