The College of Veterinary Medicine is seeking to fund three multistate projects at $35,000 per year for up to three years (subject to approval of yearly progress reporting). The CVM will approve a project initially for a 2-3 year period or until the termination at a national level of an ongoing multi-state project (whichever is shorter). Multistate budget periods start October 1 and end September 30. Funds cannot be carried over from one year to the next.

The multistate competition will be open to all CVM faculty for all current multistate projects in the College. The proposals will be evaluated by scientific experts or stakeholders identified by the collegiate Research Committee. Proposals will be ranked on scientific merit and how they fit the objectives of the Multi-State project.

The CVM has established an independent competitive process for Multistate Projects to ensure that funded projects address the approved objectives for each project. The submitted proposals will compete on a scientific basis and must demonstrate the required multistate interdependence and collaboration. These proposals should deal with one or more of the objectives of the multistate project.

An additional requirement for researchers receiving funding for a multistate project will be for the researcher to participate in the annual technical committee meeting, to write and deliver the Station report and plan future collaborative research for the project. The Minnesota Agricultural Experiment Station will pay for the official representative to attend the annual meeting for their project.

### Multistate Formula Funds

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total Funds Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>$35,000 annually per project may be requested</td>
<td>$35,000 annually per project may be requested</td>
<td>$35,000 annually per project may be requested</td>
<td>Approximately $105 is available per year for three years total for all 3 projects</td>
</tr>
<tr>
<td>(approximately $105,000 total funds available for 3 projects in 2018-2019)</td>
<td>(approximately $105,000 total funds available for 3 projects in 2019-2020)</td>
<td>(approximately $105,000 total funds available for 3 projects in 2020-2021)</td>
<td></td>
</tr>
</tbody>
</table>

### Background

The Minnesota Agricultural Experiment Station (MAES), as are all experiment stations, is mandated to spend 25% of Federal (Hatch) monies on Multi-State (regional) projects. Regional projects are now called Multi-State projects. These projects are designed so that the Experiment Stations that participate in these...
projects will conduct research collaboratively with states that have similar interests and concerns. Each project must be/have:

1. Multistate (results benefiting two or more states)
2. Multidisciplinary/cooperative
3. Peer reviewed
4. Oriented toward accomplishment of specific outcomes and impacts
5. Clearly focused objectives
6. Based on priorities developed from stake holder input
7. Responsive to CSREES goals

Each Multi-State project must be approved by the sponsoring Experiment Station, as well as, the Regional Association and the USDA-CSREES.

For more detailed information please visit: http://nifa.usda.gov/program/hatch-act-1887-multistate-research-fund

This collaborative interdependent research can only occur if the cooperating Stations meet yearly to report on current studies and plan future collaborative research. This is only possible and successful for Stations that participate regularly with members attending in a consistent fashion. Currently the following multi-state projects are eligible to request funding. **Even if you are not currently a participant on one of the projects, you may be eligible to request funding and to seek approval from the PI on the multistate project to become a project participant.**

Eligible projects, termination date and title **(Please check with CVM Research Office Staff to confirm eligibility prior to applying)**:

For more information about any of the following projects, search by project number at NIMSS: http://www.nimss.org/

| 1. NC-1202 | **Enteric Diseases of Food Animals: Enhanced Prevention, Control and Food Safety** | **Duration:** 12/5/2017 to 09/30/2022 | **Participants:** Isaacson, Richard Gebhart, Connie |

**Objectives**

1. Focus on emerging diseases: We will identify, characterize and develop improved detection and prevention methods related to newly recognized, novel or emerging causes of zoonotic enteric disease and enteric pathogens of food animals.

2. Focus on preventions and interventions: We will develop and improve preventative measures and interventions to reduce the incidence and prevalence of infections of food animals with enteric pathogens of livestock and foodborne and waterborne pathogens.

3. Focus on disseminating knowledge: We will provide training or continuing education to disseminate new information to students, producers, veterinarians, diagnostic labs and others to implement
interventions and preventative measures.

4. Group interaction: The group will interact in a variety of ways to facilitate progress including direct collaborations with joint publications, sharing of resources (pathogen strains, gene sequences, statistical analysis, bioinformatics information/expertise), and friendly feedback and facilitation for all research efforts at annual meetings.

