**EIPOD Reference**

1. Please comment on:

* The knowledge of the applicant with regard to his/her field of research.
* The motivation and work ethic of the applicant.
* The capability for practical laboratory work, or technical equivalents such as programming.

If possible, please also try to specify the kinds of techniques where you think the applicant is strong. (maximum 2000 characters)

Aaron Brooks is a talented and creative young scientist with exceptional skills in both bioinformatics and experimental molecular biology.

Aaron joined my lab at the end of April 2015. His current project investigates the effects of genetic variation through the lens of molecular mechanisms operating at several biological scales. Specifically, he is dissecting the consequences of genetic variation in a segregating yeast population by combining multiple omic measurements, including quantification of the genome, transcriptome, proteome and metabolome. Integration of these high-throughput data sets remains a significant challenge in the field, in part because of the diversity of expertise required to analyze and interpret these many facets, simultaneously. This project will push Aaron to develop his integrative modeling skills as well as deepen his understanding of the component experimental methods by working directly with collaborators currently responsible for collecting the data. This project will also serve as the forerunner for his work as an EIPOD fellow. His proposed EIPOD project is an exciting new direction related to this project that will build from the skills and collaborations that he is currently establishing, but at an even more impressive scale.

Aaron has the background and technical expertise. His deep biological knowledge is complemented by technical expertise. Aaron can perform computation and perform experiments – a powerful combination for a 21st century biologist. This is why I selected Aaron for his original project and why he will thrive as an EIPOD fellow, despite the immense challenge of the project. He has already developed – both for his PhD project and in my lab.

I am convinced that Aaron has the required skills, ambition and motivation to be highly successful in his EIPOD research.

1. Give your opinion of the applicant considering the following criteria: theoretical knowledge, interaction with colleagues, adaptability/flexibility, technical proficiency, motivation/commitment, creativity/originality, independence, communication skills. (maximum 3500 characters)

I am highly impressed by Aaron’s advanced knowledge in systems biology. The skills he gained during his PhD have already been applied to projects in my lab and will open new and exciting scientific avenues in the future.

Theoretical knowledge: Aaron has detailed theoretical knowledge of biology, and complex systems. This is evidenced by the time he spent at the Santa Fe Institute.

Interaction with colleagues: Aaron is a friendly person. He is highly appreciated and respected by his co-workers and has established himself as a senior member of my team. He has proactively organized a computational working group to discuss current topics and challenges in the lab, including management systems laboratory data and pipelines.

He technical expertise in bioinformatics and is eager to complement his skills by performing wetlab experiments.

Aaron enjoys presenting and discussing his data in different formats. (*Add:* Writing / Presenting / Outreach). I was impressed by the clarity and organization of Aaron’s dissertation. He has crafted a number of informative figures and high quality data visualizations that make his dissertation stand out. With respect to composition and presentation, Aaron’s dissertation is exceptional in quality. His thesis work demonstrates that he has not only mastered these subjects independently, but that he has seen how to combine successfully. Aaron has positioned himself well to work on some of the most exciting problems in 21st century biology.

**HFSP Reference**

1. Research experience

2013–pres. Professor of Genetics, Stanford University.

2013–pres. Co-Director, Stanford Genome Technology Center, Stanford University.

2013–pres. Associate Head of Unit and Senior Scientist, European Molecular Biology Laboratory.

2009–2013 Joint Head of Unit and Senior Scientist, European Molecular Biology Laboratory.

2003–2013 Group Leader (Visiting), Stanford Genome Technology Center, Stanford University.

2003-2009 Group Leader, European Molecular Biology Laboratory

2002–2003 Postdoctoral Fellow, Stanford University School of Medicine, Department of Biochemistry and Stanford Genome Technology Center.

1997–2001 Howard Hughes Predoctoral Fellow, Stanford University School of

Medicine, Department of Genetics.

