

Bovine Genome Coordinators Newsletter

September, 2015

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1. Cattle Genome Coordinators Newsletter

Welcome to this the Bovine Genome Coordinator Newsletter from Juan Medrano, UC Davis (jfmedrano@ucdavis.edu) Bovine Genome Coordinator, and co-coordinators Jerry Taylor, University of Missouri (taylorjerr@missouri.edu), and Alison Van Eenennaam, UC Davis (alvaneennaam@ucdavis.edu). We hope to keep the Bovine Genome Community informed of developments and activities of the Bovine Genome Coordinators through this periodic newsletter. If you have any informational items you would like distributed via this newsletter please call Alison Van Eenennaam at (530) 752-7942, or Email alvaneennaam@ucdavis.edu.

Important priorities for NRSP8, as related to Bovine Genomics for the next 5 years are:

- 1) Development of a significantly improved Dominette bovine reference genome sequence assembly, including annotation and sequence variation derived from other breeds of cattle
- 2) Development of a repository for large datasets of phenotype and genomic data, and
- 3) Translation of genetic findings from NRSP8 and USDA AFRI-funded projects into tangible deliverables for industry.

2. Improvement of the bovine genome reference assembly – Juan Medrano (jfmedrano@ucdavis.edu)

Tim Smith at USDA/MARC and Juan Medrano at UC Davis have generated approximately 83X PacBio coverage of Dominette with funding from NRSP8 Coordinator Funds, USDA/MARC, UC Davis and a donations from Zoetis. A PacBio de-novo assembly will be generated, followed by scaffolding of contigs using the recently generated Optical Map and Dovetail Genomics' Chicago

library/HiRise scaffolding approach made possible by a donation from GeneSeek/Neogen. The assembly will be completed by December 2015. Most of the PacBio data were shared with Aleksey Zimin who will generate a hybrid Pac-Bio/Sanger assembly and a full PacBio only assembly. Aleksey has been supported by USDA/NIFA for this project. In addition, Kim Worley at Baylor who is also supported by USDA/NIFA has produced a PacBio+PBjelly Dominette assembly that has been submitted to GenBank and data are available in SRA (see item 9). This will result in the need to compare and merge the produced assemblies to create one high quality Dominette reference genome. Annotation of the assembly will follow. LIC in New Zealand are in the process of generating a 70X PacBio Holstein assembly which will be publicly available (see item 10).

A paper on the optical mapping of the bovine genome was recently published:

S. Zhou, S. Goldstein, M. Place, M. Bechner, D. Patino, K. Potamouisis, P. Ravindran, L. Pape, G. Rincon, J. Hernandez-Ortiz, J.F. Medrano and D.C. Schwartz 2015. A clone-free, single molecule map of the domestic cow (*Bos taurus*) genome. BMC Genomics 16(664):1.

<http://www.biomedcentral.com/1471-2164/16/644>

3. FAANG updates – Huaijun Zhou (hzhou@ucdavis.edu)

As a part of the FAANG initiative, recent effort supported by both USDA NIFA and NRSP8 Bovine Genome Coordinator funds has kicked off. A variety of tissues from 4 Line 1 Hereford (2 males and 2 females) have been collected and processed by RNA-seq, ChIP-seq, and DNase-seq, and data will be integrated to functionally annotate the bovine genome. For more information contact Huaijun Zhou at the UC Davis (hzhou@ucdavis.edu) who is the PI on the USDA NIFA Foundational project.

4. Development and availability of Illumina functional chip – Jerry Taylor (taylorjerr@missouri.edu)

The University of Missouri in collaboration with GeneSeek have developed an Illumina 250K Bead Infinium functional variant assay which we call the GGP F250. This assay was developed with USDA NIFA funding which supported whole genome sequencing for variant discovery and the purchasing of sufficient numbers of chips to support the design. The assay was designed using sequence data on over 400 individuals from multiple taurine breeds and sequence data from the 1000 Bull Genomes Project, dbSNP and indicine cattle were used to validate the loci included in the design. The chip is focused on the detection of genic variants likely to functional in taurine cattle. The 250K beads were allocated to 199K functional variants and 34K imputation SNPs found on the BovineSNP50, BovineHD and GeneSeek Products. The assay will first be used to genotype samples from the USDA NIFA supported “Bovine Respiratory Disease CAP,” “Feed Efficiency” and “Heifer Fertility” Projects. This genotyping is expected to be completed by late November 2015 after which we shall release the manifest and allele frequency data and the assay will be generally available to the public. The anticipated cost of the assay will be about \$100 per sample dependent on volume. Inquiries can be directed to Stewart Bauck at GeneSeek (SBauck@neogen.com).