<table>
<thead>
<tr>
<th>2. NE-1748 Mastitis Resistance to Enhance Dairy Food Safety</th>
<th>Duration: 1/19/2018 to 09/30/2022</th>
<th>Godden, Sandra</th>
</tr>
</thead>
</table>

**Objectives**

1. Characterization of host mechanisms associated with mastitis susceptibility and resistance.

2. Characterization and manipulation of virulence factors of mastitis pathogens for enhancing host defenses.

3. Assessment and application of new technologies that advance mastitis control, milk quality, and dairy food safety.

<table>
<thead>
<tr>
<th>3. NC-229 Detection and Control of Porcine Reproductive and Respiratory Syndrome Virus and Emerging Viral Diseases of Swine</th>
<th>Duration: 11/22/2016 to 09/30/2019</th>
<th>Perez, Andres, Collins, James, Murtaugh, Michael, Arruda, Andreia, Rossow, Stephanie, VanderWaal, Kimberly, Rovira, Albert, Torremorell,Montserrat, Goyal, Sagar, Culhane, Marie</th>
</tr>
</thead>
</table>

**Objectives**

1. The overall objective for this five-year NC-229 project is to reduce the impact PRRS has on producers, and to assess the feasibility and financial acceptability of PRRS area control and/or elimination for producers. To that end, we focus on the following major points, which faithfully represent the current research priorities of the US swine industry (Pork Check off NPB): 1.1) PRRSV Immunity and Vaccinology: understanding correlates of immunity and mechanisms to broaden protection, 1.2) PRRSV Epidemiology and Surveillance: understanding virus transmission and differential testing of animals (DIVA), 1.3). Economic Impact of Interventions: determining the economic benefit of vaccination in positive herds

2. Develop effective and efficient approaches for detection, prevention and control of pressing viral diseases of swine of recent emergence, which includes the following: 2.1) Porcine Epidemic Diarrhea Virus, 2.2) Swine Influenza Virus, 2.3) African Swine Fever, 2.4) Emerging serotypes of
<table>
<thead>
<tr>
<th>4. NC-1180</th>
<th><strong>Control of Endemic, Emerging and Re-emerging Poultry Respiratory Diseases in the United States</strong></th>
<th><strong>Duration:</strong> 10/01/2014 to 09/30/2019</th>
<th>Johnson, Timothy Goyal, Sagar</th>
</tr>
</thead>
</table>

**Objectives**

1. Understand the ecology of poultry respiratory diseases
2. Develop new and improved diagnostic tools for poultry respiratory diseases
3. Investigate the pathogenesis of poultry respiratory diseases
4. Develop control and prevention strategies for poultry respiratory diseases

<table>
<thead>
<tr>
<th>5. NRSP-TEMP8:</th>
<th><strong>National Animal Genome Research Program</strong></th>
<th><strong>Duration:</strong> 10/01/2018 to 09/30/2023</th>
<th>McCue, Molly Mickelson, Jim Reed, Kent</th>
</tr>
</thead>
</table>

**Objectives:** Advance the quality of reference genomes for all agri-animal species by providing high contiguity assemblies, deep functional annotations of these assemblies, and comparison across species to understand structure and function of animal genomes.

**Comments:** Recent advances in second and third generation sequencing technologies have enabled the generation of draft reference genome sequence assemblies for almost all economically important agricultural animals, as described in the Accomplishments Report from the current NRSP-8 cycle. However, these genome assemblies still contain numerous gaps and local mis-assemblies, especially for highly repetitive sequence regions, such as those found in centromeres. In some cases, whole chromosomes are absent/unassigned, such as the Y chromosome in some mammals and several micro-chromosomes for all the sequenced birds. Functional annotation, at the transcriptomic, proteomic and epigenetic levels, of accurate reference assemblies are essential for most genome-wide analyses, including the dissection of the genetic architecture of complex traits and enhanced breeding using genomic selection strategies. Furthermore, identifying conserved genomic elements across animal species will provide insights into gene function and underlying regulatory mechanisms. This objective advances the quality of reference genomes for all agri-animal species through providing deeply annotated, high contiguity assemblies, obtained through comprehensive and integrated analyses of transcriptomic data with chromatin architecture and modification data across a wide range of tissues/cells and biological states. This Objective will provide a resource to enhance the research specifics in Objectives 2 and 3. The specific aims for this objective include: 1. Initiate creation of draft genome assemblies for economically important species and breeds for which assemblies are not yet available. 2. Improve existing genome assemblies to close gaps and improve assembly order, especially for highly repetitive sequence regions, such as those in centromeres and on the sex chromosomes. 3. Coordinate analysis of re-sequencing data to identify SNPs, CNVs, and InDels, and better annotate gene models within the reference assemblies. 4. Develop and apply approaches for identifying and functionally annotating regulatory elements through comprehensive and integrated...
analyses of transcriptomic data with chromatin architecture and histone modification data across a wide range of tissues and cells at different biological states. 5. Associating functional information (e.g., tissue expression, physiological processes and interaction information) with regulatory and expression elements in the genomes. 6. Compare structural and functional components of genomes across animal species to understand biological function through identifying conserved genomic elements. 7. Expand the training of students and postdocs in application of next-generation technologies to structural and functional animal genomics.

