The **Eshelman Institute for Innovation** at the UNC Eshelman School of Pharmacy was established in 2014 with a $100 million commitment from Dr. Fred Eshelman.

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<td>18</td>
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Note: This report covers the period between 2015 and 2019.
Our Purpose

To create and sustain an *Innovation Engine* to enable the UNC Eshelman School of Pharmacy to define and pursue bold, new, innovative ways to move the mission of the School forward and extend its position as a global leader.
Our Strategy

To help innovators take the Next Step forward in advancing medicine for life.

**Fund**
Provide seed funds for innovation in pharmacy and pharmaceutical sciences that will advance treatments to patients.

**Commercialize**
Provide resources, expertise, and project management to advance new therapeutics, technologies and services towards commercialization.

**Partner**
Provide connectivity between innovators and external organizations such as BioPharma, investors and philanthropists.

**Train**
Develop the capabilities of a community of innovators.

**Capabilities**
Provide access to new innovation infrastructure via acquisition and partnering.

“Our vision is to inspire a culture of innovation.”
— Dr. Fred Eshelman
Our Process

Ideate
- Curation
- Strategic Partners
- RFP
- Diligence

Fund
- Proof of Concept Grant
- Partner Co-Fund
- Strategic Managed Funds

Deliver
- Engaged Project Management
- Tranche Funding
- Milestone Focused
- Industry Advisory Board

Commercialize
- Business Development
- KVS Startup Incubation
- Entrepreneur Network
- Innovate Carolina and Office of Technology Commercialization
# Results

## Funding to Date

<table>
<thead>
<tr>
<th>$26.1M</th>
<th>131</th>
</tr>
</thead>
<tbody>
<tr>
<td>EII Grants Awarded</td>
<td>Projects Funded</td>
</tr>
</tbody>
</table>

## Commercialization

<table>
<thead>
<tr>
<th>19</th>
<th>18</th>
<th>55</th>
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<tbody>
<tr>
<td>Patent Applications</td>
<td>Technologies Licensed</td>
<td>Invention Disclosures</td>
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</table>

<table>
<thead>
<tr>
<th>12</th>
<th>$17.4M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Startup Companies*</td>
<td>Startup Funds Raised</td>
</tr>
</tbody>
</table>

## Train

<table>
<thead>
<tr>
<th>86</th>
<th>157</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Students</td>
<td>Professional Students</td>
<td>Postdoctoral Fellows</td>
</tr>
</tbody>
</table>

* Note: The EII supports the entrepreneurial activities of all 49 startup companies from the UNC Eshelman School of Pharmacy.
Fund

Provide seed funds for innovation in pharmacy and pharmaceutical sciences that will advance treatments to patients.

$26.1M
Granted in innovative ideas submitted to the EII since 2015

$500K
Investment in Student Projects

$48.7M
Follow-on Funding

123
Publications

Selected Journals
- Nature Biotechnology
- Science Translational Medicine
- Nature Communications
- ACS Nano
- Advanced Materials
- Biomaterials

Faculty Research Areas*

- Target Validation & Drug Discovery 33%
- Disease Diagnostics 6%
- Precision Medicine 7%
- Basic Pharmaceutical Science 8%
- Existing Drug Optimization & Repurposing 12%
- Healthcare Delivery and Education 15%
- Drug Delivery 19%

*Data represents numbers of projects awarded to faculty.

Grants/Contracts/SRAs Gifts and Pledges Startup Funds

($ Millions)

0 5 10 15 20 25

2016 2017 2018 2019
Commercialize

Provide resources, expertise, and project management to advance new therapeutics, technologies and services towards commercialization.

Startup Highlights

**OncoTrap, Inc.**
**Pharmacy Founder:** Rihe Liu, Ph.D.
Developing drug target-binding protein molecules via in vitro protein selection and protein engineering to trap the immunosuppressive signals in the microenvironment of diseased tissues for the immunotherapy of major solid tumors and autoimmune diseases.

**Falcon Therapeutics, Inc.**
**Pharmacy Founder:** Shawn Hingtgen, Ph.D.
Creating a new class in gene modified cell therapy by converting a patient’s own skin cells into Trilogy cells to address the large unmet need of targeting and killing solid tumor cancers.