5. Cattle GRIN Genomics Database update – Harvey Blackburn
(Harvey.Blackburn@ars.usda.gov)

The primary structure of the Animal – GRIN Genomics Database has been constructed and is operational. The development effort will include several areas of genomic information. Graduate students at Colorado State University have been uploading genomic data from various projects and extracting information. NAGP staff have also uploaded genomic information from cattle and swine populations maintained in the repository as part of the testing process. Efforts have also been ongoing to interface the Animal-GRIN system into the Internet 2 effort which ARS as a whole has been engaged in developing. Further work on front-ends/back-ends is needed to better facilitate user requests. We anticipate soliciting a broader use of the database by early 2016.

6. Cattle/Sheep/Goat/NRSP-8 Program at Plant and Animal Genome XXIV in San Diego – Stephanie McKay (Stephanie.McKay@uvm.edu)

Poster Abstract Submission Deadline: October 30, 2015.

Stephanie MacKay is seeking speakers for the PAG 2016 Cattle/Sheep/Goat workshop! If you are interested, please contact Stephanie McKay: Stephanie.mckay@uvm.edu with a tentative title of your presentation and a brief description of your work by Monday October 5th. Speakers will be chosen by Friday October 16th. Chosen speakers must be confirmed before November 1st. Deadline for workshop abstract submissions is November 6, 2015. Scientists at all career stages will be considered.

7. Nominate students for the PAG XXIV Neal A. Jorgenson Graduate Student Travel Award

Application Deadline: October 30, 2015

Up to two students will be selected to receive the Neal A. Jorgenson Genome Travel Award by the Bovine Genome coordinators. This award provides up to \$1000 for travel expenses and registration provided for graduate students in the USA to travel to and attend PAGXXIV. Look for their posters at PAG XXIV, and depending upon their research topic and the interest that it may generate their oral presentation may be selected for presentation at one of the NRSP8 cattle workshops! Apply at <http://www.intlpag.org/2016/images/pdf/PAGXXIV-grants-jorgenson.pdf>.

8. Annotation of bovine genome with the NLM controlled Medical Subject Headings

G. Morata and collaborators at the University of Nebraska have recently annotated the bovine genome with the NLM controlled Medical Subject Headings (MeSH). MeSH is a collection of comprehensive life science vocabulary containing clinical and biological annotations. Annotation and enrichment analysis software packages have been released on the Bioconductor website. This is the first effort to characterize the bovine genome with MeSH annotations.

[1] <http://dx.doi.org/10.1186/s12859-015-0453-z>

[2] <http://dx.doi.org/10.1111/age.12307>

9. PacBio + PBjelly improved genome reference which has been submitted to GenBank - Kim Worley (kworley@bcm.edu)

The nucleotide files are out:

<http://www.ncbi.nlm.nih.gov/Traces/wgs/?val=AAFC&display=contigs&search=AAFC0400000>

The read data are available in the SRA (see below)

[Whole genome sequencing of Bos taurus blood sample BTAU.HE-female](#)

6 PACBIO_SMRT (PacBio RS II) runs: 980,892 spots, 9.3G bases, 30.8Gb downloads
Accession: SRX1123979

[Whole genome sequencing of Bos taurus blood sample BTAU.HE-female](#)

40 PACBIO_SMRT (PacBio RS II) runs: 6.5M spots, 37.9G bases, 127.4Gb downloads
Accession: SRX1123978

[Whole genome sequencing of Bos taurus blood sample BTAU.HE-female](#)

53 PACBIO_SMRT (PacBio RS II) runs: 8.7M spots, 52.9G bases, 177.9Gb downloads
Accession: SRX1123977

[Whole genome sequencing of Bos taurus blood sample BTAU.HE-female](#)