Advance genome-to-phenome prediction by implementing strategies and tools to identify and validate genes and allelic variants predictive of biologically and economically important phenotypes and traits.

Comments: The goals of this Objective are to advance genome-to-phenome prediction by facilitating translation of genomic findings into biologically relevant information for genetic improvement of all species. To achieve this goal, genome-phenome association studies, functional validation methods, deep phenotype collection, comparative genomics, metagenomics and phenomics are important approaches that will produce valuable insights. In addition, analytic tool development to effectively leverage all information as well as implementation will be critical for agri-animal research communities to realize the potential of these findings to simultaneously develop agri-animals as biological model systems while maximizing the economic gains from genetic and genomic selection. The specific aims for this objective include: 1. Exploit the power of high-resolution SNP-chips, genome re-sequencing, and genotyping-by-sequencing in genome-phenome association studies for detection and validation of genomic variants that are predictive of economically important phenotypes. 2. Advance strategies, models, algorithms, pipelines and analytic tools to facilitate the identification, validation and incorporation of novel genetic elements and causal and/or highly predictive variants to allow the most accurate prediction of phenotypic performance based on genotypes. Newly identified variants will be used in Objective 1 to further annotate genomes. 3. Develop and adopt various approaches, including (e.g., CRISPR/Cas9 genome editing) for functional analysis, and evaluation and verification of functional allelic variants of causal genes important for production traits. 4. Support deep phenotyping of important traits at the molecular, cellular, tissue and organismal levels, including the use of high-throughput technologies such as transcriptome sequencing, proteomics and metabolomics studies, whole-animal parameter monitoring, and in vitro gene mutagenesis screening analyses and other tools to support precision monitoring. 5. Use comparative approaches to identify genetic variation within and across species that is associated with phenotypic variation that results from common treatments or environments, or between natural and domesticated populations. 6. Support comparative phenomics, with an emphasis on the use of farm-animal models that mimic human processes to benefit human health. 7. Develop well-characterized animal populations/genetic lines/models that allow for study of biology of various economically important phenotypes and traits. 8. Advance metagenomic studies to help in discovery of novel pathogens, understanding host-pathogen interaction and determining the role of microbiota in agri-animal nutrition, health and reproductive performance. 9. Train the next generation of animal breeders in applying and developing new methods based on high-throughput genomic data to make genetic progress.

Advance analysis, curation, storage, application, and reuse of heterogeneous big data to facilitate genome-to-phenome research in animal species of agricultural interest.

Comments: The genomic “Big Data” era is here. In the last five years, advances in next-generation DNA sequencing technologies have allowed to produce enormous amounts of data in all livestock, poultry and aquaculture species. To better understand the genetic mechanisms that underlie important traits, in the next five years agri-animal scientists will direct tremendous attention to data refining in addition to data
collection. To achieve this goal, bioinformatics/computational tools, resources and expertise will be necessary on an unprecedented scale. The bioinformatics team of the NRSP-8 project will provide in-house bioinformatics tools, databases and resources in addition to assisting researchers to utilize other open-source tools and resources housed elsewhere. The team will provide resources for “real-time communication” to facilitate research coordination needed for Objectives 1 and 2. Furthermore, Objective 3 will address the need to train students/postdocs to be future leaders in agriculture-oriented computational science. The specific aims for this objective include: 1. Facilitate livestock/poultry/aquaculture genomic research by development/promotion of data sharing standards, workflows and tools necessary to integrate these resources. 2. Facilitate communication and training within the livestock, poultry and aquaculture groups to promote community discussion and awareness of community needs, current events, available resources, and other items of interest. 3. Facilitate genome-wide research approaches to understand the genotype-to-phenotype basis of important traits in livestock, poultry and aquaculture through providing opportunities to curate and reuse data created by the community. 4. Help in training students/postdocs to be future leaders in agriculture-oriented computational science.

