



The Millennials have landed.



Session: 092921

Date: Thursday, September 29, 2016

Time: 3:45pm - 4:45pm



"Give me a laptop, I can work anywhere"
Next Gen Faculty Influence Design

Presented by:

- David DeLeon, Associate Facilities Manager, TAMU AgriLife
- Yvonne Bryant, Project Planner Facilities Planning and Construction, TAMU System
 - Jill Bard, Facility Programming and Consulting



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Agenda

- Next Generation Paradigm Shift
- Technology Paradigm Shift
- The Future of Work
- Case Study - Agriculture Building #5
- Questions
- Wrap Up

How do you...

- Check in to your hotel?
- Find your way to this session?
- Get around without a car?
- Watch TV?
- Read a book?
- Pay your bills?



Paradigm Shift

**“Give me a laptop (and wifi),
and I can work anywhere.”**

*Won-bo Shim, Professor, Plant
Pathogenic Fungi & Mycotoxicology*

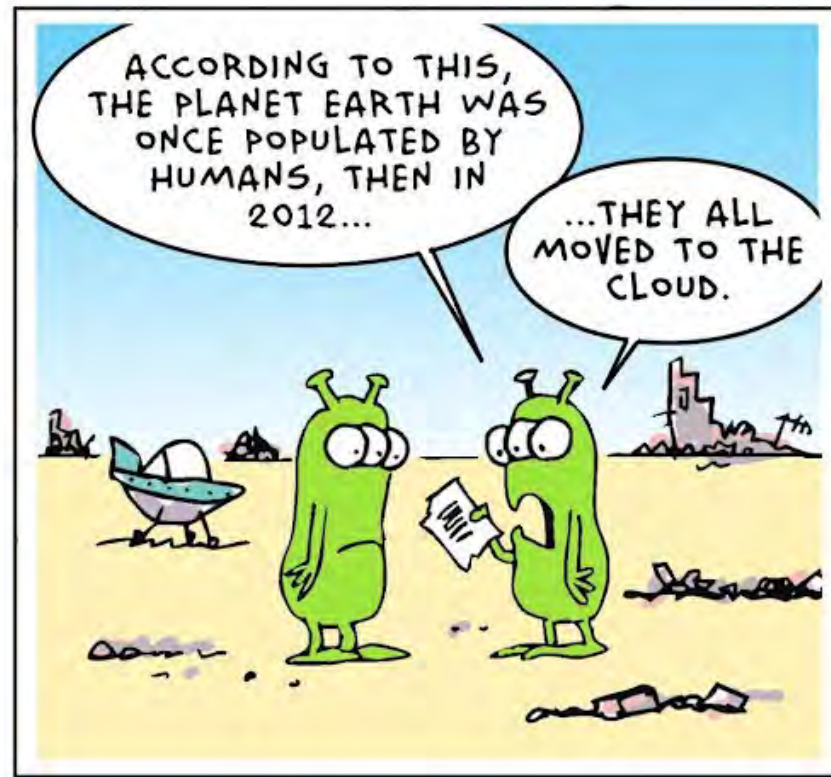
The Future is Now

- Information moves with you
- No longer tethered - ability to work outside the “office”
- Actual vs Virtual Presence
- Owned vs Shared Space
- On-Demand Access
- Internet of Things

Some Thoughts...

- **The tail end of the Millennial Generation started to college this fall (2016)**
- **If Millennials are “Digital Natives,” what will the next generation be?**
- **How will they impact our world...?**

