

HEALTH CARE

GENERATING A FUTURE

Winston-Salem leverages identity as hub of
regenerative medicine

By [Lillian Johnson](#) – Reporter, Triad Business Journal
Mar 18, 2022 **Updated** Mar 18, 2022, 6:54am EDT

Winston-Salem has been branded through the decades as many things – the Twin City, the Camel City, the City of Arts and Innovation. Now, it might add another brand to that list: the global hub of regenerative medicine.

At least, that's the goal of the Wake Forest Institute of Regenerative Medicine (WFIRM). Led by director and renowned researcher Dr. [Anthony Atala](#), WFIRM is already recognized as a global leader in regenerative medicine, having developed novel techniques and technologies and many 'firsts' in the field.

Since its founding in 2004, the institute has achieved growth many startups would envy, adding an average of almost 24 employees each year for 18 years. What began with Atala's 20-person team that came to Winston-Salem from Boston morphed into a 450-employee operation in the Triad. Within the next year, Atala expects to have 500 employees at WFIRM – not including people it brings in through its workforce and company development initiatives.



Image: WFBH Photography Wake Forest Institute of Regenerative Medicine

VIEW SLIDESHOW

16 photos



“We’re not bashful about saying we want to grow the economy around bioscience and around regenerative medicine specifically here in this region,” [Gary Green](#), WFIRM’s chief workforce development officer, said.

With several new initiatives and programs to develop workforce and technology, WFIRM first and foremost wants to ensure that the next generation continues the important work of regenerative medicine and has the means to do so.

“If you advance the field in general globally, you’re really benefiting patients at the end of the day,” Atala said.

Starts with education

In regenerative medicine, a wide range of expertise is needed – molecular biology, physiology, material sciences, chemistry, biology, computer programming, electrical

engineering, mechanical engineering. Add in biomanufacturing, another specific set of workers is necessary, like regulatory and quality assurance employees.

The RegenMed Development Organization (ReMDO), a nonprofit that aims to advance the field, has worked with WFIRM to develop the RegeneratOR initiative. RegeneratOR encompasses a multipronged approach to developing a sustainable regenerative medicine ecosystem, including the RegeneratOR Test Bed, RegeneratOR Business Incubator and RegeneratOR Workforce Development.

“It’s on their minds to not only think about the workforce today but how to make sure that the workforce is sustainable and providing really great opportunities for our young people going forward,” said [Mark Owens](#), president of Greater Winston-Salem Inc.

While there is no data on expected regenerative medicine employee growth in the Triad, average annual salary for biological scientists in the Triad is \$82,700 – well above Forsyth County’s average income of \$51,569.

The biggest – and perhaps most ambitious – piece of the puzzle that ReMDO and WFIRM are working towards is building an educational pipeline that includes K-12, technical schools, community colleges and universities, starting in the Triad, with the Workforce Development Initiative.

Funded by a three-year, \$441,000 grant from the National Science Foundation, this initiative will help connect education to regenerative medicine through faculty and curriculum development. For example, WFIRM runs a faculty development program with Winston-Salem’s Atkins High School to aid with biology and biotechnology and get regenerative medicine content into the curriculum. WFIRM is also doing outreach to community colleges and local historically Black colleges and universities, Green said.

Green said that ReMDO will be seeking other financial support for the Workforce Development Initiative, although there is no currently set mechanism or timeline.

From concept to product to scale

Last summer, [ReMDO and WFIRM launched the RegeneratOR Test Bed](#), a laboratory and small-scale production space designed with the latest technologies that external regenerative medicine startups can use to advance their own work, with an initial \$50 million investment for the project. This project derives its name from a test bed (or testbed), which isn't a literal bed but rather a platform for the rigorous testing process of new theories and technologies in a variety of industries.

The test bed will be housed in WFIRM’s facility in Innovation Quarter and should be completed soon, said Bonnie Davis, chief communications program officer at WFIRM. Outside companies in the regenerative medicine field have given donated technologies to the test bed, to be used free of charge, to the companies taking part in the test and to WFIRM. Those companies include Biospherix, Panasonic Healthcare, Phase

Holographic Imaging, Scientific Bioprocessing, CellBox, Thrive Biosciences, Etaluma and Oracle.

The benefit to the companies coming into the test bed – that they can create their prototypes without spending millions – is obvious. For WFIRM and the companies contributing technology, there is also an advantage.

Green said these contributing companies want to bring their latest technologies to the latest work being done by startups to advance regenerative medicine, and WFIRM helps to facilitate the clinical translation of products to eventually reach patients.

“When the startup is finally able to create their prototype, guess who they’re going to buy their equipment from? The companies they used here,” Atala said.

