The University of Alabama System resumed in-person learning this summer leading up to the fall 2021 semester. The return to campus has offered renewed opportunities for outreach and collaboration and a sense of resiliency among the UAB academic and health systems.

Disclosures of intellectual property have increased by 50 percent since the previous fiscal year, demonstrating UAB's campus-wide continued commitment to innovation, even amid a global pandemic. UAB researchers rose to meet ongoing challenges with life-saving technology and innovation fueled by the university's mission to advance patient care outcomes, provide world-class education and drive research innovation across the enterprise while contributing to the public good.

This year, we launched three new startups based on university technologies – ResBiotic, TixiMed and SonoPhantom. We have at least another three poised for growth in the early months of FY22 and several more earlier in the development pipeline. These emerging technologies run the gamut of medical devices designed to meet real world healthcare challenges, to technology applications that will help build more resilient communities in the near future.

While we are still navigating this post-pandemic “new normal,” the Harbert Institute remains unwavering in our charge to support our researchers and campus entrepreneurs.

Kathy Nugent, Ph.D.
Associate Vice President, Executive Director
Bill L. Harbert Institute for Innovation and Entrepreneurship
Learn more about innovation and entrepreneurship from across the university and community

Groundbreaking technologies ..................................................... 3
Economic development ............................................................... 5
Licensing activities ..................................................................... 7
Innovator recognition ................................................................. 9
UAB spinoff company files $44 million IPO

In8Bio, formerly known as Incysus, is a clinical-stage biopharmaceutical company that focuses on the discovery, development and commercialization of gamma-delta T cell therapies for cancer treatment. In8bio filed its initial public offering in August, raising $44 million.

ResBiotic: A new class of probiotics

A biomedical research company founded by C. Vivek Lal, M.D., an associate professor in the UAB Department of Pediatrics, Division of Neonatology, is working to develop and commercialize groundbreaking probiotic formulations for lung health. The product was developed in Lal’s Pulmonary Microbiome Lab at UAB, with research and expertise from UAB’s Microbiome Center, Lung Health Center, and the Translational Research in Normal & Disordered Development program.
UAB startup company receives FDA clearance for liver imaging software

AI Metrics, a medical imaging startup focused on leveraging artificial intelligence to improve patient care, has received U.S. Food and Drug Administration 510(k) clearance and CE mark clearance for the company’s Liver Surface Nodularity software.

Founded by Andrew D. Smith, M.D., Ph.D., vice chair of Clinical Research in the UAB Department of Radiology, AI Metrics technology represents a tremendous cost-saving opportunity for health systems, as the software solution applies to liver images from all CT scanners in an institution and requires no additional hardware.
Highlighting the job growth and capital raised by a selection of UAB startups companies.

<table>
<thead>
<tr>
<th>Company</th>
<th>2019</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>YUVA BIOSCIENCES</td>
<td>Raised $2M</td>
<td>Raised $4.5M</td>
</tr>
<tr>
<td></td>
<td>3 employees</td>
<td>6 employees</td>
</tr>
<tr>
<td>IN8bio</td>
<td>Raised $75M</td>
<td>Raised $200k</td>
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<tr>
<td></td>
<td>15 employees</td>
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<tr>
<td>TRIALTUS BIOSCIENCE</td>
<td>Raised $1.6M</td>
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<td></td>
<td>5 employees</td>
<td></td>
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<tr>
<td>RG</td>
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<tr>
<td>GUIDEWAY CARE</td>
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<tr>
<td></td>
<td>4 employees</td>
<td>25 employees</td>
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<tr>
<td>SonoPhantom</td>
<td></td>
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<td></td>
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<tr>
<td>ResBiotic®</td>
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<tr>
<td>TIXiMED</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2019</td>
<td>2021</td>
</tr>
</tbody>
</table>
DEVELOPMENT

Raised $1.6M
3 employees

Raised +$50K
2 employees

Raised $280K
1 employee

Raised $500K
5 employees
2 employees

AlphaYoung

Adjuvax
LICENSING

120 IP Disclosures Submitted

47 U.S. Patent Applications

19 U.S. Patents Issued
ACTIVITY

49 License Agreements

$5.01M Licensing Revenue

$852K SBIR/STTR Expenditures
Patents
Campus researchers who are inventors on patents issued in FY 2021

Blake Feltman; James T. Houston; Dean Leo Sicking
Patent 10,729,200 - Protective helmets having energy absorbing tethers

Haibin Ning; Selvum Pillay
Patent 10,792,873 - Fastening devices for landing string buoyancy and other solutions

Paul D Gamlin
Patent 10,793,606 - Modified AAV capsid proteins and uses therof

Venkatram R Atigadda; Wayne J. Brouillette; Clinton J. Grubbs; Jeonga Kim; Donald Muccio
Patent 10,800,726 - Rexinoid compounds and methods of using rexinoid compounds for treating metabolic disorders and cancer

