Systems biology final review: 40%

Requirement

1. Write a literature review, with your own thoughts.
2. Must be within systems biology research themes:
3. Using 1.5 or double space.
4. Must submit word document, not pdf,
5. Use the format and style of Cell's leading edge "Review","Primer","Perspective", must have the follow sections, 1. abstract/summary, 2. introduction, 3. several points, 4. discussion and future otherwise return for rewriting.
6. Scoring: formality 20
    a. Review format following requirement: pass: **3 points,** failed: rewriting and resubmitting in 1 week.
    b. Length: 1500-3000 words, **6 points**, every 100 words lower than 1500, deduct **1 point**; less than 1000 word, rewriting and resubmitting in 1 week, and final scored as 1000 word
    c. At least 5 references, pass: **3 points**, missing every reference, deduct **1 point**
    d. At least 3 figures, pass **3 points**, missing every figure, deduct **1 point**
    e. Turnitin plagiarism checking: <15%, **5 points**, 15-35%, deduction 0.1*(Turnitin plagiarism score-15%), >35% return for rewriting, and scored as 35%
7. Scoring: content 20
    a. Subjects: satisfied the following systems biology research themes: pass **3 points**, failed: rewriting and resubmitting in 1 week:
    b. Understanding and summarizing literature: excellent **6 points**, good **5 points**, fair **4 points**, insufficient **3 points**
    c. Logical expression: excellent **3 points**, good 2.**5 points**, fair **2 points**, insufficient **1.5 points**
    d. Critical thinking and personal opinions: excellent **5 points**, good **4 points**, fair **3 points**, insufficient **2 points**
    e. Writing: excellent **3 points**, good **2.5 points**, fair **2 points**, insufficient **1.5 points**

Systems biology research themes

1. Understanding biological regulation
    1) Metabolic control
    2) Signal networks
    3) Gene regulatory networks
    4) Growth control
    5) Pattern formation
    6) Morphogenesis

2. Inferring the details of complex processes
    1) High throughput data acquisition
        - Genomics, proteomics, other “omics”
        - Chromosomal occupancy and structure: *ChiP*
        - Epigenomics: chromosome accessibility,
        - 3D chromosome, *DNA and histone modification*
        - RNAi and other screening
        - Fluorescence activated cell sorting: *heterogeneity*
        - Automated quantitative microscopy: *spatial-temporal dynamics*
        - High-throughput imaging and analysis methods
        - Literature mining etc
    2) Statistical analysis of large-scale data
        - Bioinformatics
    3) Statistical inference
        - Frequentist’s *vs* Bayesian approach
    4) Model fitting and predictive modeling
3. Probing the constraints on, and limits of, biological performance
    1) Exploring model behaviors:
        - *parameter sensitivity*
    2) Elicidating physical and engineering constraints
        - *stochasticity, tolerance etc.*
    3) Understanding the consequences of variation and selection
        - *Robustness vs evolvability, optical behaviors vs fluctuating environments etc,*