INNOVATE @ CAROLINA

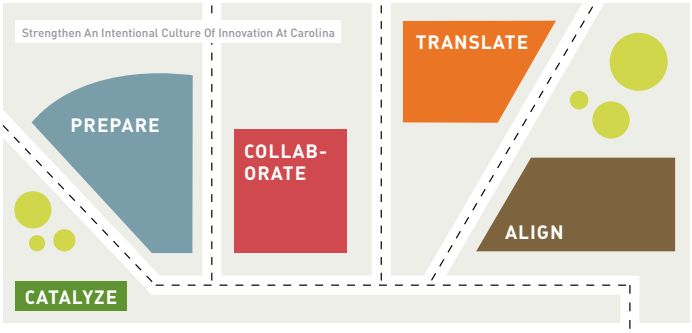
IMPORTANT IDEAS FOR A BETTER WORLD

Progress Report

Year Two of Five-Year Plan
Strategic Roadmap to Accelerate Innovation at the University of North Carolina at Chapel Hill

October 2010 – October 2012

Judith Cone
Chancellor's Office of Innovation & Entrepreneurship



THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Important ideas for a better world

Charter Members

The Chancellor's Innovation Circle

The *Strategic Roadmap to Accelerate Innovation* was developed by three groups who share a passion for Carolina's future: The Chancellor's Innovation Circle, the Faculty Steering Committee, and the Chancellor's Student Innovation Team.

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Commitment

Holden Thorp, Chancellor

From the Chancellor

Transform the University. Transform the World.

Dear Colleagues:

Three years ago we set out to create an environment at Carolina to encourage more innovation and to help see that the products of these activities would have greater impact on our community, the nation and the world. Much remains to be done to keep this process going, but I hope that you will see in this Progress Report just how we far we have come.

Thanks to all of you and to numerous Carolina faculty, staff, students, alumni and friends for your dedication. We have talked and shared ideas, started new partnerships, and launched classes, projects, performances, startups and spinoffs. It is very gratifying to see how the Carolina community has embraced new opportunities to follow their imaginations and make their ideas real, addressing pressing issues and having a huge impact on the world along the way. Buck Goldstein and I are working on the paperback edition of *Engines of Innovation*, and we taught Introduction to Entrepreneurship to 320 students this fall. UNC has recruited top innovators in their fields, our faculty continue to gain international recognition for their work, and our research rankings are climbing. These are groundbreaking events that would not be possible without your involvement and help.

I want to thank Lowry Caudill for his leadership in both chairing the Innovation Circle and in remaining a constant advocate for and participant in our work over the past two years. Additionally, my gratitude to Judith Cone, who has tirelessly championed this effort and been instrumental in moving projects forward, raising funds, generating new partnerships in the state and across the country, and connecting thousands of staff, students, faculty and others across campus to innovation and entrepreneurship resources. She has brought an entrepreneurial spirit and experienced, steady hand to guiding this effort.

There is no endpoint for where all of this will go. We have made great beginnings, but we still want to do even more. I often tell audiences that the very idea of a public university was dreamed up right here in North Carolina in 1789, the same year George Washington was inaugurated. Our founders had no idea how their innovation would turn out. Thanks to them, we have the chance to take new ideas in even more directions and continue our mission of education and service. And thanks to you, Carolina will always be an Engine of Innovation.

Thank you.

Holden Thorp, Chancellor

UNC social enterprise Nourish International addressing issues of global poverty.

Student in research lab at the University of North Carolina at Chapel Hill.

The Carolina Community Response

The Chancellor's Innovation Circle chaired by Lowry Caudill, the Faculty Steering Committee chaired by John Akin, and the Chancellor's Student Innovation Team led by Shruti Shah worked tirelessly to create the *Strategic Roadmap to Accelerate Innovation at the University of North Carolina at Chapel Hill*. Together they shaped an innovation agenda that is helping distinguish Carolina among its peers for the vision and strategic thinking it represents. Many have joined the effort to move the work forward since the publication of the Innovation Roadmap in October 2010. Among an impressive group of current students, Hudson Vincent and Mackenzie Thomas have shown extraordinary leadership in advancing innovation and entrepreneurship through their efforts with the Chancellor's Student Innovation Team, Carolina Creates, TedxUNC and the Campus Y. Across campus, there are many others who work diligently on behalf of Carolina innovators. A special acknowledgement goes to Mark Meares and Charla Edmonstone-Pickens of the Corporate and Foundation Relations office and to Charlotte Garza for providing leadership and operational support. Michelle Bolas served as host to many international groups and other campus visitors and most importantly, told the stories of Carolina innovators.

For the deans, administrators, and out other campus colleagues who have a passion for innovation and entrepreneurship in all its forms, for the donors who make this work possible, for the volunteers who give so much of their time and talent; your enthusiasm and dedication is having a significant impact on the Carolina community, people around the world, on the environment, and the economy.

It is hard to imagine a person more committed to strengthening an intentional culture of innovation and entrepreneurship than Chancellor Holden Thorp. His actions speak loudly.

Together, you are putting important ideas to use for a better world.

Judith Cone, Special Assistant to the Chancellor for Innovation & Entrepreneurship

Judith Cone, Special Assistant to the Chancellor for Innovation and Entrepreneurship

Lowry Caudill, Chair, Chancellors Innovation Circle

From W. Lowry Caudill

To the Members of the Innovation Circle,

Chancellor Holden Thorp asked us in 2009 to develop an Innovation Roadmap for the University. Our charge was to create a strategic framework that would position UNC to produce more innovations faster and, in doing so, have a greater impact on our community, nation, and world. It was an audacious goal then, and it remains a significant challenge today.

We have made tremendous progress since the release of the Roadmap in October 2010. As a member of the Board of Trustees, an adjunct professor, an innovator and entrepreneur and a parent, I see the strengths that our faculty, students, staff, and committed alumni and friends bring to the table. Collectively, we share the drive to dramatically increase the positive impact that Carolina has on the world. Individually, we all have a role to play.

This report reveals the work from many: individual innovators from all areas of the campus, partnerships that have formed in both likely and unlikely places, projects that have launched, and startups and spinoffs that have come out of UNC. It is impossible to ignore the culture of innovation and entrepreneurship that has taken root and is blossoming at Carolina. UNC is steadily building its reputation as a place where innovators thrive.

We need your help, now more than ever to become the best public university in the world for innovation and entrepreneurship. Your combined experience and wisdom propelled us to where we are today. As you read through this progress report, keep in mind that the amazing work that has been done still represents a fraction of what it will take to realize our goals. We must continue to support this work in all of its forms by securing the necessary human and financial resources. We have to keep telling our story. It is an honor to continue working with you on this important effort. Thank you for your service.

W. Lowry Caudill, PhD, Chair, Chancellor's Innovation Circle

Leadership

When Holden Thorp was selected in 2008 as the University of North Carolina at Chapel Hill's tenth chancellor, he brought to the role a burning passion for entrepreneurship and its power to change lives. He believed that Carolina could do even more to help solve the most pressing problems of our time. As an academic entrepreneur and noted scientist, he had chaired a powerhouse chemistry department and developed technology for electronic DNA chips. He had started a company and raised significant venture capital, but despite all the hard work, the company eventually failed. Learning from that experience, he started another venture that continues to thrive and demonstrates great promise. Surrounded by music and theater (he is an accomplished musician; his mother ran a theater; his wife has a masters in theater management from Yale University), he is just as passionate about the contributions to society of the arts and humanities as the sciences. In fact, he sees the blend as a great competitive advantage for Carolina. Understanding that our world is facing massive challenges that defy boundaries and require multidisciplinary approaches to solve, he believes Carolina can be an exemplar institution of higher education in translating knowledge into practical benefit. Chancellor Thorp thinks that the modern research university must be relevant and connected to communities – local, national and global. In his book, *Engines of Innovation: The Entrepreneurial University*, co-authored with University Entrepreneur-in-Residence Buck Goldstein, he lays out his theories and beliefs for higher education on this topic. His next step was to put these ideas into practice at his own institution. To demonstrate his ongoing commitment to the work, he established the Office of Innovation & Entrepreneurship in the Chancellor's Office and hired a fifteen-year veteran of the Kauffman Foundation to be the Special Assistant for Innovation & Entrepreneurship.

Without the active involvement of the deans and administrators, the accomplishments described in this report would not have been possible.

Planning

In December 2008, when Chancellor Thorp asked this prestigious committee of volunteer alumni, parents, and friends of the University to come together with faculty and students and worked to determine Carolina's future direction for innovation and entrepreneurship, he stated:

"Our to-do list is nothing less than the greatest problems of our time: cure diseases and get those cures to all the people who need them. Find and invent clean energy. Inspire students in our public schools. Feed seven billion people. Describe the world and replace conflict with understanding."

— Holden Thorp

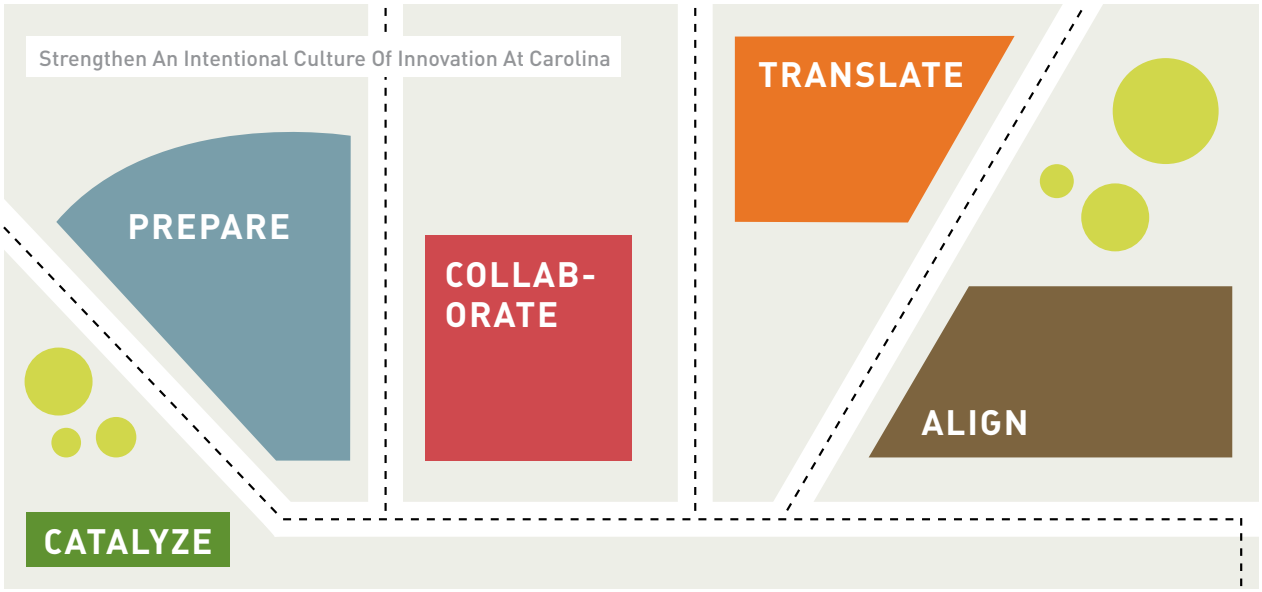
During several months of study, the Innovation Circle, Faculty Steering Committee, and Chancellor's Student Innovation Team examined Carolina's relevant programs and processes, met with constituent groups both on campus and in the region, and visited leaders in innovation and entrepreneurship at Stanford University, Massachusetts Institute of Technology, University of Utah, and the University of Florida to learn how they generate outstanding results in translating knowledge. In New York City, Innovation Circle member Ben Cameron of the Doris Duke Charitable Foundation partnered with Ruby Lerner of Creative Capital and organized a meeting to discuss how to advance innovation in the arts. The Faculty Steering Committee interviewed their colleagues and the Chancellor's Student Innovation Team sought feedback from their peers across campus. The *Strategic Roadmap to Accelerate Innovation at the University of North Carolina at Chapel Hill* (Innovation Roadmap) is the result of their diligent work.

Purpose of this report

This document explains progress toward the recommendations and goals described in the Innovation Roadmap. It also reflects what was learned in the implementation process and outlines the work that remains. In order to assess the current status, having a baseline for comparison purposes is helpful. The December 2009 report, *Innovation and Entrepreneurship at the University of North Carolina at Chapel Hill: Background and Sample of Current Activities*, was created to provide such a reference. (www.innovate.unc.edu)

The Innovation Roadmap highlighted the global challenges that compel Carolina to look outward, discussed what is needed to help solve today's most pressing problems, examined the University's translational mechanisms, and described ways to prepare its faculty and students in the methods of innovation and entrepreneurship. It organized the goals around five major recommendations – Prepare, Collaborate, Translate, Align, and Catalyze. The recommendations, goals, and tactics took into account Carolina's status as a Tier I research university, its history, and its decentralized structure.

To realize the vision laid out in the Innovation Roadmap requires sustained leadership, resources, talent, and time. Carolina has all of these in its dedicated alumni, world-class faculty and staff, gifted students, and many influential friends. Together they can make Carolina the leading public university in innovation and entrepreneurship and consequently deliver immense practical value to society.



Prepare *faculty, graduate and undergraduate students, staff, and the broader Carolina community with the knowledge, skills, and connections necessary to translate new ideas into innovations.*

Collaborate *with diverse groups on campus and beyond to explore issues, options, and creative approaches that may lead to innovations.*

Translate *important new ideas into innovations that improve society more expediently and at an increased volume.*

Align *people, incentives, resources, and processes to strengthen an intentional culture of innovation at Carolina.*

Catalyze *innovation at Carolina by facilitating the work of faculty, staff, and students as they put important ideas to use for a better world.*

Important ideas
for a better world

Strategy

Innovation Roadmap Overview

The Need
The Response
The Methods

Grand challenges

In an increasingly interconnected world confronted by complex local and global issues, the Carolina community asked itself these questions: What are the greatest challenges facing our region, state, nation, and world? Who can help solve them? What will it take? More specifically: Who can find solutions so that hundreds of millions of people worldwide no longer have to risk their lives to access something as simple and precious as clean water? Who can reverse the growing achievement gap of our youth? Who can create viable clean energy alternatives to curb dependence on oil and protect the natural world? Who can help the North Carolina economy grow? Who will launch new enterprises to fuel job creation? Who will help America with its growing competitiveness challenges? Who will help us express and define our human and artistic visions? Who will mentor and develop the intelligent, creative, ethical leaders needed to safeguard our global future?

Response of research institutions to grand challenges

America's institutions of higher education have a unique and critical role to play in addressing the most pressing issues of our day. At a time of seemingly insurmountable problems, society turns to universities and asks them to assume greater responsibility for developing new ideas and ways to address important issues. In turn, universities look to their top talent – innovators, researchers, and program leaders – to produce solutions. American universities aggregate talent since outstanding faculty and students seek the most stimulating environments to conduct basic and applied research and prepare for their future lives.

In 2010, U.S. institutions of higher education enrolled 21 million students (11.5 million full-time and 6.6 million part-time undergraduate students; 2.9 million graduate students) and had 1.4 million faculty members. Expenditures of degree-granting postsecondary institutions were $461 billion. Total expenditures for kindergarten through postsecondary education were 7.9 percent of the gross domestic product in 2009–2010, about 0.9 percentage points higher than in 1999–2000. In the Triangle alone, the research expenditures of universities and RTI exceeded $2 billion in 2009. Taken together, this is an extraordinary set of assets.

Some of the greatest inventions of our time came out of universities:

- Polio vaccine, University of Pittsburgh
- The internet, U.S. Defense Advanced Research Projects Agency (DARPA) and MIT's Lincoln Lab
- First browser for the web, Mosaic, University of Illinois
- Google, Stanford University
- Recombinant DNA, Stanford University
- Meningitis vaccine, University of Rochester
- DNA replication for breakthrough in treating genetic diseases, Oliver Smithies, Nobel Prize in Physiology-Medicine, University of North Carolina at Chapel Hill
- Fred Brooks, early computer architecture and 3D interactive computer graphics, University of North Carolina at Chapel Hill

Research funding on the rise

Carolina attracts top faculty and students. The University has 3,221 full-time distinguished faculty members charged with working on cutting-edge research and teaching UNC's more than 29,000 students, who represent some of the nation's most accomplished high school graduates and graduate students.

Carolina ranks among the top U.S. public universities in research support. Faculty attracted more than $767 million in total research grants and contracts in fiscal 2012 for research that is helping to cure diseases and produce new knowledge to help people and protect the environment. On a year-to-year average, UNC-Chapel Hill's research awards comprise a little over half of the total research awards for all UNC system campuses.

The steady growth of research funding over the past fifteen years is a great tribute to the success of the faculty and a multidisciplinary approach to advancing knowledge and science. UNC-Chapel Hill faculty are part of an internationally recognized research enterprise that draws from five health sciences schools (dentistry, medicine, nursing, pharmacy, and public health), UNC Health Care and its teaching hospitals, as well as basic and social science units in the College of Arts & Sciences.

UNC-Chapel Hill rose to ninth from sixteenth among leading private and public research universities for the level of federal funding devoted to research and development in all fields during fiscal 2010. The new ranking, based on data compiled by the National Science Foundation, was published by The Chronicle of Higher Education. Carolina has gained ten spots in the national top twenty-five list since 2008.

Carolina's assets

At the core of the University of North Carolina at Chapel Hill's traditions, and central to its future, is a commitment to innovation. The founding of Carolina in 1793 represented an early innovation in education. As the first public university in the nation, its emphasis on teaching, research, and service has helped to shape public higher education as we know it.

Carolina is both compelled and poised to accelerate and apply innovation and its accompanying entrepreneurial focus in a concerted and deliberate way to grapple with fundamental issues affecting the quality of human life and, in that context, to help solve the world's most pressing problems.

The University's strength comes from fostering creativity and discovery in the classroom, the lab, the studio, and on stage and from inspiring a campus-wide culture of inquiry through basic and applied research. Carolina's commitment to a rich liberal arts education and top professional programs equips our faculty and students to assess the current state of knowledge in a discipline, augment that knowledge through rigorous new research, and share the results of this new knowledge in ways that benefit the state, the nation, and the world. From this base of expertise and experimentation, breakthrough approaches are launched.

As the knowledge and capacity of UNC grows and the local, national, and global challenges mount; it is clear that the world needs Carolina now more than ever. With its considerable assets and advantages, it must move more quickly to put important ideas to use for a better world. The Innovation Roadmap outlines a way to build on UNC's legacy and assets to extend its impact even further.

"Our academic mission is to create new knowledge, discover innovative solutions to the world's greatest challenges, educate our outstanding undergraduate and graduate students and contribute meaningfully to the state, nation and world. Through scholarship and creative work, our extraordinary faculty shed light on the past, communicate new ideas and interpret the world. They also take on some of the biggest problems of our time: social and economic disparities, drug addiction, climate change, international conflict, life-threatening diseases and more."

— Karen Gil, Dean, College of Arts & Sciences

Carolina's response: Strengthen a culture of innovation and entrepreneurship

The strategy set forth in the Innovation Roadmap is not limited to building a strong entrepreneurship curriculum or nurturing more startups based on intellectual property. To be sure, these are important topics and are covered in the recommendations. The Roadmap describes a more comprehensive plan on how to strengthen an intentional culture of innovation. This topic and its potential outcomes are too important to be tied to a few programs or tactics. Innovation and entrepreneurship cannot be limited to a school, department, or unit on campus. It is only when the innovation process is embedded into the very fabric of the University that Carolina will reach its full potential as a disruptive force for good.

The Roadmap describes a path to accelerate the number and speed of innovations coming from the University of North Carolina at Chapel Hill. It explains how faculty, students, staff, and the greater Carolina community translate their ideas into innovations addressing a wide range of issues.

Common understanding – terms

Such words as *innovation* and *entrepreneurship* are ubiquitous and used in various ways. For the purpose of this work, they are defined as:

Innovation: The successful implementation of a novel, valuable idea. This definition emphasizes the equal importance of the three elements: Novel – Valuable – Implemented. In the context of our University, it is summarized as: Important ideas put to use for a better world.