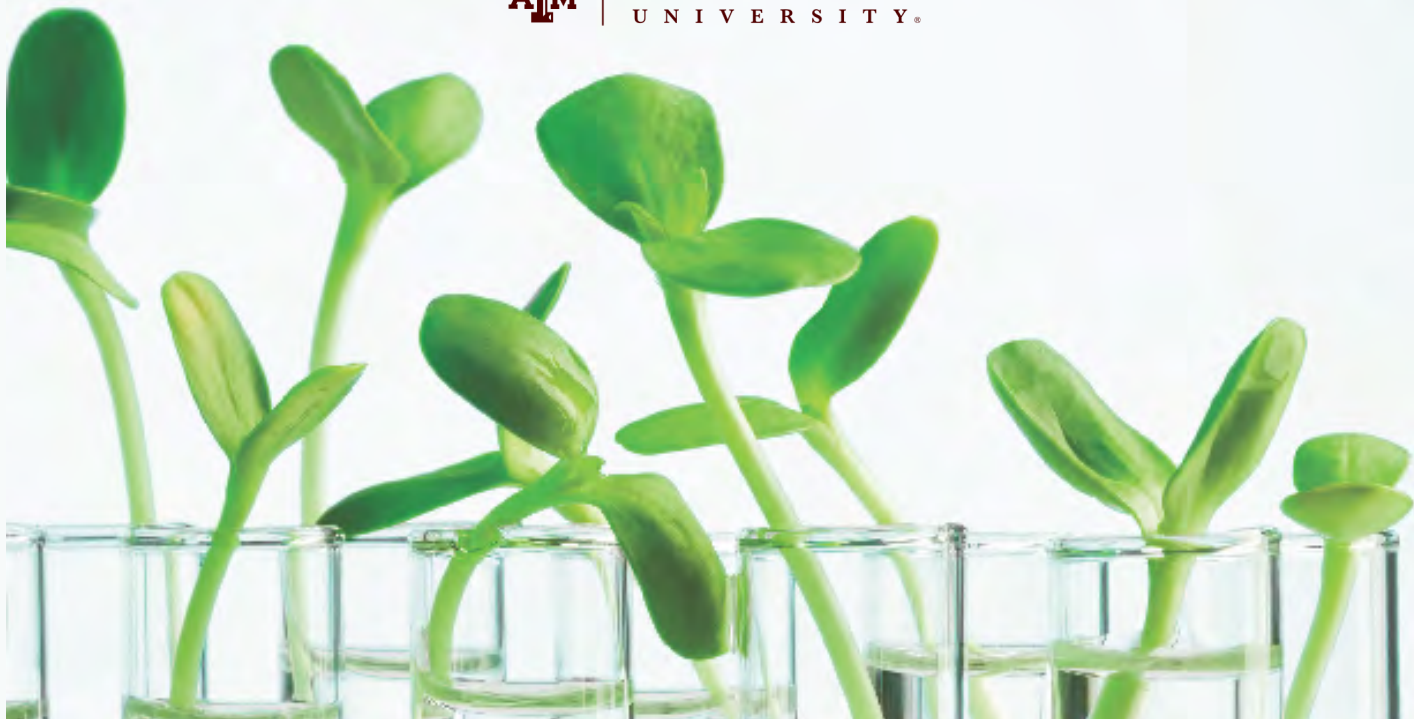
they are in the cloud...



PROGRAM OF REQUIREMENTS (POR) FOR:

AGRICULTURE BUILDING #5

PROJECT NO. 02-3208



Plant-microbe Interactions

Dr. Leland S. Pierson III
Professor & Department Head



- Molecular regulation and roles of microbial secondary metabolites in bacteria: Effects on community structure and function
- Signaling among microbial communities in vitro and on plants







Peterson 120A
979-845-8288
lpierson@tamu.edu

Michael Kolomiets
Professor, Molecular Biology of Plant Defense Responses




RM 312C, Peterson Building
979-458-6624
kolomiets@tamu.edu

Research Interests

- Investigate the functions of lipid-based biochemical and signal transduction pathways in maize defenses against pathogens, pests and abiotic stresses.
- Determine the requirement of host and fungal lipids as molecular signals in the regulation of pathogenicity and mycotoxin production by seed infecting fungi

Dennis Gross
Professor, Plant Pathology




RM 202E, Peterson Building
979-458-0637
d-gross@tamu.edu

Research Interests

- Focuses on molecular genetic studies of plant pathogenic bacteria, especially *Pseudomonas syringae* pv. *syringae*, and the influence of bacterial metabolites and virulence factors, as modulated by the plant environment, on ecological success.




Libo Shan
Associate Professor, Plant Molecular Biology




RM 136A, Borlaug Center
979-845-8818
lshan@tamu.edu

Research Interests

- Understand how plant-microbe interactions shape the evolution of microbial pathogenicity and plant immunity in both model and economically important plants.




Charles Kenerley
Professor



Peterson 202A
979-845-8261
c-kenery@tamu.edu

Research Interests

- Understands the interactions of *Trichoderma* species with pathogenic fungi as well as plant hosts to promote crop protection through Biological Control.
- Has developed a system for determining the mechanisms of bio-control using the ubiquitous mycoparasite *T. virens*



MARTIN DICKMAN
CHRISTINE RICHARDSON PROFESSOR
DIRECTOR-INSTITUTE FOR PLANT GENOMICS & BIOTECHNOLOGY



RM 107 BORLAUG CENTER
979-862-4786
MDICKMAN@TAMU.EDU

Research Interests

- Understanding the mechanisms and pathways that regulate plant programmed cell death with emphasis on both plant-pathogen interactions and abiotic stress. Developing alternative disease control strategies using transgenic approaches. Fungal functional genomics.

(Patho/Develop/Mycotoxins)

WON-BO SHIM
PROFESSOR




Peterson 202J
979-458-2190
wshim@tamu.edu

Research Interests

- The Shim lab at Texas A&M University is focusing on studying fungal pathogens of field crops, particularly *Fusarium* species.

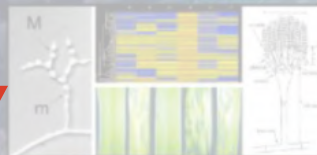


Daniel Ebbole
Professor, Fungal Molecular Biology



Research Interests

- Interests are in fungal genetics, focusing on development and pathogenesis.
- Understanding of signaling in plant-microbe interactions, focusing on secreted proteins in the rice blast pathosystem.
- Exploring developmental processes in *Neurospora crassa*, a model genetic system, and evolution of developmental pathways in ascomycete fungi.



