March 29, 2017

Dear Adjudicating Officer,

Please accept this letter recommending the work of Dr. Shicheng Guo, an expert in the field of epigenetics. My name is Dr. Liliane Schoofs, and I am a Professor in the Department of Biology at the University of Leuven. I lead the Research Group of Functional Genomic and Proteomics at this institution, where I study the molecular mechanisms underlying neurobiology and behavior. My work focuses on the pathways that modulate learning and memory, focusing on the neuropeptides. I perform research primarily using the microscopically small worm *C. elegans* and a few insect fly species. My educational background includes a Ph.D. in Biology from the University of Leuven and postdoctoral research at the University of Rouen, the United States Department of Agriculture, and Texas A&M University. I am a Councilor of the European Society of Comparative Endocrinology (ESCE). Although I have never met Dr. Guo, these credentials and my experience and knowledge of the field qualify me to provide an informed assessment of Dr. Guo’s substantial achievements. The superior quality of Dr. Guo’s research and publications place him at the very top of his field, and make him a valuable asset to the U.S. scientific community. For this reason, I recommend that the U.S. act at once to retain his expertise.

Before describing his research in more depth, it must be mentioned that Dr. Guo’s record of publication is exemplary. Most of Dr. Guo’s 38 published articles have been disseminated by high-profile journals that are known for attracting significant interest and attention in the field, such as *Clinical Epigenetics*, *PLOS Biology*, and *Nature*. Because publication in journals of this caliber is restricted to research that meets the highest standards of both quality and relevance, Dr. Guo’s consistent rate of publication is particularly praiseworthy. Moreover, Dr. Guo’s work has been extraordinarily well-received by his peers, who frequently cite his research in their articles. His articles have been cited over 800 times to date, with several of his articles receiving over 100 citations. This record of citation is a strong indicator of the utility of Dr. Guo’s research for advancing the state of knowledge in the field.

In addition to performing and publishing his own research, Dr. Guo also provides service to the field through peer review. Dr. Guo has held the position of Editorial Board Member for several journals, including *Frontiers in Oncology* and *Frontiers in Genetics*. In addition, he regularly completes reviews for over a dozen top journals in the field, such as *Medicine*, *Scientific Reports*, *Tumor Biology*, and *Oncotarget*. To ensure the high standards of their publications, these journals only request the assistance of the most informed members of the field. Thus, this aspect of Dr. Guo’s record, like all others, is an impressive marker of a researcher who performs well above the majority of his peers.

While all of Dr. Guo’s studies are worthy of attention, for the sake of brevity, I will limit myself to discussing his work surveying the methylome of the silkworm *Bombyx mori*. Despite completing the silkworm genome in 2014 using whole-genome shotgun (WGS) sequencing, scientists still do not fully understand silkworm epigenetic regulation, or its effect on various biological processes. For this reason, Dr. Guo surveyed the methylome of the silkworm at single-base resolution, employing Illumina high-throughput bisulfate sequencing (MethylC-Seq). Based on his exhaustive testing and analysis of the results, Dr. Guo conservatively estimates that 0.11% of genomic cytosines are methylcytosines. His findings contradicted the common understanding that the silkworm was non-methylated in the genome. Furthermore, he located these methylcytosines in CG dinucleotides. Dr. Guo discovered that CG methylation is greatly enhanced in gene bodies, and is positively correlated to gene expression levels. This suggests that CG methylation plays a positive role in gene transcription. Dr. Guo’s study not only revealed major new insights about epigenetics in a model insect, but also demonstrated a method for sequencing the epigenomes of hypomethlyated organisms.

Dr. Guo’s study, published in *Nature Biotechnology*, has been cited at least 167 times. It has appeared in major review articles, such as an article in *Nature Review Genetics* titled “Ten years of genetics and genomics: what have we achieved and where are we heading?” that outlined the key developments in the field. Review articles, particularly in such prestigious journals, only include the most advanced and noteworthy studies in the field, so Dr. Guo’s inclusion by these authors confirms that his research is indeed at the forefront of epigenetics studies. In another notable citation, Zhan et. al cited Dr. Guo’s work to understand genome-wide DNA methylation in monarch butterflies. Using Dr. Guo’s findings as a reference point, these scientists were able to identify a gene related to the long-distance migration of the butterfly. These findings, published in *Cell*, were enabled by Dr. Guo’s foundational study. As these examples clearly illustrated, Dr. Guo’s study has had a significant impact on subsequent work in the field.

Dr. Guo’s work in the field of epigenetics has important implications for medical research. Understanding the genomic targets of DNA methylation in silkworm is an important step to modelling DNA methylation in other insects. These results are further extrapolated for use as a reference point in human biology and evolution. Dr. Guo’s leadership in this area is indispensable, and the U.S. scientific community cannot afford to lose his innovative approach and expansive knowledge.

If you have any further questions, please contact my office.

Congenially yours,

Dr. Jacobsen, Steve, PhD

Professor,

Department of Molecular, Cell and Developmental Biology

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