6.047/6.878 TERM PROJECT PROPOSAL EVALUATION FORM

Proposal Title: Analysis of gut microbiota and GWAS data to identify gut-brain interaction in ASD

Reviewer Role: #3. Discussant

Please use this review form to evaluate each proposal.

Reviewers will provide an overall impact score to reflect their assessment of the likelihood for the project to exert a sustained, powerful influence on the research field(s) involved, in consideration of the following five scored review criteria, and additional review criteria. An application does not need to be strong in all categories to be judged likely to have major scientific impact.

Overall Impact. ***What is the expected impact of this proposal, weighed by how likely it is to succeed. This requires originality, challenge, and relevance, but also that the aims are actually accomplished, so a high score also requires that they are likely to succeed.***

Brief summary of proposal (Primary Reviewers only, 1 paragraph, 2-3 sentences):

Summary of your assessment (Most salient points of the review, all reviewers):

The project is particularly interesting in its combination of two, seemingly correlated disorders and its attempt to relate the two; however, the approach used seems infeasible due to lack of firsthand, quality data as a sound basis for analysis.

Overall score (1-9, 9=best): 6

DETAILED REVIEW CRITERIA

Primary reviewers can be more thorough, and secondary reviewers can be more brief.

All reviewers will consider each of the five review criteria below in the determination of scientific and technical merit, and give a separate score for each.

Please note, your stated scores will not impact the grade of the student whose proposals you are reviewing. On the contrary, constructive criticism can help improve their proposals.

1. Significance/Challenge: ***If the application succeeds, what is the expected advance in the field. Is the problem tackled sufficiently complex and interesting for a term project? For your own proposals, you should balance challenge and probability of success. Please note that a score of 5 should still correspond to a feasible proposal for a term.***

Score (1-5, 5=best): 3

Strengths

- Significance is meaningful and would have implications in bettering our understanding of ASD and its development.

- Success would allow us to understand how gut microbiota and ASD are correlated, or not a causal relationship, which has been an outstanding question.

Weaknesses

- How will Aim 1 be achieved? In particular, the statistical clustering methods will likely be noisy and imperfect, making it difficult to identify a clear subset of the ASD patients who also have gut disorders. If this population cannot be determined, then the follow up aims

of the project cannot be accomplished.

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2. [Relevance] *Is the work proposed relevant to the class material? Are techniques presented in the class used, or extended, are the topics relevant to the biological problems presented in the class.* *Note: If the investigators are engaged in a similar activity (e.g. UROP), have they defined clear boundaries of what will be achieved in the context of the class.*

Score (1-5, 5=best): 4

Strengths

- The methods that are proposed are discussed and covered in class lectures, and the biological problem of autism is also discussed in the context of gene regulatory networks.

Weaknesses

- Some of the proposed methods extend beyond methods discussed in class, but are generally understandable by other students.

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3. [Innovation/Originality] *Are the methods proposed original, or are existing methods applied to original problems? Is the literature cited sufficiently enough to show that the investigators have a good grasp of the state of the field, so that they can show how their work relates to it. If there are closely related papers, do they show how their proposed work differs?*

Score (1-5, 5=best): 3

Strengths

- An attempt to analyze two distinct datasets concurrently in order to gain correlated insights in to autism and gut disorders is original – this particular combination of data has not been extensively studied.

Weaknesses

- Lack of citations in the literature for the feasibility of such a method; for example, finding previous studies that combined datasets for different diseases may be helpful in guiding this research.

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4. [Approach]. *This is about the "precision of dragon-slaying". No matter how big the challenge they're tackling, are they meticulous about how they will address it, the potential issues that may be most trickiest or most difficult, and how they will go about them, and what they will try to do if it doesn't work. Are the methods well laid out, and are the necessary datasets available? Is there a plan for testing the methodologies by simulation or gold standard datasets. Will they be able to interpret their results? Is there a plan for validation of the results? Even if all the other scores are very strong, this score determines the overall potential for success of the project.*

Score (1-5, 5=best): 2

Strengths

- Clearly defined goals for examining the output of many of algorithms and techniques.

Weaknesses

- Many uses of statistical clustering methods, which may not yield beneficial or clean results that can be interpreted.
- The statistical methods are vague or unspecified, which yields doubts on the understanding of scope and applicability of techniques that may be used.

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5. Presentation/Timeline. **Are the investigators explaining their ideas clearly, and providing enough background and information for the reviewers to assess the work. Please point to specific parts that were unclear, or should have been expanded. Is a detailed timeline presented for achieving the work?**

Score (1-5, 5=best):

Strengths

- Timeline is detailed, with key progress checkpoints that should be met by certain dates.
- Clear project aims and goals, with substantial background.

Weaknesses

- Lack of clarity in the methodology, in particular vague or generic techniques cited.