Consortium on Law and Values in Health, Environment & the Life Sciences

2010-11 Student Proposal Cover Page

Applicant Information

Applicant Name: Nathan Crowe
Project Title: 'A Fantastical Experiment:' Tracing the Development of Biology and Society in America Through the Lens of Cloning, 1952-1982
Department: Program in the History of Science, Technology, and Medicine
College: Institute of Technology
Home address: 3350 Colfax Ave. S. Apt. #3 Minneapolis, MN 55408
City & State: Minneapolis, MN Zip: 55408
Faculty advisor name: Mark Borrello Email: borrello@umn.edu
Dept. Head's name: Sally Kohlstedt Dept. Head's email: sgk@umn.edu
Dean's name: Steven Crouch Dean's email: crouch@umn.edu

How did you hear about this funding opportunity? My DGS, Susan Jones

Funding

Total amount of funding requested: $8782.00

Executive summary (maximum 200 words)

My dissertation examines the history of nuclear transfer (commonly referred to as 'cloning'), tracing its scientific development and the public discussions it provoked from its birth in 1952 until it fell out of general favor in the early 1980s. This history reflects a change in both the practice of biology after 1950 and the growing uneasiness within the public about the direction of biological research and the motivations of its practitioners. This study gives insights into the relationship between science and society, particularly addressing the question of why certain scientific events become relevant within society while others are neglected. The answer to this question is not as simple as it may seem and relies heavily on the development of the science itself and the social climate in which it is introduced. Consequently, my work is relevant for those concerned with shaping the current direction of scientific research and those interested in anticipating tensions between biology and society in the future. I am applying for a Consortium grant to complete the primary research phase of my dissertation this summer, which includes salary and research related expenses.

Approvals

Check all appropriate approvals required for your proposal. Approvals must be obtained prior to receipt of funding. If you have applied for approval but have not yet received it, indicate that below.

☐ IRB Status
☐ IACUC Status
☐ Other Status

Checklist

☒ The proposal is 1000 words or less excluding budget, biographies, references and citations.
☒ The proposal includes a work plan with a specific timeline using months or quarters to identify work to be done and completion dates.
The proposal includes a 1-2 paragraph biography of the applicant and all co-investigators.

The budget form is complete including the funds sought for this project, other pending applications for this project, and the amount/source of matching or other funds.

The applicant's faculty advisor is copied on the application email. Professional students w/o advisors check NA.

All necessary approvals are pending or received.
'A Fantastical Experiment:' Tracing the Development of Biology and Society in America Through the Lens of Cloning, 1952-1982

Project Description:
My dissertation examines the history of nuclear transfer, tracing its scientific development and the public discussions it provoked from its birth in 1952 until it fell out of general favor in the early 1980s. Taken together, the scientific and social narratives surrounding nuclear transfer reflect a change during this time in both biological practice and the public evaluation of science. In common parlance, nuclear transfer is known as cloning, and its most popular association is with the birth of a cloned sheep, Dolly, in 1997 — an event that sparked significant political, social, and scientific discussions in the United States and Europe. However, Dolly’s birth and the subsequent debates in fact mirrored similar events that occurred in the 1960s and 1970s, when nuclear transfer was a more common scientific practice. Historians and science studies scholars have generally focused on the events immediately leading up to and following Dolly’s birth, overlooking the important lessons that can be derived from an analysis of the earlier history of nuclear transfer.

Embryologists Robert Briggs and Thomas King had pioneered successful nuclear transfer experiments with frogs in 1952, intending to answer basic questions about development and eventually to gain control over cancer cells. Their work gained significant scientific attention, and other laboratories began using similar techniques. British biologist John Gurdon extended the experiments in the 1960s by using nuclei from more specialized frog cells. In the late 1960s, Nobel Prize-winning geneticist Joshua Lederberg speculated publicly that this technique could one day be used to clone humans. Ethical and scientific debates over the ramifications of cloning raged throughout the 1970s and were exacerbated by claims of fraud within the scientific community and popular books on the subject. These debates eventually garnered enough attention that at a 1978 congressional hearing, biologists were called to testify about the nature of their work, their motivations, and the potential accomplishments of nuclear transfer.