BRIAN SHAW
ASSOCIATE PROFESSOR,
FUNGAL BIOLOGY



979-862-7818
bshaw@tamu.edu

Research Interests

- Fungal Growth and Development
- Role of Endocytosis in cell shape.
- Characterization of





Plant Pathology

Images courtesy of the Department of Plant Pathology and Microbiology, Agriculture & Life Sciences, Texas A&M University

Plant defense


Clint Magill
Professor, Fungal Genetics & Host Resistance



Research Interests

- Use of molecular probes to gain new insights into fungal plant pathogens and to measure host responses to pathogens.
- Developing real-time PCR primers for downy mildew pathogens.
- PCR-based tags for genes conferring resistance to headsmut, anthracnose, downy mildew and grain mold in sorghum.

RM 202H, Peterson Building
979-845-8250
c-magill@tamu.edu



Carlos F. Gonzalez
Professor, Plant Bacteriology

Research Interests

- Encompasses a range of studies that address mechanisms involved in the plant-bacterial, human-bacterial and phage-bacterial-interactions.
- The model systems used are members of the *Burkholderia cepacia* complex (Bcc) and the xylem limited bacterium *Xylella fastidiosa* and their respective phages.

NMR Annex N313A
979-845-8462
cf-gonzalez@tamu.edu

Virology/Plant interactions

Herman Scholthof
Professor, Plant Virology




Research Interests

- Molecular and biochemical circuitry controlling virus-induced RNA silencing and its suppression.
- Precision engineering of novel molecular biotechnology and bioenergy tools based on plant viruses and their encoded products.
- Development of novel virus-based plant gene regulatory and editing techniques.

RM 113D, Peterson Building
979-862-1495
herscho@tamu.edu

Biofuels/Synthetic Biology

JOSHUA YUAN
ASSOCIATE PROFESSOR, SYNTHETIC AND SYSTEMS BIOLOGY




Research Interests

- Synthetic design of photosynthetic systems for efficient terpene production for fuels, chemicals, and high value compounds
- Systems biology-guided biodesign of microorganisms for lignin conversion and complete biomass utilization
- Structure dynamics guided biocatalyst design

RM 139A, Borlaug Center
979-845-3016
jyuan@tamu.edu

Heath Wilkinson
Associate Professor, Plant Pathology




Research Interests

- Characterizing microbial communities and isolates from extreme environments for industrially relevant traits.
 - Biomass to high value chemicals and fuels
 - Bioremediation
- Comparative genomics

Peterson 115B
979-845-1491
h-wilkinson@tamu.edu



Karen-Beth Scholthof
Professor, Plant Virology




Research Interests

- Molecular virology of *Panicum mosaic virus* and its satellite virus, SPMV. Emphasis on SPMV biology and biotechnology applications.
- History of plant pathology, with an emphasis on *Tobacco mosaic virus* in the early 20th century in the United States.

Peterson 117C
979-845-8266
kbs@tamu.edu

Applied plant pathology



David Appel
Professor




Research Interests

Improving our understanding of the epidemiology of plant diseases such as Oak Wilt, Pierce's Disease, & Sudden Oak Death to produce better disease management recommendations.

Thomas Isakeit
Professor & Extension Specialist

Educational Programs and Research Activities

- Directed by the needs of Texas growers
- Diseases of agronomic and vegetable

RM 320C, Peterson Building
979-862-1340
t-isakeit@tamu.edu

Young-Ki Jo
Associate Professor & Extension Specialist




Research Interests

Improving our understanding of the epidemiology of plant diseases such as Sudden Oak Death to produce better disease management recommendations.

Images courtesy of the Department of Plant Pathology and Microbiology, Agriculture & Life Sciences, Texas A&M University

What they do...

Their mission is to engage the *grand challenges* of our time:

Protect the environment

Enrich future generations

Improve health

Feed our world

Promote economic growth

Image courtesy of the Department of Plant Pathology and Microbiology,
Agriculture & Life Sciences, Texas A&M University

A close-up photograph of a petri dish containing a white agar medium. A large, circular area of the agar is covered with a dense, fuzzy growth of bright green mold. The mold has a slightly irregular, circular shape and is surrounded by a thin, clear zone. The background is a soft, out-of-focus grey, suggesting the petri dish is on a light-colored surface.

What they do...

“Plants are the hosts - the research comprises diverse scientific disciplines but is linked together by the common host.”

*-Dr. Leland Pierson III,
Professor and Department Head, Plant Pathology
and Microbiology*

Image courtesy of the Department of Plant Pathology and Microbiology,
Agriculture & Life Sciences, Texas A&M University

What they do...