Scott Barnum; James M. Johnston; Theresa N. Ramos
Patent 10,830,774 - Methods and compositions for diagnosis and treatment of meningitis

Matthew N. Alder; Max D. Cooper; Brantley R. Herrin
Patent 10,870,692 - Methods and compositions related to soluble monoclonal variable lymphocyte receptors of defined antigen specificity

Michael E. Niederweis; Mikhail Pavlenok
Patent 10,870,883 - MSP nanopores and related methods

Haibin Ning; Selvum Pillay; Uday K. Vaidya
Patent 10,907,719 - Hybrid composite gear with enhanced strength and wear resistance

Julie M Decker; Beatrice H. Hahn; Ying Y. Li; Denise Kothe Monti; George M. Shaw
Patent 10,946,090 - Consensus/ancestral immunogens
Patents
Campus researchers who are inventors on patents issued in FY 2021

Victor M Darley-Usmar
Patent 10,954,228 - 1 H-pyrazol-1-yl-thiazoles as inhibitors of lactate dehydrogenase and methods of use thereof

David M Bedwell; Ming Du; Kim M Keeling; Venkateshwar Mutyam; Steven M Rowe
Patent 10,960,018 - Methods and compounds for stimulating read-through of premature termination codons

Victor M Darley-Usmar
Patent 10,961,200 - Small molecule inhibitors of lactate dehydrogenase and methods of use thereof

Selvum Pillay
Patent 11,008,134 - Foldable and/or collapsible plastic/composite utility enclosures

Joanne Murphy-Ullrich
Patent 11,033,535 - Oxadiazoles and thiadiazoles as TGF-β inhibitors

Harrison Kim
Patent 11,040,152 - Injection device and methods related thereto

Roslyn B Mannon
Patent 11,041,208 - Urine biomarkers for detecting graft rejection

Joanne Murphy-Ullrich
Patent 11,046,729 - Dipeptide analogs as TGF-beta inhibitors

Junqin Chen; Gu Jing; Anath Shalev; Lance Thielen
Patent 11,103,508 - Substituted quinazoline sulfonamides as thioredoxin interacting protein (TXNIP) inhibitors
RECOGNIZING

Disclosers
Campus researchers that disclosed intellectual property in FY 2021

Aaron Fobian
Abinash Nayak
Adam Luechtefeld
Addie Yazbak
Aftab Ahmad
Aijun Qiao
Alan W Eberhardt
Alexis Walter
Alfredo L. Guzman
Amit Gaggar
Amitkumar N. Mehta
Andre Leier
Andres Guerrero
Andrew D. Smith
Andrew Kyle Taylor
Andrzej Tadeusz Slominski
Angela M Stowe
Anil Kumar Challa
Anna Sorace
Arie Nakhmani
Ashleigh Allgood
Ashlesha A. Deshpande
Ashraf F Fouad
Benjamin Horst
Benjamin M. Larimer
Bhupendra Singh
Bianca Vamesu
Brian M. Casey
Brooks Wingo
Carlos J. Orihuela
Chander Raman
Chang Long Wu
Chao Li
Charitharth Vivek Lal
Christian Faul
Christian Stackhouse
Christopher Anthony Girkin
Christopher D Willey
Christopher P Yanucil
Chu-Fang Chou
Claude Rivers
Craig Decker
Dan Berkowitz
Daniel C. Marson
Daniel Larry Smith
Daniel W Jones
David Askenazi
David E. Briles
David M Bedwell
Dawn Kissner DeCarlo
Denver R. Fuller
Dorothy Carol Ogdon
Dorothy W Pekmezi
Eric P. Plaisance
Erik Roberson
Ezzuddin Abuhussein
Gangjian Qin
Gayan B Wijeratne
## Disclosers
Campus researchers that disclosed intellectual property in FY 2021