The development of nuclear transfer techniques in 1952 represented an increased desire of biologists to manipulate life for specific biomedical purposes. The new insights and control that biologists had gained in the decades following 1950 — exemplified by the discovery of DNA’s structure in 1953 — raised the level of interest and concern of the broader society about the direction of biological research and the motivations of its practitioners. Other social factors during these decades also contributed to a growing awareness of the direction of biology including a disillusionment with science after World War II, a growing fear in the 1960s of the ‘population bomb,’ and the public’s (at least through their representatives in government) increased input into the biological research, as federal funding for science grew during these years. Finally, the discipline of bioethics emerged in the late 1960s, creating a source of expertise for the public on issues surrounding biology, society, and morality. Cloning, in fact, would become one of the "opening rounds of bioethical discourse."1

In my dissertation, I argue that cloning via nuclear transfer became a contested science in the 1970s not just because of the new molecular and engineering culture of biological research, but also because many in society had developed a prudent approach in evaluating biological research. To do this, I answer several important historical questions.

---

How did the technique of nuclear transfer develop, and how do these experiments reflect a change in the way biological research was conducted during this time? What events contributed to the shifting attitudes within the public toward biology? In what ways were nuclear transfer experiments contesting or tapping into the publics' understanding of the role of biology in society and the limits of biologists themselves?

I draw upon archival sources, published works and a series of oral histories for my analysis of the scientific developments and social reactions to nuclear transfer. I have already examined the archival material from Briggs and King's research at the Fox Chase Cancer Center in Philadelphia. I would use funding from the Consortium award to conduct research at the National Archives including the National Institutes of Health (NIH) to shed light on the motivations of these biologists, as the new era of federal funding demanded researchers to validate their work. I would also conduct oral histories of several participating scientists, which would offer an invaluable window into the early motivations of researchers. These include two members of Briggs and King's original research team, Marie Di Berardino and Robert McKinnell, as well as John Gurdon. I will also evaluate the papers of Joshua Lederberg and Paul Ramsey, two important figures who engaged in early debates over cloning. Additionally, understanding the archival and published records of the early bioethics institutions including the Hastings Center (official records granted to the National Library of Medicine) and the Kennedy Institute for Ethics will be important to situate the role of this emerging discipline.

Greater Significance:
The history of nuclear transfer experiments and its subsequent discussions allow us greater insight into the relationship between biology and society during the last 60 years, a period in which the profile of biology has risen substantially. The results of this study could inform today's science policy experts who seek to understand why, out of the abundance of scientific activity — almost all of which has consequences for the future — certain scientific experiments or ideas become significant within society. As we move forward, the insights of my work will be invaluable as biological knowledge becomes more impenetrable to the lay public and their reactions become more dependent on the social climate in which scientific discoveries and debates occur.

Timeline for Award Use:

**June 2010** - Using consortium funds, I will spend four weeks in Washington D.C. conducting research at the NLM (papers of Joshua Lederberg, the Hastings Center) and the National Archives (NIH papers).

**July 2010** - Under the proposed plan, I will also spend two weeks at Duke University examining the papers of Paul Ramsey. The remaining weeks I will prepare for upcoming oral histories.

**August 2010** - Conduct oral histories with Marie Di Berardino (Philadelphia), Robert McKinnell (Minneapolis) and John Gurdon (London).
Brief Biography:  
I am a PhD candidate in the History of Science, Technology, and Medicine program. Since passing my preliminary exams in the summer of 2009 I have made steady progress through the early stages of my dissertation, securing topic approval from my committee and completing the necessary review of the secondary literature. I plan to complete all of my dissertation research by the end of the 2010 and to begin full-time writing by the beginning of 2011.

