

# Iowa Board of Regents Economic Development Appropriation Request

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Presentation to the Joint Economic Development Appropriations Subcommittee on February 21, 2019

# Why should Iowa invest in bioscience economic development?

- Bioscience could be a growth engine for Iowa's economy – the sector is large, growing, and supports high paying jobs
- Iowa's bioscience employment, wages and overall sector growth are all strong relative to the nation and overall private sector growth in Iowa
- The four platforms represent areas with large markets and significant growth potential
- Iowa has unique strengths and prior investments that enable us to capture market growth in each of these platforms

# What is the market potential for each platform?

| PLATFORM                          | MARKET POTENTIAL   |
|-----------------------------------|--|
| Biobased Chemicals                | US Chemical Market \$250 billion, growing at the rate of GDP     |
| Precision and Digital Agriculture | \$3.3 billion in 2016; expected to grow to \$5.9 billion by 2021 |
| Vaccines and Immunotherapeutics   | \$33 billion in 2016; expected to grow to \$45 billion by 2021   |
| Medical Devices                   | \$483 billion in 2016; expected to grow to \$634 billion by 2021 |

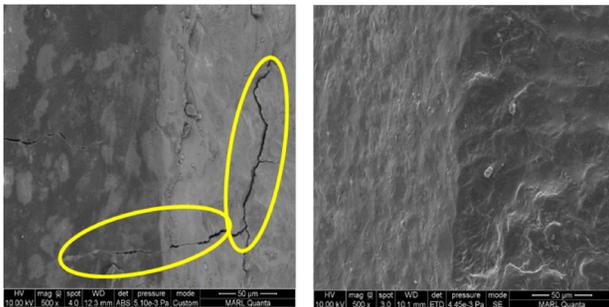
# Platforms have a lot to build from ... example from Biobased Chemicals

## Examples of New Technologies

### Novel Insecticide



### Novel Nylon



## Examples of Large Member Companies



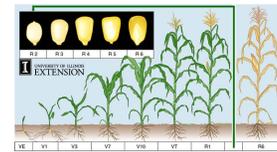
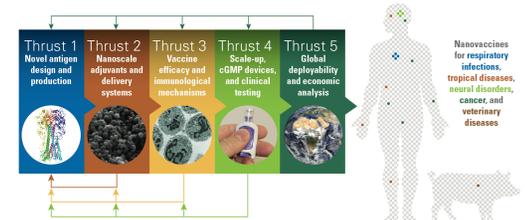
- Existing ISU research centers
  - *Center for Biorenewable Chemicals (CBiRC)*
  - *BioCentury Research Farm*
  - *Center for Metabolic Biology*
  - *Center for Bioplastics and Biocomposites*
  - *Bioeconomy Institute (BEI)*
  - *Center for Crop Utilization Research*
- Technology transfer (via CBiRC)
  - >40 invention disclosures
  - 8 startups to date
  - 7 STTR/SBIR grants
  - 2 pre-paid license agreements
- Industry partnerships
  - 49 CBiRC members since inception
  - 24 CB<sup>2</sup> members since inception
  - *RAPID BEI* biorefinery projects
  - Numerous industry-sponsored projects
- Workforce development (Biorenewable Technologies graduate program, Biofoundry program)

# Other investments, collaborations to be leveraged

**Vaccines & immunotherapeutics:** ISU College of Vet Med, Veterinary Diagnostic Lab, Nanovaccine Institute; USDA Animal Health and Regulatory Centers

**Precision & digital ag:** Plant Sciences Institute, Biocentury Research Farm, Precision ag initiatives (crop & livestock), Data driven discovery initiatives, ISU farms networking project

**All platforms:** ISU-UI bioscience seed grant program; Federal funding, industry partnerships, technology transfer and commercialization services

