

Breakout Session II: Devising solutions within and among Grand Challenge areas

The research of Arthropod Genomics Research (AGR) supports the ARS Grand Challenge to “Use disruptive genomics technologies to interfere with the transmission of plant diseases by insects” that will lead to a “decreased impact of emerging pest species that threaten U.S. Agriculture”. AGR is divided into three challenges aimed at 1) *Controlling Vectored Diseases*, 2) *Managing Herbivorous Insects*, and 3) *Implementing Biocontrol*.

After participants redistribute into one of the above three challenge areas, each group is to use outlines from all the Scientific Teams and the consensus built within Session IV to perform and/or propose solutions to the following:

Building a “knowledgebase” that empowers scientists to achieve Grand Challenge goals:

- 1) Identify tools/software/applications, best practices and other activities that are universal to more than one analytical pipeline (e.g. mapping of reads used in variant detection by genome re-sequencing and RNA-seq analyses) versus those that are unique to a single process. Outline and prioritize those that are needed to address the challenge areas.
- 2) Using the gap analyses from Scientific Teams generated in Breakout I, prioritize the protocols, pipelines, or workflows that need to be developed in order to address the Grand Challenge. Indicate which protocols and pipelines are reusable across workflows.
- 3) Propose a format for standard operating procedures (SOPs) that could be adopted across ARS, and used when developing protocols for designing experiments, operating software applications, submitting analysis jobs on the HPC, describing workflows, etc. Consider options for review, validation, and updating processes of these SOPs.
- 4) Conceptualize mechanisms or platforms for the distribution of knowledge, workflows, pipelines, documentation, training modules and other materials. Consider accessibility to ARS and the greater scientific community, and how news of updates, events, or changes will be seamlessly communicated to scientists.
- 5) For scientists with the need or desire to enter into a Mentor-protégé partnership, define how this relationship will be administered, progress monitored, and outcomes documented. Develop a means to identify protégés and pair those individuals with potential Mentors having the requisite skill sets.

Developing communication plans for Scientific Teams and Virtual Research Support Core:

- 6) Develop a communication schema between the four Scientific Teams, and the delegation & recruitment strategies used within each. In other words, how will tasks such as protocols identified as needed by more than one Scientific Team be developed? How will the Training Group and Virtual Research Support Core (VRSC) be involved? How will members from outside of the Arthropod Genomics community be recruited or integrated into an interdisciplinary applications-focuses team?
- 7) Develop an efficient communication schema between SYs within the Scientific Teams and the VRSC. How will this schema lead to the identification of scientist’s needs, finding appropriate solutions, implementation of the solutions, and providing adequate training for scientists to fully utilize the new resource(s).

Prepare PowerPoint slides and written outline to present