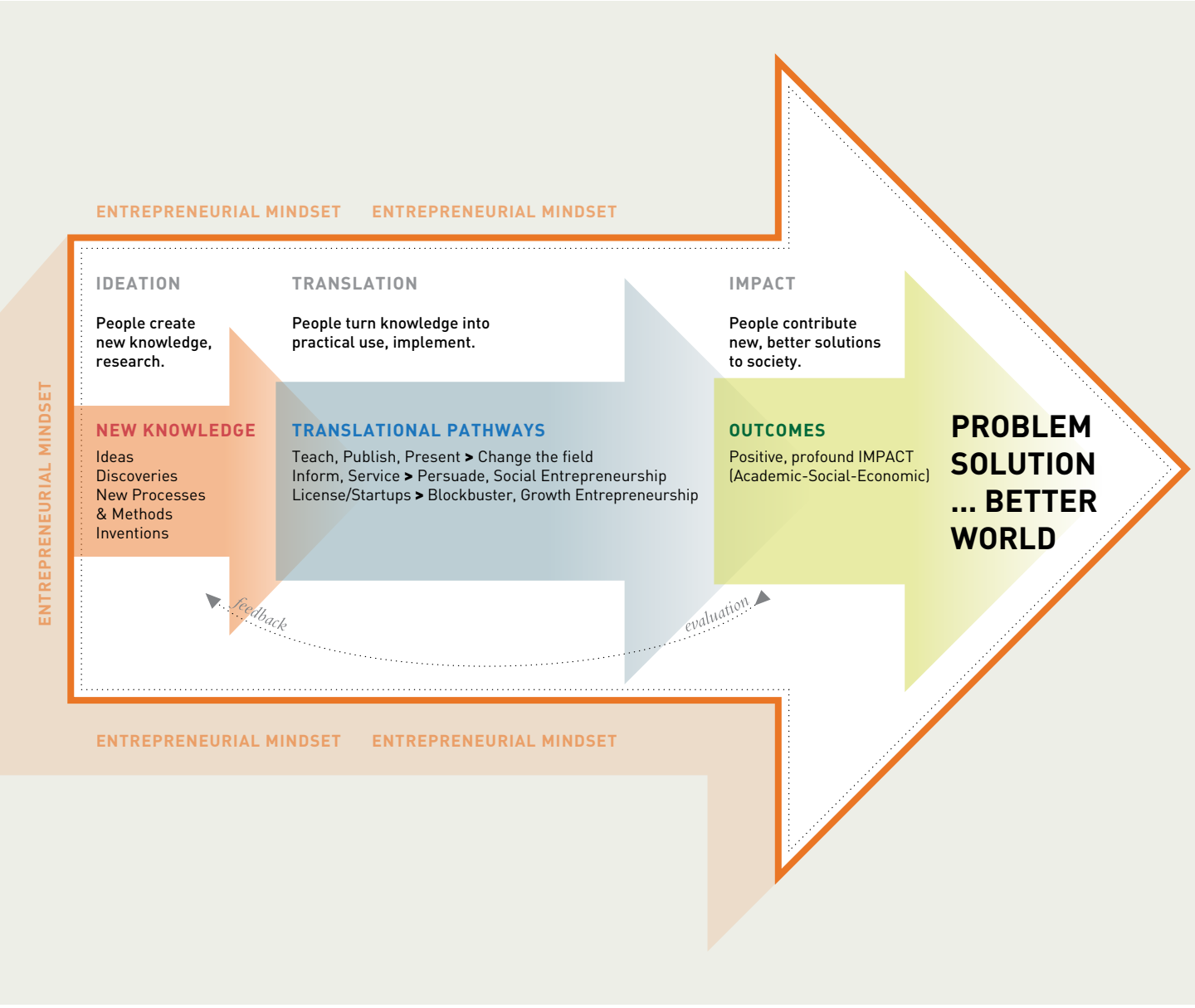
Entrepreneurship: Creating an enterprise in order to deliver a product, service, or process targeted to a specific audience, without regard for the resources currently at hand.

Entrepreneurial mindset: A specific way of thinking that questions the status quo, focuses on converting problems into opportunities by finding new and better actions, convinces others to support the new approach, allows one to persevere through the hurdles, and accepts ambiguity and risk as part of the disruption process.

Entrepreneurial skillset: The set of competencies necessary to successfully open and operate an enterprise. They include understanding customers, knowledge of industry and product, marketing and sales, operations, human resources, legal, technology, negotiations, building strategic alliances, and finance.

Innovation process: Moving from ideation through translation to impact. The process starts with an idea and is then translated in a way that results in the desired impact on the target condition or opportunity.

The innovation process



Common understanding – vision and mission

Vision: With a special focus on the world's most pressing problems, innovators and innovations launched at Carolina consistently put important ideas to use for a better world.
Mission: Continually strengthen an intentional culture of innovation so that Carolina is the place where innovators thrive.

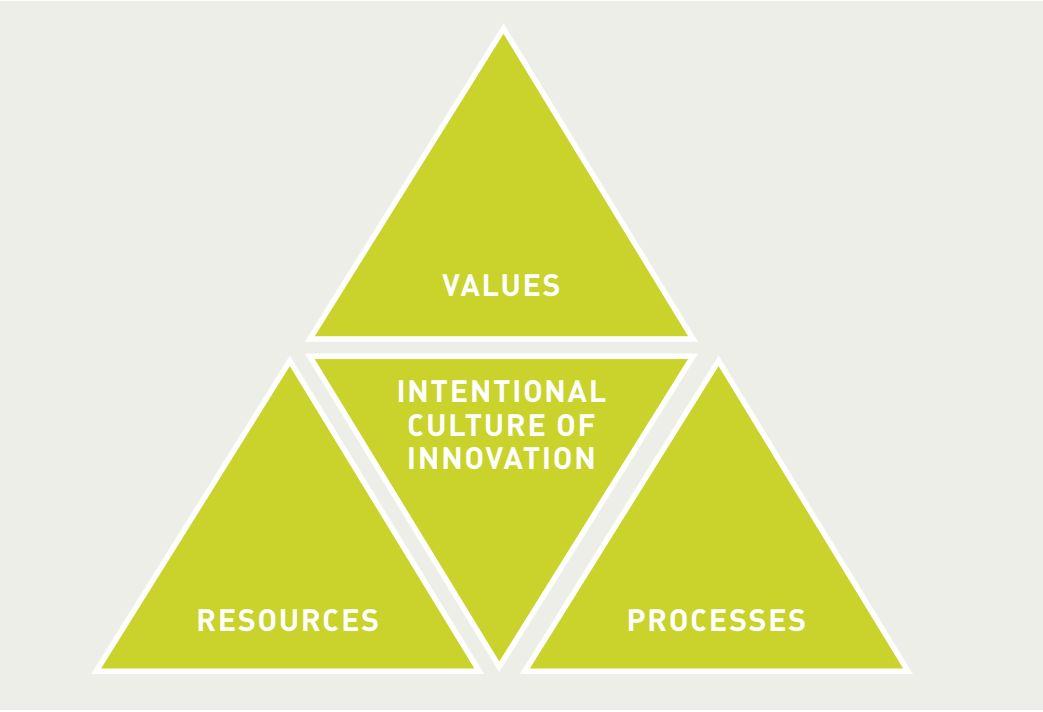
Intended Results:

- Ideas and discoveries are leveraged across the University and widely disseminated.
- Carolina classrooms, labs, and studios are incubators of discovery that yield innovations (unique, valuable, put to use) that serve the public good.
- Carolina attracts the most talented and innovative faculty and students in the world because of its dedication to discovery, experimentation, and innovation.
- Carolina is recognized globally as one of the most innovative and entrepreneurial universities in the world.
- The world is significantly improved because of Carolina innovations and its entrepreneurially minded faculty, students, and staff.

Common understanding – culture

Given that it is difficult to predict or orchestrate specific innovations, the Roadmap recommendations focus on providing a supportive climate for the Carolina community so its members can creatively explore responses to major issues. Such a conducive environment requires that leaders make this a priority and implement the structures, incentives, and resources to accelerate the innovation process. Strengthening an intentional culture of innovation requires clarity and alignment among three key elements:

Values: That which is worth doing.
Resources: Required people, time, money, facilities, and equipment.
Processes: Needed structures, rules, and methods.

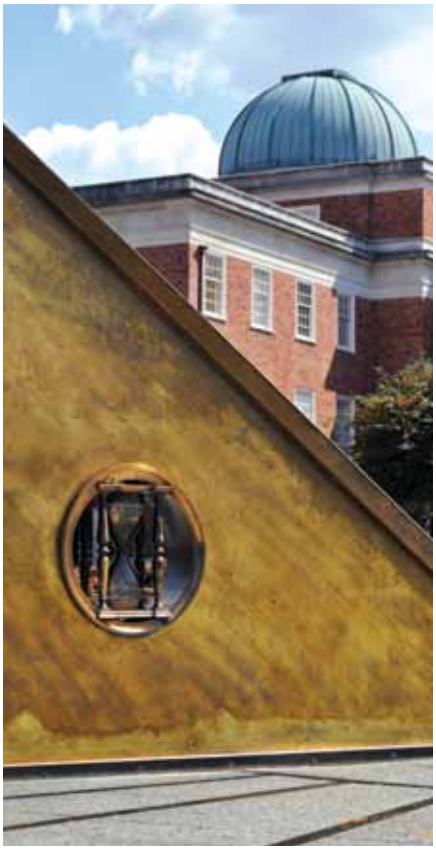


A vision without the right resources is just a hallucination

A vision without the right processes is demoralizing

The place where innovators thrive…

Carolina's values, resources, and processes must be mutually supportive to create and foster a campus culture of innovation. If we are committed to a goal, then we must allocate appropriate resources to avoid undermining our hopes. If we put resources behind our aspirations, then we must remove bureaucracy that impedes success. Vision without resources is a hallucination. Vision without helpful processes is debilitating.



Carolina's values, resources, and processes must be mutually supportive to create and foster a campus culture of innovation. If we are committed to a goal, then we must allocate appropriate resources to avoid undermining our hopes. If we put resources behind our aspirations, then we must remove bureaucracy that impedes success. Vision without resources is a hallucination. Vision without helpful processes is debilitating.

An innovation culture grows when faculty, staff, and students start with the seeds of ideas, combine them in unusual ways, and discover something new and worthwhile. Since innovation places a premium on the novel, on what has not been done or thought before, it is spurred by entrepreneurial thinking. Entrepreneurial thinkers see problems as opportunities, question everything, conduct analyses, take purposeful action, engage partners, try alternative solutions, learn from failures, make meaning, and persevere to reach the goal. The innovation process starts with ideas and ends with successful implementation resulting in desired impact.

Encouraging faculty, students, and staff to think entrepreneurially means UNC has a responsibility to provide the best environment for such explorations. The campus resources and processes must be aligned to support people posing questions and taking actions that disrupt the status quo in big and small ways. This foundational commitment is far-reaching and such alignment of values, resources, and processes will ultimately affect Carolina's overall impact. It will be a factor in whether top faculty, students, and staff choose Carolina and stay here, truly making UNC known around the world as a place where innovators thrive. The Roadmap takes seriously this issue of support and it is addressed in the recommendations. To create an innovation culture requires the sum of thousands of deliberate actions taken by thousands of faculty, students, staff, and partners directed toward accelerating impact. Over the past two years, the process has begun at Carolina. It is a top-down, bottom-up, inside-out, and outside-in approach.

To strengthen a culture of innovation requires that governing boards demonstrate their commitment to such a culture, that selection committees look for candidates who share a belief in the urgency of translating knowledge to benefit society and have proven track records in doing so; strategic planning efforts throughout the campus include this in their deliberations. Senior administrators and other campus leaders make this one of their top priorities, are forward-thinking in their approaches, find resources, and remove roadblocks to the innovation process. The University's fundraising and communication efforts align to these goals with people assigned to tell the stories of impact and raise the funds needed to implement the work.

The following section reviews progress made during the past two years toward meeting the recommendations and achieving the goals set out in the 2010 *Strategic Roadmap to Accelerate Innovation at the University of North Carolina at Chapel Hill*. It provides a snapshot of the environment in 2009 when the Innovation Circle began its work, key accomplishments to date, lessons learned along the way, and critical next steps.

Water In Our World
UNC's Pan-Campus Theme for 2012–2014

> "It's not every day you find an issue where effective diplomacy and development will allow you to save millions of lives, feed the hungry, empower women, advance our national security interests, protect the environment, and demonstrate to billions of people that the United States cares, cares about you and your welfare. Water is that issue." — *U.S. Secretary of State Hillary Rodham Clinton*

Water in Our World is UNC's first pan-campus theme to mobilize resources and people from across campus around a common issue. From its inception, driving forces advocating for this theme have included UNC's Global Research Institute, UNC Global, and the Institute for the Environment, and the Water Institute at UNC. A formal proposal was presented to the Faculty Council in November 2011 by Jamie Bartram and Larry Band that served as the impetus for the two-year campus water theme. The proposal received unanimous approval in December 2011 and plans have been underway ever since that time.

Leadership is provided by co-chairs Jamie Bartram, Director of the UNC Water Institute and a professor in the Gillings School of Global Public Health, and Terry Rhodes, Senior Associate Dean for Fine Arts & Humanities in the College of Arts & Sciences. Under their guidance, the steering committee composed of faculty, staff, administrators, students, and community leaders from a wide array of disciplines, highlights the nature of this theme as an interdisciplinary effort.

Action

Strategic Roadmap

Progress Report: Year Two of Five-Year Plan October 2012

Administrators, deans, institute and center directors, faculty, staff, students, and external leaders are responsible for the accomplishments described in this section.

Recommendations at a glance

Recommendation 1: Prepare faculty, graduate and undergraduate students, staff, and the broader Carolina community with the knowledge, skills, and connections necessary to translate new ideas into innovations.

Goal 1.1 Ensure that faculty, students, staff, and the broader Carolina community understand the University's commitment to innovation and the resources available to help them reach their related goals.

Goal 1.2 Build capacity for innovation.

Recommendation 2: Collaborate with diverse groups on campus and beyond to explore issues, options, and creative approaches that may lead to innovations.

Goal 2.1 Enhance robust interdisciplinary collaboration among basic and social scientists, humanistic scholars, and those in hybrid disciplines such as bioengineering and applied sciences to address the great challenges of our times.

Goal 2.2 Collaborate and coordinate around key themes of local, national, and global significance to mobilize the campus toward new understanding of issues and solutions.

Goal 2.3 Improve industry collaborations and increase industry funding.

Goal 2.4 Extend collaborations with state and regional partners to help North Carolina further develop into a leading competitive, global, entrepreneurial, knowledge and innovation economy.

Goal 2.5 Strengthen collaborations with Carolina's strategic international partners.

Recommendation 3: Translate important new ideas more expediently and at an increased volume into innovations that improve society.

Goal 3.1 Support faculty, students, and staff as they develop understanding of issues and contribute solutions to complex social and environmental problems through social entrepreneurship.

Goal 3.2 Effectively organize and manage the University's commercialization services to maximize the quality and volume of potentially important innovations for society. Return revenue from these innovations to the University to support this work when possible.

Goal 3.3 Measure the impact of innovations and innovators launched at Carolina.

Recommendation 4: Align people, incentives, resources, and processes to strengthen an intentional culture of innovation at Carolina.

Goal 4.1 Encourage leadership across campus to support and promote innovation in their schools, departments, institutes, and offices.

Goal 4.2 Recruit, retain, and reward faculty, students, and staff who show promise, aptitude, and/or achievement in innovation.

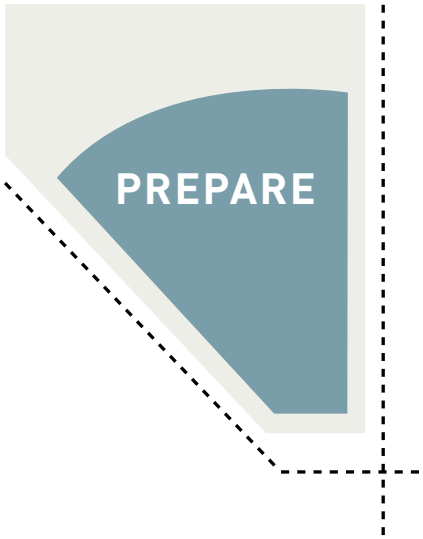
Goal 4.3 Align the University's internal methods and processes to foster innovation, especially in working across schools.

Goal 4.4 Provide the necessary funds to support nascent and promising innovations on campus.

Recommendation 5: Catalyze innovation at Carolina by facilitating the work of faculty, staff, and students as they put important ideas to use for a better world.

Goal 5.1 Leverage the talents of leaders across campus to prepare, collaborate, translate, and align resources and processes to strengthen the culture of innovation at Carolina.

Goal 5.2 Create the Chancellor's Catalyze Group to facilitate the implementation of this Roadmap.



Recommendation 1: Prepare faculty, graduate and undergraduate students, staff, and the broader Carolina community with the knowledge, skills, and connections necessary to translate new ideas into innovations.

This recommendation has two goals: 1) build awareness; and 2) learn the skills of innovation and entrepreneurship.

GOAL 1.1 Ensure that faculty, students, staff, and the broader Carolina community understand the University's commitment to innovation and the resources available to help them reach their related goals.

Aspirations:
In the future, Carolina's commitment to innovation will be well understood and embraced by the campus community. Faculty, students, and staff will consider how their work in the classroom, lab, studio, and that of the entire research enterprise can advance Carolina's collective, positive impact on society. From the moment they are recruited through the day of graduation, students will have the opportunity to experience how their learning applies to innovation and what they can do to actively participate in the process. Faculty, students, and staff will be drawn to Carolina because of its commitment to innovation and entrepreneurship.

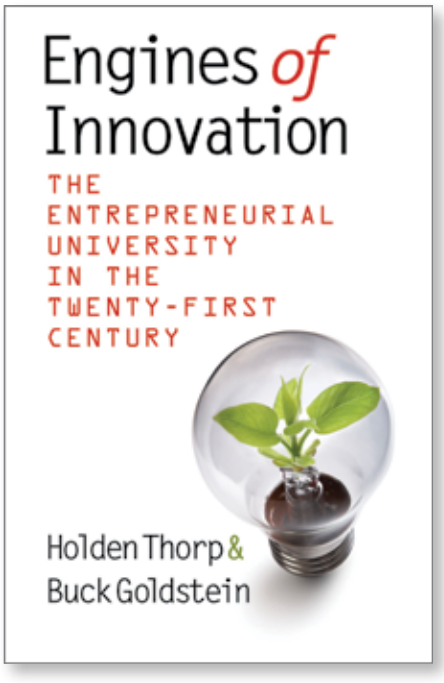
Status in 2009:
The five-year Carolina Entrepreneurial Initiative (CEI), funded by the Kauffman Foundation, catalyzed the first wave of entrepreneurship education on the campus and was ending in 2009. A cross-campus committee, chaired by then Dean of the College of Arts & Sciences Bernadette Gray-Little, worked together to create a wide-range of programs. The initiative was managed by by Jack Kasarda of the Frank Hawkins Kenan Institute of Private Enterprise. The Kenan Institute oversaw the cross-campus programs and created a marketing campaign that included an electronic newsletter, a website, and printed pieces. The goal was to explain the CEI initiative and create awareness of its relevance to diverse populations on campus. To demonstrate the cross-campus nature, Bill Drayton, founder of Ashoka, was the first featured speaker, signaling that social entrepreneurship was just as important as commercial enterprise.

Accomplishments to date:
The Chancellor's Office of Innovation & Entrepreneurship developed and implemented a plan to raise awareness about the Innovation Roadmap among students, faculty, staff, alumni, and parents. It included the website www.innovate.unc.edu, newsletter, social media, and speaking engagements. Campus colleagues embraced the Innovate@Carolina initiative and many described their innovative projects under this umbrella title. (This is discussed further in the final Recommendation: Catalyze).

- Chancellor Thorp and co-author Buck Goldstein promoted their book, *Engines of Innovation*, nationally and on campus with speaking engagements, interviews, and book signings.
- Chancellor Thorp was appointed by then U.S. Commerce Secretary Gary Locke to the National Advisory Council on Innovation and Entrepreneurship (NACIE).
- University communications launched the Minds on a Mission media spot at sporting events in order to reach a national audience. They also developed a strategy for www.unc.edu to support a focus on innovation and entrepreneurship.
- The Deans promoted the messages in their communication outlets as it related to their work.