8 PACBIO_SMRT (PacBio RS II) runs: 1.3M spots, 13.8G bases, 44.7Gb downloads
Accession: SRX1123976

[Whole genome sequencing of Bos taurus blood sample BTAU.HE-female](#)

51 PACBIO_SMRT (PacBio RS II) runs: 8.3M spots, 28.1G bases, 97.6Gb downloads
Accession: SRX1123975

10. LIC (New Zealand) plans to sequence one Holstein Friesian bull to 70x coverage using PacBio

LIC would like to announce that LIC are working on a breed specific reference for a high usage NZ Holstein Friesian bull. The assembly is planned as a 70x coverage PacBio long read assembly and will be used to investigate the influence of the physical reference in phasing, imputation, structural variation detection and gene discovery for the NZ dairy population. LIC plans to make the assembly publically available.

11. eBEEF (eBEEF.org) beef genetics/genomics community of practice with eXtension

A new website (eBEEF.org) dedicated to beef cattle genetics was launched at the 2015 Beef Improvement Federation Conference. eBEEF is the beef genetics/genomics community of practice within eXtension (the interactive learning environment delivering research-based information emerging from America's land-grant university system). The mission of eBEEF is to foster a research and outreach community, engage beef cattle producers and agricultural professionals through training and publications, and support research and outreach projects. eBEEF was developed in an attempt to consolidate information about beef breeding and genetics into a single site rather than in the disparate collection of sites that currently houses a lot of beef genetics and genomics information, especially that associated with the various USDA AFRI-funded beef projects.

Beef cattle specialists from six land grant institutions (Dr. Darrh Bullock, University of Kentucky; Dr. Jared Decker, University of Missouri; Dr. Megan Rolf, Oklahoma State University; Dr. Matt

Spangler, University of Nebraska; Dr. Bob Weaber, Kansas State University; and Dr. Alison Van Eenennaam; University of California – Davis) are participants in eBEEF. The site contains factsheets, short frequently asked question (FAQ) video clips, relevant conference recordings and webinars, a YouTube channel, Twitter account, a blog and links to other useful beef sites. Interested parties can sign up to join at eBEEF.org to receive a quarterly email newsletter.

12. Discussion of other issues of concern/priorities for the bovine genome community – summary of points raised at Teleconference held on 9/23/201

There were many groups represented on the conference call. LIC noted they would unlikely be finished with the Holstein assembly by the end of 2015. Jim Reecy asked about when the Dominette assembly will be switched to the reference. Kim Pruitt from NCBI confirmed there would be 3 Dominette assemblies coming into play – need to know what the community wants to call the reference sequence. Medrano said there would an attempt to merge the 3 reference assemblies. This will be done in collaboration with Aleksey Zimin. The assembly has not been put together at this point. The X chromosome will be part of the assembly – Dominette does not help with Y chromosome. Kim Worley mentioned the Baylor draft Y chromosome assembly is available in GenBank. Huaijun Zhou said they are working on 2 animals for FAANG on 8 important tissues. Jerry asked whether we should be working on tissues from RNA seq from the reference animal. Jerry has RNA seq data on 17 tissues. The assay requires isolated nuclei from fresh tissue and that is why can't use tissues from Dominette herself. It was suggested that it is possible to do CHIP-seq from frozen tissue – but nuclei for DNase-seq requires fresh tissue. Kim from NCBI asked if these data would be submitted publically – yes that is the plan. All will be entered into Bio Project. Jim Reecy said you need to get more animals to really functionally annotate the genome – to ask higher order questions. Fernando asked how to become involved – there is a FAANG workshop in 2 weeks in DC (October 7-8), and also another workshop in January. Go to <http://www.faang.org/bbs?s=go-faang.txt> and can sign up for any of the working groups you want to. Question about the number of genes in the design of the functional chip – Jerry can send a document to interested parties. Email Jerry Taylor if you would you like a copy of that document (taylorjerr@missouri.edu). There was a question about the repository being developed by Harvey Blackburn – it is unique in that there is the ability to store biological samples. Stephanie McKay spoke about inviting speakers at PAG – contact her if you would like to speak at PAG (Stephanie.mckay@uvm.edu). The Neal A. Jorgenson Graduate Student Travel Award winner(s) may be asked to speak at PAG this year too. There was a suggestion to send out invitations to try to ensure we have participation at PAG. Lakshmi discussed NIFA update. See Item 13 below for a detailed summary. Kim Worley said PacBio data are available for those interested in obtaining those data – see item 9. Erdogan Memili from Mississippi State University said he is interested in organizing the next Cattle/Sheep/Goat workshop for PAG 2017. It was suggested he attend the Cattle community business meeting at PAG in 2016 and become nominated to organize the 2017 sessions.

