

# United States Efforts to Establish a National Plant Microbial Germplasm System – Status and Future Prospects

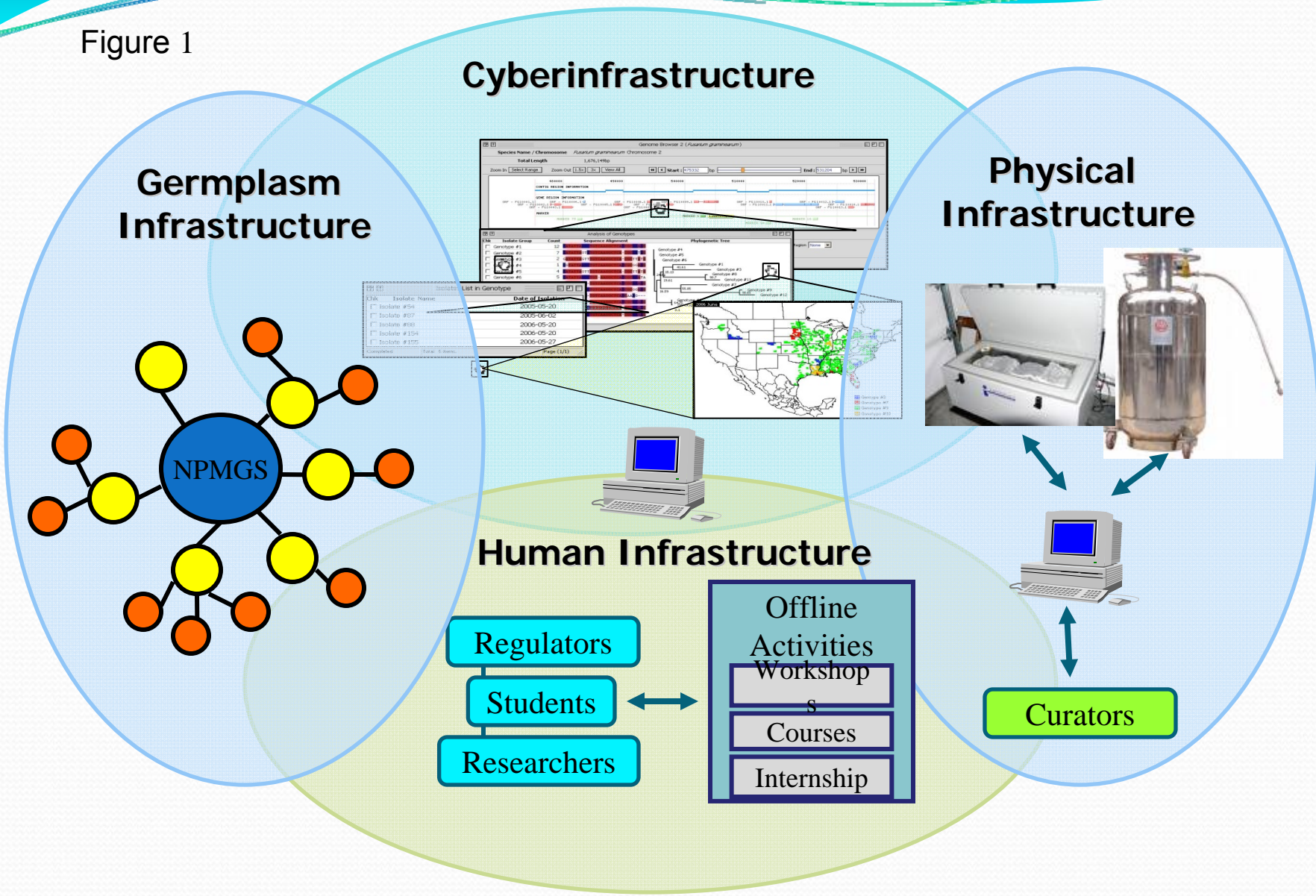
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## OVERVIEW OF PLAN FOR NPMGS

### Establishment of a system of plant-associated microbial resources

- Composed of multiple elements:
  - Traditional living culture collections
  - Libraries of molecular components
  - Centralized searchable database and supporting IT tools
- A permanently-funded interconnected system of specialized centers with a central backup facility for organizational coordination and management, and for physical maintenance and distribution of strains

Figure 1





## OVERVIEW OF PLAN FOR NPMGS(cont.)

- A database with strain information from each specialized center would link separate repositories and all strains deposited in a back-up facility
- Ensure preservation and safeguarding of collections of living plant-associated microbes that represent phenotypic and genotypic diversity in a permanent repository system with a robust database that provides access to critical information
- Steering committee of stakeholders will provide oversight

## NPMGS STRUCTURE

### Specialized Centers Associated with Experts as Curators

- **10-30 Specialized Centers**
  - Maintain, authenticate, and distribute specific groups of MOs
  - Includes curation, accurate taxonomic nomenclature
  - Focus on single groups – bacteria, fungi, etc.