| 6. NC-1206 | **Antimicrobial Resistance** | **Duration:** 10/01/2017 to 09/30/2022 | Davies, Peter Godden, Sandra Goldsmith, Timothy Grannick, Jennifer Ji, Yinduo Johnson, Timothy Singer, Randall Vilalta, Carlos |

**Objectives**
1. Enhance surveillance and monitoring of antibiotic resistance and develop improved diagnostic tests.
2. Determine the ecology and mechanisms involved in resistance and transmission of resistance.
3. Develop and evaluate interventions (including alternatives to antibiotics) that reduce antimicrobial resistance in food production systems.
4. Quantify animal health, public health, social, economic, and environmental impacts of antimicrobial interventions in food production systems.
5. Create and deliver programs on antibiotic stewardship in food production systems through education and outreach.

| 7. NE-1701 | **Mycobacterial Diseases of Animals** | **Duration:** 10/01/2017 to 09/30/2022 |

**Objectives**
Objective 1 will focus on understanding the epidemiology and transmission of JD and TB in animals through the application of predictive modeling and assessment of recommended control practices.
Comments: To accomplish our overall objective of developing a better understanding of the epidemiology and transmission of JD and TB.
Objective 2 will seek to develop and implement new generations of diagnostic tests for JD and TB.
Comments: Improved methods for the rapid, specific, sensitive, and cost-efficient diagnosis of JD or TB-infected remain a major priority.
Objective 3 will focus on improving our understanding of biology and pathogenesis of Mycobacterial diseases, as well as the host response to infection.
Comments: It is well recognized that the ability to identify the route of invasion and the host-pathogen interactions at a molecular level is important for the future development of strategies to prevent infections or to limit the spread of the infection. Similarly, the elucidation of gene products specific to in vivo growth holds great promise in identifying new antigens for diagnostics or vaccine development, as well as products essential to pathogenesis. Hence, as part of the proposed multi-state initiative, we envision studies of the basic biology of the causative organisms of JD and TB and their interaction with the host. Specifically, we anticipate studies that will employ state-of-the-art microbiological, molecular biology, genomic, proteomic, metabolomic, immunology, and or bioinformatic approaches.
Objective 4 will focus on development of programs to create and evaluate and develop new generations of vaccines for JD and TB.
Comments: Under the auspices of this multi-state initiative, we propose specific research projects to help achieve each of the 4 objectives and include a strong education and extension plan. We envision many of the projects to be crosscutting in nature (i.e. cut across objectives and/or address both diseases) that will together help address the major animal, human, and societal issues surrounding detection and control of mycobacterial diseases in animals. It is important to note that our research objectives are closely linked and coordinated with our education, extension and outreach plan.

### Objectives

1. Create and share data and technology to enhance the development and application of genomics, epigenomics, and systems biology in poultry.

2. Facilitate the creation and sharing of poultry research populations and the collection and analysis of relevant new phenotypes including those produced by gene editing.

3. Elucidate genetic mechanisms that underlie economically important traits, including genetic variants and functional regulatory elements within the genomes of poultry species, and develop new methods to apply that knowledge to poultry breeding practices.

All of these active projects have existing objectives upon which the projects were approved both regionally and nationally. Therefore, all CVM projects should address one or more of these objectives if the CVM
chooses to actively participate in the project. **Objectives for each multistate Research Project in the NCRA are listed above or can be found online at:** https://www.nimss.org/ by using the keyword search tool.

Participation in one of the CVM’s Multi-State projects does not guarantee that the investigator will receive funding for their project research. However, there are inherent advantages to participating in these projects regardless of funding. These include collaborating with colleagues in their particular area of interest and meeting once a year to discuss the topic and to plan future research that would not be possible if the collaborations did not take place. The Minnesota Agriculture Experiment Station (MAES) realizes the importance of these collaborations and encourages members to participate in the annual meeting and will support the attendance of the official MN representative at the annual meeting. The PI of the funded projects will become the official representative.