What we learned:
Hundreds of thousands of people on and off campus received the messages communicated through the Innovate@Carolina campaign, yet that is a fraction of the target audience. The decentralized nature of the campus makes communication to faculty, students, and staff a continual challenge. There is an overload of information and messages pushed to campus audiences. With more than 100 professional communicators deployed in schools, institutes/centers, and departments across campus – each with their own particular interest and story to promote – keeping a focus on innovation and entrepreneurship requires constant attention. This is even more challenging in reaching external audiences. Communicating the story of Carolina's impact is critical to securing the support needed to continue the work.

Next steps:
- Senior leaders (administrators, deans, institute/center directors) continue to insert the messages of innovation and entrepreneurship in their communication strategies.
- University senior communicators continue promoting innovation and entrepreneurship as a top priority, seeking local, statewide, and national exposure in a systematic way.
- Admissions and Student Affairs continue to include the messages of innovation and entrepreneurship in the recruitment process.
- Provide funding to encourage and support these initiatives.



Co-authored by Chancellor Holden Thorp and UNC Entrepreneur-in-Residence Buck Goldstein, *Engines of Innovation* has received national acclaim.

GOAL 1.2 Build capacity for innovation.

Aspirations:
In the future, a broad representation of the Carolina community will gain the knowledge, skills, and connections needed to translate their ideas into greater benefit to society. Faculty, students, and staff, and the greater Carolina community who wish to learn about innovation and entrepreneurship will have easy-to-find, appropriate, and engaging opportunities.

The curriculum will offer classes to help participants develop ideas and apply translation methods. Participants will understand that calculated risks and inevitable failures are part of learning, that translation best occurs by collaborating with a diverse team, and that skills such as negotiating and communicating are important to the process. They will learn how to translate ideas into impact through persuasion and social and commercial entrepreneurship.

Students will have the chance to be involved in one or two campus-wide initiatives addressing a single topic of importance that will yield new understanding and catalyze incremental and radical innovations. Upon graduation, students involved in these programs will appreciate how innovative thinking can help them analyze situations, assess needs, grasp opportunities, create new approaches, test methods, and measure results. They will have experienced the entrepreneurial process and believe in their ability to apply their skills to new endeavors.

Status in 2009:
The cross-campus entrepreneurship initiative, Carolina Entrepreneurial Initiative, created or expanded several programs:

- The Minor in Entrepreneurship (Economics Department, College of Arts & Sciences). The Minor had tracts in social, commercial, artistic, and scientific entrepreneurship. Practicing entrepreneurs, venture capitalists, venture lawyers, and others with the most current and relevant knowledge on specific entrepreneurial topics co-taught the courses with a noted academic. It was designed to promulgate a broad definition of entrepreneurial thinking and help make UNC an engine of innovation. Capped at 100 students a year, it included a mandatory internship in an entrepreneurial venture. Dean Karen Gil led the working group and John Akin, John Stewart, and Buck Goldstein led the program.
- Launching the Venture. Program sponsored by the Center for Entrepreneurial Studies at the Kenan-Flagler Business School, open to all students, faculty and staff, and designed as a series of courses to turn new ideas into viable ventures. (Launching the Venture is further discussed in Recommendation 3: Translate.)
- Honors First-Year Seminars in Entrepreneurship. Small classes to explore multiple topics related to entrepreneurship.
- Graduate Certificate in Entrepreneurship.
- Kauffman Fellows. Competitive grant program for faculty.
- Carolina Challenge. Annual startup competition open to all UNC students, staff, faculty, and alumni.
- Carolina Launch Pad. Renaissance Computing Institute (RENCI) provided mentoring and office spaces for four tech-related ventures.

Buiding entrepreneurship, knowledge, skills

The Minor in Entrepreneurship in College of Arts & Sciences complements students' majors in the liberal arts and sciences with the skill base they need to think entrepreneurially and engage in successful venture creation. Launched with a Kauffman Foundation grant eight years ago, the Minor engages the University community through faculty outreach, mentoring networks, workshops and the flagship undergraduate curriculum. Many practicing entrepreneurs, venture capitalists, venture lawyers, and experts on entrepreneurial topics co-teach with a noted academic. This fall, the Minor created an Introduction to Entrepreneurship course open to all undergraduates, co-taught by John Akin, Buck Goldstein, and Chancellor Holden Thorp.

Other initiatives:

- Carolina KickStart (previously BioStart) was two years old and undergoing a leadership transition. Housed within UNC's Translational and Clinical Science (NC TraCS) Institute, established by Dean William Roper to support and accelerate faculty-founded startups in the life sciences. NC TraCS's "bench-to-bedside" mission aligned with entrepreneurial commercialization of biomedical innovations.
- The public policy department and the law school held clinics for entrepreneurs.
- The Venture Capital Investment Competition® was created at UNC in 1998 as an educational event for MBAs to learn about venture funding and was expanding. It is led by Patrick Vernon.

Accomplishments to date:

1. Programs:
   - The Minor in Entrepreneurship in the College of Arts & Sciences launched a large, multidisciplinary format for Introduction to Entrepreneurship in response to student demand. The class is open to all undergraduates and began in fall 2012. Jason Norris, an alumnus of the Minor, set up the JNO Awards. These awards are between $3,000 and $5,000 and awarded to students enrolled in the Minor through a competitive process. Students applying for the award must have a stated interest in launching their own ventures, whether while enrolled at the University or following their graduation.
     - o More than 700 students have completed the Minor and their related internships. Students apply their entrepreneurial thinking inside and outside the University. Alumni have started their own ventures, such as Nourish International, ABAN and iContact.
     - o Two new tracts in technology and sports will be added to the existing four (social, commercial, scientific, artistic).
     - o Funding: Raised $9.1 million of the $12.6 million goal.
   - The Faculty Bootcamp was started to encourage an entrepreneurial mindset and helps maximize faculty impact. Managed by the Minor in Entrepreneurship faculty in the Economics Department, it is a four-day workshop for faculty who are invited by the Chancellor. Each member brings an idea or venture relevant to his or her work and develops it through team projects applying entrepreneurial methods. In three years, seventy-five faculty members have completed the workshop. During the past session, two faculty members from other UNC institutions audited the workshop to see if this might replicable to their universities.
   - The Kenan-Flagler Business School under the leadership of Dean Dean has more than twenty MBA electives in its entrepreneurship curriculum and an undergraduate certificate in entrepreneurship. The courses cover a broad spectrum, including specialty topics such as family business, entrepreneurship through acquisition, product development, and social entrepreneurship. In addition, the Center for Entrepreneurial Studies offers a wide range of programs, conferences and competitions
     - o The Venture Capital Investment Competition® is now in its fifteenth year, the VCIC® competition attracts 1,200 students, 150 venture capitalists, and 100 entrepreneurs each year from three different continents. Twenty-five percent of aspiring entrepreneurs who participate in VCIC go on to raise venture funding.

The Carolina Challenge

The Carolina Challenge is an annual startup competition open to all UNC students, staff, faculty, and alumni with a focus on fostering entrepreneurship through experiential learning. In 2012, individuals from 30 disciplines participated in the competition, a testament to its broadening reach across the UNC community. Entrants compete in one of four tracks: high-tech, low-tech, social, and faculty/staff/alumni.

Carolina Creates

Carolina Creates is a student organization launched by the Chancellor's Student Innovation Team (CSIT) and co-sponsored by Innovate@Carolina and UNC Student Affairs. The mission is to foster creation through connection with five initiatives: Carolina Creates Global (TEDxUNC), Music, Visual Arts, Writers, and Online. The group launched UNC's first crowdfunding platform for innovation projects this spring at carolinacreates.unc.edu.

carolina creates
music · global · writers · art · carolinacreates.com

  - Rankings for Kenan-Flagler Business School:
    - 2012: No. 8, Entrepreneurship, Top Undergraduate Business Schools by Specialty, *Bloomberg Businessweek*.
    - 2011: No. 10, Top Graduate Entrepreneurship Programs, *U.S. News and World Report*.
    - 2010: No. 5, Top Business Schools for Private Equity, *Private Equity Blogger*.
    - 2010: No. 20, Top Graduate Entrepreneurship Programs, *Entrepreneur Magazine*.
- The newly formed Joint M.D.-M.B.A. program brings together the expertise from the UNC School of Medicine and Kenan-Flagler Business School. This unique dual-degree program offers medical students the opportunity to earn both a doctor of medicine and a masters of business administration degree in five years. Unlike most M.D.-M.B.A. programs, Carolina's goes beyond offering health-care management courses by also integrating leadership, innovation, and entrepreneurship into the curriculum.
- Social innovation and social entrepreneurship.
  - The Campus Y, directed by Richard Harrill, PhD, convened cross-campus leaders to seek integration across the campus and to work with experts in the field like Ashoka and Net Impact.
  - The Campus Y built student capacity through the Campus Y Social Innovation Incubator program and co-curricular activities in community needs assessment, project planning, fundraising, evaluation, finance, and communication.
  - The Social Entrepreneur-in-Residence program in the College of Arts & Sciences was created through private support. Dennis Whittle, founder of Global Giving, served as the Global Social Entrepreneur in Residence for Global Education in 2011-2012 and is currently the Richards Donohoe Social Entrepreneur in Residence in the College of Arts and Sciences.
- The Institute for the Arts and Humanities launched the IAH Innovation Fund with funding from the Office of the Vice Chancellor for Research in 2011. Selected projects receive an initial seed grant of $5,000 for planning and preliminary work, and the IAH may award up to $45,000 in additional funds to each project team over the course of three years, dependent upon the project's financial needs and its success in meeting its objectives.
- University Career Services created a variety of capacity building and skill building programs throughout the year. Numerous panels and networking events involving the local entrepreneurial community, attended by more than 500 students annually, help UNC students discuss and engage with those audiences. "Entrepreneurship treks" take students off campus and into the community for entrepreneurial gatherings at organizations like Bull City Forward, 8 Rivers Job and Internship Fair, and the Tech Jobs Under the Big Top event.
- The School of Education under the leadership of Dean Bill McDiarmid launched a Minor in Education in the fall of 2012 open to all undergraduates. It is designed to arm students with the capacity to think critically about educational issues and to participate knowledgeably and productively in public debates about them. Students participating in the Minor will make connections with other disciplines, integrating perspectives from their major. UNC ranked No. 4 among large schools contributing the most graduating seniors to Teach for America in 2011, and Teach for America hired more Carolina graduates than any other single employer in 2009 and 2010.

2. Student leadership:
The Campus Y, the Student Union, the Chancellor's Student Innovation Team (CSIT) and the Entrepreneurship Club provide strong, engaged student leadership. CSIT was created at the beginning of the strategic planning process in January 2010. The first president, Shruti Shah, established the group and passed leadership to current Co-Presidents Hudson Vincent and Mackenzie Thomas. This group founded Carolina Creates, a student organization sponsored by Innovate@Carolina and UNC Student Affairs, which is designed to foster the creative process through connection with five initiatives: Carolina Creates Global (TEDxUNC), Music, Visual Arts, Writers, and Online. To fund student projects, they created the first crowd sourcing tool specifically for UNC. The Carolina Creates website states: "Give back to UNC today by supporting these fantastic student initiatives! You can donate as little or as much as you'd like – your entire gift will count as a donation to UNC Annual Fund and go directly to supporting the student initiative of your choice. Check out all the fantastic opportunities below!" (carolinacreates.unc.edu)

3. Research on innovation and entrepreneurship:
UNC's innovation and entrepreneurship research agenda is advanced through the work of talented scholars across campus. Highlights include:

- Howard Aldrich, Professor and Department Chair, Sociology and Adjunct Professor of Management, Kenan-Flagler Business School, is a respected entrepreneurship scholar. He recently released his latest book, *An Evolutionary Approach to Entrepreneurship: Selected Essays*. For the past several years he has worked with large datasets that track entrepreneurs over time in an attempt to learn what successful entrepreneurs do that distinguishes them from their less successful counterparts.
- Maryann Feldman, Heninger Distinguished Professor, Department of Public Policy, researches the places that promote innovation, the commercialization of academic research, and the factors that promote technological change and economic growth. A large part of Feldman's work concerns the geography of innovation – investigating the reasons why innovation clusters spatially, and the mechanisms that support and sustain industrial clusters. Her dissertation, which was subsequently published as a book, was entitled *The Geography of Innovation*. Recently, Feldman and Nichola Lowe, associate professor in the Department of City & Regional Planning, compiled the initial database of companies to study entrepreneurship in the Research Triangle Park region to see if entrepreneurship creates jobs, capital, and economic stability in North Carolina. This twenty-year retrospective report, *Starting Something: The State of the Entrepreneurial Economy of North Carolina, 1992–2011*, aggregates data from 1,823 high-growth companies founded in North Carolina since 1992 and shows these companies created 40,560 jobs. Of these firms, 397 have attracted $7.7 billion in private capital from more than 600 funds since 1997.
- James (Jim) H. Johnson, Jr. is the William R. Kenan, Jr. Distinguished Professor of Strategy and Entrepreneurship and Director of the Urban Investment Strategies Center at the Frank Hawkins Kenan Institute of Private Enterprise. His research interests include community and economic development, the effects of demographic changes on the U.S. workplace, interethnic minority conflict in advanced industrial societies, urban poverty and public policy in urban America, and workforce diversity issues. Not only

TEDxUNC

Carolina Creates organized the first TEDxUNC conference in January 2012. TEDxUNC: Global Initiative highlighted creation through connection, generating new thought on global issues by connecting existing resources. At TEDxUNC, innovative thinkers from both the university and the greater community discussed their approaches to some of humanity's fundamental concerns.

Ted Zoller

Ted Zoller, PhD, Director, Center for Entrepreneurial Studies, Kenan-Flagler Business School, leads the Launching the Venture program. It is a series of courses that help faculty, staff and students from across the UNC campus turn new ideas into viable ventures. Launch is designed as an intense academic exercise that teaches a replicable process for evaluating and launching new ventures. It aspires to instill a lifelong entrepreneurial mindset which transcends the classroom experience.

is Johnson a respected scholar, but he is a social innovator. Working closely with Union Baptist Church in Durham, based on his extensive research he designed the Durham Scholars Program and the social-enterprise model for the new Union Independent School. Opened in August 2012, the school provides comprehensive support to local students while serving as a national model. Union Baptist, with 5,000 members, used $2 million of its own funds and borrowed another $8 million to buy land across the street from the church to build the new 49,000-square-foot school. The church launched a campaign, chaired by Johnson, to raise $30 million in endowment to cover operating costs and tuition.

- Emil Malizia, Professor, Department of City & Regional Planning and Director, Institute for Economic Development, conducts extensive research in economic development. The faculty in the Department of City & Regional Planning provided assistance to the Orange County Economic Development Commission through several class projects. In the summer of 2011, Malizia helped Orange County conduct a focused study of UNC spinoffs. In December 2011, he completed "Real Estate Analysis of UNC Spin-off Companies." He continues to work with the County on real estate needs for startups and to advise on incubator space in Chapel Hill.
- Ted Zoller, Director of the Center for Entrepreneurial Studies and Associate Professor of Strategy and Entrepreneurship, Kenan-Flagler Business School, studies social networks in dynamic entrepreneurial regions to better understand the necessary relations between various types of people. In order to identify the senior people in a region who play active key roles in nurturing startup teams, he developed the Dealmakers Algorithm.

What we learned:

The campus provides many excellent research-based educational programs for selected audiences mostly focused on undergraduate students.

- For undergraduates there is some cross-fertilization on campus, yet the Minor in Entrepreneurship in the College of Arts & Sciences is unavailable to undergraduate business students and MBAs.
- Graduate students outside of the Kenan-Flagler Business School, postdocs, and faculty have few educational or co-curriculum opportunities to build their entrepreneurial capacity. Unfortunately, the Graduate Certificate in Entrepreneurship is not currently offered.
- Once the Kauffman Foundation funding ended, financial support for faculty development and faculty research also ceased.
- As is true across the campus during this time of severe budget cuts, program leaders are over-worked and under-resourced.

Next steps:

- Continue to evaluate, support, and improve existing programs.
- Devise a strategy to fill in missing pieces in the educational areas, especially for faculty, graduate students and postdocs.
- Bring together program leaders and sponsors from across the campus in a more formal way to further integrate the work.
- Integrate the lean startup methodology and work closely with National Collegiate Inventors & Innovators Alliance (NCIIA).
- Support faculty research projects.
- Raise funds to support capacity building in innovation and entrepreneurship.

The Carolina Innovation Scholars Program

The Carolina Innovation Scholars Program was established by Chancellor Holden Thorp in 2009 to attract the brightest and most entrepreneurial students to the University of North Carolina at Chapel Hill. Each scholar receives a four-year award that covers the full cost of tuition, fees, room, and board in addition to an entrepreneurial enrichment stipend. The Carolina Innovation Scholarship is intended to help launch the careers of scholars who are ready to start new ventures, as well as provide them with a wide and growing network of entrepreneurs and support organizations to help fund and nurture the scholars during their time at Carolina. Administered by the Office of Scholarships and Student Aid and linked through the Minor in Entrepreneurship in the College of Arts & Sciences, Scholars are prepared to invent solutions and create value, whether in commerce, science, society, or the arts. The program is privately funded with individually named scholarships: Mackenzie Family Foundation Innovation Scholars; (in honor of) Holden Thorp Leadership Carolina Innovation Scholar; and (in memory of) Frederick J Houk, Jr. Carolina Innovation Scholar.

2012–11 Carolina Innovation Scholars:

- *Mackenzie Innovation Scholars:*
  - *Courtney Sanford '14 Marietta, GA. Double major: Public Health and Biostatistics; Minor in Entrepreneurship*
  - *Arjun Bhattacharya '15. Cary, NC. Double major: Biology and Mathematical Decision Sciences; Minor in Mathematics.*
  - *Andrew Bauer '16. Neptune, NJ. Major: Business*
- *Thorp Innovation Scholar:*
  - *Kevin Jang '15. Cary, NC. Major: Computer Science*
- *Houk Innovation Scholar:*
  - *Sarah Browning '15. Fayetteville, NC. Double major: Biology and Global Studies*

COLLAB-
ORATE

Recommendation 2: Collaborate with diverse groups on campus and beyond to explore issues, options, and creative approaches that may lead to innovations.

This recommendation has five goals to promote: 1) multidisciplinarity; 2) key themes; 3) industry relations; 4) regional and state connections; and 5) global reach.

GOAL 2.1 Enhance robust interdisciplinary collaboration among basic and social scientists, humanistic scholars, and those in hybrid disciplines such as bioengineering and applied sciences to address the great challenges of our times.

Aspirations:
In the future, collaborations within and beyond the Carolina campus (including with other universities, the private and social sectors, communities, and government) will leverage talent, innovation, and non-traditional partnerships to achieve even greater impact. Those seeking collaborations on campus will find a supportive environment where the rules have been examined and rewritten to smooth the path for interdisciplinary opportunities. Carolina will have highly-rated hybrid disciplines such as bioengineering, environmental engineering, and applied sciences all working together with social scientists and humanities scholars on some of the most serious challenges facing society locally, nationally, and globally, with resources to support their efforts. This is especially important since there is no engineering school at Carolina. Complex issues require advanced disciplinary knowledge and the expertise that comes by combining multiple fields of study.

Status in 2009:
The need for multidisciplinary approaches was apparent, but the path to a solution was elusive. Faculty and administrators had been discussing the need for strengthening applied sciences at Carolina for nearly twenty years.

The decentralized nature of Carolina's campus that puts strong, separate disciplines at the undergraduate, graduate, and professional levels was simultaneously a major obstacle to finding solutions to urgent problems. Ad hoc collaboration was strong but formal hybrid disciplines and multidisciplinary approaches were few.

The Department of Environmental Sciences and Engineering in the Gillings School of Global Public Health offered a multidisciplinary experience for those interested in working at the interface between people and the environment.

The Joint Department of Biomedical Engineering (BME), established December 2003, was an academic department co-located at the University of North Carolina at Chapel Hill and North Carolina State University linking the School of Medicine at UNC to the College of Engineering at NC State. NC State offered a BS in Biomedical Engineering and UNC-Chapel Hill offered the BME concentration in the Applied Sciences undergraduate

Grad student Andrew Stuart in the lab of Dr. Wei You at UNC

degree program. Disparities existed across the three facets of BME (UNC, NC State and the Curriculum in Applied Sciences and Engineering), including curriculum challenges and differences between UNC and NC State in expectations and criteria for teaching, buyout, salary, and research support, tenure expectations, mentoring, promotion, and five-year RTP rules. A growing imbalance in student enrollment vs. faculty recruitment was heightened by challenges of severe budget cuts.