If you have any informational items you would like distributed via the next bovine genome coordinator newsletter please call Alison Van Eenennaam at UC Davis at (530) 752-7942, or Email alvaneennaam@ucdavis.edu.

13. NIFA updates - Lakshmi Kumar Matukumalli (imatukumalli@nifa.usda.gov)

I. NIFA Updates (<http://www.nifa.usda.gov/newsroom/newsletters/update.html>)

II. Animal Awards 2014 : <http://nifa.usda.gov/press-release/usda-invests-276-million-projects-address-food-security-hunger-through-improved-animal>

III. NIFA Personnel Highlights

- Director of NIFA: Dr. Sonny Ramaswamy (sramaswamy@nifa.usda.gov)
- Deputy Director of Institute of Food Production and Sustainability (IFPS): Dr Parag Chitnis (parag.chitnis@nifa.usda.gov)
- Director of Division of Animal Systems: Dr. Adele Turzillo (aturzillo@nifa.usda.gov)

IV. NIFA Budgets and 2014-18 Farm Bill Updates:

- Total enacted discretionary & mandatory FY-15 Appropriations: **\$1,435,007,000**
- President's proposed FY-16 Total discretionary & mandatory funding: **\$1,687,543,000**
 - FY-2016 NIFA [Explanatory Notes](#)
 - AMR-dedicated funding proposed: \$33 million in AFRI
 - Competitive capacity carve-outs: Hatch (\$12.5M), Smith Lever (\$4M), Evans-Allen (\$2.5M)
- 2014-18 Farm Bill ([Agricultural Act of 2014](#)) Updates:
- **Centers of Excellence (Sec. 7214 of [Farm Bill](#))**, This new provision states that NIFA shall prioritize centers of excellence established for purposes of carrying out research, extension, and education activities relating to the food and agricultural sciences (as defined in section 1404 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3103)) for the receipt of funding for any competitive research or extension program administered by NIFA
- **Commodity Boards Provision.** The 2014 Farm Bill (Section 7404) requires USDA to establish procedures and a timeline under which federal or state commodity boards can propose topics for funding under the Agriculture and Food Research Initiative (AFRI) Requests for Applications (RFAs). This new provision is implemented in 2016 for AFRI programs. Commodity boards can provide matching funds to AFRI programs (\$150K to \$2.5M). The due date for submissions is Sept 22nd. The commodity board priorities will be incorporated into AFRI RFAs and will be released soon after.

<http://nifa.usda.gov/commodity-boards>

V. AFRI Competitive Programs

In FY 2016 Agriculture and Food Research Initiative (**AFRI**) is implementing commodity boards' provision. The RFAs will be released after reviewing and incorporating Commodity board requests. (<http://www.nifa.usda.gov/afri-request-applications>). AFRI foundational programs do not change significantly from year to year. Hence it can be useful to see the last year RFAs in you are planning on submitting a proposal.

1. **Foundational Program:** <http://www.nifa.usda.gov/funding-opportunity/agriculture-and-food-research-initiative-foundational-program>

Animal Health & Disease:

Tools and Resources - Immune Reagents of Agricultural Animals:

Animal Well-Being:

Animal Reproduction:

Animal Nutrition, Growth and Lactation:

Tools and Resources - Animal Breeding, Genetics and Genomics:

Improving Food Safety:

Engineering, Products, and Processes:

Nanotechnology for Agricultural and Food Systems:

Economics, Markets and Trade:

Environmental and Natural Resource Economics:

Small and Medium-Sized Farms:

Two new opportunities that began in FY2014 and are included again under FY2015 Foundational Program:

→ **“Critical Agricultural Research and Extension” (CARE) Program**
(\$200,000; short-term, very applied science);