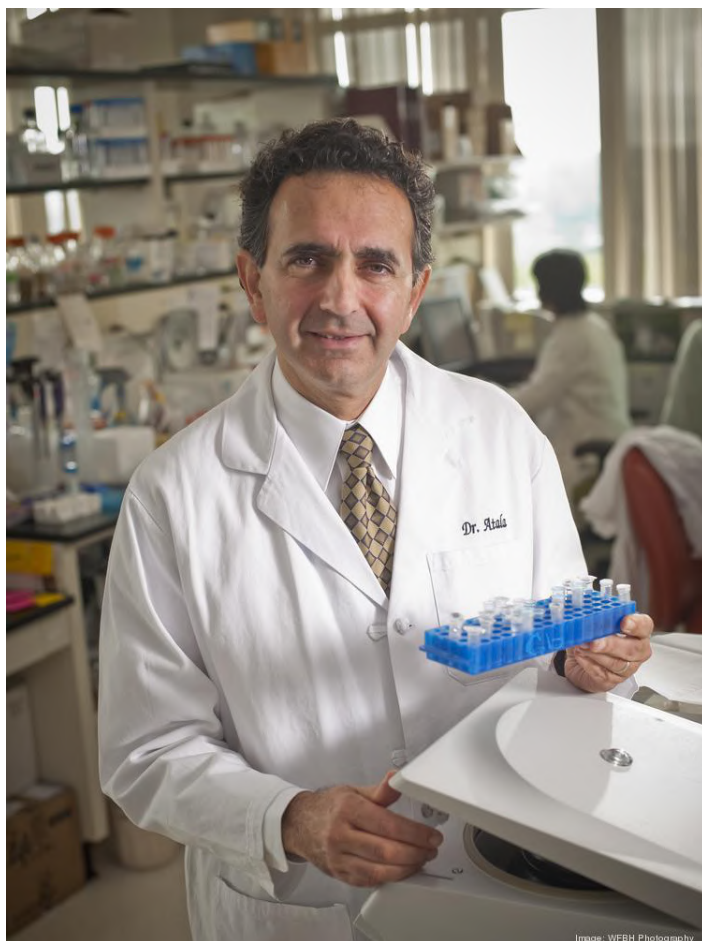


Image: WFBH Photography [Enlarge](#)

Dr. Anthony Atala in the Regenerative medicine laboratories, Wake Forest Institute for Regenerative Medicine, PTRP.

The final component of the RegeneratOR initiative is the RegeneratOR Business Incubator. This is not your traditional incubator; instead of incubating startups and early-stage companies, the goal is to aid in product and idea development, whether for a startup or an established company.

The incubator program is already at capacity with six companies, and WFIRM is looking at additional space within Innovation Quarter to be able to expand this program, Green said. He said that companies in the incubator that have leased space in WFIRM's building and one additional company is considering other space in Innovation Quarter. WFIRM will be working with Innovation Quarter to help other companies establish a presence there as well.

Some of these companies are here in the Triad, but some are coming from as far away as Florida and Korea – and hopefully, they will want to stay and scale their businesses and products here.

“These companies that are associated with regenerative medicine very much want to be a part of a broader economic cluster around regenerative medicine and they want proximity to the research and the newest ideas and the people who are generating the intellectual capital,” Green said.

In addition, ReMDO is working with the entrepreneurial ecosystem in Winston-Salem on its initiatives. Companies in the business incubator have automatic entry into Winston Starts, for example, as well as access to the RegeneratOR Test Bed.

The future capital of regenerative medicine

For Owens, he absolutely wants to be able to claim that Winston-Salem and the greater Triad is the hub of regenerative medicine – not Boston or San Francisco, two other metros that have a strong regenerative medicine research presence according to Mary Hecht-Kissell with the North Carolina Biotechnology Center.

In fact, Owens argues that the Triad is well on its way: in the region, there are 23,000 degrees issued every year and 10,000 of those are in health care and the life sciences. Since 2018, the area has experienced a 600% increase in life science economic development projects. Both elements are direct pathways to increasing regenerative medicine activity. And WFIRM and the RegeneratOR initiative represent the intersection of innovation and health care, an identity Winston-Salem is carving out for itself.

Winston-Salem is essentially making a bet on the expected growth of regenerative medicine, [Christopher Chung](#), CEO of the Economic Development Partnership of NC, said.

[According to Verified Market Research](#), the regenerative medicine global market size was valued at \$27.7 billion in 2020 and is projected to reach \$149.8 billion by 2028, growing at a compound annual growth rate of 23.54% between 2021 and 2028.

So, hopefully it will be a bet that pays off. There will be concrete ways – based on what one would expect to find in an industry-specific region – to measure how successful Winston-Salem is in becoming the hub of regenerative medicine, Chung said. It includes an educational curriculum that creates a strong talent pool here; a desire from both

early-stage and mature companies to be here; funding in the region that specifically targets the industry here; and young professionals who want to work in regenerative medicine moving here.

The future of regenerative medicine as a viable treatment is no more a question of if, but rather one of when and at what cost. And when that happens, it'll be all the better for Winston-Salem.

"The fact that Winston-Salem has started to build this cluster before we get to a tipping point – it's all it can do to give the region a major head start on the rest of the world," Chung said.