We hope that the Internal Multi-State Competitive Grant Program will result in the development of research programs, which will be highly successful in securing extramural funding in new and novel areas of research. Both basic and applied research will be supported. This program is meant to facilitate increased interdisciplinary and inter-collegiate research and to enhance partnerships with those outside the University of Minnesota.

**Multi-State Research Program Description**

**Eligibility.** All faculty (tenured, tenure-track, non-tenure track, and professional/administrative) in the College of Veterinary Medicine, University of Minnesota are eligible to submit proposals. Co-Principal Investigators and Co-Investigators outside the CVM are permitted.

**Funding Levels.** The availability of funds allocated to this program will be dependent upon MAES allocations as budgeted by the Dean. Funding requests should not exceed $35,000 per annum.

**Guidelines**

Guidelines to be considered for funding:

1. **Assure accountability.** The Government Performance and Results Act (GPRA) (1993) mandates that all federally sponsored research must include both performance indicators and performance measures. Potential milestones or indicators of progress should be identified. Accountability must be measured in these terms and will enhance our reporting and input to the required GPRA process, as well as strengthen the NCRA knowledge base for regional research programs.

2. **Direct impact/outcome to society/people.** Every project supported must show how the proposed research will contribute to society. Measurable impacts and expected outcomes that will result from the research should be clearly identified. Where feasible, researchers should identify possible implications for improving competitiveness of animal products.

3. **Potential for future funding.** The opportunities to leverage support from other federal or state agencies, as well as from private sources, can be greatly expanded by successful regional and state research programs. Research proposals should discuss the role of outside funding in the current proposal and the likelihood of future leverage support if the proposal is successful.
4. **Information and technology transfer (Extension).** Every project supported by MAES must demonstrate how its results will be delivered to the user.

**Review Process**
Submitted proposals will be reviewed by the CVM Research Committee for scientific merit. External ad hoc reviewers may be solicited by the CVM Research Committee for review of scientific merit and appropriateness to commodity priorities. The recommendations of the CVM Research Committee and ad hoc reviewers will enter into funding decisions to be made by the Dean. Final funding decisions will be made by the Dean considering the ranking of proposals by the Research Committee.

Grants will be reviewed for scientific merit using the following criteria:

- Justification: 15%
- Literature review: 5%
- Objectives/hypothesis match those of Multi-State project: 10%
- Plan of work: 55%
- Interdisciplinary nature of the project: 5%
- Potential for future external funding /Documentation of successful leveraging of past funds received: 10%

**Timeline**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Deadline</td>
<td>April 16, 2018</td>
</tr>
<tr>
<td>Funding Decision</td>
<td>June 1, 2018</td>
</tr>
<tr>
<td>CRIS project documentation/approvals</td>
<td></td>
</tr>
<tr>
<td>Research Award Form</td>
<td></td>
</tr>
<tr>
<td>Funds Available:</td>
<td>October 1, 2018</td>
</tr>
</tbody>
</table>

**New Proposals**

- **Title Page** - Complete attached cover page and obtain required signatures.

- **Project Summary** – 200 to 300 words, including summary of objective(s) and approach(s) on a separate page.

- **Body of Proposal** – maximum of five pages, single-spaced
  1. Significance of research
  2. Review of literature
     
     Summarize the literature which represents the state of knowledge relevant to the proposed project and which provides critical background information related to the problem elucidated in the previous section, as well as for key research methods and/or techniques. Focus on the most important and more recent literature; if recent literature is lacking in this area, justify why it remains a compelling area for inquiry (e.g., significant new topics lacking information rather than those lacking scientific importance). Provide references for all citations in the Literature Review section. Double check that all citations have references, and vice versa, before submission.
  3. Objectives and hypothesis (Testable Hypothesis) – Must consider objectives of parent multistate project
4. Plan of work -- approach, methodologies and timetable

5. Previous work of investigator(s) related to this proposal

6. Plan and timetable for extramural grant submissions -- list funding agency and time of grant submission and documentation of leveraging of past funds received thru CVM formula funds/capacity grants and Signature Program funding. Description of successful leveraging previous CVM formula or signature program program funds.

