Editorial

Debating New Theory in Neuroscience

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Launching a new journal in the field of neuroscience is a formidable task. With thousands of articles being published yearly in a number of existing journals, what can another journal add to the field that is not already available? What can attract neuroscientists to submit their best articles to an unproven journal when so many exist with clear track records? Rigorous standards in what is considered acceptable are necessary if a journal is to have true impact on the field, but who wishes to consider subjecting one's work to such standards when the journal's future is unknown? Can a new journal actually set any kind of new standard that does not already exist?

When we were asked to lead AIMS Neuroscience, these questions and many more caused us to hesitate. We had to choose a goal and navigate a course toward a niche not filled by any other journal. When surveying the landscape based on recent developments, there was one consistent aspect we saw. The massive European Union Human Brain Project, the US BRAIN project, and the Research Domain Criteria emphasis of NIMH each seem focused on producing new technologies and massive amounts of data. However, we had to agree with the observation made by many others. Where is the theory to guide all of these activities? This is the niche we hope to fill.

Our goal is a lofty one in that we wish to provide a forum in which to expedite the speed with which theoretical neuroscience progresses toward generating testable hypotheses. In the presence of current and developing technology that offers unprecedented access to functions of the nervous system at all levels and the ability to analyze data via supercomputers, we want to serve the role of providing the widest variety of the best theoretical views leading to suggested studies to facilitate "intelligent" use of that technology.

In the past, dominant theories tended to result in direct and indirect suppression of newer ideas. Criticism of the peer review process have been made [1], noting that anonymous reviewers may have a conflict of interest. Common sense says that the theories of the most influential scientists in the field are those that tend to be perpetuated, and the "Good Old Boys" club related to funding agencies is familiar to all. However, the introduction of new technologies in neuroscience has resulted in quite

a different problem; an absence of reasonable theories [2].

Over the past 20 years, the speed and quantity of communication has changed dramatically. Sites, such as ResearchGate.net and Academia.edu, show that social networking among scientists is growing. Many of us have found Twitter and LinkedIn useful in promoting our articles and ideas. Open access journals provide unlimited access to one's articles, provided it is possible to get someone to read them. The question then becomes, "Is it possible to design a journal that can actually facilitate progress in theoretical neuroscience in the presence of all these factors?" Hopefully, we have found a way.

Two recent articles provide some insight into what needs to occur to meet our goal. Wang, Song, and Barabasi [3] noted that, "Paradigm-changing discoveries have notoriously limited early impact, precisely because the more a discovery deviates from the current paradigm, the longer it takes to be appreciated by the community. (p. 127)" We suspect this also reflects the fact that published articles in the past had restricted audiences (e.g., those in the same field or sub-field, those with subscriptions, etc.). The abstract of the study by Uzzi, Mukherjee, Stringer, and Jones [4] provides insight into papers making the greatest impact in science:

> *Novelty is an essential feature of creative ideas, yet the building blocks of new ideas are often embodied in existing knowledge. From this perspective, balancing atypical knowledge with conventional knowledge may be critical to the link between innovativeness and impact. Our analysis of 17.9 million papers spanning all scientific fields suggests that science follows a nearly universal pattern: The highest-impact science is primarily grounded in exceptionally conventional combinations of prior work yet simultaneously features an intrusion of unusual combinations. Papers of this type were twice as likely to be highly cited works. Novel combinations of prior work are rare, yet teams are 37.7% more likely than solo authors to insert novel combinations into familiar knowledge domains. (p. 468)*

Ours is an open access journal that will allow maximum exposure to everyone in the neuroscience field. We will announce topics well in advance of each issue and specify the submission date. We would like to publish up to 5 articles with as wide a range of theoretical views as possible on a given topic. The peer review will be done in a month, with publication on-line within a couple of weeks. Over the next month, the authors of the articles are next asked to write a commentary paper of no more than 2000 words evaluating the other articles simultaneously published with their own with the goals of synthesis, integration, and expansion where possible. For any obviously incompatible points, we ask for specific suggestions on ways to empirically address the points to clarify which is likely correct. Only a cursory review will be done for the commentaries and these will also be published in the next issue. At the time of the publication of the original articles, a general call for commentary papers will occur, targeting submission within a month. These will be subjected to peer review and up to 5 new commentaries will be published the third month. The overall process is designed to create productive interaction and generation of new ideas.

In addition to these planned topic areas, we will also review other theoretical papers that do not fall into our planned areas and publish those that represent well-founded novel contributions. These articles will also be open for commentary. An open call for commentaries on the single paper will occur with the goal of these being received within a month and with peer review within 4 weeks. Those accepted will be published within 2 weeks. We also encourage empirical papers that relate to theory, hopefully many of which will be stimulated by prior issues of our journal. The same rapid review and publication will occur with any such articles. We anticipate publishing 8 to 10 original

articles each month in addition to commentaries. This target allows each issue to have two to three topics to facilitate interest from professionals in different areas of neuroscience.

We are particularly pleased with the idea of Registered Reports which was originated by Dr. Chris Chambers. We can foresee that this offers a means for interested researchers to provide the best planned studies with significant theoretical impact. Dr. Chambers is providing his own editorial in this issue.

The novel journal format of AIMS Neuroscience will require a rather large editorial board and ad hoc reviewers. We are looking for neuroscientists to join us in making this journal a success. We hope that some of you will give serious consideration to helping us in our endeavor.

Obviously, since there is no journal currently using our approach, there will necessarily be growing pains since we are exploring new territories. We may need to make adjustments in our overall approach to topics and commentaries based on logistical considerations, but we will do our best to reach the goal of making ours the most exciting and insightful neuroscience journal in the field. We plan to publish our own best theoretical work in AIMS Neuroscience and hope you will be willing to join us with yours. With innovative, strong theories we believe the advances that will occur in the next few years will surprise us all.

References

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