- **plant microbiology**
- **genomics**
- **disease management**
- **microbial ecology**
- **plant-microbe interactions**

Image courtesy of the Department of Plant Pathology and Microbiology,
Agriculture & Life Sciences, Texas A&M University

Technology Impact



A helicopter drone used by Dr. Charlie Rush, Texas A&M AgriLife plant pathologist in Amarillo, flies over a wheat field to track disease progression. (Texas A&M AgriLife Research photo by Kay Ledbetter)

Remote Control



Image from AgriLife Research, Texas A&M University

Technology

- **“BYOD” Bring your own device - researchers use their smartphones in the field and back at the lab**
 - ❖ **as cameras**
 - ❖ **GPS locators**
 - ❖ **apps for disease measurements**
 - ❖ **remote transfer of meteorological data**
- **More and more data from analysis instruments will be stored in the cloud**

Advances in Research



The Game Changer

<http://www.bandwidthblog.com/2016/09/14/crispr-cas9-genome-editing/>

Clustered
Regularly-
Interspaced
Short
Palindromic
Repeats



The Next Challenge



- New technologies and techniques rapidly generate massive amounts of data that will need to be analyzed
- Big Data is becoming a bottleneck to research - this is a challenge everyone is trying to solve

Research Collaborators



Image courtesy of the Department of Plant Pathology and Microbiology, Agriculture & Life Sciences, Texas A&M University

Location, Location, Location



Imagery ©2016 Google, Map data ©2016 Google 1000 ft

The Research Neighborhood



1. New Plant Pathology Building Site
2. Kleberg Center
3. HEEP Center
4. Biochemistry/Biophysics
5. Nuclear Magnetic Resonance Facility
6. Horticulture/Forest Science
7. Borlaug Center
8. Southern Crop Improvement Greenhouse
9. AgriLife Center

The Challenge



“If you don’t have the facilities, you simply can’t compete to hire new faculty.”

*-Dr. Leland Pierson III,
Professor and Department Head*

Image courtesy of the Department of Plant Pathology and Microbiology,
Agriculture & Life Sciences, Texas A&M University



The Vision

- **The building should showcase the research (Science on Display)**
- **It should be a place to share ideas**
- **Provide generic, flexible, efficient research labs**
- **Provide a home for undergraduate and graduate students**

The Vision

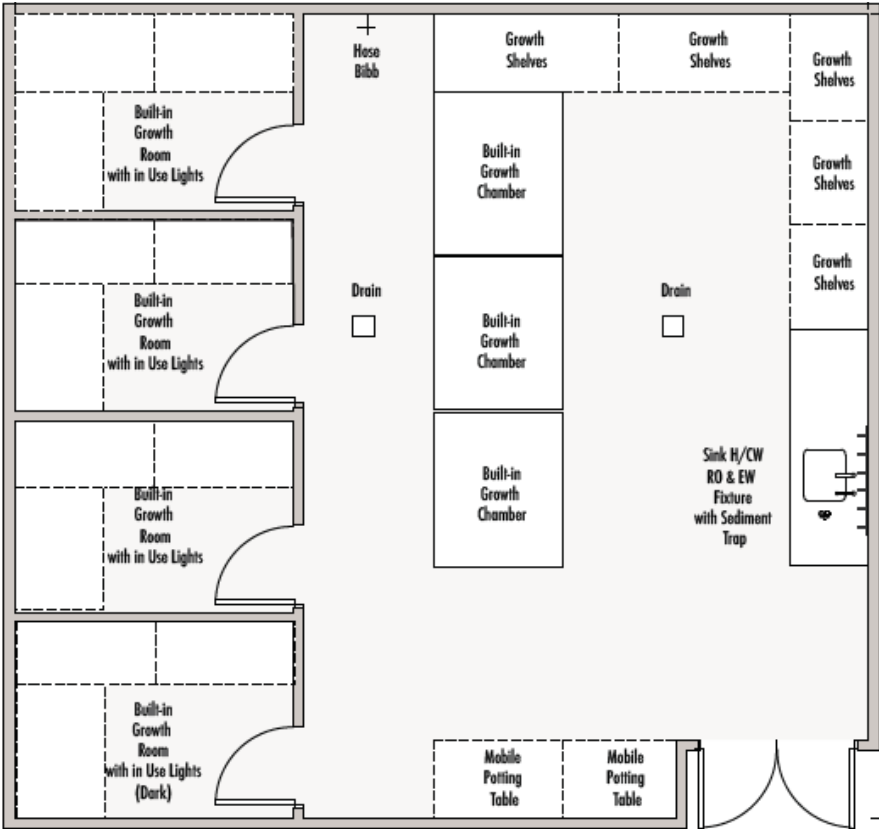
- **Supports the department in becoming the leader in Plant and Microbiology Research**
- **Flexibility allows the building to meet future needs as the department grows**
- **Is a Recruiting Tool to attract new faculty and students**

Image courtesy of the Department of Plant Pathology and Microbiology, Agriculture & Life Sciences, Texas A&M University

