

Strengthening Emerging Model System Biology at the University of Michigan

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Executive Summary (1 page)

The Model System revolution (which began in the 1980s and continues to this day) was driven by development of powerful genetic tools in various organisms (e.g., *S. cerevisiae*, *C. elegans*, *Drosophila*, *Arabidopsis*, *Mouse*, *Zebrafish* and *Xenopus*) and the realization that at the level of molecular pathways, many basic processes are highly conserved. While these popular models have driven major advances in many fields, e.g., development, cell biology, gene regulation and simple behaviors, they represent an extremely narrow breadth of biological diversity and do not cover all important areas of biological inquiry. Recent advances in high-throughput DNA sequencing and genome editing via CRISPR/Cas9-based mutagenesis have opened the door to the use of non-traditional model organisms to address important questions in cell/molecular biology. Evolution has created a veritable smorgasbord of organismal diversity that is well-suited for revolutionizing how we address basic and disease-related biological questions. There is no doubt that these emerging model systems will play a critical role in the life sciences in the coming decades, particularly in areas that are currently understudied or unapproachable due to the tight focus on a limited number of model organisms. ***Increasing the diversity of model systems at the University of Michigan is essential to maintain our position as a leader in basic and biomedical research.***

To address the aforementioned need, we have assembled a multidisciplinary group of researchers from several departments/units and submitted a Scientific Research Initiative Letter of Intent that proposed to hire three faculty working on non-traditional model systems. Our intent was that hiring in these areas would start to address the lack of emerging model system biology at the UM. The BICC suggested that our proposal could be improved with more focus on a particular research area. The current proposal requests funds to support a seminar program focusing on three research areas where emerging model systems making an impact. Prominent researchers in these areas will be invited to visit the UM, give a seminar, and advise us on areas that could be developed into Scientific Research Initiatives. In addition, we will also invite post-doctoral fellows from the speaker's lab or institutions to give more informal presentations to our group, with the goal of identifying candidates that could be recruited in subsequent faculty searches. **We envision this seminar series to result in the establishment of up to three groups who will develop and submit Scientific Research Initiatives to the BSI over the next two years.**

A key feature of our series will be to establish relationships with senior and junior researchers using emerging model systems, and to showcase existing strengths at the UM, illustrating. We provide specific examples of how investigators using emerging systems would synergize with existing departments/programs on campus (MCDB, EEB, HG, MIP, C-POD and others). This will **strengthen connections** between existing research programs and provide a foundation for a long-term emphasis on developing emerging model system science at the University of Michigan.