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Department of Biology
1009 Silver Building
100 Washington Square East
New York, NY 10003-6888
Telephone: (212) 998-8210
Fax: (212) 995-3671
Email: gloria.coruzzi@nyu.edu

Gloria Coruzzi, Ph.D.
Chair
Carroll and Milton Petrie Professor

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To the Members of the Search Committee:

I am writing to enthusiastically endorse the application of **Dr. E. Jane Albert Hubbard** for a faculty position in your department. Dr. Hubbard is a scholar of the first rank who brings an extraordinary level of scholarship, vision, excellence, and devotion to all three aspects of her professorship - research, teaching, and service- that is rarely matched by any one individual.

Dr. Hubbard joined the Biology Department at NYU in January 1998, after graduate training at Columbia University (PhD 1993), and postdoctoral work in the laboratory of Iva Greenwald. Her performance as both a graduate student and post-doc was outstanding, with papers in excellent journals including *Science* and *Genes and Development*. As an Assistant Professor at NYU, she established her lab in the field of germ cell development. She initiated two major new approaches to understanding the molecular events that control the behavior of stem cells: one molecular-genetic approach, which involved the development of a new genetic screen, and the other a mathematically-based, systems approach to model this developmental process in collaboration with colleagues at NYU Courant and Weizmann. Both approaches have been highly successful, as judged externally by grants, papers and recognition in the field.

The importance, significance, novelty and excellence of this work are validated externally by her ample and generous funding. Her first NIH grant in reproductive biology received an unprecedented 1.6% score in the highly competitive general medical section of NIH, and has recently been renewed for 4 additional years (2006-2010). Dr. Hubbard is also a visionary in her second area of research in Systems Biology being performed in collaboration with computer scientists at NYU's Courant and the Weizmann Institute, whose goal to "creating a virtual multi-cellular animal model", has received external validation and acclaim, most tangibly in the form of a 1.2M NIH GLUE grant, on which Dr. Hubbard is lead PI.

In the genetic approach, Dr. Hubbard developed a temperature sensitive screen for mutants that have lost control of germ line proliferation. To date, Dr. Hubbard's lab has screened more than 30,000 genomes for defects in germ line cell production. This large

temperature sensitive screen has identified two general classes of mutants called *nog* (no apparent germ line), and *pro* (proximal proliferation mutants) that show germ cells proliferating in a region of the gonad that normally contains only differentiated cells. Dr. Hubbard's laboratory has cloned the affected genes in several mutants. These studies have revealed novel functions for genes previously known to be involved in germ line cell fate (e.g. *glp-1*), and have also identified a number of newly discovered genes involved in this process (e.g. *pro-1*) Dr. Hubbard publishes studies that are deep, insightful and complete, rather than partial stories. They challenge current dogma, and present new models for the regulation of germ line cell differentiation. Dr. Hubbard has published 5 excellent papers in high profile journals including *Genetics (2)*, *Developmental Biology* (2) and *Development (1)*, the latter of which has been highlighted by the Faculty of 1000. This paper reports a new and important finding, that development of the germ line requires a previously uncharacterized interaction between specific somatic cells (distinct from the well-known 'Distal Tip Cells') and the germ line. The paper also identifies the gene responsible for the phenotype, which encodes a WD repeat protein – later found in yeast and drosophila.

In addition to the molecular-genetic approach, Dr. Hubbard's research program has a second and extremely important component, which is indirectly related to her work in the germ line, but represents a novel and innovative direction, a systems-based modeling of development. It is clear that in the genomic era, mathematical approaches will be required to fully describe and understand biological processes. Dr. Hubbard has taken a proactive stance in this movement toward combining math and biology, and has initiated collaborations with local and international computer experts who are interested in modeling various biological processes including germ line development. The strategy is to use computer models to predict experiments, the results of which are then used to refine the models. This work is past the beginning stages, as evidenced by their recent publication in *PNAS*, "Computational Insights into C. elegans vuval development", which was recently highlighted in Nature Reviews Genetics (April 2005).

Dr. Hubbard's publications in the emerging field of Systems Biology are attempting to break new ground and those in developmental genetics are deep and challenge existing dogma. Her publication rate had an initial lag phase early in her career, due to setting up a new genetic system, and to Dr. Hubbard's style of publishing the full story- not small pieces. However, as you will see from her vitae, Dr. Hubbard is now reaping the rewards of her initial investment, and there is every indication that this high publication trajectory will continue.

In addition to her research, Dr. Hubbard is an extraordinary, devoted and award winning teacher. Dr. Hubbard developed two new courses at NYU: Advanced Genetics for graduate students, and Genetics laboratory course for undergraduate students. Most importantly, she went beyond the norm to write and obtain an NSF grant to fund the equipment component required for her Genetics course. She is also involved in team teaching several other classes, including Principles of Biology, Molecular and Cellular Biology, Molecular Genetics, Developmental Genetics, and Molecular Controls of Form and Function. All indications suggest that she is very effective and engaging in the

classroom and her student evaluations are excellent. Dr. Hubbard received a "Golden Dozen" award at NYU in Spring 04, to recognize her dedication and achievements in teaching. She is very dedicated to using her research program to train a new generation of graduate and undergraduate students. At the graduate level, she is an active member of the Developmental Genetics track, which is co-sponsored by faculty in our department and the Skirball Institute at NYU School of Medicine. She has trained numerous PhD students, MS students, and undergraduate students. She works with each student individually, and the results are quite impressive. Several of her undergraduate students have won competitive awards for research, and some undergraduates have presented work done in her lab at national meetings, at least two will be co-authors on publications, and one was inspired to go to the PhD program at Princeton University. Dr. Hubbard serves as a key mentor and role mode to her students.

In addition to research and teaching activities, Dr. Hubbard is an outstanding colleague who contributes far more than her share to the various activities of the department. She has served on numerous departmental committees, including Admissions and Awards, Curriculum, Advisement, and Faculty Recruitment. She takes these duties very seriously; she speaks her mind clearly, and has a real passion for the academic life. Dr. Hubbard is also serves on grant panels including NIH, has co-organized a recent International *C. elegans* meeting, and also served as a session chair. She has also co-organized several New York Area Worm Meetings and is an extremely active member of the Faculty of 1000, whose reviews have received the highest praise.

In summary, Dr. Hubbard excels in research, education and service. Her choice of research approach is excellent and important to the field of biology, reproduction and stem cell research and combines a host of interdisciplinary approaches: Genetics, Development, Systems Biology and newer genomic approaches. Dr. Hubbard's publications spanning two areas have hit a high mark. Her publications in Developmental Genetics are deep and challenge existing dogma, and her collaborative publications in the emerging field of Systems Biology break new ground. There is every indication that this high publication trajectory and grant track record will continue. Jane is a most highly regarded member of our department, and I can think of no other scientist who embodies the research scholar-teacher role more. She has the unreserved respect and support of myself and of all of her colleagues at NYU Biology. Her departure from NYU will be a great loss for our department.

Please feel free to contact me if you have any questions or need additional information.

Sincerely,

Gloria Coruzzi

Gloria Coruzzi, Ph.D