Accomplishments to date:

- Innovation Circle Chair, Lowry Caudill, convened a group of leading faculty members led by Ed Samulski to explore how to further applied sciences at Carolina. The Applied Science Task Force's recommendation of a new department of Applied Physical Sciences in the College of Arts & Sciences has been accepted by the Dean of the College. This is a major breakthrough.
- The 2011 Academic Plan established "interdisciplinarity" in teaching, research and public service as a central focus and outlined action steps to proactively build support for it across campus.
- Institutes and Centers strengthened interdisciplinary collaboration. Examples:
    - o The Center for Integrative Chemical Biology and Drug Discovery brings dedicated medicinal chemistry expertise to bear on biological targets of therapeutic relevance under investigation by UNC faculty.
    - o The Center for Nanotechnology in Drug Delivery in the Division of Molecular Pharmaceutics, Eshelman School of Pharmacy focuses on safely and effectively translating new drug and imaging discoveries into clinical trials using nanotechnology with the goal to improve human health.
    - o The Carolina Population Center is a community of scholars and professionals collaborating on interdisciplinary research and methods that advance understanding of population issues.
- The Joint M.D.-M.B.A. program brings together medicine and business as described in the previous section.
- The Frank Hawkins Kenan Institute of Private Enterprise appointed noted scientist and academic entrepreneur, Joe Desimone, as its new head. Its charge is to become a global leader in innovation and entrepreneurship.
- Biomedical Engineering recruited top faculty and external funding has increased every year since 2009. In the past fiscal year, 2011–2012, external funding grew by 26.2 percent. It has established new initiatives and extended and improved its educational component at the undergraduate and graduate levels both at UNC and NC State. The College of Arts & Sciences gave its consent to begin preparations for BME to extend into the College with full obligation and control of the UNC BME undergraduate curriculum. The graduate program spanning UNC and NC State has been completely revamped and received very positive feedback in its 2012 external review.

John Papanikolas' lab in Caudill Labs at UNC.

Applied Sciences task force

Edward Samulski, ASTF Chair, Chemistry
Nancy Allbritton, Chair of Biomedical Engineering
Lowry Caudill, Chair of the Innovation Circle, Board of Trustees (Facilitator)
Arthur Champagne, Chair of Physics & Astronomy
Michael Crimmins, Sr. Assoc. Dean (ex officio)
Joseph DeSimone, Director of Institute for Advanced Materials
Anselmo Lastra, Chair of Computer Science
Thomas Meyer, Director of Energy Frontier Research Center
Peter Mucha, Chair of Mathematics
Richard Superfine, Physics & Astronomy

Applied Sciences Initiative contributors

Bruce Carney, Provost
Judith Cone, Chancellor's Office of Innovation & Entrepreneurship
Barbara Entwisle, Vice Chancellor for Research
M. Gregory Forest, Applied Mathematics
Karen Gil, Dean of the College of Arts & Science
William Kier, Chair of Biology
Matt Redinbo, Chair of Chemistry
Sergei Sheiko, Chemistry
Russell M. Taylor II, Computer Science
Holden Thorp, Chancellor

Recommended next steps for Applied Sciences:

- *Select a chair for the new unit.*
- *Organize an advisory-steering committee to work with the chair.*
- *Identify possible joint appointments from existing faculty.*
- *Acquire resources.*

COLLABORATE

Administratively, the department made major changes in order to enhance efficiencies and reduce costs. Five out of the eight technology companies presenting at the recent NC TraCS Emerging Company Showcase came out of BME. The department is chaired by Nancy Allbritton.

- Digital Humanities Lab led by Bobby Allen received a $1.39 million grant from the Andrew W. Mellon Foundation to expand digital humanities at UNC-Chapel Hill. Digital Humanities is an area of research, teaching, and knowledge creation at the intersection of computing and humanities. It is interdisciplinary and embraces a variety of topics, ranging from curating online collections to mining information from large data sets.

"The greatest training we can offer our students is to teach them to realize the connectivity of our world. We have the opportunity to teach holistically through all that we have and do at Carolina. Education should not be a check list. It should be a great, wonderful, sometimes even messy experience that helps students learn to move more freely and creatively in the world."

—McKay Coble, Professor of Dramatic Art, Former Chair of the Faculty

What we learned:
Input from multiple disciplines and professions, both inside and outside of the academy, are necessary for dealing with challenging issues. The 2011 Academic Plan calls for the need to "reach agreement on our priorities and provide the resources to realize them." Inherent in the recommendation is the acknowledgement that to be successful at advancing interdisciplinary solutions the University must be strategic in setting its priorities and directing resources.

Forging an agreement like the Applied Science Task Force recommendations requires dedication and time from top academics and support from the chancellor, the provost and dean(s) at the beginning of the process. The faculty members devoting significant time to such a committee need to know that it is a campus priority and that there is support for their recommendations.

Next steps:

- Continue to advance hybrid disciplines by finding the needed internal and external champions and sustainable financial support.
  - o Tie the advancement of hybrid disciplines to Carolina's Strategic Plan for Research and ultimately to the University's Strategic Plan. Include in all major University strategy deliberations and fundraising plans.
  - o Strengthen existing hybrid disciplines like biomedical engineering and environmental engineering.
  - o Implement the Applied Science Task Force recommendation for a new Department of Applied Physical Sciences in the College of Arts & Sciences.
- Support the recommendation in the Academic Plan to prioritize interdisciplinary proposals and provide them with effective and equitable administrative support.
- Continue to strengthen the collaboration between the School of Medicine and the Kenan-Flagler Business School and other such alliances.
- Lower barriers and streamline processes.
- Raise funds to support the work.

GOAL 2.2 Collaborate and coordinate around key themes of local, national, and global significance to mobilize the campus toward new understanding of issues and solutions.

Aspirations:
In the future, through collaborative initiatives that examine one important topic at a time such as water, poverty, economic disparities, climate change, or fossil-fuel scarcity, the Carolina community will stimulate intellectual exchange and discovery across the humanities, fine arts, social and natural sciences, and professional schools. This approach will yield a dramatic positive impact on our community's understanding of the issues it seeks to address, build bridges between disciplines, produce new collaborative teaching and research, and result in significant innovations.

Status in 2009:
UNC-Chapel Hill was highly collaborative and had engaged in some multidisciplinary projects but had never adopted a pan-campus theme.

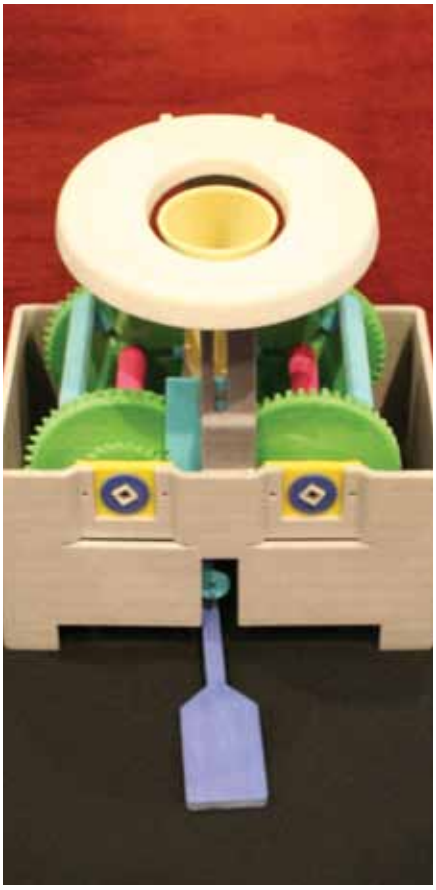
Accomplishments to date:

- Created Key Themes initiative and selected water as first theme calling it *Water in Our World*. The Faculty Council approved the concept of key themes and water as the first focus which was featured at University Day, October 12, 2012.
- Formed cross-campus steering committee to lead, manage and promote the initiative.
- Coordinated support from across campus to encourage creative and collaborative approaches to addressing the water topic. From its inception, driving forces advocating for this theme have included the Global Research Institute, UNC Global, the Institute for the Environment, and the Water Institute at the Gillings School of Global Public Health.

What we learned:
It takes a combination of interest from the faculty and leadership at the provost level, a process that enables buy-in across campus to select a topic, significant administrative and financial support, a dedicated project manager, and a dedicated fundraiser to plan and manage such a campus-wide initiative.

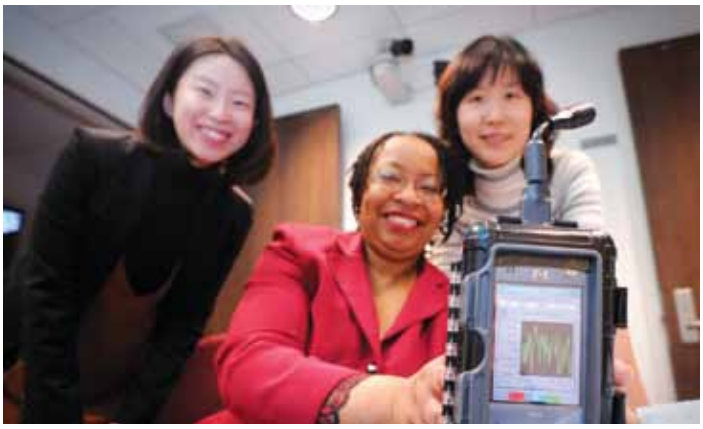
Next steps:

- Assess the outcomes of this approach.
- If the method proves successful in advancing understanding of an issue, builds cross-campus relationships, and leads to new knowledge and solutions; we recommend faculty leaders consider planning the next key themes at least two to three years in advance.
- Build in a one-year planning phase to identify support before launch of a new theme. Hire a Key Themes director with content expertise and project management experience in organizing multi-faceted projects with diverse constituencies.
- Begin fundraising well in advance of the launch.

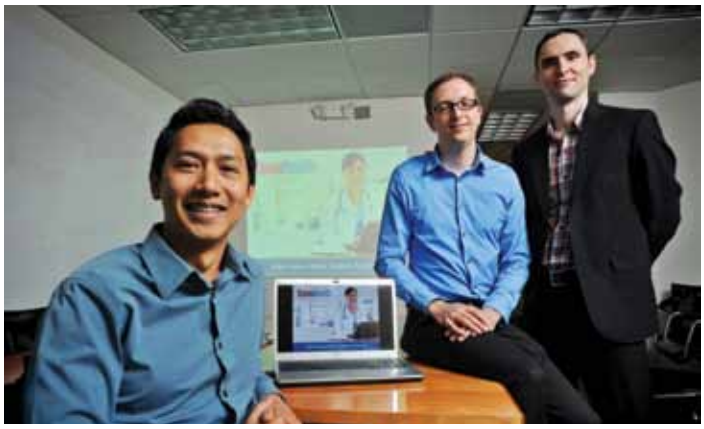


Sanitation Creations

With a graduate degree from UNC's Gillings School of Global Public Health, alumna Liz Morris founded Sanitation Creations to offer environmentally-friendly, hygienic sanitation solutions that are odorless, waterless, and economical. Morris was a participant in UNC's Launching the Venture, winner of the 2012 Cherokee Challenge, 3rd place winner in the Muhammad Yunus Social Business competition sponsored by the UNC General Administration, and is receiving mentoring from the Blackstone Entrepreneurs Network.



Debra Barksdale, Associate Professor in UNC's School of Nursing, and graduate students display an impedance cardiograph.



The team from Keona Health, a UNC startup that has developed a system for delivering online triage services to patients by registered nurses.

Aquagenx

Based on the work of Mark Sobsey, PhD, UNC's internationally recognized water sanitation and hygiene expert, Aquagenx has created a portable, affordable household-level test. It detects and quantifies fecal bacteria in water without the need for a lab, electricity, or expertise. The field test could prevent the spread of infectious disease that kills millions annually by identifying high-risk communities and prompting action. Aquagenx is a resident team in the Campus Y Incubator, won first place and $15,000 in seed funding in the Carolina Challenge, and were chosen as the South Regional Champion in the Walmart Better Living Business Plan Challenge.

GOAL 2.3 Improve industry collaborations and increase industry funding.

Aspirations:
In the future, Carolina will have strong industry partners, working collaboratively toward mutually beneficial goals. Research dollars will grow significantly in the next five years due to strategic attention to this opportunity. Industry will view Carolina as a smart, fair, speedy, and service-oriented partner with brilliant researchers working at the cutting edge of their fields.

Status in 2009:
In 2009, UNC had a significantly smaller share of its research sponsored by industry than its peers. In 2007, UNC received $8.670 million in industry funding or roughly five percent of the total research funding. Like many other schools, UNC was a black box to industry. It was difficult to know whom to contact, there was a lack of communication among campus staff and faculty, and there was no concerted effort to improve this condition. See figures 1 and 2.

Accomplishments to date:

- 2012 research funding from industry grew to $26 million.
- The Vice Chancellor for Research has created an Industry Relations Task Force to rethink how UNC handles direct and indirect costs when it comes to sponsored research from industry and how to significantly improve total industry research funding over the next five years.
- The School of Medicine has created a full-time position to help increase industry funding, especially in the area of drug discovery. A drug discovery web portal is in beta testing now that will help potential industry sponsors better understand UNC's broad portfolio in this area.
- Currently the University is negotiating several novel UNC-industry collaborations.

FIGURE 1: TRENDS IN NON-FEDERAL RESEARCH FUNDING, UNC–CHAPEL HILL, 2002–2012

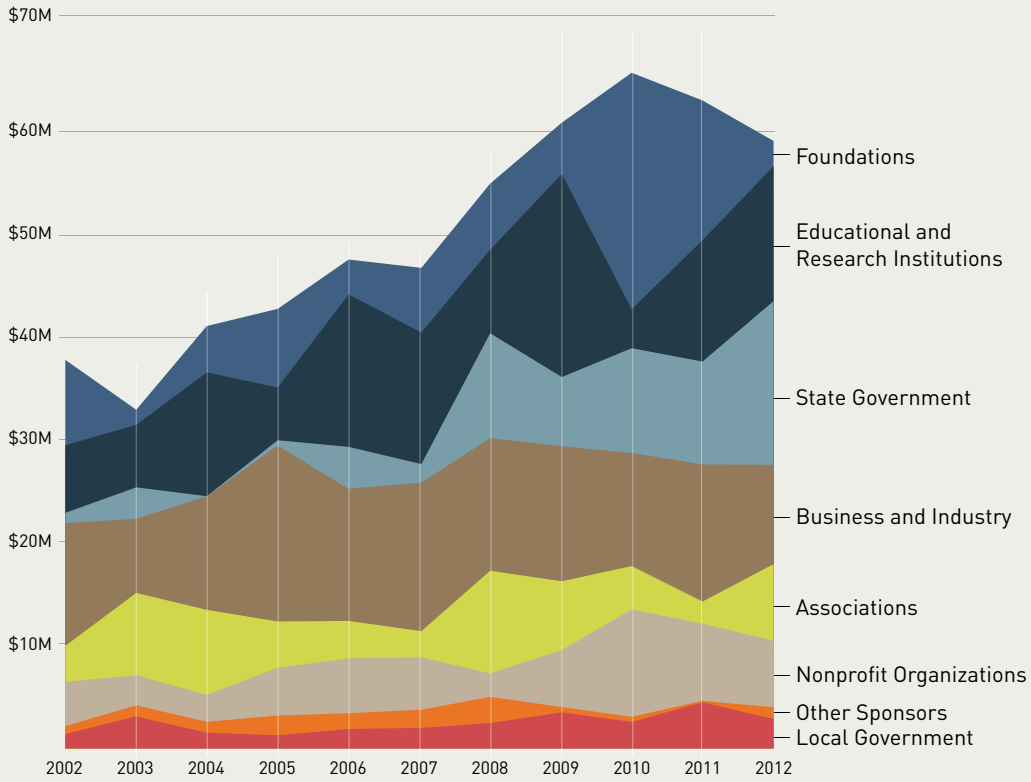
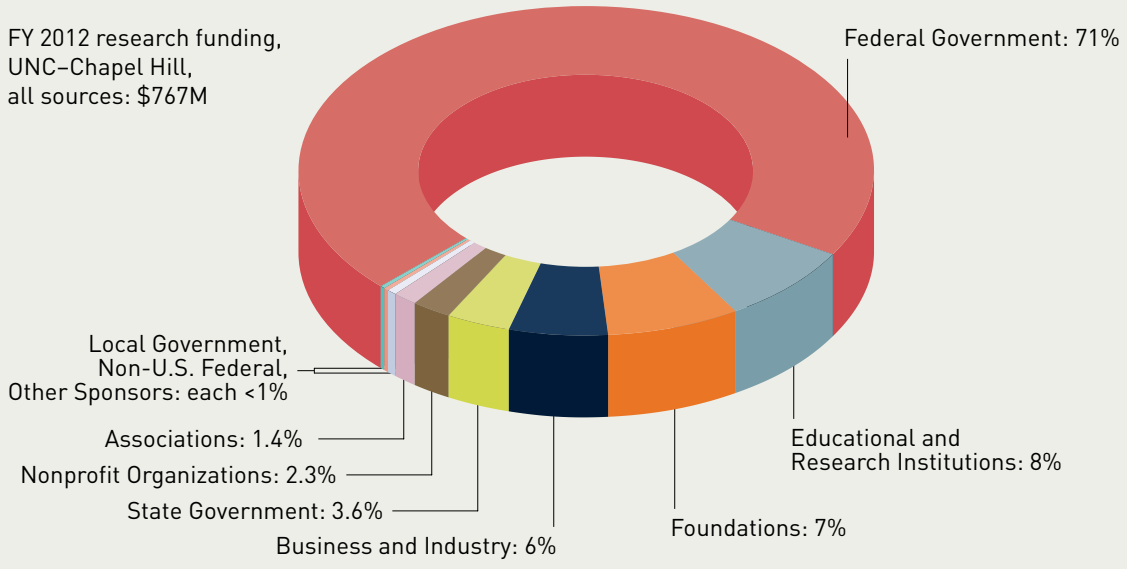


FIGURE 2: SOURCES OF RESEARCH FUNDING, FY 2012, UNC–CHAPEL HILL



Thomas Stith

As Director of Economic Development for the Frank Hawkins Kenan Institute of Private Enterprise, Thomas Stith leads the Center for Jobs and Innovative Business Development. The Center recently received a five-year, $642,949 grant from the U.S. Economic Development Administration (EDA) and $1 million in matching funds from the Kenan Institute. EDA is funding centers in eight states to leverage university assets to promote American innovation and strengthen regional economic ecosystems.

What we learned:
There are at least two contributing factors to the low percent of research funding coming from industry at UNC: 1) lack of engineering; and 2) absence of strategic approach to improving industry relations. Collaboration among all units that deal with industry is needed in formulating and executing a plan for improving industry relations including: Office of Technology Development, Office of Sponsored Research, Corporate and Foundation Relations, Clinical Trials, Legal, deans of research-intensive schools, and high-producing research faculty.

Next steps:

- Encourage the Task Force on Industry Relations to release a bold plan to improve industry relations. An intentional effort to recruit industry research must be undertaken with clear guidelines adopted across the campus to streamline processes and provide consistent service.
- Get wide institutional buy-in to support improving industry collaborations.
- Ask the Commercialization Task Force to also make recommendations on how to improve industry relations.

GOAL 2.4 Extend collaborations with state and regional partners to help North Carolina further develop into a leading competitive, global, entrepreneurial, knowledge, and innovation economy.

Aspirations:
In the future, the Research Triangle Park (RTP) region will be a leading entrepreneurial engine in the United States. Governments and industry leaders around the world will contact North Carolina leaders when considering significant investments, partnerships, and resource allocation. Entrepreneurs will have the knowledge and skills they need to grow companies and will be connected into a strong network of seasoned business people. The path will be smoothed for them and the needed funding available. Strategic initiatives will have been successful in solidifying North Carolina's economic future.

Status in 2009:
Carolina did not play a major leadership role in regional partnerships or economic-development related activities, relying heavily for its statewide engagement on the significant role historically played by the School of Government in training local, county and state officials. The strong tradition of faculty-engaged scholarship across disciplines defined Carolina's service in the public realm, but neither of these valuable activities were specifically geared at developing the state's innovation economy or competitive advantage in the global marketplace. The Frank Hawkins Kenan Institute of Private Enterprise played a leadership role in the aeronautics industry and in some projects related to Eastern Carolina.