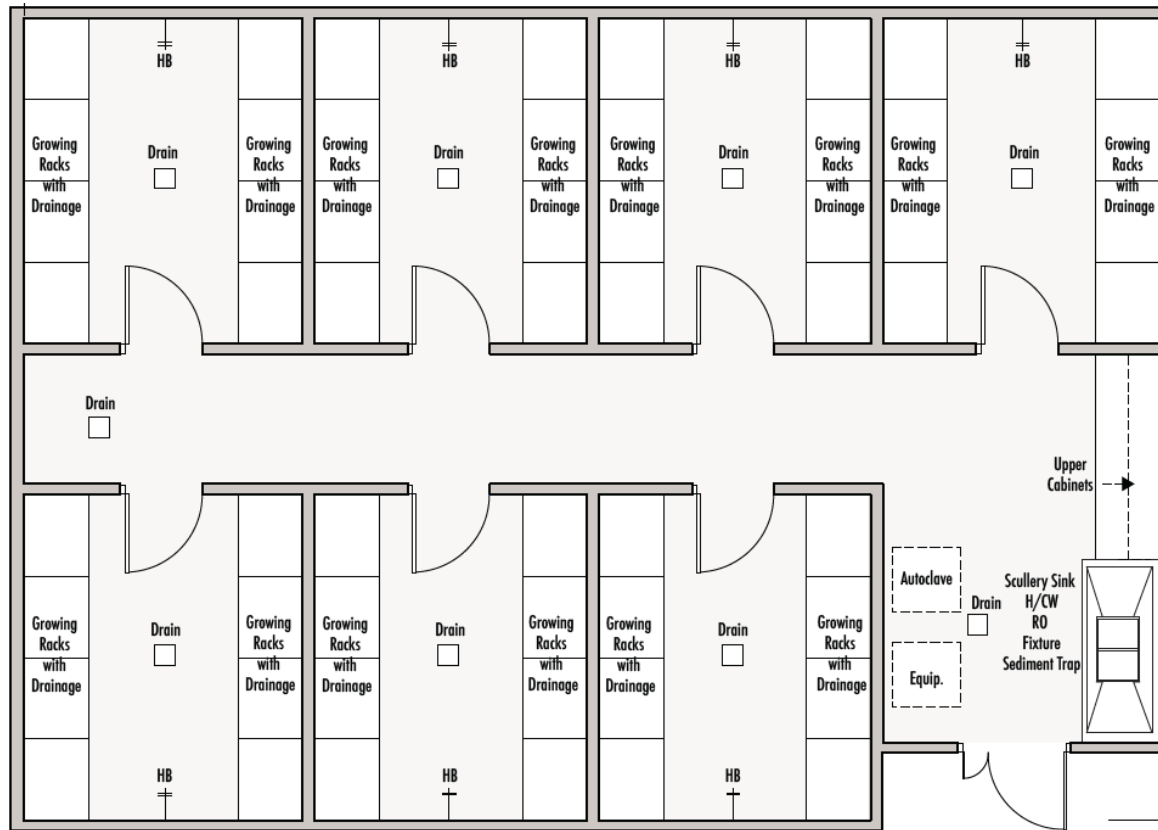
Top Priorities

- **Reproducible Environmental Controls for Research**
- **BL2 containment capability**
- **Flexible Research Labs**
- **Collaboration spaces - a home for faculty and students**
- **The whole package: a building designed to support and encourage the intersection of research, technology and learning.**