## NPMGS STRUCTURE (cont.)

### Centralized Back-up Facility with All Strains and Molecular Libraries

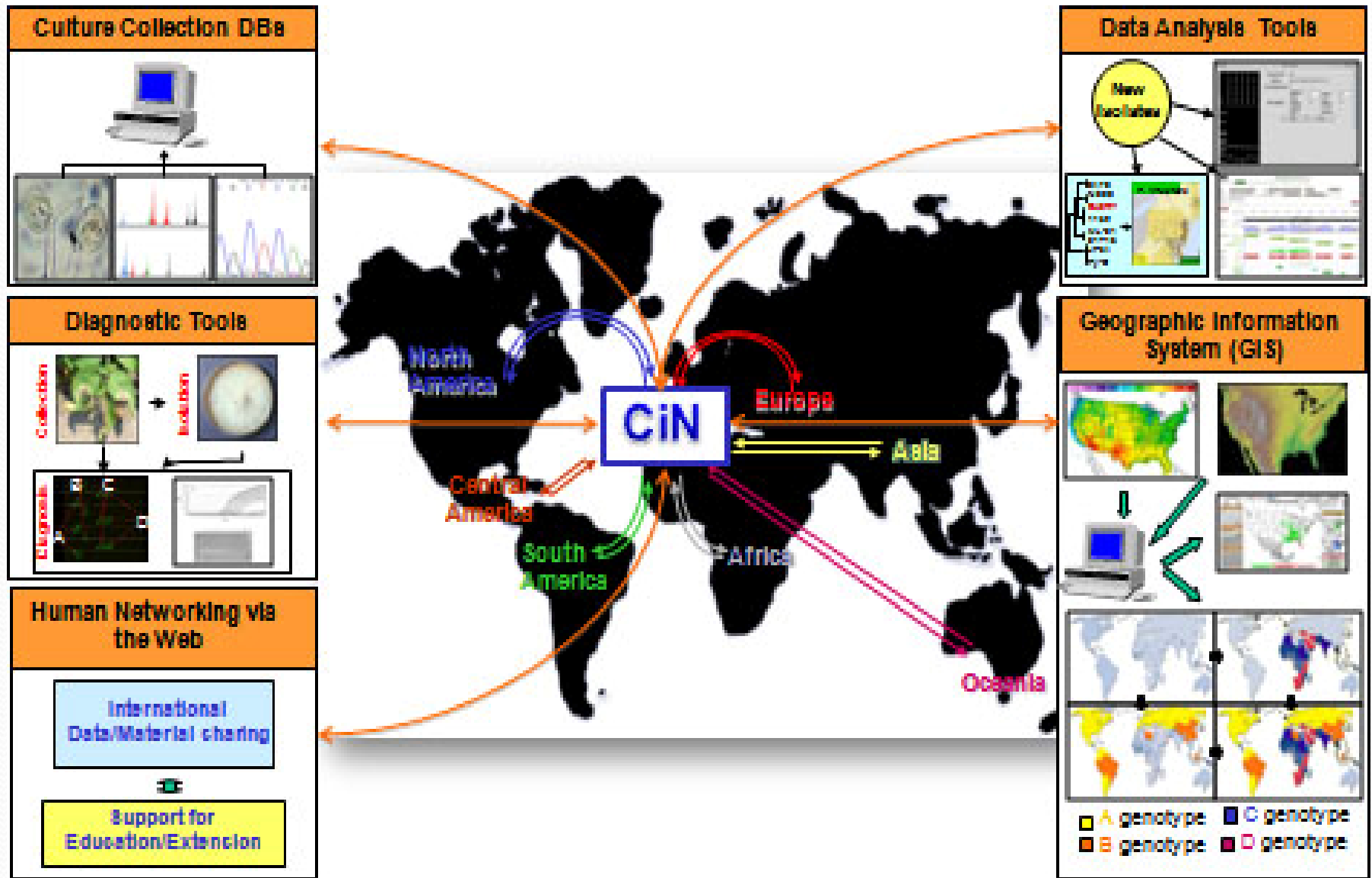
- Strains with duplicates deposited at NCGRP, Ft. Collins
- Could be a point for distribution?
- Receives newly acquired strains from Specialized Centers
- Relatively little activity except to maintain and distribute as needed

## NPMGS STRUCTURE (cont.)

### Centralized Strain Information Database

- Searchable database for plant-associated microbes in addition to ARS National Plant Germplasm System, Germplasm Resources Information Network (GRIN-Global)
- Data on acquisition and characteristics
- Includes support for nomenclature scientists to update accuracy of scientific names
- Data to include plant host, symptoms, toxin production and epidemiological data

Figure 4





# Actions / Accomplishments

- USDA-ARS proposed budget increase in FY11 - \$3,650,000 for research on scientific collections.
- – Enhance capacity to conserve a broad diversity of National Plant Germplasm System Resources
- Specific Activities
- – Expand plant germplasm collection and conservation – Expand plant genome databases by developing IT and sciences.
  - Provide effective management of GRIN Global System
  - Expand capacity for training collections management

# Actions / Accomplishments

- >30% of microbe collections at NCAUR-Peoria backed up at NCGRP Ft. Collins
- Discussions ongoing to back up collections of fungal pathogens affecting insects and nematodes (ARSEF) Ithaca
- Over 2,000 mixed isolates of yeasts from the Phaff Yeast Culture Collection-Davis, CA backed-up at Ft. Collins
- 405 isolates of *Listeria* from Peoria backed-up
- *Penicillium* isolates from Pullman backed-up
- other “at risk” collections?
- Possible collaborations- GBRCN, WFCC, Global Crop Diversity Trust, Biodiversity International, ISBER, UKFCC, NIH/NIAID, others?

# Actions / Accomplishments

- NSF proposal submitted to Directorate for Biological Sciences/ Division of Biological Infrastructure Living Stock Collections, Research Coordination Network (RCN) McCluskey et al.
- Objectives are to cultivate a network of scientists to establish a system of collections with independent long-term support.
- Host independent meetings, sponsor teaching workshops and symposia associated with national/international conferences, develop dedicated internet site for germplasm network, sponsor educational exchanges btw existing collections, and establish connections with international groups.