Accomplishments to date:

- Created Blackstone Entrepreneurs Network (collaboration among UNC-Chapel Hill, North Carolina State University, North Carolina Central University, Duke University, and the Council for Entrepreneurial Development) with a $3.6 million gift from the Blackstone Charitable Foundation. Its purpose it to create a highly networked entrepreneurial region using experienced entrepreneurs to collectively mentor a pipeline of startups with high-growth potential.
- The School of Government under the leadership of Dean Mike Smith created the Government Innovation Grant Awards, a technology-based innovation awards program. The program, a partnership among the School, Local Government Federal Credit Union, and North Carolina Local Government Information Systems Association, is designed to spur and reward technology-based innovation by offering incentives to North Carolina local governments engaged in innovative, replicable endeavors that help improve citizen services.
- Researchers in entrepreneurial studies are working on mapping the entrepreneurship ecosystem of the Triangle and studying the region's economy.
- The Center for Jobs and Innovative Business Development at the Frank Hawkins Kenan Institute of Private Enterprise under the leadership of Thomas Stith received a five-year, $642,949 grant from the U.S. Economic Development Administration (EDA) and $1 million in matching funds from the Kenan Institute to promote business growth and job creation in eastern North Carolina. EDA is funding centers in eight states through the University Center Economic Development Program, a partnership to leverage university assets to promote American innovation and strengthen regional economic ecosystems. In North Carolina, Fayetteville State University, and Western Carolina University in Cullowhee also received grants. The goal is to extend the reach and impact of an extensive network of partners already working in the area to create a vibrant economic development ecosystem for eastern North Carolina.

What we learned:

It is apparent to leaders in the state, the region and locally that each group – be it a university, a state agency, an economic development group, or the private sector – has to work together to advance our state and nation. And, it is equally apparent that we each need to improve our own initiatives to promote innovation and entrepreneurship.

There is a willingness and hunger to collaborate, especially on seizing big opportunities as can be seen in the joint projects between faculty members and regional and state development efforts.

In 1950, the creation of RTP put the region on the map as being innovative. That model has been emulated around the world and still positions the Triangle as a leader. Such a disruptive plan is needed today.

Chancellor Holden Thorp

Blackstone Network

UNC led in the formation of the Blackstone Entrepreneurs Network to help North Carolina's world-class researchers, universities, and entrepreneurs come together to bring more high-growth potential startups to market. The Blackstone EN does this by recruiting the region's most successful serial entrepreneurs to serve as Entrepreneurs-in-Residence (EIRs) who work as a team to guide high-potential startups out of universities and the region. Blackstone EIRs bring their connections and experience to grow a network dense with dealmakers and help build successful companies. In its first year of operations, Blackstone EN has nine EIRs, seventy-two potential companies reviewed, and twenty network clients currently working with EIRs.

Government Innovation Grant Awards

The Local Government Federal Credit Union's Government Innovation Grant Awards (GIGa) program provides competitive funding to local government entities based on innovation within the organization. The program spurs and rewards technology-based innovation across governments in North Carolina by offering incentives to those governments engaged in innovative, repeatable endeavors which help improve citizen services by increasing efficiencies, effectiveness, and possibly creating cost savings. More importantly, the grant program elevates the importance of technology in the public sector and result in increased managerial and elected official interest in governmental technology investments.

The grants program is a joint project of the School of Government at UNC, the Local Government Federal Credit Union and the North Carolina Local Government Information Systems Association.

Next steps:

- Participate in the current strategic planning process to reimagine the future of the RTP and the Triangle.
- Collaborate with Innovation Circle members who are leading entrepreneurs and capital providers to explore ways UNC can contribute to the state's innovation goals.
- Work with the State of North Carolina and regional economic development groups to contribute to widespread prosperity.
- Continue the close working relationships with the towns of Chapel Hill and Carrboro as well as with Orange County.

GOAL 2.5 Strengthen collaborations with Carolina's strategic international partners.

Aspirations:

In the future, Carolina will enhance and leverage the relationships with our emerging roster of close strategic international partners – schools such as National University of Singapore, King's College-London, Tsinghua University, and Universidad San Francisco de Quito, which is instrumental to our Galapagos projects, and other partners. When working on important complex global problems, these strong, complementary institutions offer vital knowledge, resources, and access.

Accomplishments to date:

UNC Global has strengthened Carolina's strategic partnerships through internal and external efforts. On campus, UNC Global has established a Partnership Roundtable comprised of delegates representing each of the University's strategic and emerging partnerships, or areas of the world in which the University seeks to develop partnerships. Led by UNC's chief international officer, the Roundtable has contributed to the support and extension of the partnerships. Externally, the Global Relations office within UNC Global has developed collaborative relationships with the corresponding international offices at partner institutions. Achievements include:

- The launching of the first strategic partnership website with King's College London that is co-managed by the international offices at both partner institutions.
- The establishment of stronger cooperative marketing efforts with the National University of Singapore.
- The development of additional protocols for hosting international visitors.
- The development of a Global Visiting Students Program, which will bring non-degree, non-exchange students to campus, helping to further strengthen relations with partner institutions.

Niklaus Steiner, PhD, Director of the Center for Global Initiatives, started the Social Entrepreneur-in-Residence program, and brought in Dennis Whittle to be the first. The Center for Global Initiatives is a catalyst for the innovative work of faculty and students at the University. The Center is entrepreneurial in its approach to fostering initiatives that deepen knowledge and understanding of our complex world. For its work, the Center is recognized by the U.S. Department of Education as one of only eleven National Resources Centers in Global Studies.

Joe DeSimone

In August 2012, Joseph DeSimone, PhD was selected by James Dean, Dean of the Kenan-Flagler Business School, to lead the prestigious Frank Hawkins Kenan Institute of Private Enterprise. Dean Dean believes DeSimone has the right mix of academic credentials, entrepreneurship experience, leadership ability, commitment to excellence, and devotion to Carolina to lead the Kenan Institute into its next era as a global leader in entrepreneurship.

DeSimone is the Chancellor's Eminent Professor of Chemistry at the University of North Carolina at Chapel Hill, and William R. Kenan, Jr. Distinguished Professor of Chemical Engineering at North Carolina State University and of Chemistry at UNC. DeSimone is also an adjunct member at Memorial Sloan-Kettering Cancer Center. He has published over 290 scientific articles and has 130 issued patents in his name with over 80 patents pending.

DeSimone is a member of both the National Academy of Sciences (2012) and the National Academy of Engineering (2005). He is also a member of the American Academy of Arts and Sciences (2005). DeSimone has received over 50 major awards and recognitions including the 2012 Walston Chubb Award for Innovation by Sigma Xi; the 2010 AAAS Mentor Award in recognition of his efforts to advance diversity in the chemistry PhD workforce; the 2009 NIH Director's Pioneer Award; the 2009 North Carolina Award; the 2008 Lemelson-MIT Prize for Invention and Innovation.

DeSimone, an innovative polymer chemist, has made breakthrough contributions in green chemistry, fluoropolymer synthesis, colloid science, and nano-biomaterials. He pioneered supercritical CO2-based polymerization reactions and the self-assembly of molecules in compressible media. In 2002 DeSimone, along with Dr. Richard Stack (Duke University) and Dr. Robert Langer (MIT), co-founded Bioabsorbable Vascular Solutions (BVS) to commercialize a fully bioabsorbable, drug-eluting stent. The stent achieved CE Mark approval in Europe in 2011 and is being further evaluated in a series of international clinical trials led by Abbott for the treatment of coronary artery disease. DeSimone's group is now heavily focused on harnessing the fabrication technologies from the semiconductor industry to design high-performance, cost-effective vaccines and medicines. DeSimone and his team have developed a roll-to-roll particle fabrication technology called PRINT (Particle Replication in Non-wetting Templates). They are exploiting the advantages of PRINT to generate "calibration quality" nano-tools to define the geometric (size, shape), surface (zeta potential, stealthing ligands), and deformability limitations for the effective delivery of drugs and vaccines. DeSimone recently launched Liquidia Technologies (www.liquidia.com), which employs roughly 60 people in Research Triangle Park, North Carolina and has raised over $60 million in venture financing, including the first ever equity investment by the Bill and Melinda Gates Foundation in a for-profit biotech company. Liquidia has converted PRINT into a GMP compliant process and has recently brought its first product, a seasonal influenza vaccine based on PRINT particles, into its first clinical trial.

TRANSLATE

Recommendation 3: Translate important new ideas more expediently and at an increased volume into innovations that improve society.

This recommendation has three goals: 1) create social projects and enterprises; 2) commercialize university ideas; and 3) measure impact.

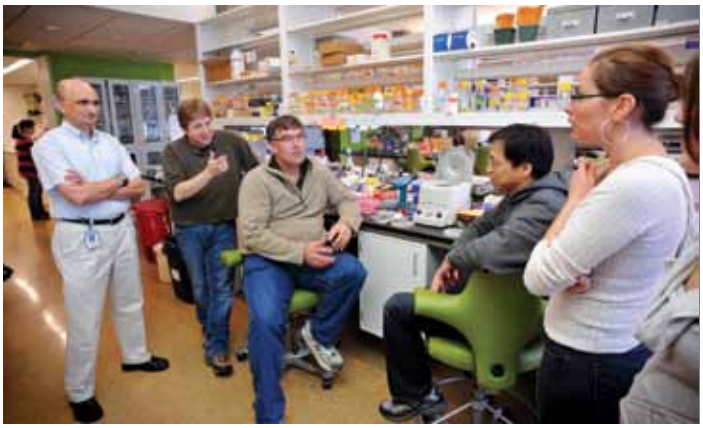
GOAL 3.1 Support faculty, students, and staff as they develop understanding of issues and contribute solutions to complex social and environmental problems through social entrepreneurship.

Aspirations:
In the future, social entrepreneurship will flourish resulting in innovations that help address some of the most challenging issues locally, nationally, and globally. UNC-Chapel Hill will be highly regarded for its rigorous attention to evaluation and assessment as a core pillar of its service activities, and known for the number of successful social businesses, nonprofits, and triple-bottom line companies that it produces.

Status in 2009:
With UNC's teaching, research and public service mission, Carolina faculty, staff, and students had a long history of engagement with the community, state, nation, and world. The Center for Public Service supported and awarded faculty and student engaged-scholarship for many years. The Campus Y had a 150-year history of student service and social justice activity, and the campus had over 650 registered student organizations mainly engaged in service activity. Co-curricular activities for promoting innovation and entrepreneurship in the social realm had been largely informal. The Minor in Entrepreneurship in the College of Arts & Sciences had a social entrepreneurship tract and a limited number of classes were available through the Public Policy department and the Kenan-Flagler Business School.

Accomplishments to date:

- Innovation Circle members Tom Uhlman and Jonathan Reckford convened leaders in all programs, departments, and schools that engage in social innovation and entrepreneurship to discuss how the work of each fit into the overall campus ecosystem. From that meeting, Richard Harrill, director of the Campus Y, agreed to continue to bring the groups together to forma strong campus network of leaders.



The Genome Sciences Building brings faculty and researchers together, fostering collaboration among multiple units across campus.

Carolina Launch Pad is funded by RENCI through the UNC Office of the Provost.

- The Campus Y:
  - Created an advisory board and is developing an integrated strategy for the campus to create and grow social ventures. It includes representatives from Student Affairs, the Office of Diversity and Multicultural Affairs, the Kenan-Flagler Business School Center for Entrepreneurial Studies/Kenan Institute of Private Enterprise, the Public Policy Clinic in the Department of Public Policy, the Urban Investment Strategies Center, BASE, APPLES, the Minor in Entrepreneurship in the College of Arts & Sciences, student representatives, social entrepreneurs, representatives from schools and/or institutes and centers that have faculty, students and staff who create social ventures or assist those who do.
  - Launched a social innovation incubator located in its historic building on the main quad. In its first year, after a rigorous selection, four student innovation teams were chosen to be housed in the incubator. Residence in the incubator is open to student teams across campus (not limited to Y groups) and can include hybrid social/for-profit ventures. Selected teams receive individualized mentoring and support for their project development, capacity-building curriculum delivered through expert workshops, and space for one-year for their ventures.
  - Developed co-curriculum available free to students across campus, providing expert workshops in areas such as business plan development, budget and finance, communications, legal liability issues, fundraising, and strategic planning.
- Launching the Venture, the Carolina Challenge, and the Minor in Entrepreneurship continued to grow their popular social tracts.
- The Center for Global Initiatives piloted the Social Entrepreneur-in-Residence program in 2011. CGI recruited Dennis Whittle, founder of Global Giving, who met regularly with students on their projects and ventures and assisted with the production of UNC's first TEDx event.
- Raised funds to establish the Social Entrepreneur-in-Residence Program in the College of Arts & Sciences.
- Recruited and coached teams to participate in the first Social Business Competition organized by the UNC General Administration with special guest Nobel Prize- winning founder of microfinance, Mohammed Yunus. Each of the seventeen campuses submitted two social businesses and both UNC-Chapel Hill teams were finalists with Sanitation Creations taking third place overall.

Incubator in Chapel Hill

The soon to be opened downtown incubator is the first in Chapel Hill's history. Jim Kitchen, UNC alumnus and adjunct in the Kenan-Flagler Business School, began mentoring UNC students who gravitated to his free space above Julian's on Franklin. Bursting at the seams, Jim realized he was onto something and began talking to the Mayor, town administrators and council members and Ted Zoller about opening an incubator. Fast forward six months, and the incubator is set to open in December. It is a mutually beneficial public and private partnership between the University, the Town of Chapel Hill, Orange County Economic Development, the Downtown Partnership, and private supporters.

TRANSLATE

- Innovation Labs in the Gillings School of Global Public Health were launched with funds from a $50 million gift from Dennis and Joan Gillings to anticipate emerging public health challenges, accelerate solutions, and improve people's lives across the state and the world. In addition, Dean Barbara Rimer of the School recruited Don Holzworth, a noted global health care entrepreneur, to serve as Entrepreneur-in-Residence. He works with faculty to create tangible solutions to global health problems, including building ventures as university spinouts and developing in-country ventures to support local economies. There have been eighteen Gillings Innovation Laboratories funded and two Commissioned Innovation Labs awarded. The Innovation Labs were so successful that other funders wanted to partner with the School to solve problems through Commissioned Innovation Labs. To date there are 18 Gillings Innovation Laboratories funded and two Commissioned Innovations Labs awarded by ChildFund and the International Association of Plumbing and Mechanical Officials
- The Carolina Center for Public Service created the Robert E. Bryan Social Innovation Fellowship. The Fellowship is open to aspiring social change-makers who are interested in providing a significant contribution locally, nationally, or internationally through the creation of an entrepreneurial project that addresses a community issue or need.
- Led by Dean Jack Richman, the School of Social Work's Jordan Institute launched the Middle Space, a nonprofit to help private companies, public agencies, and other nonprofits improve the triple bottom line of their organizations – their economic, environmental, and social performance.

Bethany Hargis in the H4 center in Career Services at the University of North Carolina at Chapel Hill. The collaborative workspace is open to students, faculty and staff during the summer months.

What we learned:
Carolina students, faculty, and staff are continually seeking entrepreneurial and innovative solutions to the world's pressing social problems. To achieve lasting impact and to equip them with the skills and capacities necessary to navigate both the for-profit and non-profit sectors requires rigorous planning and training. Special attention is needed around outcome evaluation and assessment of activities.

Next steps:

- Allocate resources to provide a rigorous academic foundation for students pursuing social entrepreneurship. Provide more advanced educational opportunities in such topics as measuring performance outcomes of social ventures, organization-building, diversified funding plans for nonprofit organizations, and related topics.
- Establish a social innovation seed fund.
- Provide fundraising support at a university-wide level for the social innovation initiative.
- Ensure that student and faculty social entrepreneurs have access to seed funding and a mentor/assistance program with entrepreneurs-in-residence, faculty experts and those external to the university.

GOAL 3.2 Effectively organize and manage the University's commercialization services to maximize the quality and volume of potentially important innovations for society. Return revenue from these innovations to the University to support this work when possible.

Aspirations:
In the future, more innovative ideas will be developed at Carolina and launched efficiently into the commercial sector. Carolina will be recognized as one of the top leaders in technology development and transfer because of the breadth of our innovations and the effectiveness of our leadership, people, strategies, policies, and their resulting impacts.

Status in 2009:
Historically, UNC lagged significantly behind its peers in commercializing its intellectual property. The Office of Technology Development had fewer employees and a lower budget than its peers. It also had fewer startups with an average of 2 a year over a ten-year period, and licensing revenue hovered around $2 million a year during that period.

Carolina KickStart was created to expand commercialization services to life science startup teams and the Carolina Express License was under consideration. Launching the Venture and the Carolina Challenge were also working with startups. See figure 3 for details.

FIGURE 3: UNC-CH OTD 4-YEAR SUMMARY (FY06–FY09)

	Total 4 Yrs FY06–FY09	Average for 4 Yrs FY06–FY09
Disclosures	469	117
New Patents Filed	450	113
U.S. Patents Issued	102	26
Foreign Patents Issued	118	30
Licenses/Options/Letters of Intent	260	32
Software License	31	8
Miscellaneous Agreements	3302	823
Revenue-Royalties	$9,700,000	$2,425,000
Startup Companies	15	4
Startups signing Carolina Express	0	0
License		

Accomplishments to date:
- The first campus-wide commercialization meeting was convened by Innovation Circle members Christy Shaffer and Don Holzworth in early 2011. The purpose of that meeting was to discuss ways to make Carolina a higher-performing institution in technology transfer. That meeting demonstrated the need for a comprehensive plan.

Deborah Stroman, PhD CLU

Deborah Stroman, Ph.D. CLU teaches Sport Administration at UNC and is chairperson of the Black Faculty and Staff Caucus, faculty advisor to the Carolina Business Club and Sigma Alpha Lambda (honors leadership society); director of the undergraduate sport administration internship program; and departmental academic advisor. Her research interests are social issues in sport, entrepreneurship, and leadership. An entrepreneur, she founded the company LASER™ (Life After Sports with Effective Results) to counsel former college and professional athletes to successfully transition from their sports career.

Scott Singleton Synerca
First User of Carolina
Express License

Scott Singleton, PhD, is an associate professor in the Eshelman School of Pharmacy and on the front line in the fight against resistant bacteria. To be able to partner with companies to develop new, more effective antibiotic compounds and bring them to market, Singleton started Synereca Pharmaceuticals in July 2009. He is the company's president and chief scientific officer. In March 2010, Synereca became the first UNC research spinoff company to use the Carolina Express License. Synerca also received a Carolina KickStart commercialization grant to sort out property rights and patents.

- Personnel turnovers (Vice Chancellor for Research, Director for the Office of Technology Development) delayed strategic planning. The new Vice Chancellor for Research, Barbara Entwisle, recently established a Task Force on Commercialization to recommend a comprehensive plan for the campus.
- Carolina KickStart, Launching the Venture, Carolina Challenge, the newly-created Blackstone Entrepreneurs Network, unit laison, and the Office of Technology Development are working together resulting in an increase in the pipeline of startups. In 2012 Carolina jumped from the previous average of 2 per year to seven licensed startups.
- The Office of Technology Development:
    - The Carolina Express License, developed in late 2009, has gained national recognition as a model of how to expedite the commercialization process. The Carolina Express License is a standard license agreement aimed exclusively at UNC startups and intended to increase the number of new companies started and technologies licensed rather than maximizing financial gain. The license offers the same terms to all UNC startups and, while optional, offers the best possible deal available from the University in areas such as royalties (1 percent on products requiring FDA approval based upon human clinical trials and 2 percent on all other products – cash payout to the University in the event of a merger, stock sale, asset sale or IPO – 0.75 percent of the company's fair market value) and other provisions that encourage broad commercialization of the licensed technology. To date seventeen companies have executed an Express License, (FY10-FY11-FY12: 3, 6, 8 = average 6/yr) and the model has been adopted by several other universities and institutions.
    - The startups increased from an average of 3.75 during the FY06-09 period to an average of 8 during the FY10-12 period. There was a steady climb during FY10-FY11-FY12 to 5, 7, 11 startups per year. See figure 4, 5, 6, and 7 for details.