References

Documentation and description of successful leveraging previous CVM formula or signature program program funds. Please work with the CVM research office staff to complete spreadsheet tracking outputs generated and funding received as a result of previously received formula fund/capacity grants and/or signature program research.

Biographical Sketch (For all key personnel)

Single Column Budget – Provide a budget justification on a separate page.

Please contact the CVM research office with questions as to allowability of expenses. These funds may be used to support travel required to conduct research but no conference travel. Equipment may be requested and funded in proportion to the extent it directly benefits a project. Non-faculty salary expenses are allowed (excluding tuition benefits). Summer salary for nine month appointments unless justified is not allowed. All personnel effort required to complete the project (paid and unpaid) must be detailed be in the budget/justification.

Year 1 funds will begin on October 1, 2018 and must be expended by September 30, 2019.

Year 2 budgets will begin October 1, 2019 and will end on September 30, 2020.

No expenditures may be incurred before the starting date or after the termination date of the budget period. Unused funds from one budget period may not be carried forward to the next budget period.

Formula funded projects are subject to the following terms and conditions: https://nifa.usda.gov/resource/capacity-award-terms-and-conditions-dec-2017

Submission Process
Please send your proposal as a single pdf via email using Multi-state Capacity Grants in the subject line to vetres@umn.edu and submit a signed paper copy to the Research Office (440 VMC) by April 16, 2018.
Multistate Formula Fund Proposal Cover Page

Title of Proposal: ______________________________________________________________

Principal Investigator____________________________ Dept/Affiliation____________________ Name/Signature
Co-Investigator____________________________ Dept/Affiliation__________________________ Name/Signature
Co-Investigator____________________________ Dept/Affiliation__________________________ Name/Signature

Principal Investigator Affiliated Department Head (Signature)___________________________

Co-I Department Head (Signature)______________________________

Co-I Department Head (Signature)______________________________

Total funds requested: ___________ Year 1 ___________ Year 2

PROJECT SUMMARY
To ensure research compliance is satisfied, the following questions must be answered. For detailed information on any question, please visit the following link:  

By signing the cover pages of this proposal, all investigators and department heads are indicating that the information listed below is correct.

### Does this project involve any of the following?
- Human Subjects
- Animal Subjects
- Purchase/Use of Custom Antibodies produced in animals housed outside the University
- Human Blood, Body Fluids, or Other Potentially Infectious Materials
- Stem Cell
- Recombinant DNA, Infectious Agents or Biological Toxins
- Radioactive Materials and/or Ionizing or Nonionizing Radiation Producing Equipment
- Chemicals

If yes please answer the following:

<table>
<thead>
<tr>
<th>a. Human Subjects</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes, what is the status of the Human Subjects' Application?</td>
<td>Pending</td>
<td>Approved</td>
</tr>
<tr>
<td>Exempt Category:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Code Number:</td>
<td>Approval Date:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. An Animal Subjects</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes, what is the status of the Animal Subjects' Application?</td>
<td>Pending</td>
<td>Approved</td>
</tr>
<tr>
<td>Study Code/Protocol ID:</td>
<td>Approval Date:</td>
<td></td>
</tr>
</tbody>
</table>

| c. Purchase/Use of custom antibodies that have been or will be housed outside the university? | No | Yes |

| d. Human Blood, Body Fluids, or Other Potentially Infectious Materials Help | No | Yes |
| If yes, do you have Blood-borne Pathogen training and immunizations? | No | Yes |

| e. Stem Cell | |
| Will your research involve: | |
| Human embryonic stem (hES) cells | No | Yes |
| Human embryos less than 14 days old | No | Yes |
| Human induced pluripotent stem (iPS) cells, or other human stem cell sources, that are intended to make or contribute to an embryo | No | Yes |

If you answered yes to any of the questions above please obtain approval for your protocol from the
f. Recombinant DNA, Infectious Agents or Biological Toxins
   - No ________ Yes
If yes, what is the status of the Institutional Biosafety Committee Application?
   - Pending ________ No ________ Yes

---

g. Radioactive Materials and/or Ionizing or Nonionizing Radiation Producing Equipment Help
   - No ________ Yes
If yes, do you have the appropriate permits and adequate radiation safety information?
   - No ________ Yes
Department of Environmental Health and Safety (DEHS): (612) 626-6002

---

h. Chemicals
   - No ________ Yes
If yes, do you have the appropriate chemical safety training and hazardous waste training records?
   - No ________ Yes

---

i. Subrecipients and Involvement with Other Outside Entities:

   j. a. Does this proposal include any outgoing subawards?
      - No ________ Yes
If yes, please enter names of Subrecipients.