Environmental Controls

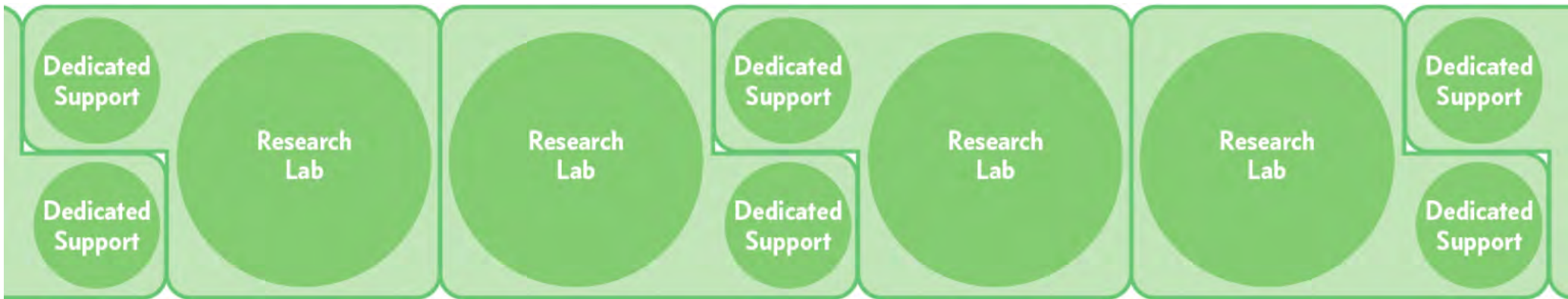


BL2 Containment



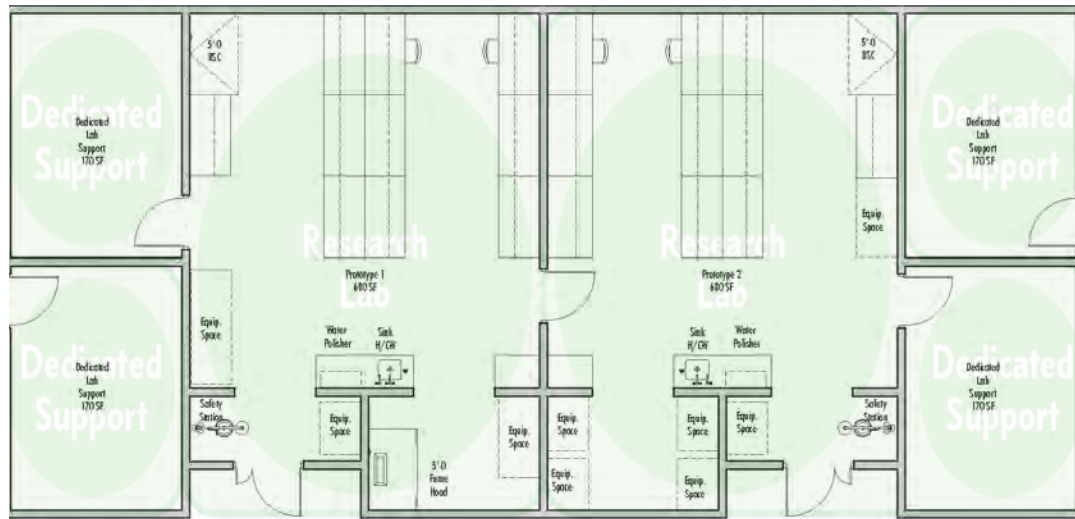
Flexible Research Labs

Reaching consensus on the “right”
flavor of flexible, prototype lab

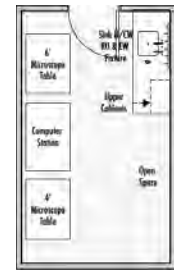
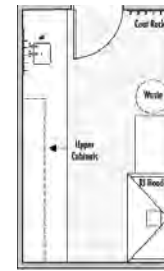
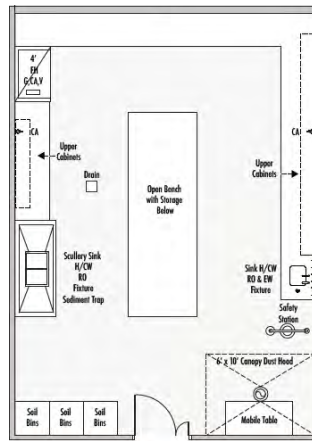
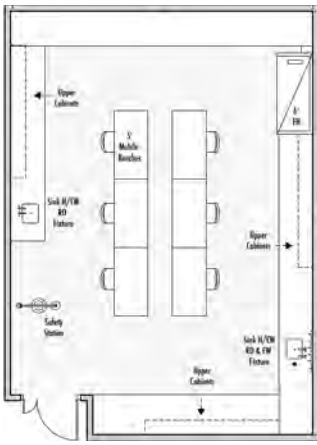


Flexible Research Labs

Flexibility also meant allowing space for customization



Flexible Research Labs



Balancing “dedicated” vs. shared research capabilities

Collaboration Spaces



Image courtesy of Kirksey Architects



Image © Paul Hester, Hester + Hardaway. EYP/WTW are the Design Architects. EYP is the Architect of Record.