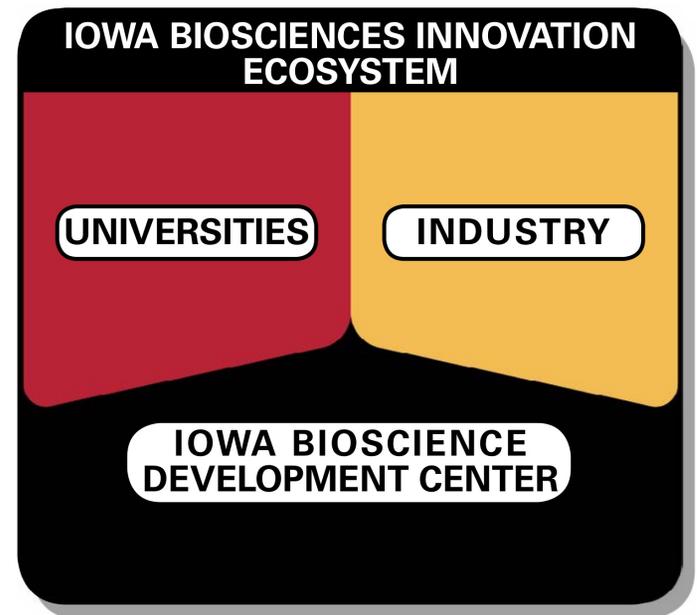


## Bioscience Innovation Ecosystem Overview

- IEDA is planning a “lean hub” concept
- **Iowa Bioscience Development Center** (Iowa Innovation Corp) leads strategic direction and investment development in collaboration with Universities and Industry
- In partnership with IBDC and Industry, **Universities** lead platform technology development & commercialization, and augment services to provide specialized and focused support for platform activities

# Vision for Legislative Funding Request (\$4M/yr)

- Establish a nationally renowned innovation ecosystem in Iowa-advantaged bioscience platforms
- Enable Iowa to grow and diversify its economy
- Budget request for ongoing support addresses current barriers and gaps



# How would platform funding be used? (\$1M/platform)

To accelerate translation of discoveries to commercial products by building the partnerships and leveraging strengths:

1. Hire one Chief Technical Office per platform
2. Dedicated resources to obtain large-scale federal funding that substantially leverages state and industry investment
3. Dedicated expert resources for IP, licensing and business plan development
4. Seed funding program for early stage technologies and to encourage Industry-University collaborations
5. Iowa Innovates program to attract young innovators to Iowa

| Budget Item   | Amount (\$) | Purpose ( <b>original budget of \$1M/platform</b> )  |
|---|-------------|--|
| Chief Technology Officer (CTO) salary and benefits                | 250,000     | CTO will (1) identify, prioritize, and <b>accelerate transfer of platform technologies</b> , (2) develop <b>awareness of industry and capital investment opportunities</b> , (3) develop <b>strong relationships between the university and industry partners</b> , (4) ensure <b>IBDC and university strategic thinking and priorities are aligned</b> .  |
| Early-stage seed program  | 250,000     | <b>Address barriers to translating technologies</b> through (1) collaborative research between industry and universities to de-risk technologies with high potential for commercialization, (2) conduct studies needed to address regulatory requirements, (3) support platform technology start-up companies and provide accelerator funding.   |
| Large-scale funding pursuit                                       | 100,000     | <b>Pursue large-scale federal grants to develop industry-university partnerships</b> that accelerate technology transfer and establish Iowa a national leader in the specific innovation area. Involves hiring experienced consultants with a track record for success (ISU's NSF Engineering Research Center for Biorenewable Chemicals received \$39M over 10 years, which was instrumental in establishing Iowa as the national center of innovation for biobased chemicals.) |
| Tech transfer and industry agreements staff (salary and benefits) | 200,000     | <b>Add capacity and platform-specific expertise to existing tech transfer and industry agreements staff</b> to offer specialist knowledge and significantly reduce turn-around time for research agreements, invention disclosures, patenting, and licensing with industry partners.   |
| Iowa Innovates program  | 200,000     | Recruit new talent by <b>attracting young innovators to Iowa</b> who are working on technologies aligned with the bioscience platforms through their doctoral research or early-stage career experiences.  |

# What are we planning to achieve?

- Universities operate in a new way as a critical IBDC and industry partner
- Enhanced commercialization of new technologies
- Accelerated translation of scientific breakthroughs
- Improved collaboration between industry and universities to solve problems
- Further development of a skilled biosciences workforce
- Growth and diversification of Iowa's economy