**Mucommune, LLC**
**Pharmacy Founder:** Sam Lai, Ph.D.
Seeking to advance “muco-trapping” monoclonal antibodies for use in reinforcing female reproductive health with a lead product as a vaginal ring releasing muco-trapping mAb against sperm for convenient, non-hormonal contraception.

**Inhalon Biopharma, Inc.**
**Pharmacy Founder:** Sam Lai, Ph.D.
Advancing “muco-trapping” monoclonal antibodies for use in treating and preventing respiratory infections with a lead product as an inhalable antibody for treatment of RSV infections.

**Irex Pharma, LLC**
**Pharmacy Founder:** Emily Hull-Ryde, Ph.D.
Developing innovative therapies that directly target excess mucus production with utility for patients with respiratory indications such as cystic fibrosis, allergy exacerbations, and chronic obstructive pulmonary disease.

$17.4M
Startup Funds Raised
Commercialize

Provide resources, expertise, and project management to advance new therapeutics, technologies and services towards commercialization.

**KickStart Accelerator**

The EII has partnered with Innovate Carolina/KickStart Venture Services in the first campus-wide space dedicated to UNC IP-based startups, which was created as a part of the UNC Convergent Science Innovation Pilot.

- Central location
- Startup guidance
- Innovation culture
- Office space
- Open lab space
- Private lab space
- Shared facilities and equipment
UNC-Chapel Hill Provost Robert A. Blouin (left) shakes hands with Deerfield Managing Partner James Flynn at a ceremony announcing the creation of Pinnacle Hill.
Partner

Provide connectivity between innovators and external organizations such as BioPharma, investors and philanthropists.

**Pinnacle Hill**

**Deerfield**
- Up to $65 M to advance research
- Scientific, operational, commercial expertise

**UNC-Chapel Hill**
- World-class science, research, and discovery
- Intellectual property

Pinnacle Hill will support a project of Lindsey James, an assistant professor in the UNC Eshelman School of Pharmacy’s Division of Chemical Biology and Medicinal Chemistry. Her work focuses on multiple myeloma, a devastating cancer that develops in bone marrow. James and her research team are interested in epigenetic abnormalities that lead to cancer and are working to apply medicinal chemistry, chemical biology, and cancer biology approaches to discover potential therapeutic agents.
Train

Develop the capabilities of a community of innovators.

Young Innovators Program

The Young Innovators Program is developing the next generation of innovative thinkers by engaging exceptional high school students in hands-on laboratory research, encouraging them to explore STEM opportunities in pharmaceutical science research, and empowering them to discover new ways to improve the health of patients through the practice of pharmacy.

86 High-school interns from across North Carolina

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, not Hispanic or Latino</td>
<td>42%</td>
<td>58%</td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>49%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
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</table>

EII Fellows

Laura Rowley, Ph.D.
*EII Fellow from: Sept. 2015 - Jan. 2017*
Current role:
- Director, Life Science Economic Development, N.C. Biotechnology Center

Joe Moore, Pharm.D.
*EII Fellow from: July 2015 - Aug. 2016*
Current role:
- Pharmacy Manager, Scripts RX

Adam Friedman, Ph.D.
*EII Fellow from: Oct. 2015 - April 2017*
Current role:
- Consultant, Adivo Associates
- Adjunct Assistant Professor, UNC Eshelman School of Pharmacy

Matt Howe, Ph.D.
*EII Fellow from: April 2017 - Oct. 2017*
Current role:
- Commercialization Manager, University of North Carolina

Andrew Lerner, Ph.D.
*EII Fellow from: Feb. 2019 - April 2020*
Current role:
- Program Director for Translation Programs, Duke Innovation & Entrepreneurship Initiative
**Capabilities**

Building on our strengths through strategic investments and collaborations at UNC and beyond, we aim to expand our ability to commercialize our discoveries and improve patient lives.

Emphasis on translation of therapeutics (example below), digital health, devices and diagnostics.