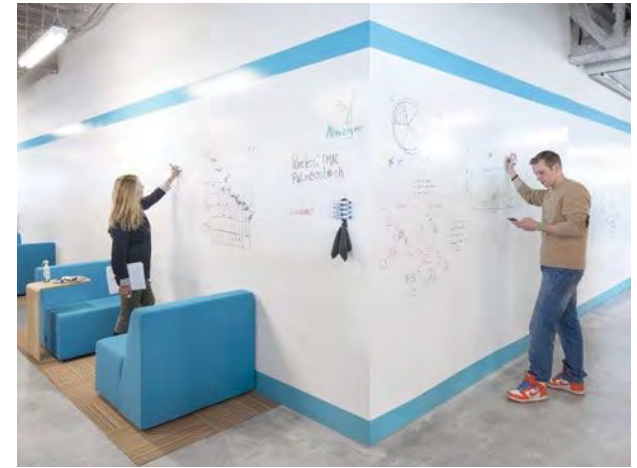
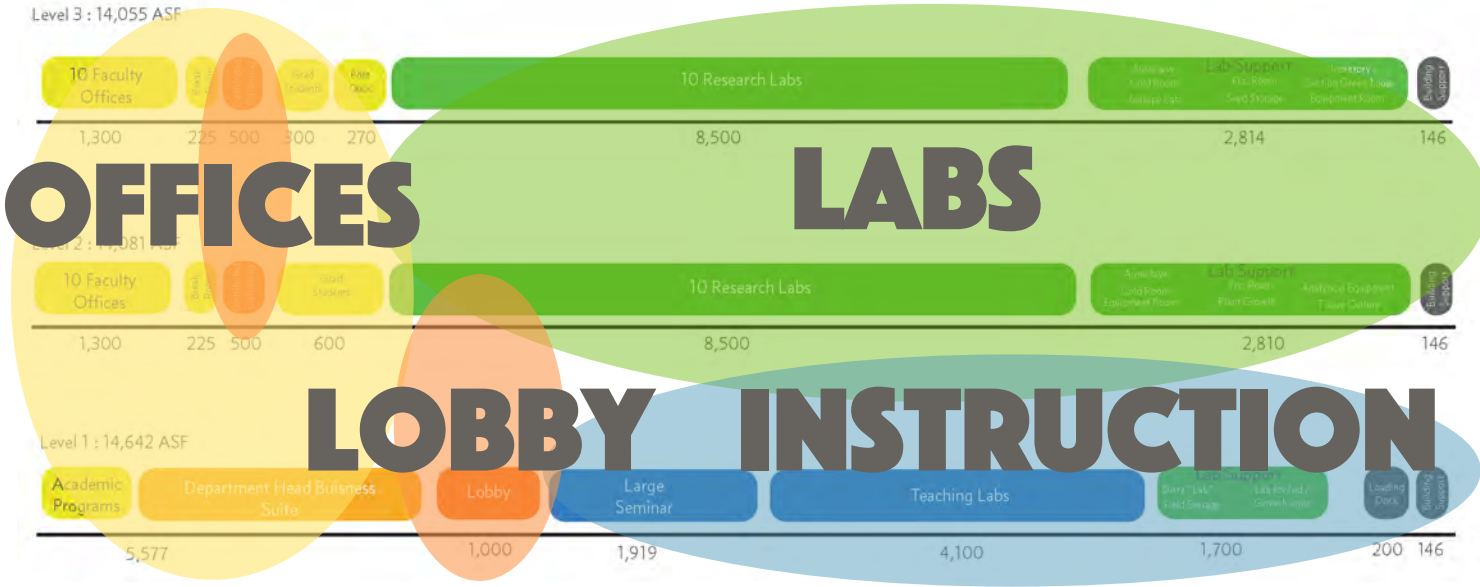
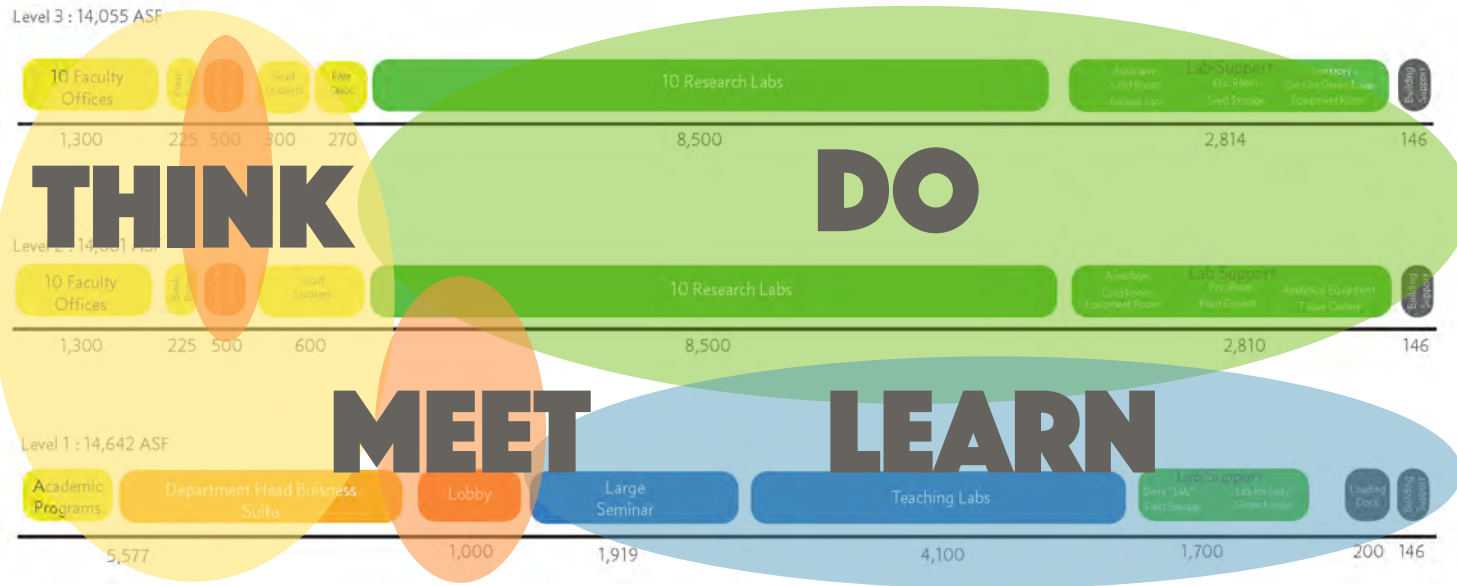