   Does this proposal include any OTHER planned activity with the community or other outside entities (excluding subawards)?
   - No ________ Yes
If yes, what type of entity/entities will be involved? (Select all that apply)
   - Other higher educational institution(s)
   - Governmental agency
   - K-12 schools or other non-higher education agencies
   - Healthcare organization
   - For-profit business and/or industry
   - Non-profit and/or registered 501(c)3 organization
   - Community group (e.g., neighborhood association, informal citizens group)
   - Other (please specify):

   If yes, please describe the primary role(s) of the involved entity/entities.

---

k. Financial and Business Conflict of Interest:
   a. Do you, or your co-investigators, or key personnel (i.e., anyone responsible for the design, conduct or reporting on this project), or a family member (yours or theirs) have a significant financial interest, OR business interest in a business entity that could benefit from the results of this project? See? For help with definitions.
      - No ________ Yes

If yes, please indicate the most recent REPA # where these interests have been identified:

REPA #
b. Do you, or your co-investigators, or key personnel have a familial connection OR financial or business interest (of any amount) with any proposed subrecipient or collaborator?

________ No ________ Yes

If yes, please contact SPA for further direction.

Additional Comments - NOTE: Comments will display on and print on the PRF.
Please do not include information you prefer to keep private:

i. Inventions:

m. Is it likely that anything patentable (i.e. new, useful, or improved) will result from the current research project?

________ No ________ Yes

If this a renewal or continuing project, have any inventions been conceived or reduced to practice under prior research on this project?

________ No ________ Yes

Does this proposal contain private commercial or trade secret information? If yes, clearly identify the private commercial information in the text of the proposal.

________ No ________ Yes

Does the PI or any investigator have any active patent disclosures with the Office of Technology Commercialization relating to the work contemplated in this proposal?

________ No ________ Yes

n. Does this project involve University resources, space or staff from more than one department or college?

________ No ________ Yes

If yes, LIST DEPARTMENT/COLLEGE BELOW this form must be approved by all department heads and deans involved.

1. 
2. 
3. 
4. 
5.

o. Program Income:

Is program income anticipated on this project?

________ No ________ Yes

If yes, indicate specific type(s) of program income by selecting one or more items from questions a through d below:

___ From fees for services performed?
___From the use or rental of real or personal property acquired under this project?
___From the sale of commodities or items fabricated under the award?
___From license fees and royalties on patents and copyrights that may develop from this project?
<table>
<thead>
<tr>
<th>Senior Personnel (faculty)</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name, Role — Faculty Salary Not Allowed for 12 month appts — small amount of summer salary may be justified by 9 month appointments requiring effort for summer research activity related to project</td>
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<td>Name/Role on Project and Effort</td>
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<thead>
<tr>
<th>Salaries - Other Personnel (non-faculty) (Research Associates, Postdocs, Undergrad Students, Scientists, Technical, Other Professional)</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name/Role on Project and Effort Level (% effort/FTE)</td>
<td>salary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fringe</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>salary</td>
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<td>fringe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Personnel Costs</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel — No conference travel — travel expenses required to conduct research only</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials and Supplies (computer purchase not allowed)—please show detailed calculations items/quantity/cost</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other Expenses (laboratory/scientific services, animal costs)</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total Costs Requested</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
</table>
Budget Justification
Budget and detailed itemized expense justification including detailed calculations for cost estimates

Unallowable Expenses include: (Faculty salary unless 9 month appointment needing small amount of summer salary to conduct research, travel to scientific meetings, non-University of Minnesota subcontracts, purchase of personal computers).

Description of all faculty and personnel roles on project and estimated level of effort committed in support of project must be included

Personnel: (Justify all paid and unpaid personnel, include percent time on project and description of role)

Travel:

Materials and Supplies:

Other Expense: