

## **Suggested Template/Questions for Participant Contributions to the**

### **"Opportunities in Extreme Computing for Biology Workshop"**

- What specific problem could be attacked and solved with the application of sustained multiple petaflops of computing power? What progress could be obtained on the problem at roughly the 10, 100, and 1000 petaflops levels of sustained performance?
- Is the problem one of the “top 10” problems for the scientific discipline, independent of computing? Who would constitute the community of scientists and/or engineers that would enthusiastically address the problem? What would be the degree of international potential participation?
- How is the use of petascale computational modeling and simulation irreplaceable in answering this question? Does it augment existing techniques or replace them? Is there history of large-scale computation being the preferred approach for this problem?
- Why are the other techniques (e.g., experiments/observation, more traditional theory) that could answer these questions not satisfactory? Is it even feasible to consider other techniques?
- What is the current status of the computing tools for the work being proposed: mathematical models, algorithms, software, and data analysis tools? What is the largest scale to date that codes have been run? (e.g. 1,000, 10,000, 100,000 cores) Are there existing code teams working on codes for this problem area, or is this a new area that would need seed investments?
- What experimental and observational data is there available to validate the codes? Is the validation method well established?
- What are the missing pieces in the areas of mathematical models, algorithms, software required to solve the problem? How would you rank them in terms of importance, cost, and risk?