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DEPARTMENT OF INTEGRATIVE BIOLOGY

BERKELEY, CALIFORNIA 94720-3140

December 15, 2003

Biocomplexity Faculty Search Committee
c/o Prof. Rob de Ruyter van Steveninck
Biocomplexity Institute
Indiana University
Swain Hall West 117
Bloomington, IN 47405-7105

Dear Search Committee :

I am writing this letter in support of Lance Davidson's application for a position in your department. Lance Davidson earned his Ph.D. in Biophysics at the University of California at Berkeley, where George Oster and I were his major professors (Oster was his mathematical modeling mentor, I was his biomechanical mentor, and Ray Keller taught him how to work with living embryos). Lance is one of those rare biologists who excels both in empirical laboratory research and in quantitative theoretical work, and is therefore able to couple theory with experiment in an impressive way. His research is aimed at understanding the physical mechanisms by which shape changes occur during morphogenesis, and he has been focusing on the process of gastrulation in sea urchin and frog embryos. A real strength of the mathematical models Lance has developed is that they involve measurable parameters and yield predictions that allow him to test experimentally alternative hypotheses. He is also a skilled developmental biologist, and is a wizard at microsurgery and biomechanical measurements of embryonic cells and tissues.

While a postdoc at the University of Virginia, Lance has studied neural tube closure in frog embryos, mesoderm migration during frog gastrulation, and cell intercalation. He has also documented the cell behaviors responsible for the incredibly rapid wound healing shown by embryos. He is now also studying the mechanisms responsible for the migration of head mesoderm; he has developed an explant system in which he can study these processes and is developing techniques to visualize actin, cell-cell interactions, and cell-substrate junctional complexes in real time.

By his quantitative skills, his computer programming experience, and his talents at working with living embryos and explants, Lance is uniquely suited to making innovative, important contributions to our understanding of how embryos take shape. He is both clever and hard-working, and he has tremendous potential for a productive, creative career. Although I have not had the opportunity to see Lance teach, I have heard him give a number of scientific talks, all of which were clear, well-organized, well-illustrated, and interesting; therefore, I suspect that he will be an effective teacher.

Sincerely,

M. A. R. Koehl
Professor