<table>
<thead>
<tr>
<th>George Y. Gillespie</th>
<th>Joe Tector</th>
</tr>
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<tbody>
<tr>
<td>Gillian Huskin</td>
<td>John Knight</td>
</tr>
<tr>
<td>Grant Richard Williams</td>
<td>Jonathan R Sligh</td>
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<tr>
<td>Gregory D. Kennedy</td>
<td>Joseph L Henley</td>
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<td>Gregory Kane Friedman</td>
<td>Joseph Palmer</td>
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<td>Guangjie Cheng</td>
<td>Joshua Bernstock</td>
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<td>Gurusai Sujitha Peramsetty</td>
<td>Joshua Charles Anderson</td>
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<tr>
<td>Guy Yembi-Goma</td>
<td>Joshua R Nicholson</td>
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<tr>
<td>Hao Jiang</td>
<td>Jun Zhang</td>
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<td>Harrison Kim</td>
<td>Jyoti Sharma</td>
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<td>Harrison Walker</td>
<td>Kai Jiao</td>
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<tr>
<td>Hasan Alrefai</td>
<td>Kathleen Weden</td>
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<td>Hayden Pacl</td>
<td>Kathryn Green</td>
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<tr>
<td>Hayley N Widden</td>
<td>Kelly Shelton Trawick</td>
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<td>Hector H Gutierrez</td>
<td>Kenneth David Pruitt</td>
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<td>Hengbin Wang</td>
<td>Keshav K Singh</td>
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<td>Hunter Dean</td>
<td>Kevi Jay Rodzinak</td>
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<td>Isabella Reed</td>
<td>Kevin Harrod</td>
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<td>Jake Y Chen</td>
<td>Kevin M Pawlik</td>
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<td>James Henry Willig</td>
<td>Kim M Keeling</td>
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<tr>
<td>James J. Kobie</td>
<td>Krista Jackson</td>
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<tr>
<td>James M. Markert</td>
<td>Kyle D Wood</td>
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<tr>
<td>Jana Hecking</td>
<td>Kyung-Don Kang</td>
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<tr>
<td>Jasvinder Singh</td>
<td>Lara Ianov</td>
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<tr>
<td>Jeffrey R Curtis</td>
<td>Lara Tapy</td>
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<tr>
<td>Jegen Kandasamy</td>
<td>Lauren Davis Padalino</td>
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<tr>
<td>Jesse G.A. Jones</td>
<td>Lawrence J. Delucas</td>
</tr>
<tr>
<td>Jianyi Zhang</td>
<td>Leslie Moon</td>
</tr>
<tr>
<td>Jinsuh Kim</td>
<td>Lianwu Fu</td>
</tr>
</tbody>
</table>
Disclosers
Campus researchers that disclosed intellectual property in FY 2021

Lorie Harper
Louis Burt Nabors
Lufang Zhou
Macy Jane Moon
Manoj Tanwar
Margaux Barnes
Maria Bartolomeo Grant
Mark E Clark
Mark T Dransfield
Mark Walter
Martin D Holland
Martin D Holland
Harrison Kim
Massimo Antonio Fazio
Matt Might
Melanie Gibbons Hallman
Melissa Harris
Mica M. Hughes-Harrell
Michael E. Niederweis
Michael John Patton
Michael Scott Piepenbrink
Michelle R Brown
Mike Wells
Mikhail Pavlenok
Min Xie
Ming Du
Mohamed Galal Shoreibah
Mohammad Awad
Mohanraj Thirumalai
Moon Nahm
Muhammad Rifqi Aufan
Mythreya Karthikeyan
Nagababu Enika
Namasivayam Ambalavanan
Nancy M. Borkowski
Narendra Wajapeyee
Natalia Filippova
Natalie R Baker
Nathan Howard Mcwain
Norberto Gonzalez-Juarbe
Olaf Kutsch
Parmanand Malvi
Patricia M Speck
Paul A Baker
Paul A Goepfert
Peter H King
Pi-Ling Chang
Pritam Mondal
Qin Wang
Radomir Matthew Slominski
Randall Quentin Cron
Rebecca E. Kennedy
Rebekah A Llinares
Reepa Saha
Robert H Whitaker
Robert Samuel Welner
Romi Gupta
Rouzbeh R Nazari
Disclosers
Campus researchers that disclosed intellectual property in FY 2021

Roy Joseph
Rui Zhao
Saad Alsuwailem
Saidulu Mattapally
Sandeep Bodduluri
Sandipan Pati
SangSang Park
Sarah Owens
Sasanka Ramanadham
Saurabh Aggarwal
School of Nursing
Scott M Wilson
Scott W Ballinger
Seth Daniel Fortmann
Seyedabdollah Mirbozorgi
Shama Ahmad
Shariq Qayyum
Smita Bhatia
Srikanth Iyer
Srini Tridandapani
Stacy A Krueger-Hadfield
Steven Carroll
Steven D. Thompson
Steven G Lloyd
Steven J Pittler
Steven M Rowe
Stijn De Langhe
Surya P. Bhatt
Tejeshwar Jain

Thanh Minh Nguyen
Thomas M Ryan
Thomas T Norton
Tim M Townes
Timothy J Gawne
Tom J. Brett
Utpreksha Vaish
Venkateshwar Mutyam
Victoria Gail Wicks
Victoria Williams
Vikas Dudeja
Vineeth Vijayan
Vinoy Thomas
Virginia Camacho
Vivek Vishwanath Shukla
W Winn Chatham
Wei Li
Wendy Demark-Wahnefried
Wesley Joe Young
William J Placzek
Xiaoguang Margaret Liu
Xiaosi Han
Xuan Huang
Yiming Zhang
Yogesh K Vohra
Yuhua Song
Zainab Motolani Shonibare
Zehong Cao
Zhiying Lu
Zongliang Yue