- Integrated Research and Extension Projects
- *Develop and implement solutions to critical producer problems associated with animal and crop production, protection, or product quality. Emphasis will be placed on achieving results that can be applied by the producer as quickly as possible following project completion. Applications should include justification of why the issue is critical and how project outcomes will rapidly impact the stakeholder community. The project must include stakeholders.*

→ **“Exploratory” (\$100,000; support transformative preliminary data)**

1. *New and emerging innovative ideas that have high potential impact;*
2. *Application of new knowledge or new approaches to unsolved challenges that have high potential impact;*
3. *Tools required to have a paradigm shift in the field; and/or*
4. *Rapid response to natural disasters and similar unanticipated events.*

AFRI Challenge area priorities change from year to year. Please check for NIFA website for updates

- **FY 2016 Food Security Challenge: To be announced**
- **FY2015 Food Safety Challenge: To be announced**
- **FY2015 Food, Agriculture, Natural Resources and Human Sciences Education and Literacy Initiative (*provides fellowships to undergraduate, predoctoral, and postdoctoral students in the agricultural sciences*)**
- **FY2015 Climate Change Challenge Area: To be announced**
- **FY2015 Water Program Challenge: To be announced**
- **Sustainable Bioenergy Challenge: To be announced**

AFRI Foundational Programs in Animal Health & Production: Outcomes for FY 2015

Animal Health and Production and Animal Products (\$27.8 million total program funds)				
Program Area	Program Contacts	Funding (\$ million)	# Standard Awards¹	Success Rate
Animal Breeding, Genetics, and Genomics	Lakshmi Kumar Matukumalli	\$2.5	5	18%
Animal Reproduction	<u>Mark Mirando</u>	\$4.5	9	16%
Animal Health and Disease	<u>Margo Holland, Peter Johnson</u>	\$11.5	23	16%
Animal Nutrition, Growth, and Lactation	<u>Steve Smith</u>	\$6.6	13	16%
Animal Well-Being ²	<u>Peter Johnson</u>	\$1.5	3	18%

¹Budgets ≤ \$500,000 total (including indirect costs) for up to 5 years; excludes seed, sabbatical, equipment and conference awards.

- VI. Dual Purpose with Dual Benefit: Research in Biomedicine and Agriculture Using Agriculturally Important Domestic Species** – NIH and NIFA have extended this joint program for an additional 3 years as PAR-13-204. Applications are submitted to NIH using the R01 funding mechanism and reviewed at NIH’s Center for Scientific Review using special emphasis review panels (including reviewers with expertise in agricultural animals). Applications must address one of the areas of identified in the PAR; focus on a problem that is similar, if not identical, in human health and animal agriculture; use an agricultural animal as the model; and be justified in terms of relevance to human health and animal agriculture. Program contact is Dr. Mark Mirando (mmirando@nifa.usda.gov); next application deadline is September 24, 2015. <http://grants.nih.gov/grants/guide/pa-files/PAR-13-204.html>
- VII. Ecology and Evolution of Infectious Disease** - Funding opportunity partnering NIFA, NSF, NIH, and the U.K. Biotechnology and Biological Sciences Research Council. Applications are submitted to and reviewed at NSF with NIFA, NIH, & U.K. participation.

NIFA provides a minimum of **\$2.5 million** each year. Program contact is Peter Johnson pjohnson@nifa.usda.gov; next application deadline is November 18, 2015. NIFA awards to date: FY2012 (one: IHNV); FY2013 (two US-UK Collaborative Research Awards: Foot and Mouth Disease; and, Potato Virus); In FY2014, (one US-UK award on Mycobacterial Diseases (Johne's & Bovine Tuberculosis))