1. Publication List  
   Please list up to 10 publications in areas closest to the applicant’s proposed research, including title, journal, author(s) and year. Number your publications starting from “1”.
   1. Steinmetz, L.M., Scharfe, C., Deutschbauer, A.M., Mokranjac, D., Herman, Z. S., Jones, T., Chu, A.M., Giaever, G., Prokisch, H., Oefner, P.J. & Davis, R.W. Systematic screen for human disease genes in yeast. Nature Genet. (2002).
   2. Steinmetz, L.M., Sinha, H., Richards, D.R., Spiegelman, J.I., Oefner, P.J., McCusker, J.H. & Davis, R.W. Dissecting the architecture of a quantitative trait locus in yeast. Nature (2002).
   3. Mancera, E., Bourgon, R., Brozzi, A., Huber, W. & Steinmetz, L.M. High-resolution mapping of meiotic crossovers and noncrossovers in yeast. Nature (2008)
   4. Blandin, S.A., Wang-Sattler, R., Lamacchia, M., Gagneur, J., Lycett, G., Ning, Y., Levashina, E.A. & Steinmetz, L.M. Dissecting the genetic basis of resistance to malaria parasites in Anopheles gambiae. Science (2009), PMCID: PMC2959166
   5. Wilkening, S., Pelechano, V., Järvelin, A., Tekkedil, M.M., Anders, S., Benes, V. & Steinmetz, L.M. An efficient method for genome-wide polyadenylation site mapping and RNA quantification. Nucleic Acids Res. (2013).
   6. Pelechano, V., Wei, W. & Steinmetz, L.M. Extensive transcriptional heterogeneity revealed by isoform profiling. Nature (2013).
   7. Gagneur, J., Stegle, O., Zhu, C., Jakob, J., Tekkedil, M.M., Aiyar, R.S., Schuon, A.K., Pe’er, D. & Steinmetz, L.M. Genotype-environment interactions reveal causal pathways that mediate genetic effects on phenotype. PLoS Genetics (2013)
   8. Wilkening, S., Lin, G., Fritsch, E.S., Tekkedil, M.M., Anders, S., Kuehn, R., Nguyen, M., Aiyar, R.S., Proctor, M., Sakhanenko, N.A., Galas, D.J., Gagneur, J., Deutschbauer, A. & Steinmetz, L.M. An Evaluation of High-Throughput Approaches to QTL Mapping in Saccharomyces cerevisiae. Genetics (2014).
   9. Fritsch, E.S., Chabbert, C.D., Klaus, B. & Steinmetz, L.M. A genome-wide map of mitochondrial DNA recombination in yeast. Genetics (2014).
   10. Aiyar, R., Bohnert, M., Duvezin-Caubet, S., Voisset, C., Gagneur, J., Fritsch, E., Couplan, E., von der Malsburg, K., Funaya, C., Soubigou, F., Courtin, F., Suresh, S., Kucharczyk, R., Evrard, J., Antony, C., St.Onge, R.P., Blondel, M., di Rago, J.-P., van der Laan, M. & Steinmetz, L.M. Mitochondrial protein sorting as a therapeutic target for ATP synthase disorders. Nature Commun. (2014).
2. Reference  
   In this section you will be required to provide a letter of recommendation assessing the applicant’s qualifications and suitability to perform the proposed research. You will first be asked to confirm that you are supporting only one applicant and that you have seen and approved the research plan. You will also be asked if you have interviewed the applicant and to indicate how many Postdocs, Ph.D. students and technicians are currently in your laboratory. In 2-3 pages you should endeavor to convince the review committee that the proposed research project is novel, high impact and provides an excellent opportunity for the applicant to expand their expertise to achieve their career goals.

**Reference for Aaron Brooks**

Dear Evaluating Committee,

I would like to provide the strongest recommendation for my postdoctoral student, Dr. Aaron Brooks, to be selected for the Human Frontier Science Program postdoctoral fellowship program. Aaron is a talented and creative young scientist whose outstanding capabilities are demonstrated by the results of his innovative doctoral research.

I am an expert in genomics research and technology development with many years of experience managing interdisciplinary projects and international collaborations. I am Professor of Genetics at Stanford University and Co-Director of the Stanford Genome Technology Center. In addition, I have been leading a research group at the European Molecular Biology Laboratory (EMBL) and served as founding chairman of its Genome Biology Unit. My laboratory develops and applies cutting-edge technologies to investigate the genetic basis of diseases, with the ultimate goal of developing personalized, preventative medicine. We designed the first tiling microarray for yeast, which was a technological breakthrough that changed the view of how genomes are expressed. We also performed the first high-resolution, genome-wide map of yeast meiotic recombination outcomes, which has been described as a landmark in the field. These seminal approaches have become gold standard in transcriptomics and our technologies are now widely applied by others.

Aaron joined my lab as a postdoctoral scientist in April 2015. He is working on several projects that harness expertise he developed during his doctoral research. His primary project will investigate the effects of genetic variation through the lens of molecular mechanisms operating at several biological scales. Specifically, Aaron will integrate high-throughput measurements of the genome, transcriptome, proteome and metabolome to interpret the consequences and mechanisms of genetic variation in a segregating yeast population. While the field has shown interest in combining multiple -omics datasets, there has been little consensus on how to do it and few examples of success. With this project Aaron has an opportunity to use his skills in integrative biological network modeling to address the problem, hopefully narrowing the present gap between our knowledge of genotype and prediction of phenotype, one of the long-standing challenges in contemporary biology. I expect that Aaron will generate key insights and bring ample creativity to the project, just as he did for his graduate work.

*Add:* Why is project novel and of high impact.

*Add:* How will fellowship help reach your career goals

I am happy to have him on my team. I fully endorse his application for your fellowship given both its scientific significance and exceptional quality. Please do not hesitate to contact me if you require further information.

Sincerely,

Lars Steinmetz

The evaluation criteria to be addressed are:

Originality and contribution:

* Novelty of the proposed research project; the applicant’s intellectual contribution in developing the proposal; expected impact of the proposed work; potential of the research to move the field forward.

Learning potential and knowledge exchange:

* The learning potential for the applicant through exposure to new techniques and literature; the knowledge/techniques the applicant will bring to the lab (particularly important for Cross-Disciplinary Fellowship applicants); unique synergy that will be achieved through hosting the fellow in the proposed laboratory.

Career development:

* Alignment of what will be learned during the fellowship with the knowledge needed by the applicant to pursue their career goals; possibility of the proposed work to build the applicant’s international network of collaborators; the suitability of the proposed host laboratory environment to nurture the applicant’s career goals