## What is impact of \$2M budget? (\$0.5M/platform)

| Budget Item   | Amount (\$)                                   | Impact ( <b>reduced budget of \$0.5M per platform</b> )   |
|---|---|---|
| Chief Technology Officer (CTO) salary and benefits                | 250,000                                       | CTO will (1) identify, prioritize, and <b>accelerate transfer of platform technologies</b> , (2) develop <b>awareness of industry and capital investment opportunities</b> , (3) develop <b>strong relationships between the university and industry partners</b> , (4) ensure <b>IBDC and university strategic thinking and priorities are aligned</b> . |
| Early-stage seed program  | <del>250,000</del><br>167,000                 | <b>Fewer technology projects</b> can be accelerated, reduced innovation and economic development output.  |
| Large-scale funding pursuit                                       | <del>100,000</del><br>33,000                  | Opportunities pursued for platform every 3 years, <b>vastly reduces the potential for bringing significant external funds into the innovation system</b> and consequently the platform's potential for success.   |
| Tech transfer and industry agreements staff (salary and benefits) | <del>200,000</del><br>50,000                  | Instead of transforming pace of negotiations with industry, <b>incremental change in capacity to serve industry</b> .   |
| Iowa Innovates program  | <del>200,000</del><br>0                       | Cut entirely, <b>eliminates new young innovator talent recruitment</b> into the platform and State.   |
| <b>Total for platform</b>   | <del><b>1,000,000</b></del><br><b>500,000</b> |   |

# Thank you! Questions?

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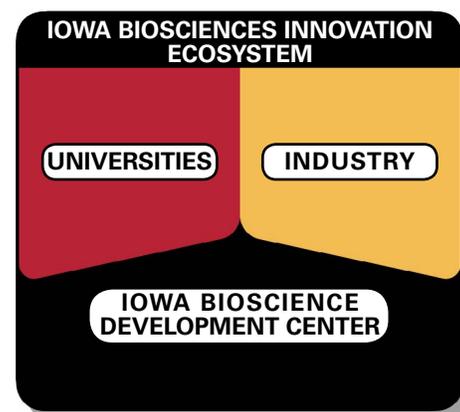
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# BIOSCIENCES CRUCIAL TO IOWA'S ECONOMIC GROWTH

**LEGISLATIVE FUNDING REQUEST:** Establish a nationally renowned innovation ecosystem in Iowa-advantaged bioscience platforms to grow and diversify Iowa's economy.

## ANTICIPATED OUTCOMES:

- Accelerated translation of scientific breakthroughs, leading to commercialization, for growing and diversifying Iowa's economy
- Close collaborations between industry and universities to solve problems
- Development of a skilled workforce in biosciences



## IOWA IS WELL POSITIONED FOR BIOSCIENCES ECONOMIC GROWTH:

- Iowa is currently outperforming the nation in bioscience employment growth
- The bioscience sector has been outperforming Iowa's overall private sector growth
- Iowa has 36% more bioscience employment than national levels
- There is enormous potential for further growth in Iowa, while providing high paying jobs (average salaries of \$68K for biosciences versus \$42K for all private sector jobs)

## THE BIOSCIENCE PLATFORMS:

The Iowa Governor's office, the Iowa Economic Development Authority (IEDA) and the Iowa Innovation Council identified four platforms as the focus for future bioscience development efforts based on the market potential for growth, R&D competencies and competitive advantages.

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## SUCCESSFUL BIOSCIENCE DEVELOPMENT REQUIRES ENHANCED PARTNERSHIPS OF UNIVERSITIES, IBDC, AND INDUSTRY:

The FY2020 Board of Regents appropriation request for the bioscience platforms will accelerate the pace at which discoveries are translated into commercial opportunities by:

- Hiring one Chief Technical Officer for each platform, who will, in partnership with IBDC staff, provide technical expertise as well as business knowledge.
- Dedicating resources to obtain funding for large-scale federal programs focused on university-industry partnerships and for intellectual property and business plan development in the platform areas.
- Creating a seed funding program focused on early-stage technologies, encouraging University-industry collaborative partnerships.
- Creating an "Iowa Innovates" program to attract young innovators to Iowa.