FIGURE 4: UNC-CH OTD AVERAGES (FY06–FY09, FY10–FY12)

	Average for 4 Yrs FY06–FY09	Average for 3 Yrs FY10–FY12
Disclosures	117	143
New Patents Filed	113	124
U.S. Patents Issued	26	31
Foreign Patents Issued	30	28
Licenses/Options/Letters of Intent	32	30
Software License	8	8
Miscellaneous Agreements	823	730
Revenue-Royalties	$2,425,000	$2,433,333
Startup Companies	4	8
Startups signing Carolina Express License	0	6

FIGURE 5

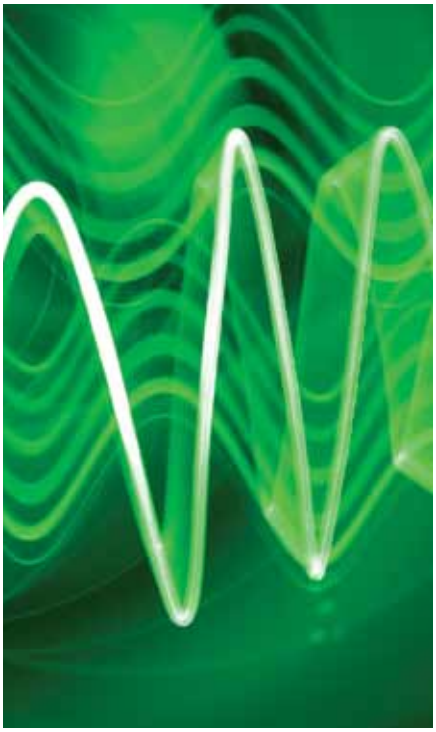
In 2010, AUTM data shows that the University of Carolina at Chapel Hill brought in $737,591,959 in research expenditures. Out of the fifteen listed, Carolina ranks:

- Inputs
  - Licensing Revenues: 14th
  - Expenses Reimbursed: 7th
  - Percent Reimbursed: 4th
- Investments in Commercialization (costs)
  - Patent Expenses: 14th
  - Patent Expenses/Research Dollars as %: 13th
- Results
  - Disclosures: 14th
  - Disclosures/$100M Research Exp as %: 15th
  - Patents Filed: 14th
  - Startups: 13th
- Staff
  - Licensing FTE: 14th
  - Other FTE: 13th
  - Research expenditures per FTE: 2nd (fewer people per research expenditures)

- Carolina KickStart developed a series of programs to advance commercialization:
  - BioEntrepreneur Workshop. Brings biomedical researchers and clinicians from UNC and Duke University together for an overview of life science startups and has local entrepreneurs work one on one with the faculty to help them lay out a twelve-month action plan. Results: 42 faculty attended which has yielded 3 startup companies to date.New Enterprise Opportunity (NEO). Designed to support faculty members with very early-stage technology. NEO provides a number of services to help form, launch, and grow the company: incorporation and documentation, consultants for SBIR grants and providing an evaluation of the technology, and recruitment of the CEO.
  - KickStart Commercialization Award. Provides pre-seed funds of up to $50,000 to help UNC startups meet early milestones in their commercialization efforts. The awards are flexible for early-stage companies and fund both technical activities (validation studies, prototype development) and business activities (market research, IP review). These awards have funded eighteen UNC startups with $665,206 with an ROI of 9.1 (companies received $6,110,696 in non-dilutive and institutional investment).
  - KickStart Labs. Launched in Fall 2012, provides 6,000 sq. ft. of dedicated on-campus Class A wet-lab incubator space and offices for UNC startups. The state-of-the-art facility provides bench space, office space, shared areas (cold-room, hoods), and shared equipment.

Clinical Sensors

Clinical Sensors, Inc. was established in 2009 by Professor Mark Schoenfish, PhD, to develop sensors for diagnosing infection in Intensive Care Units (ICUs) and assessing prognosis upon treatment. The company is focused on the development of miniaturized sensors for analysis of sepsis biomarkers to save lives, reduce complications, and decrease health care costs related to the treatment of sepsis. Clinical Sensors is currently receiving mentoring with the Blackstone Entrepreneurs Network.



Impulsonic

Impulsonic was founded by students and researchers from the GAMMA lab in the Computer Science department at the University of North Carolina at Chapel Hill. Over the past six years, the GAMMA lab has leveraged its high-performance computer graphics expertise to develop cutting-edge technology for real-time sound synthesis and rendering for a variety of applications, ranging from movies and games, to architectural design and outdoor noise modeling. Impulsonic will bring next generation audio and acoustics technology to these applications through innovation.

The short-term lease and access to capital equipment is ideal for startups with SBIR or early VC funding. Assisted with 12 Facility Use Agreements (FUAs) and reduced the average time to get such an agreement in place from six to two months.

- Research to Revenue and eTeams. Teams of students from the sciences (PhD, post-doc), the law school, and the business school work together to provide an initial assessment of a UNC technology. Working with a local entrepreneur as coach, the teams assess the IP, technical risk, and market feasibility. Results: 28 technologies were evaluated by a total of 62 students. Currently 35% of students have moved to careers related to technology development or startups.
- Communication. Held a series of webinars on basics of entrepreneurship. A total of 225 unique visitors have viewed the series. Carolina KickStart monthly newsletter includes current news on UNC startups, curated articles on entrepreneurship and local events. The newsletter reaches 744 subscribers.
- Engage the entrepreneurial community.
    - Emerging Company Showcase. Produced in conjunction with Innovate@Carolina, RENCI, OTD and the Kenan-Flagler Business School, showcases companies spinning out of UNC. An hour of short company pitches in two tracts is followed by several hours of networking where more than 250 entrepreneurs, investors, consultants, and service providers meet with each company. Two dozen companies are selected each year with attendance averaging 236 (increasing by 23% per year).
    - Business lead recruitment. Results: 24 companies/potentials have been introduced to management talent; 12 now playing an active role in company development.
- Mentorship to faculty, staff, and students aspiring to commercialize their technology. Business and Technology Innovation Fellowships were established. The Business Fellow is a recent M.B.A. graduate who is given access to UNC's early-stage pipeline to find a startup opportunity. The Technology Fellow, funded by the Kauffman Foundation, is a recent PhD student who has worked in the lab of a technology that is being spun out. Two past fellows have successfully launched startups. They have secured a combined $530,000 in funding for their startups ($80,000 and $450,000).
- Pharmacy Technology Scout. Uncovered pipeline of commercial potential out to 3+ years; 10 potential new startup opportunities identified.
- Track and report. Developed a CRM database to track contacts and UNC startups. Database includes 878 contacts with details on technical/business expertise, CVs, LinkedIn Info, associated companies, and contact information.
- Dean of Pharmacy Bob Blouin appointed Dhiren Thakker as associate dean of entrepreneurship, established the Center for Drug Discovery led by Stephen Fry, and recruited a noted translational scientist to bring his entire team to Carolina. Additionally, the Pharmacy School includes engaged scholarship (entrepreneurial activities) in their tenure considerations.

Led by Rich Superfine,PhD, Rheomics is a UNC startup that builds systems to diagnose clotting disorders and cancer metastasis.

Augment Medical was developed by students in the joint UNC/NCSU Biomedical Engineering program and is a resident team at UNC's Carolina Launch Pad.

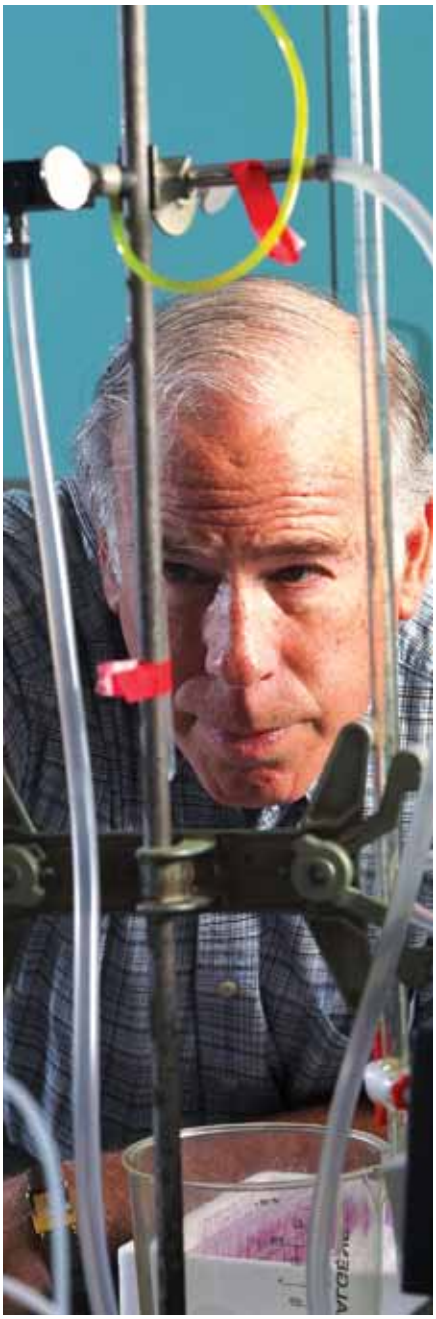
- The Center for Entrepreneurial Studies in the Kenan-Flagler Business School enhanced two programs to help founders: Launching the Venture and Carolina Challenge.
    - o Launching the Venture is an interactive six-month course designed to assist faculty entrepreneurs in evaluating the feasibility of their potential company, designing a business strategy, and creating a business plan. The course is free to UNC-affiliated faculty, staff, and students. It is offered in partnership with the OTD and Carolina KickStart. Launching the Venture continues to help faculty, staff, and students from across UNC-Chapel Hill turn new ideas into viable ventures. Since its inception in 1999, Launch has helped create over fifty startups.
    - o The Carolina Challenge annual startup competition is open to all UNC students, staff, faculty, and alumni with a special focus on fostering entrepreneurship. It has enhanced the program and extended its reach over the years. In 2012, individuals from thirty different disciplines participated in the competition, which is a testament to its ever-broadening reach and importance to the University community. Entrants compete in one of four tracks: high-tech, low-tech, social, and faculty/staff/alumni. The Carolina Challenge awards $50,000 in prize money each year to a total of twelve competing ventures. In 2012, there were 400 total participants – 258 were competitors and the others were judges. Of the 258, 79 were current MBAs or BSBAs, 15 were faculty-student teams, and the rest were non-business students. Public health PhD student, Alice Wang and second-year MBA student Alan Lefebvre won the top-prize of $15,000 for KM Water Solutions.
- Blackstone Entrepreneurs Network was established to guide high-potential startups. (Described in previous section)

What we learned:
Creating and implementing a strategic, coordinated approach to supporting Carolina's commercialization efforts is even more urgent today than previously. With the intense focus on addressing societal needs by converting knowledge into practical value, faculty are creating more work for the technology transfer office. Yet, many faculty are unaware of where to turn for help with their ideas. When the focus on innovation increases the volume of high-potential startups (a desired outcome), it also increases the need for additional staff and patent dollars. An already understaffed, over-worked, under budgeted OTD finds it challenging to keep up with the demand.

Targeted Reading Intervention

Dr. Lynne Vernon-Fagens in the UNC School of Education created Targeted Reading Intervention (TRI) to meet the needs of the rural communities, teachers and students. The TRI is a dual-level professional development intervention for both K-1 classroom teachers and their struggling readers.

TRANSLATE



Phil Singer, PhD in his lab, UNC-Chapel Hill. Singer is a professor of Environmental Sciences and Engineering, Director of the UNC Drinking Water Center, and a member of the National Academy of Engineering.

Carolina traditionally has underperformed in translating its knowledge into practical benefit through commercializing its IP, thus there was no culture of startups that helped push the university forward. Nor had the University kept track of the startups coming from students. The Kenan-Flagler Business School has shown leadership in its curricular and co-curricular programs and has some successful student-created startups.

Agreeing on the philosophical framework for innovation and commercialization is critical and will inform decisions on structure, people, processes, and budgets. Carolina wants its innovators to contribute practical benefit to society, especially addressing some of today's most serious issues. The University must back that mandate with significant support, maximize intellectual property, and find the right licensing for technologies. It must invest the resources upfront and demonstrate patience, especially since Carolina IP is heavily weighted toward life science. When the University thinks of patent dollars as investments rather than expenses, revenues generated from licenses become of secondary concern. If UNC cares most about moving ideas to impact, then it will make the long-term investment required.

Once the Chancellor made commercialization a priority and brought together the resources needed, progress began. The University is at a crossroads.

UNC has much work ahead in translating its knowledge into practical benefit as the following data indicate.

Next steps:

- Move forward with the Task Force for Commercialization. It will include at least the following groups: Office of Technology Development (OTD), Corporate Relations, Office of Sponsored Research, Carolina KickStart at the TraCS Institute, Kenan-Flagler Business School/Center for Entrepreneurial Studies/Kenan Institute of Private Enterprise, Office of Innovation & Entrepreneurship, student representatives, academic entrepreneurs, serial entrepreneurs, investors, professional service providers, representatives from schools and/or institutes and centers who have faculty, students, and staff who commercialize or assist those who do, and others as identified.
- Leverage the Frank Hawkins Kenan Institute of Private Enterprise. The new leader, Joe DeSimone, is an academic entrepreneur, helped lead the design of the Carolina Express License, holds 70 patents, and has a spinout called Liquidia. Recommend a bold and innovative plan for commercialization for Carolina backed by the University. For any plan to be successfully implemented means the University will have to provide the optimal organizational structure, assign experienced leaders for this work, and adequately fund commercialization as a core function of the research agenda.
- Continue to support programs across the campus dedicated to commercialization.

GOAL 3.3 Measure the impact of innovations and innovators launched at Carolina.

Aspirations:
In the future, the University will know the extended benefit of Carolina innovators and innovations to society.

Status in 2009:
In 2009, it was difficult to find the correct information on startups and on commercialization. Databases were either non-existent, in multiple places, or issued conflicting information.

Accomplishments to date:

- The Office of Innovation & Entrepreneurship engaged program leaders across campus to discuss the need for a common platform for managing contacts, networks, and programs as a first step to measurement. Discussions are under way with the Salesforce Foundation to implement Salesforce as the CRM for the innovation and entrepreneurship programs. The Blackstone Entrepreneurs Network is the first program to adopt Salesforce and has found it to be a helpful tool in tracking and communicating information to various stakeholders.

FIGURE 6: ASSOCIATION OF UNIVERSITY TECHNOLOGY MANAGERS AUTM

	Research Expenditures	Licensing FTE	Other FTE	$Research/ Licensing FTE	Licensing Revenues	Patent Expenses
Stanford	$805,973,770	17	13	$47,410,222	$65,466,286	$7,059,494
Univ. of California System	$5,171,519,289	72	91	$71,826,657	$104,434,511	$26,583,654
Univ. of Texas System	$2,346,099,522	46.7	54.3	$50,237,677	$38,309,487	$7,726,017
Univ. of Utah	$450,488,999	9.75	18.5	$46,204,000	$37,547,208	$3,296,298
MIT	$1,400,945,000	20	15	$70,047,250	$69,200,000	$15,300,000
Univ. of Michigan	$1,139,493,986	9	17	$126,610,443	$39,822,113	$5,731,315
Univ. of Florida	$535,877,029	17	6.5	$31,522,178	$29,235,006	$4,346,136
Univ. of Illinois Chicago Urbana	$878,072,000	22	11	$39,912,364	$13,471,311	$4,743,201
Ohio State Univ.	$755,661,682	6.82	6.02	$110,800,833	$1,907,046	$3,401,174
Univ. of Washington/Wash. Res. Fdn.	$887,329,593	15.38	42	$57,693,732	$69,032,163	$3,857,918
Univ. of Wisconsin at Madison	$1,029,000,000	24	46	$42,875,000	$54,300,000	$9,780,000
Duke Univ.	$826,993,375	10	16	$82,699,338	$25,733,526	$3,868,220
Univ. of North Carolina Chapel Hill	$737,591,959	6	7	$122,931,993	$2,597,841	$2,955,491
North Carolina State Univ.	$360,795,000	6	9	$60,132,500	$5,117,361	$2,691,790
Univ. of Virginia Patent Fdn.	$276,308,000	7	9	$39,472,571	$5,206,704	$2,999,202

What we learned:

- The diffused nature of the innovation and entrepreneurship programs seems to work fairly well on campus in assisting life science startups. Non life science startups do not such extensive support.
- Data collection and measuring impact has not been a priority and systems are non-existent or do not meet the needs of the staff. The current OTD tracking and measurement software is causing an already understaffed office to spend extra time tracking down data and making reports.

Next steps:

- Establish a tracking system across the campus for social and commercial startups and their impact.
  - o Continue Salesforce implementation.
  - o Equip OTD with the appropriate software needed to operate efficiently.
- Document the significant role Carolina plays in our local and regional economy.
  - o Convene a group of researchers to include the Office of the Vice Chancellor for Research, Office of Institutional Research and Assessment, the Odum Institute for Research in Social Science, and others to discuss the options for this study.
  - o Replicate the study, *Entrepreneurial Impact The Role of MIT*, which analyzes the economic effect of MIT alumni-founded companies and its entrepreneurial ecosystem.
  - o Study the broader contributions in terms of innovation and our influence on political, social, cultural, and environmental benefits as well as the economic impact.

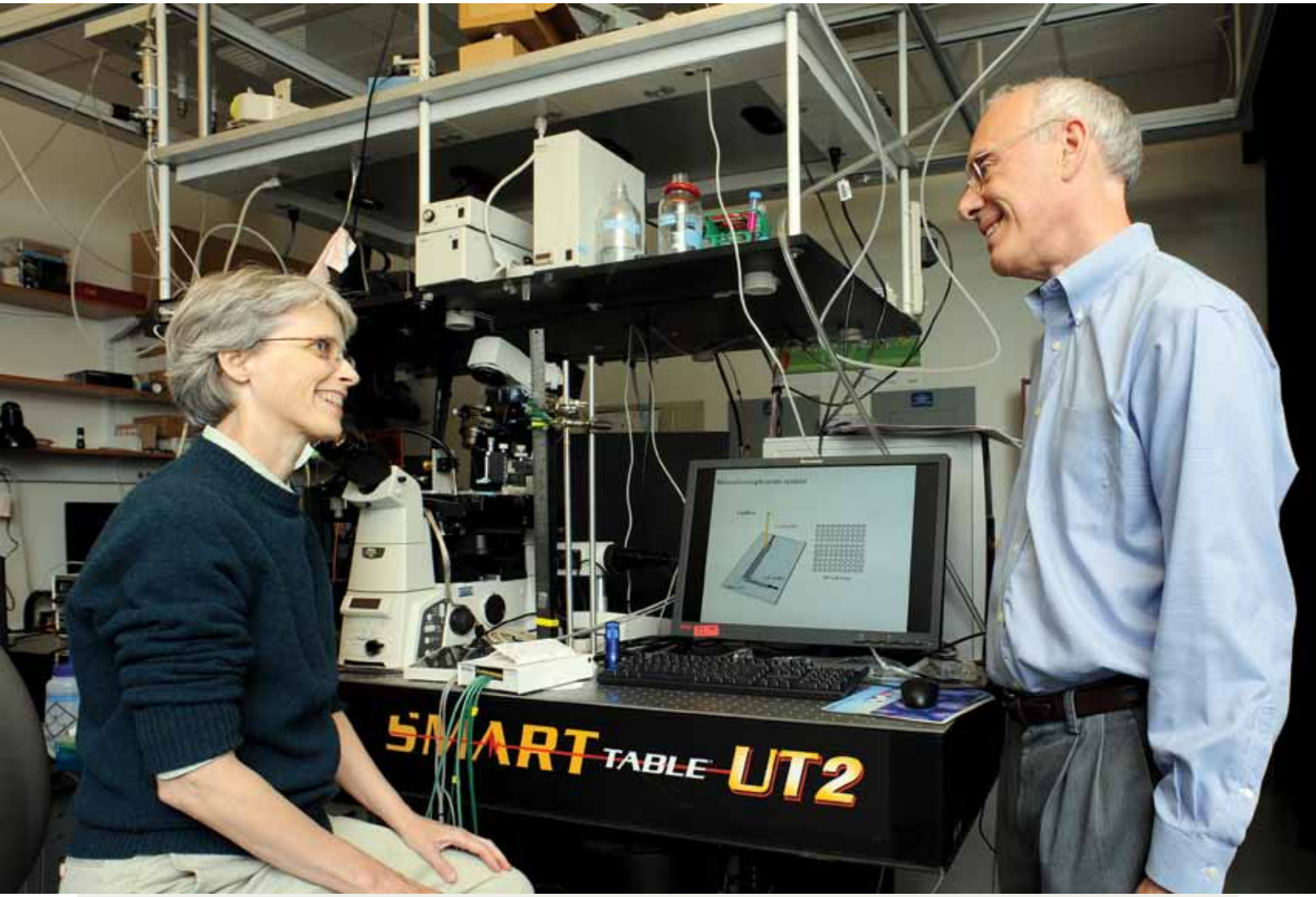
Please note that data from the Association of University Technology Managers (AUTM) is self-reported and there are variations in how institutions categorize items. For instance, California and Texas aggregate their data by state.