Throughout my graduate career at the University of Minnesota, I have conducted a broad study of the history of twentieth century biology, focusing particularly on the history of developmental biology and the rise of molecular biology. The success that I have found within this graduate program has been the direct result of the academic foundations set by my undergraduate and master’s degree programs. As an undergraduate at St. Mary’s College of Maryland, I double majored in biology and history, graduating in the spring of 2003. In an effort to explore my interest in both, I pursued a terminal masters degree at North Carolina State University. While in my masters program, I completed course work and a master’s thesis within the history of science and became thoroughly convinced that I wanted to pursue a career within the field. I graduated from North Carolina State University in May 2006 and began at the University of Minnesota that fall.
<table>
<thead>
<tr>
<th>Description &amp; justification</th>
<th>Requested funding</th>
<th>Matching/other funding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel costs</strong></td>
<td><strong>Amount</strong></td>
<td><strong>Amount</strong></td>
</tr>
<tr>
<td>Your salary (stipend)</td>
<td>10 weeks of salary (20 hrs per week) at $19.72 per hour - Total: $3,944</td>
<td>$3,944.00</td>
</tr>
<tr>
<td>Other personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Personnel Subtotal</strong></td>
<td></td>
<td>$3,944.00</td>
</tr>
<tr>
<td>Speaker Honoraria</td>
<td>Number of speakers and amount of honoraria</td>
<td></td>
</tr>
<tr>
<td>Supplies &amp; Services</td>
<td>To make copies at archives</td>
<td>$200.00</td>
</tr>
<tr>
<td>Equipment</td>
<td>PCM-M10 Portable Digital Recorder for oral histories (priced via Amazon.com on 2/08/2010)</td>
<td></td>
</tr>
<tr>
<td>Travel to Washington, DC for four weeks to conduct research at National Archives (National Institutes of Health), Georgetown University (Kennedy Institute of Ethics), National Library of Medicine (Joshua Lederberg and Hastings Center)</td>
<td>Flight ($300); metro rail pass for 20 business days ($80); lodging ($0 - staying with friends); meals $40/day (federal per diem is $71) for 28 days ($1120) - Total: $1500</td>
<td></td>
</tr>
<tr>
<td>Travel to Durham, NC for two weeks to conduct archival research at Duke University with Paul Ramsey's papers</td>
<td>Flight ($300); ground transportation for 10 days ($50); lodging ($0 - staying with friends); meals $40/day for 14 days ($560) - Total:</td>
<td></td>
</tr>
<tr>
<td>Travel to Philadelphia to conduct oral histories with Marie Di Berardino and associated scientists - 5 day visit</td>
<td>Flight ($300); metro transportation for 5 days ($20); lodging ($0 - staying with friends); meals $40/day for 5 days ($200) - Total:</td>
<td></td>
</tr>
<tr>
<td>Travel to London, UK to conduct oral history with John Gurdon and associated scientists - 5 day visit</td>
<td>Flight ($1200); ground transportation ($20); lodging ($0 - staying with friends); meals $40/day for 5 days ($200) - Total:</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal research supplies, equipment, travel, other</strong></td>
<td>$4,838.00</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>TOTAL BUDGET</strong></td>
<td><strong>$8,782.00</strong></td>
<td><strong>$0.00</strong></td>
</tr>
</tbody>
</table>

1. Stipend justification. You must justify the amount of stipend you are requesting by identifying the number of hours you plan to work on the project and the hourly wage used for research assistants in your department. Include fringe benefits.

2-4. Identify all other personnel to be paid from this grant including interpreters, travel guides, etc. and justify their salary by identifying the number of hours they will work and the hourly wage. What is the hourly wage based on?
6. For colloquia, identify the number of speakers and the amount of honoraria you will provide.
7. Supplies and services. List out all supplies and their estimated costs. Explain in line 7 or in the body of your proposal what the supplies will be used for.
8. Equipment costs are allowable only if the justification clearly shows that the equipment is necessary for the project. Include explanation of what will happen to equipment at completion of project.
9. Travel costs must include a description of the purpose of the travel, start and stop dates of travel, transportation costs, housing costs, and allowable per diem (use University rates found at http://travel.umn.edu).