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13577&org=NSF

- VIII. Veterinary Medicine Loan Repayment Program (VMLRP; www.nifa.usda.gov/vmlrp) - \$5 M** (FY-15 enacted). NIFA's VMLRP administers competitively awarded educational loan repayments incentivizing veterinarians to serve in shortage situations in the food supply veterinary sector. Up to \$75,000 in loan repayments may be awarded for a minimum of 3 years of service in shortage situations, and opportunities for competitive renewal awards exist for those still carrying eligible educational debt after completing the first three years of service. This program emphasizes addressing shortages in the private food animal veterinary sector, however approximately 10% of awards may be made to veterinarians filling shortages in veterinary public practice. Since 2010, over 245 veterinarians have been matched to priority shortage situations nominated for inclusion in this program by State Animal Health Officials (SAHOs; aka, State Veterinarians). The FY-14 VMLRP cycle was completed in September, 2014 with offers being made to 51 veterinarians from a total of 163 applicants. Program contact is Dr. Gary Sherman; vmlrp@nifa.usda.gov.
- IX. Small Business Innovative Research (SBIR) program - \$21.5 M:** Competitive Grants for qualified small businesses (< 500 employees); Funded through set-aside formula (2.9% of all USDA extramural R&D funds). More than 70% of funds from NIFA, with remaining from ARS, FSIS, APHIS, ERS, FAS and NASS. Phase I and Phase II R&D projects with commercial promise are supported. Animal Production & Protection, is one of ten programs. Program Goals/Priorities are to develop innovative, marketable technologies that will provide significant improvement to: feed efficiency, safety and/or quality of end products, animal health & well-being, productivity, and mitigate impact of livestock on the environment. Program Contact is Dr. Bob Smith (rsmith@nifa.usda.gov).
- X. Other competitive grant programs with opportunities for animal and veterinary scientists**
- Organic Agriculture Research and Extension Initiative (OREI)
 - Organic Transitions
 - Higher Education Challenge Grants (experiential student learning; curriculum development; faculty development)
 - Beginning Farmers and Ranchers Program
 - Biotechnology Risk Assessment Grants (BRAG)
 - AFRI Small and Medium-Sized Farms (see Ag Economics & Rural Communities in AFRI Foundational RFA)
 - 2015 Aquaculture Research Competitive Special Research Grants

XI. Capacity Grant Programs: Distributions of Federal Appropriations to State Agricultural Experiment (SAES), state Cooperative Extension Systems (SCES), and Veterinary Colleges by formula; used by states to address local or regional agriculture-related research, education and extension needs:

A. Hatch Capacity (formula) Grant Program: \$244 M (FY-15 enacted) - Supports agricultural/rural research across many discipline areas (animals, plants, soil, water, food safety, climate change, bioenergy). Funding distribution within each State is managed by the Director of the SAES.

B. Smith Lever Capacity (formula) Grant Program: \$300 M (FY-15 enacted) - Supports Cooperative Extension education efforts across many discipline areas (animals, plants, soil, water, food safety, climate change, bioenergy, education). Funding distribution within each State is managed by the Director of the SCES.

C Animal Health and Disease Research (AHDR) Sec. 1433 Capacity Grant program; \$4 M (FY-15 enacted) – These research dollars must be used for animal health and disease research in agriculturally relevant species. Funds are managed through the office of the Director of each SAES and/or the Dean of the Veterinary school, or the Head of the Land Grant University Veterinary Sciences department.

Multi-State Research Committees (MSRCs) and National Research Support Projects (NRSPs): Facilitate gatherings of scientists sharing interest in solving animal health and animal production challenges especially important to specific states/regions (MSRCs) or the nation (NRSPs). These regional committees and national projects are supported as a specific apportionment (25% minimum) of the annual Hatch Capacity appropriation. For complete searchable listings and descriptions of MSRCs and NRSPs, go to the National Information Management and Support System ([NIMSS](#)).

XII. Stakeholder Input

- An AFRI Stakeholder Listening Session is tentatively planned for 2015.
- Joint ARS-NIFA Aquaculture Stakeholder Listening Sessions and a catfish stakeholder meeting were held in 2013. Results from the listening sessions and meeting can be found on the ARS National Program 106 website at: <http://www.ars.usda.gov/SP2UserFiles/Program/106/Stakeholder%20Webinar%20Input%20Summary%206.pdf> .
- Stakeholder input relating to any NIFA program is welcome at any time. Comments should be directed to the National Program Leader responsible for the specific program(s). Contact information for NPLs is located towards the end of each grant program’s informational webpage.
- **National Academies Report on “Critical Role of Animal Science Research in Food Security and Sustainability”** The NAS [Report](#) released in 2015 identifies several [major priorities](#) in domestic agriculture that include Breeding technology and

Genetics, Environmental changes, Animal health and Animal welfare. The report also advocates the use of systems approaches. NIFA is currently analyzing these recommendations closely.