	Patent Exp/ Res. Dollars	Expenses Reimbursed	Percent Reimbursed	Patent Investment	Disclosures	Disclosures/ $100M Research Exp.	Patents Filed	Startups
Stanford	0.88%	$2,747,634	39%	$4,311,860	467	58	476	N/A
Univ. of California System	0.51%	$20,825,631	78%	$5,758,023	1565	30	1183	75
Univ. of Texas System	0.33%	$4,107,164	53%	$3,618,853	713	30	704	33
Univ. of Utah	0.73%	$1,057,047	32%	$2,239,251	208	46	219	18
MIT	1.09%	$8,760,000	57%	$6,540,000	521	37	569	17
Univ. of Michigan	0.50%	$4,040,148	70%	$1,691,167	290	25	307	10
Univ. of Florida	0.81%	$2,408,283	55%	$1,937,853	295	55	288	9
Univ. of Illinois Chicago Urbana	0.54%	$1,241,005	26%	$3,502,196	327	37	377	8
Ohio State Univ.	0.45%	$686,615	20%	$2,714,559	173	23	129	8
Univ. of Washington/Wash. Res. Fdn.	0.43%	N/A	N/A	N/A	354	40	273	7
Univ. of Wisconsin at Madison	0.95%	$1,250,000	13%	$8,530,000	356	35	216	5
Duke Univ.	0.47%	$1,631,600	42%	$2,236,620	214	26	282	5
Univ. of North Carolina Chapel Hill	0.40%	$1,955,913	66%	$999,578	125	17	125	5
North Carolina State Univ.	0.75%	$1,877,506	70%	$814,284	124	34	68	4
Univ. of Virginia Patent Fdn.	1.09%	$1,475,871	49%	$1,523,331	139	50	185	2

FIGURE 7: UNC-CH OTD 5-YEAR SUMMARY (FY06–FY10)

	FY06	FY07	FY08	FY09	4-yr total	4-yr average
DISCLOSURES						
Inventions (incl. research tools)	86	86	99	118	389	97
Software	0	18	15	16	49	12
Other	11	9	8	3	31	8
Total	**97**	**113**	**122**	**137**	**469**	**117**
PATENT ACTIVITY						
New Patents Filed	113	109	121	107	450	113
U.S. Patents Issued	32	32	18	20	102	26
Foreign Patents Issued	39	36	22	21	118	30
Total Issued	**71**	**68**	**40**	**41**	**220**	**55**
COMMERCIALIZATION AGREEMENTS						
Licenses/Options/Letter of Intent	55	87	50	68	260	65
Software License	4	2	10	15	31	8
Total Commercialization Agreements	**59**	**89**	**60**	**83**	**291**	**73**
MISCELLANEOUS AGREEMENTS						
MTA*	586	717	756	753	2812	703
CDA	43	75	99	162	379	95
Other (IIAs, Patent Exemption Agreements, etc.)	29	20	30	22	101	25
Total Miscellaneous Agreements *	**668**	**812**	**885**	**937**	**3302**	**826**
REVENUE						
Royalties ($ millions)	**$2.2**	**$1.7**	**$2.8**	**$3.0**	**$9.7**	**$2.4**
NEW VENTURE DEVELOPMENT						
Start-Up Companies	6	1	7	1	15	4
Start-ups signing Carolina Express					**0**	**0**

*In 2010 OTD adopted significant changes in its MTA program to reduce the volume. FY12 was the first full year for these changes.



Nancy Allbritton

Nancy Allbritton, MD, PhD, is Professor & Chair of the UNC/NCSU Joint Department of Biomedical Engineering, the Paul Debreczeny Distinguished Professor of the UNC Department of Chemistry, and Professor, UNC Department of Pharmacology. She obtained her B.S. in physics from Louisiana State University, Ph.D. in Medical Physics/Medical Engineering from M.I.T., and M.D. from Johns Hopkins University. Allbritton was a professor in the Departments of Physiology and Biophysics, Biomedical Engineering, Chemistry, and Chemical Engineering at the University of California, Irvine until her recruitment to UNC in 2007.

At UNC Dr. Albritton co-founded Cell Microsystems to address the challenges with current cell separations - high capital cost, intensive manpower and time requirements, a high rate of cell death, the need for large samples, severely limited options for cell identification, and technology limitations resulting in the inability to separate the cells of interest. The IsoRaft system is an elegant yet simple cell separation and clone selection technology that addresses many of these limitations. It lowers the barrier to entry for performing cell isolations by reducing both the fixed and variable costs, making cell separation technology affordable to every individual lab.

Her current research is directed at the development of new technologies to address biological problems with a primary emphasis on cell and protein-based methodologies. Allbritton founded two previous biotech start-ups based on technology developed in her lab: Cell Biosciences (now Protein Simple) and along with Drs. Sims and Wang, she founded Intellego, Inc., a UCI spin out that became a subsidiary of Amkor, Inc.

Ric Boucher

William Rand Kenan Professor of Medicine
Director, UNC Cystic Fibrosis and Pulmonary Diseases Research and Treatment Center
Co-Director, UNC Gene Therapy Center

Richard C. Boucher Jr., MD, is recognized internationally as a preeminent leader in cystic fibrosis research, having made a series of seminal discoveries and pioneered the development of important therapies. At UNC he has built a global center for pulmonary disease investigation and clinical care. Cystic Fibrosis (CF) is the most common lethal genetic disease in the Caucasian population, affecting one in 3300 births. Other ethnic populations are affected less frequently. The CF gene codes for a protein responsible for controlling salt and water transport across the cells lining the lung, pancreas, and other organs. When this gene is abnormal, secretions in these organs become dehydrated and sticky, and eventually clog airways.

Since the 1970s, his work at UNC has focused on cystic fibrosis whose cause was unknown until Dr. Boucher's discoveries in the early 1990s. Working closely with aUNC team headed by Oliver Smithies, PhD, Professor of Pathology and Laboratory Medicine and a co-recipient of the 2007 Nobel Prize in physiology or medicine, theycreated the first cystic fibrosis mouse model and discovered the extracellular signaling functions of adenosine triphosphate (ATP) in the lungs and its importance in healthy lung functioning. This discovery became the basis for the UNC startup Inspire Pharmaceuticals. Inspire Pharmaceuticals developed and marketed a drug that mimics the ATP function for use with cystic fibrosis patients and in the process created 250 jobs, went public, and later was sold.

From the days of his research, Boucher had a commitment to getting treatments into clinics to help patients. Before the advancements in CF treatments, the average life expectancy of a young person with CF was 16 years old; now it is well over 40. Christy Shaffer, former CEO of Inspire Pharmaceuticals said of Boucher, "Ric was doing translational research long before most people had even heard that term. He has the academic credentials and is a serial entrepreneur—that combination is rare."

Christy Shaffer and Rick Boucher

ALIGN

Recommendation 4: Align people, incentives, resources, and processes to strengthen an intentional culture of innovation at Carolina.

This recommendation has four goals: 1) strengthen support from campus leaders; 2) recruit, retain, reward innovators; 3) align processes; and 4) fund innovations.

GOAL 4.1 Encourage leaders across campus to support and promote innovation in their schools, departments, institutes, and offices.

Aspirations:
In the future, administrators and campus leaders will seek ways to advance innovation in their strategic plans. When faculty and staff have promising ideas, leaders will be flexible and creative in finding ways to assist the innovative faculty or staff member when appropriate.

Status in 2009:
In 2009, there was no way to systematically encourage a culture of innovation and entrepreneurship. The Carolina Entrepreneurial Initiative had introduced the concept as a cross-campus entrepreneurship focus, recruited and organized a campus-wide leadership structure, and launched successful programs. Once Kauffman funding ended, formal campus-wide support for faculty and student innovation was limited.
The only space on campus institutionally supported for startups was at the Renaissance Computing Institute (RENCI) which housed the Carolina Launch Pad program.

Accomplishments to date:

- Top administrators have consistently and strategically demonstrated support for innovation and entrepreneurship:
- The Chancellor through the release of his book, *Engines of Innovation*, participation in the U.S. Department of Commerce's National Advisory Council on Innovation and Entrepreneurship (NACIE), and numerous speaking engagements. He worked closely with the senior leadership team to advance the innovation vision through their work. This included innovation as a standard agenda item in regular senior leadership meetings and senior communication officers promoting the story of innovation and innovators at Carolina.
- The Provost has directly supported several key initiatives and championed the Roadmap in general. Recently, he presented the Innovate@Carolina work at the annual Association of American Universities (AAU) Provosts meeting.
- Senior communication and advancement personnel have promoted innovation and entrepreneurship.
- The Special Assistant to the Chancellor for Innovation and Entrepreneurship has worked with leaders across campus and served on key task forces and committees, sponsored events and programs, presented the Innovate@Carolina initiative to numerous audiences, and worked closely with the leaders across the campus.

A Ban Against Neglect (ABAN) founder Callie Brauel

Local kids help out on a recent work day at UNC student-led venture Hope Gardens

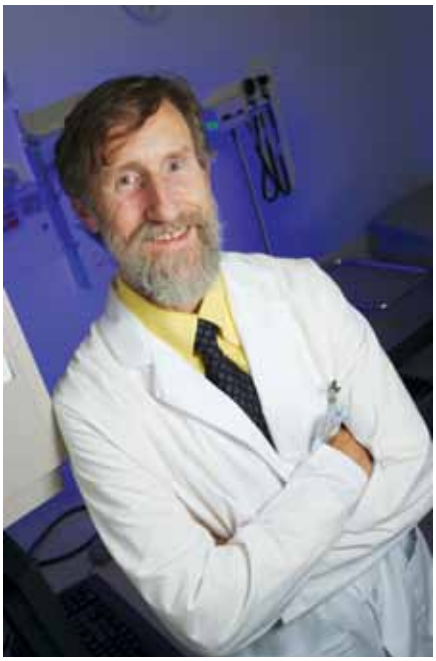
- Created innovation spaces for students, faculty, and staff including the Carolina Union Innovation HUB, H4 in Career Services, the Campus Y Social Innovation Incubator, innovation space in the Health Sciences Library, Carolina Launch Pad at RENCI, LAUNCH (downtown Chapel Hill incubator), wet lab space for faculty and students in the new Genome building, and Entrepreneurs Lounge in Sitterson Hall – the home of computer science. Carolina Launch Pad supports five emerging companies each year. Launch Pad is a collaboration between RENCI, OTD, and the Kenan-Flagler Business School that supports information technology startups founded by UNC faculty, students, and staff. Companies receive office space at RENCI for one year, high speed Internet connectivity, conference facilities, office supplies and easy access to consultations with RENCI technical staff. In addition, Launch Pad connect hosted start-ups with coaching, mentoring, and presentations by professionals with OTD, the business school, and the local business community.
- The C. Felix Harvey Award is given to the UNC faculty member or members whose proposed outreach project best reflects applied scholarly expertise in the humanities and social sciences. It seeks to support faculty who want to move their research findings from the campus to directly serve communities.
- Entrepreneurs-in-Residence are at work across campus helping faculty vet their ideas for market potential and building ventures. Currently there are EIRs serving pan-campus, in the department of economics, schools of public health, social work, education, public policy, medicine, and business, and with the Blackstone Entrepreneurs Network.
- Associate deans of entrepreneurship have been appointed in medicine, pharmacy, and computer science to lead their entrepreneurship development efforts. This marks an important step in further solidifying the commitment of these units to entrepreneurship. Respectively, they are Cam Patterson, Dhiren Thakker, and Tim Quigg.
- The Dean of the Kenan-Flagler Business School, Jim Dean, hired a new director for the Frank Hawkins Kenan Institute of Private Enterprise. He sought a leader who could turn the Institute into a global leader in entrepreneurship and selected Joe DeSimone.
- Institute for the Arts and Humanities (IAH) holds an annual competition for the most innovative faculty ideas and then works closely with the applicants and awards recipients to help them create and execute on their plans.
- The Office of the Vice Chancellor for Research, in conjunction with Innovate@Carolina sponsored a Carolina Apps competition to bring Carolina-born ideas to wider audiences through the creation of innovative mobile applications with broad public appeal. The use of mobile apps in the

Dennis Whittle, EIR

UNC has the potential "to become the Silicon Valley of social entrepreneurship," says Dennis Whittle '83, the first Global Social Entrepreneur-in-Residence at UNC's Center for Global Initiatives. Entrepreneurs-in-Residence are a common feature on the campus helping faculty vet their ideas for market potential and building ventures. The serve in the the schools of public health, social work, education, public policy, medicine, business, and the College and Arts & Sciences.

research, translation, and application of knowledge developed at UNC is a relatively new frontier. The first proposal selected was developed from concept to finished product with the technical assistance of an external development team and launched for beta testing this fall.

- UNC Health Care:
  - Launched a Center for Innovation aimed at the development of patient-centered innovations that address the current challenges facing our nation's health care delivery system related to cost efficiency, quality of care, innovative health care delivery, and alignment of incentives among industry participants. The Center's mission is to initiate, evaluate, disseminate and support adoption of patient-centered disruptive innovations in the delivery and financing of health care and increase value with improved health outcomes and lower costs. The Center provides rapid assessment, coordinated facilitation, partnership development, and funding for innovation using nimble and agile approach.
  - Innovation has long been a focus of UNC Health Care and the UNC School of Medicine. Last year with the support of resources that now form the Center for Innovation, UNC Health Care and Blue Cross and Blue Shield of NC opened a new and collaborative primary care practice called Carolina Advanced Health (www.carolinaadvancedhealth.org) that aligns incentives between payer and provider and offers an advanced model of care under one roof for patients with chronic illness. UNC Health Care's continued focus on innovation is expected to result in new business model innovations, clinical process redesign efforts, new care delivery models and pathways, continuum of care expansions, new technology deployments, and translational research discoveries.



UNC Health Innovation Centers

Directed by Chief Innovation Officer David Rubinow, MD and Chair of Psychiatry, UNC Health Care's Health Innovation Center was launched to initiate, evaluate, disseminate and support adoption of disruptive innovations in the delivery and financing of health care that are patient centered and increased value with improved health outcomes and lower costs.

What we learned:

For the translation of ideas into practical value to become part of the institutional culture requires sustained and intentional effort and the consistent alignment of resources, people, budgets, time, space, and reward systems. The three steps in the Innovation Process – ideation, translation, and impact – typically are not equally supported in a major research university. The first step, ideation includes research which is UNC's core competency. The second step, translation to audiences beyond academic peers, is more difficult within the framework of the research university which impacts the final step – impact.

Next steps:

In order to keep the momentum and continue the Roadmap implementation:

- Senior administrators, deans, directors, department heads, and student leaders continue to focus on innovation as a top priority and direct time and resources appropriately.
- Board of Trustees, Board of Visitors, Parents Council in Student Affairs, and key advisory boards across campus continue to make innovation and entrepreneurship a priority.
- All major university strategy documents reflect innovation as a priority.
- Demonstrate institutional commitment by including innovation and entrepreneurship as a top priority in the upcoming multi-billion dollar fundraising campaign.

GOAL 4.2 Recruit, retain, and reward faculty, students, and staff who show promise, aptitude, and/or achievement in innovation.

Aspirations:
In the future, faculty, students, and staff will be rewarded for pursuing promising ideas to their ultimate application. When the most talented, innovative prospective faculty, staff, and students make their choices on which institutions to join or choose, the supportive innovation culture will weigh favorably for Carolina.

Status in 2009:
Carolina has a long history of recruiting and supporting innovators who are recognized leaders in their respective fields of study. In the December 2009 *Sample of Current Activities*, a historical timeline shows the rich history of innovations launched for the public good since the University's founding in 1789.

Accomplishments to date:
UNC boasts a world-class faculty and gifted student body. The following is a snapshot of some of the incredible achievements by Carolina innovators in the past two years, as well as success stories in UNC's ability to compete for top faculty and student talent.

Outstanding Achievements.

- An HIV study led by UNC professor Myron S. Cohen, MD, was named the 2011 Breakthrough of the Year by the journal *Science*. The study, HIV Prevention Trials Network 052, evaluated whether antiretroviral drugs can prevent sexual transmission of HIV among couples in which one partner has HIV and the other does not. The research found that early treatment with antiretroviral therapy reduced HIV transmission in couples by at least 96 percent. The work prompted the observation by U.S. Secretary of State Hillary Clinton that "The goal of an AIDS-free generation is ambitious, but it is possible."
- Kevin Guskiewicz, PhD, Kenan Distinguished Professor and Chair in the Department of Exercise and Sport Science, has made major advances in the diagnosis, treatment, and prevention of sports-related concussions. Through a combination of laboratory and on-the-field research, Guskiewicz has played an important role in raising awareness about the prevalence and dangers of sports-related brain injuries in both professional and youth athletics. He received the MacArthur Genius Award in 2011 for his work.

Recruitment.

- Sasha Kabanov, PhD and a group of twenty researchers from the University of Nebraska moved halfway across the country this summer to the University of North Carolina at Chapel Hill. Kabanov leads the Center for Nanotechnology and Drug Delivery in the UNC Eshelman School of Pharmacy. He works primarily in the areas of polymer-based drug and gene delivery, as well as biologically active polymers. He established the field of polymer genomics, which investigates the effects of polymers and nanomaterials on cellular responses to develop safe and efficient therapeutics. He is a pioneer in the use of nanotechnology to treat cancer and other diseases and is known for his discovery of a polymer that can make anticancer medications up to one thousand times more effective than

Concussion research

Kevin Guskiewicz, PhD, is the Kenan Distinguished Professor and founding director of the Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center and the Center for the Study of Retired Athletes at The University of North Carolina at Chapel Hill. Over the past 17 years, his clinical research program has focused on sport-related concussion. He has investigated the effect of sport-related concussion on balance and neuropsychological function in high school and collegiate athletes, the biomechanics of sport concussion, and the long-term neurological effects of concussion in retired professional football players. Kevin has received 22 funded research grants, and published 135 manuscripts (95 peer-reviewed journal publications; and 8 textbook chapters on sport concussion). In 2010 he was named to the NCAA's Concussion Committee and the NFL's Head, Neck, and Spine Committee. In September 2011, he was awarded a MacArthur Fellowship, given annually to individuals who "show exceptional merit and promise for continued and enhanced creative work."

AIDS research

UNC's Myron Cohen, MD and his research team have made one of the greatest breakthroughs of 2011. Early results of HTPN 052 suggest that HIV transmission can be halted between couples if the infected person is treated with antiviral medications. UNC's Dr. Mina Hosseinipour (shown below with her study team), ran the study site in Malawi at UNC Project.

conventional chemotherapeutic agents against drug-resistant tumors. He has also invented technologies that hold promise for more effective treatments of brain-related diseases such as stroke, Alzheimer's, and Parkinson's.

- Stephen Frye, PhD was recruited because of his extensive industry background as a medical chemist with GlaxoSmithKline. Frye is Director of the Center for Integrative Chemical Biology and Drug Discovery, Fred Eshelman Distinguished Professor of Pharmacy. He is also the lead principal investigator for the North Carolina Comprehensive Chemical Biology Center, a UNC-based, National Cancer Institute designated center that engages in oncology drug discovery. His research focuses on chemical biology of chromatin regulation and drug discovery.
- Carolina Innovation Scholars are some of the brightest and most sought after students in the country. They receive a four-year reward that covers the full cost of tuition, fees, room, and board. Linked through the Minor in Entrepreneurship in the College of Arts & Sciences, Carolina Innovation Scholars benefit from mentoring and enrichment across the University. Currently there are five scholars; three more will be recruited this year. The program is funded by three individual funds: Mackenzie Family Foundation Innovation Scholarships, Frederick J. Houk, Jr. Carolina Innovation Scholarship, and Holden Thorp Leadership Carolina Scholarship. They are: Mackenzie Scholars – Courtney Sanford, Arjun Bhattacharya, Andrew Bauer; Houk Scholar – Sarah Browning; and Thorp Scholar – Kevin Jang.