Image from www.ideapaint.com

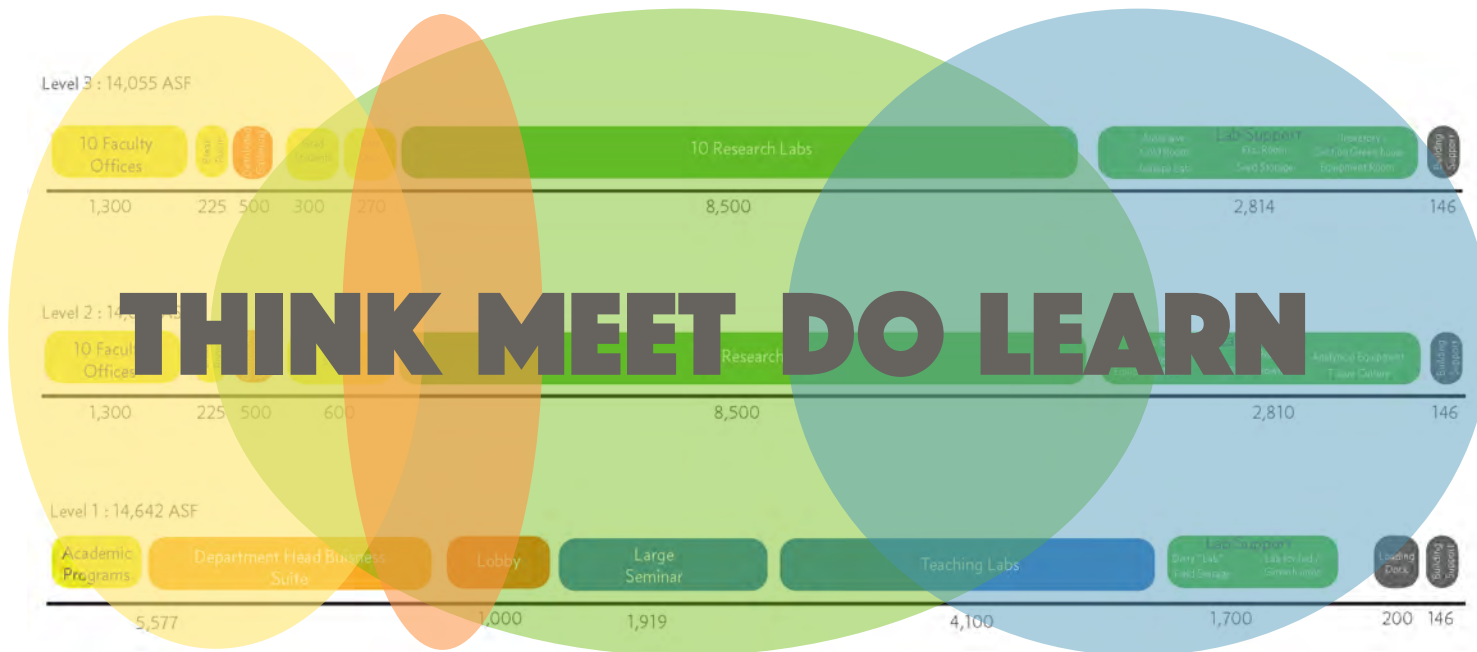
Building Stacking



Adjacencies



Collaboration



Questions?

Wrap Up

- **New Research Technology & Methods**
- **Flexibility**
- **Specific Research Requirements**
- **Collaboration**

Acknowledgements

Thank you to the following individuals for their expert input and advice on this presentation:

Leland Pierson	Professor and Department Head, Plant Pathology, TAMU AgriLife
Henry Judah	TAMUS Associate Director, Risk Management
Ed Pierson	TAMU COE/TEES, Director of Information Technology and CIO
Chris Garcia	TAMU Information Technology, Sr. Lead Network Analyst
Terry Phillips	Facility Programming and Consulting
Maria Batista	Facility Programming and Consulting
Amanda Crawley	Facility Programming and Consulting
Tim McGreger	Facility Programming and Consulting



Seminar Evaluation

We hope you enjoyed this session...

Please take a moment to complete the evaluation form.

Thank you!



Project Budget

48,000 ASF/ 83,000 GSF*

\$45M TPC/ \$33M AACC

Estimated Construction Cost

\$542/GSF TPC

\$395/GSF AACC

*** includes added classrms/funding
5,600 ASF/ 9,300 GSF**