XIII. Other Areas of Importance

Antimicrobial Resistance (AMR)

President Obama announced new initiatives to combat antimicrobial resistance and increase research in developing new antimicrobials. The new initiatives proposed include increasing USDA budget related to AMR. These increases will also reflect in the NIFA's proposed budget for FY2016.

<http://www.whitehouse.gov/the-press-office/2015/01/27/fact-sheet-president-s-2016-budget-proposes-historic-investment-combat-a>

eXtension Communities of Practice (CoPs)

The online Extension community has established several communities of practice to bring together researchers and extension professionals to share the latest research results that can help farmers. <http://about.extension.org/communities-of-practice-descriptions/> Researchers are encouraged to participate/support Extension activities, share educational material, and even develop new CoPs.

DAIReXNET meets the educational and decision-making needs of dairy producers, allied industry partners, Extension employees, and consumers with science-based information and learning opportunities about the dairy industry.

eBEEF (eBEEF.org) is the beef genetics/genomics community of practice within eXtension. More information can be found at <http://www.ebeef.org>.

International Collaborations

International researchers can be Co-Project Director's on NIFA grants and receive funds via subcontracts.

USDA (NIFA) + UK(Biotechnology & Biological Sciences Research Council-BBSRC) Partnership

In 2014, NIFA AFRI Animal Health and Disease and Veterinary Immune Reagents did a pilot program with the UK-BBSRC offering a joint competitive program where each agency funds researchers in their respective countries. 5 awards were announced ([News release](#)). A US-UK meeting was held this summer to discuss the continuation of this program.

Binational Agricultural Research Development & Development Fund (BARDD: US-Israel) is encouraging collaborations between US and Israel scientists in several challenge areas including Food Security

<http://www.bard-isus.com/local.aspx?fid=69>

Functional Annotation of Animal Genomes (FAANG)

The US-EU Animal Biotech taskforce scientific committee held a meeting at Plant and Animal Genome 2014 to highlight the need for functional annotation of animal genomes. (AgENCODE). Activities to establish standards and facilitate international collaborations were discussed.

A group of researchers are hosting a fall 2015 meeting in Washington DC area (October 7 and 8) to bring together and engage with USDA, NSF, NIH, & other federal agencies, along with international funding agencies in the area of animal sciences research. Please contact Chris Tuggle at Iowa State University for more details. <http://www.faang.org/bbs?s=go-faang.txt>

XIV. Personnel Updates

National Program Leaders and Program Specialists, Division of Animal Systems:

National Program Leaders:

Adele Turzillo	Division Director aturzillo@nifa.usda.gov	(202) 401-6158
Margo Holland	Animal Health & Well-Being mholland@nifa.usda.gov	(202) 401-5044
Gene Kim	Aquaculture gene.w.kim@nifa.usda.gov	(202) 401-1108
Peter Johnson	Animal Health & Well-Being pjohnson@nifa.usda.gov	(202) 401-1896
Charlotte Kirk Baer	Animal Nutrition cbaer@nifa.usda.gov	(202) 720 5280
Lakshmi Matukumalli	Animal Genomics lmatumalli@nifa.usda.gov	(202) 401-1766
Mark Mirando	Animal Nutrition, Growth & Repro. mmirando@nifa.usda.gov	(202) 401-4336
Danielle Tack	Animal Health Program Coordinator danielle.tack@nifa.usda.gov	(202) 401-6802
Gary Sherman	Veterinary Science & Medicine gsherman@nifa.usda.gov	(202) 401-4952
Bob Smith	Veterinary Medicine rsmith@nifa.usda.gov	(202) 401-4892
Steve Smith	Animal Production Systems sismith@nifa.usda.gov	(202) 401-6134

Program Specialists:

Desiree Abrams	Animal Systems dabrams@nifa.usda.gov	(202) 401.5046
Max Mayeaux	Aquaculture mmayeaux@nifa.usda.gov	(202) 401-3352
Lisa Stephens	Animal Protection & Biosecurity lstephens@nifa.usda.gov	(202) 401-6438
Davida Tengey	Animal Systems dtengey@nifa.usda.gov	(202) 401-1772