What we learned:

UNC's demonstrated focus on innovation and entrepreneurship attracts top faculty and students from across the country. Entrepreneurship is intriguing to incoming students and a useful recruitment tool in the admissions process. Faculty who want to develop their ideas are choosing this campus because of its reputation in turning ideas into action. Tenure policy and reward systems need to be in line with recruitment and retention efforts. It will take constant vigilance to ensure that Carolina becomes and remains the place where innovators thrive.

Next steps:

- In all recruitment activities, hire people who believe in the vision of putting important ideas to work for a better world and have a track record of facilitating innovation and entrepreneurship. When forming search committees and hiring search firms, discuss this vision and include those who are committed to it. This is paramount in the search for the new chancellor and then later the provost and vice chancellor for advancement.
- Create a reward system to encourage innovation that is fair, meaningful, and customized for faculty, students, and staff. Design rewards that are tangible and intangible, including scholarships, grants, fellowships, professorships, cash rewards, time, and recognition. Realize that often the greatest reward for faculty is permission to pursue an innovation, especially when it is outside the departmental priorities.
- Review policies on tenure and promotion and what counts as University service to include consideration of innovation activities, especially with committees such as the Provost's Task Force on Promotion and Tenure.
- Continue to raise funds to support this work.

GOAL 4.3 Align the University's internal methods and processes to foster innovation, especially in working across schools.

Aspirations:
In the future, Carolina will regularly assess its internal methods and procedures and make needed changes to support the innovation culture. The University will be known for its entrepreneurial can-do attitude and willingness to quickly address roadblocks to innovation. There will be no incentive for faculty to go outside the system to pursue their translational opportunities. Those pursuits will be easier through the University because of its added value, service attitude, and efficiency.

Status in 2009:
It was well known that campus translational systems needed updating, did not support multidisciplinarity, were rule-laden, cumbersome, and slow. The OTD office was understaffed leading to some frustration on campus and in the community. The Eshelman School of Pharmacy included consideration of engaged scholarship in its tenure policy, but the overall tenure policies for the campus did not include credit for engagement and commercialization.

Accomplishments to date:
- While progress has been made in changing rules and regulations to be more supportive of the innovation process overall, much work remains.
- The Vice Chancellor for Finance & Administration, Karol Gray, is overseeing major improvements in internal processes through at least three task forces – Industry Relations, Commercialization and Clinical Trials.
- The Vice Chancellor for Research holds monthly meetings for key staff members to discuss how to streamline operations and better work with industry. The group represents such units as: Sponsored Research, OTD, Carolina KickStart, Corporate and Foundation Relations, Legal, Conflict of Interest, Clinical Trials, and the Office of Innovation & Entrepreneurship. It has proven to be a helpful forum.
- The Vice Chancellor for Research has convened three task forces: Industry Relations, Commercialization, and Clinical Trials.

What we learned:
There is a desire to work in a collaborative, multidisciplinary manner, but campus systems remain a major impediment. UNC can be a confusing environment for those who want to work outside of their units and for those trying to use outdated systems to produce novel results. Processes need significant attention.

Next steps:
- Leadership at the highest administrative level needs to indicate that improving processes to support the innovation ecosystem is critical.
- Continue overall improvements currently underway and develop an ongoing method to streamline processes.
- Encourage the Task Force on Commercialization and the Industry Relations Task Force to include in their reports ways to streamline processes.

Sasha Kabanov Group

Elena Batrakova, PhD, Sasha Kabanov, PhD, and eighteen postdocs, researchers, and grad students have found a new home in the Genetic Medicine Building. The group from the University of Nebraska moved halfway across the country this summer to the University of North Carolina at Chapel Hill to join the Center for Nanotechnology and Drug Delivery in the UNC Eshelman School of Pharmacy. Kabanov's group brings to UNC a research program that will receive more than $2.5 million in research funding from the National Institutes of Health over the next three years.

Gillings Innovation Labs

The laboratories, funded through a gift to the public health school by Dennis and Joan Gillings, aim to help accelerate delivery of real-world solutions for some of the most challenging public health problems. Each innovation lab engages in one or more of the following areas: high-impact research, demonstration projects, and teaching practices which anticipate future public health challenges and accelerate sustainable solutions in North Carolina and around the world. Currently there are 18 funded laboratories working in areas from Microfinance in Health to Mapping Tropical Disease: A Most Critical First Step.

GOAL 4.4 Provide the necessary funds to support nascent and promising innovations on campus.

Aspiration:
In the future, advancing innovative activities will be an important part of the criteria for how resources are allocated. Grantors and donors will fund innovation activities because of their confidence in the University's ability to increase the number of innovators and innovations and the velocity in which promising ideas go through the innovation process at Carolina to deliver value to society.

Status in 2009
The Kauffman Foundation grant ended and along with it the sources of funds for course creation, program support, and awards to faculty and students.

Accomplishments to date:

- Raised $52 million for the various initiatives described in the Roadmap and for other initiatives that promote innovation and entrepreneurship.
- Several grant programs were created such as: Awards from the Minor for Entrepreneurship in the College of Arts & Sciences, Carolina KickStart, IAH Awards, the Campus Y Incubator Award, and App Development.

What we learned:
The Office of Advancement at UNC is structured to support units, so cross-campus initiatives like the global initiative, innovation and entrepreneurship, or the pan-campus water theme are dependent on intentional fundraising collaboration between units.

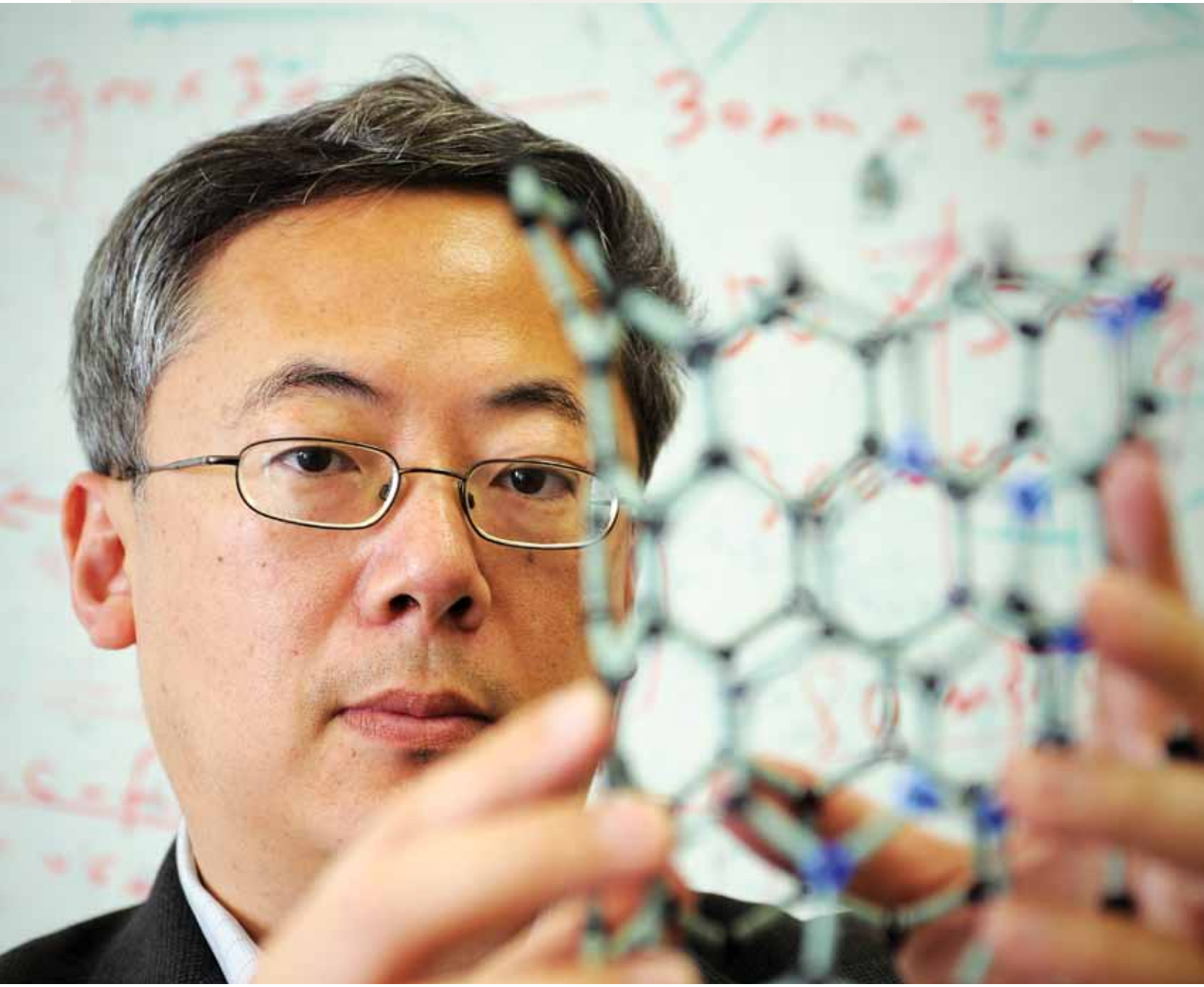
Next steps:

- Create a fundraising plan for Innovate@Carolina in conjunction with the upcoming multi-billion dollar campaign and assign direct support for its implementation.
- Secure commitment from deans, directors and their respective lead development officers to promote innovation as it relates to their area.
- Create grants and investment funds *inside* the University.
    - o Proof of concept grants.
    - o Investment funds through an alumni angel fund.
- Connect UNC startups to funding sources (grants and investment) *outside* the University.

Otto Zhou

Brain Tumors

Otto Zhou, PhD, Distinguished Professor, Physics-Astronomy, has been awarded nearly $2 million in American Recovery and Reinvestment Act (ARRA) funding from the National Cancer Institute to apply carbon nanotube X-ray technology invented at UNC to a promising experimental microbeam radiation therapy now housed in massive synchrotrons – facilities larger than Kenan Stadium. Using carbon nanotechnology, Zhou and Sha Chang, associate professor of radiation oncology, hope to be the first to deliver the same radiation dose with a desktop-size device. About 44,500 Americans are annually diagnosed with brain tumors; only 30 percent survive. "We've made little progress in 30 years in the survival rate," Zhou says. "We want to build a system to cure brain tumors."



Recommendation 5: Catalyze innovation at Carolina by facilitating the work of faculty, staff, and students as they put important ideas to use for a better world.

This recommendation has two goals: 1) leverage campus resources; and 2) catalyze the work.

GOAL 5.1 Leverage the talents of leaders across campus to prepare, collaborate, translate, and align resources and processes to strengthen an intentional culture of innovation at Carolina.

Aspirations:
In the future, faculty, staff, and students will lead a wide variety of integrated initiatives focused on translating promising ideas into innovative practices. Program leaders will meet regularly to leverage resources, assess the overall culture of innovation, and take steps to fulfill Carolina's innovation mission. This cooperative network approach will encourage widespread experimentation, autonomy, and integration.

Status in 2009:
The Kauffman-funded Carolina Entrepreneurship Initiative convened leaders from across campus. As a result collaborations and informal partnerships were formed. When funding ended the infrastructure for collaboration ended as well.

Accomplishments to date:
Established the Office of Innovation & Entrepreneurship in the Chancellor's Office to connect resources, people, and programs with existing and emerging opportunities.

- Formally and informally met with innovators and leaders from across the campus to regularly create new connections and promote collaboration.
- Worked to reduce redundancies and encourage the sharing of resources among programs.
- Maintained a collective and ongoing conversation about innovation and entrepreneurship with audiences internal and external to the university through an inclusive process.
- Monitored and supported projects at various stages of development across campus, filling gaps, and making connections to resources and people where possible. Targeted projects included applied sciences, the Kenan Institute director search, App development competition, pan-campus water issue, and the development of a collaborative county/town/university incubator.
- Worked closely with the Chancellor's Student Innovation Team as it continues to play an important role in advancing innovation initiatives.

What we learned:
Building a tightly linked, effective, and collaborative ecosystem for innovation and entrepreneurship takes time and deliberate attention. It is a people-intensive enterprise that involves nurturing relationships and building trust among individuals and groups that sometimes feel under-supported. The Carolina community continually demonstrates a willingness to extend themselves beyond the confines of their immediate discipline or program to collaborate, imagine, build, and implement.

Next steps:

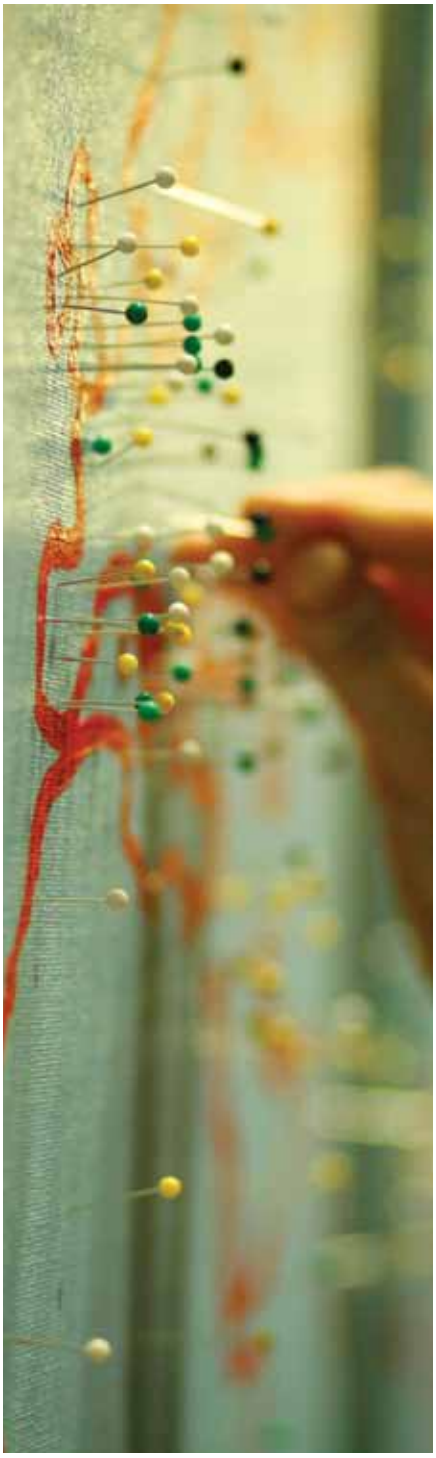
- Continue to work with colleagues across campus to connect them to each other, raise awareness, leverage existing resources, and fill in gaps.
- Serve as a catalyst for cross-campus initiatives such as Global Entrepreneurship Week.
- Make small awards to program leaders and student groups to support their work.
- Encourage program leaders to use common technology tools to collect data, tract activities, and report impact.
- Release innovate.unc.edu website 2.0 that serves as a navigational gateway to campus resources for innovation and entrepreneurship. Encourage program leaders to link to the website and republish the navigation page on their websites.
- Raise funds to support this work.

GOAL 5.2 Create the Chancellor's Catalyze Group to facilitate the implementation of this Roadmap.

Aspirations:
In the future, the goals described in this Roadmap will receive the targeted attention and resources needed over time to realize the vision. The Chancellor's Catalyze Group (now the Chancellor's Office of Innovation & Entrepreneurship) will continuously encourage the integration, collaboration, and alignment of resources and processes. The campus will have a virtual entry point for anyone interested in learning more about innovation activities and how their plans might fit in. Further, it will have central data services, evaluation and reporting assistance, and access to required resources. The collective story of innovation at Carolina and its profound impact on society will be widely disseminated.

Status in 2009:
The marketing efforts to promote innovation and entrepreneurship across campus through the Carolina Entrepreneurial Initiative, funded by the Kauffman grant, had ended and the website affiliated with CEI was de-activated. There was no individual or group charged with continuing the work.

CATALYZE



Students at TEDxUNC map their global travels.

Accomplishments to date:

- Established the Chancellor's Office of Innovation & Entrepreneurship.
- The Special Assistant for Innovation and Entrepreneurship and the Chair of the Innovation Circle fulfilled more than 90 speaking engagements with deans, chairs, standing committees, faculty, employees, parents, women's groups, alumni, and external groups in Chapel Hill, the region, state, and nationally. The Office worked with communication officers across campus to cross-pollinate the messages about innovation and entrepreneurship.
- Developed the website innovate.unc.edu as a major communication tool for gathering and communicating Carolina's stories about innovators. Created a user-friendly central online gateway to innovation and entrepreneurship to help the Carolina community learn more about the resources, courses, programs, and people available to support innovation and opportunities for involvement.
- The UNC home page on the web has a permanent link to Innovate@Carolina and it carried year-long lead story series about innovators at Carolina.
- Published newsletters and communicated using social media: blogs, Twitter, LinkedIn, and Facebook. Help others publish stories on UNC innovators and innovations through campus media outlets including unc.edu, endeavors.unc.edu, and the University Gazette.
- Brought to campus world-class innovators such as Steve Case, founder of AOL and philanthropist; Desh Deshpande, entrepreneur and philanthropist; Cheryl Dorsey President of Echoing Green; Robert Langer, MIT professor with 800 issued or pending patents and numerous spinouts; Thomas Fogarty, noted pioneer in medical device inventions; and Art Collins, former CEO of Medtronic.
- Provided funding for staff support and helped raise sponsorships for upcoming Global Entrepreneurship Week November 12-18, 2012. GEW is an international week-long celebration of entrepreneurship funded by the Kauffman Foundation. UNC's program will include nearly 30 talented speakers over the course of the week, as well as an information fair and a 24-hour "entrepreneurathon".

Faculty:

- Communicated innovation goals to faculty through provost and senior leadership and speeches.
- Encouraged selected faculty to promote understanding of the Innovation Roadmap goals with their colleagues.
- Aligned the Roadmap goals with the Academic Plan through discussions with the Academic Plan Steering Committee.

Students:

- Office of Innovation and Entrepreneurship oversaw and engaged in activities of the Chancellor's Student Innovation Team (CSIT).
- Attended and sponsored entrepreneurship events across campus (TEDxUNC, Emerging Companies Showcase, Campus Y Social Innovation, Campus Y Incubator selection process, and Carolina Challenge finals).

Staff:

- Encouraged (through presentations and meetings) administrators and campus leaders to work with their staff members to explain the innovation goals and to solicit their involvement.
- Encouraged (through presentations and meetings) senior administrators and campus leaders to include the innovation goals in presentations to key audiences.

What we learned:

Consistent message, networks, individual relationships, credibility, resources, and a combination of one-on-one conversations with the ability to reach audiences through electronic media are all key elements in building a culture of innovation for UNC. Each of these needs to continue to realize the potential for truly embedding innovation and entrepreneurship as a lasting hallmark of the Carolina way.

Next steps:

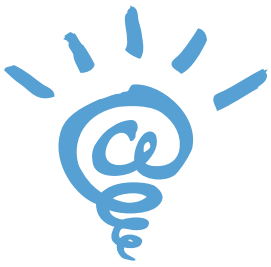
- Work with the Admissions office to include messages about innovation and entrepreneurship at Carolina throughout the recruiting process.
- Continue telling UNC's innovation story and engaging current and potential audiences in the work.
- Continue to work closely with key individuals in departments and programs to strengthen a network of super-connectors around innovation and entrepreneurship across campus.
- Mobilize the interests and talents of student groups across campus in conjunction with the Chancellor's Student Innovation Team (CSIT). Expand the reach of student innovation efforts to more deliberately involve graduate students and post-docs.
- Work closely with the Office of Advancement to help raise the required resources.
- Continue to represent the University at key meetings nationally.
- Help measure impact.
- Advocate for strengthening a culture of innovation and entrepreneurship at Carolina.

Special Acknowledgment to the Deans

Without your strong support, this work would not have been possible. You exemplify *commitment*, *strategy*, and *action* for the greater good.

Dean Bob Blouin, Eshelman School of Pharmacy
Dean Jack Boger, School of Law
Dean James Dean, Kenan-Flagler Business School
Dean Karen Gil, College of Arts & Sciences
Dean Susan King, School of Journalism
Dean Gary Marchionini, School of Information & Library Sciences
Dean Steve Matson, Graduate School
Dean Bill McDiarmid, School of Education
Dean Jack Richman, School of Social Work
Dean Barbara Rimer, Gillings School of Global Public Health
Dean William Roper, School of Medicine
Dean Mike Smith, School of Government
Dean Kristen Swanson, School of Nursing
Dean Jane Weintraub, School of Dentistry
Dean Jan Yopp, Summer School

Special thanks to Amanda Zettervall, UNC Creative, for her outstanding work in designing this report.



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