**Realizing the Value of UNC’s Discovery Engine**
Accelerating the translation of discoveries into patient treatments

Driven by philanthropic funds, UNC’s Discovery Engine operates through a sustainable model of innovation:

- **Novel Therapeutic Targets**
- **Drug Discovery**
- **Early Translational Research**
- **Out-license Company Formation**

Driving a sustainable model of innovation
Appealing to UNC philanthropy
Placing UNC at the forefront of academic drug discovery
Our Team

John Bamforth, Ph.D.
Director

Originally from the UK, John spent 29 years working at Eli Lilly in various leadership roles. John brings over 30 years of experience in BioPharma leadership to the EII.

Roy Zwahlen, J.D.
Associate Director

Roy has over 10 years of experience working for Biotechnology Innovation Organization and the UNC Eshelman School of Pharmacy. Roy brings experience in innovation management, economic development and trade, entrepreneurship, and IP to the EII.

Scott Savage, M.S.
Chief Financial Officer

Scott has over 12 years of experience working for UNC Health Care Systems and UNC Eshelman School of Pharmacy. Scott brings valuable experience in Health System Leadership to the EII.

Alex Abuin, Ph.D.
Assistant Director for Translational Studies

Originally from Spain, Alex has over 23 years of experience working for pharmaceutical companies in Houston, TX & San Francisco, CA. Alex brings experience in early translational drug discovery to the EII.

Mark Crowell, RTTP
Executive Entrepreneur in Residence

Mark has 32 years of experience in academic innovation management and technology transfer. Mark provides strategic advice and support in areas related to business development, innovation ecosystem strategic planning, and translational research partnerships to the EII.

Bob Dieterle, MBA
Executive Entrepreneur in Residence

Bob has over 27 years of experience leading emerging technology ventures in the IT industry and has previously worked for IBM, Lenovo, and MobileSmith Health. Bob provides strategic advice and support in areas related to digital health IT, market strategy, and product development to the EII.
Our Team

Kelly Collins  
Senior Director of Development

Kelly serves as Campaign Director for the UNC Eshelman School of Pharmacy, developing and implementing strategy to achieve the School's $175 million goal for the Campaign for Carolina. She brings over 13 years of higher education and healthcare fundraising experience to her role as lead development officer for the EII.

Ryan McDaniel  
Executive Assistant

Ryan has over six years of administrative management experience and has been with the UNC Eshelman School of Pharmacy for three years. Ryan provides exceptional administrative support to the EII.

Alexandra Sturchio  
Awards Program Manager

Originally from Boston, MA, Alexandra has five years of grant management experience from Brigham and Women's Hospital. Alexandra brings expertise in grant management and healthcare management to the EII.

Ashlie Thomas  
Project Manager

Ashlie has spent six years working in academic research and has over three years of experience working as a researcher in vaccine design at UNC. Ashlie brings an educational background in biology and chemistry to the EII.

Sumitra Pati, Ph.D.  
Innovation and Entrepreneurship Fellow

Sumitra has over nine years of experience in the pharmaceutical and biomedical sciences. Sumitra brings a passion for analytical problem solving and life science innovation to the EII.
Steering Committee

Fred Eshelman, Pharm.D.
Founder
Eshelman Ventures, LLC

Angela Kashuba, BSc.Phm., Pharm.D.
Dean, UNC Eshelman School of Pharmacy
John A. and Margaret P. McNeill, Sr. Distinguished Professor
The University of North Carolina at Chapel Hill

Robert A. Blouin, Pharm.D.
Executive Vice Chancellor and Provost
The University of North Carolina at Chapel Hill

William N. Charman, Ph.D.
Former Dean, Faculty of Pharmacy and Pharmaceutical Sciences
Monash University

Eugene Flood, Jr., Ph.D.
Managing Partner
Next Sector Capital

Michael S. Maddux, Pharm.D.
Executive Director
American College of Clinical Pharmacy

Cynthia Schwalm, M.B.A
Independent Board Director
Hikma Pharmaceuticals, PLC, Kadmon Group, Inc., Caladrius Biosciences, Inc., GI Therapeutics, Inc.