Organized Research Centers/Institutes for Advanced Studies  
Annual Report and Budget Proposal Guidelines  
Budget Request July 1, 2015-June 30, 2016  

Items I through II (combined) must not exceed three pages

Center Name: EvoS  
Center Director: David Sloan Wilson  
Center Co-Directors (if applicable): The Steering Committee consists of Nicole Cameron (Psychology), Leslie Heywood (English), Andreas Pape (Economics), Matthew Parker (Biology), Rolf Quam (Anthropology) and Hiroki Sayama (Bioengineering and Systems Science and Engineering)

Center Accomplishments During Reporting Period

a) Describe center accomplishments during reporting period. Summarize how the center brings visibility to the University. Include demonstration of multidisciplinary success of center (i.e. multidisciplinary authors on papers, multidisciplinary grant support, etc.)  
EvoS continues to be a major intellectual presence on campus at all levels (undergraduate, graduate, faculty). Its centerpiece continues to be the EvoS Seminar Series, which brings approximately 10 distinguished speakers to campus every semester, representing all biological and human-related topic areas from a unified theoretical perspective. Unlike other seminar series, which are typically attended by faculty and graduate students from a single academic discipline, the EvoS seminar series is attended by an interdisciplinary audience of faculty and graduate students and by large numbers (<90) of undergraduate students thanks to the 2-credit “Current Topics in Evolutionary Studies” seminar associated with the series. This newly produced informational video about EvoS describes how it integrates teaching and research across age categories and disciplines.

b) Discuss collaborations with government, academic and/or industrial partners.  
EvoS has inspired a number of similar programs at other colleges and universities that are organized as a consortium with its own website and E journal. The Binghamton Neighborhood Project, which provides science-based solutions to real-world problems in our area, is an outgrowth of EvoS and includes collaborations with a variety of partners such as the mayor’s office, the United Way of Broome County, and the Safe Streets Neighborhood Association. EvoS is also closely connected to the Evolution Institute, a think tank that formulates public policy from an evolutionary perspective, which D.S. Wilson also directs. BU’s Office of Creative Development played an important role in developing This View of Life, a communication outlet that is currently run by the EI. There are good reasons to strengthen the ties between EvoS-Binghamton, other campuses with EvoS programs, and the EI.

II. Future Directions

Summarize briefly the center’s long-range plans:  
EvoS is at a crossroads, given that the director (D.S. Wilson) is going on half retirement starting fall 2015. His purpose is to become more research active by reducing his teaching and administrative load. He is still fully invested in the continuation and growth of EvoS, but the program must be structured in a way that does not require as much of his involvement in the teaching and day-to-day operation and ultimately results in a new director for the program. Wilson has been in conversation with Don Nieman and Anne McCall on this issue. Obviously, the continuation of EvoS as an Institute for Advanced Studies supported by the Research Foundation hinges on the continuation of EvoS as a campus-wide curriculum program supported by the Provost and Dean of Harpur College.

Given that EvoS is going to continue as a program, we have identified the following growth areas for externally supported research.

1) Using an Expanded View of Evolution to Achieve the Core Goals of STEM Education.  
Teaching evolution across the curriculum is an important objective worthy of external support in its own right, but in addition we have evidence that it can help to achieve the core goals of STEM education, broadening the possibilities for external funding. This is the subject of a white paper written in January 2015 and circulated among faculty and administrators involved in STEM education research in addition to the upper administration, which is included in this report as an appendix.
2) K-12 Education. The same principles that make EvoS successful at the level of higher education can be applied at the level of K-12 education. This includes not only “teaching evolution” but also “using evolution to teach” by creating social environments conducive to learning any subject. We have already had success in this area with the Regents Academy, a program for at-risk Binghamton High School students that was demonstrated to be highly successful in a randomized control trial (Wilson, Kauffman and Purdy 2011), although the program was nevertheless discontinued by the Binghamton City School District after three years, revealing the paradox of practices that work but don’t spread (Wilson 2014). We are currently beginning a partnership with a charter school in Ithaca and a number of other collaborations in the education sector through the Evolution Institute. This is an example of a topic area that could be developed in the Binghamton area through the auspices of EvoS or at other locations through the auspices of the EI, with the optimal scenario a combination of both.

3) Integrating Evolutionary Studies with Environmental Studies. One of the most important discoveries in evolutionary science during the last few decades is that genetic evolution can take place much faster than previously thought. This means that the properties of species that determine their ecological interactions cannot be assumed to be constant over short time scales. Evolution and ecology must be studied in conjunction with each other as never before, with important practical implications for medicine, agriculture, and environmental biology. Carl Lipo, the newly hired director of BU’s environmental studies program (a Sustainable Communities TAE Core Hire), is acutely aware of the need for environmental studies to be integrated with evolutionary studies and EvoS was one of the drawing cards that attracted him to Binghamton. There is a lot of external funding potential worth exploring for forging stronger ties between Environmental Studies and Evolutionary Studies at BU.

4) Community-based Research and University-Community Relations. The Binghamton Neighborhood Project is an outgrowth of EvoS that uses the Binghamton area as a “field site” for basic and applied human-related research from an evolutionary perspective. It has its own steering committee but still falls under the umbrella of EvoS as an IAS (i.e., it does not have the status of a separate ORC). The BNP is one of the most active branches of EvoS and many of its projects have external funding potential, including the currently funded Binghamton Religion and Spirituality Project. In addition to its external funding potential, the BNP has national visibility and plays an important role in University-Community relations. Between its basic science potential, practical applications, and appeal to agencies and donors interested in the Binghamton community per se, the BNP can draw upon a wide range of external funding sources.

5) The EvoS Lifestyle Project. This project, which received IAS funding two years ago, experienced a delay involving an attempted collaboration with the UHS Diabetes Care Unit that ultimately did not work out. The project has returned to its original intention of drawing participants from the general population and will begin trials this summer. It still has the potential for external funding that was originally envisioned for it.

Describe how these plans are being met: The structure of EvoS is unique—nearly 100 BU faculty representing all academic disciplines and sharing a single theoretical perspective. For any given project such as the four listed above, a group of faculty who are interested in starting an initiative begin working together and are facilitated by the resources provided by EvoS. Examples of facilitation include the use of our new physical space (Science III rm 113), pilot grants (when resources are available), bringing colleagues to campus and publicizing a topic through the EvoS seminar series, and so on. In addition to project development, most projects originate because we are an ongoing multidisciplinary community capable of communicating with each other by virtue of a shared theoretical perspective.

Estimate anticipated non-budgetary resource needs you foresee in the future for the center and describe your timetable for scheduling an external review of your center. As stated at the beginning of section II, the future of EvoS requires a high-level discussion that includes the Provost and Dean of Harpur College along with the Research Foundation. An optimum course of action would be to recruit a new director for EvoS, but this needs to be synergistic with departmental and TAE interests. There are strong parallels between BU’s Environmental Studies program and EvoS. Recruiting a new director for the Environmental Studies program represents a quantum jump in BU’s investment in the program and the choice of Carl Lipo as the director is an excellent start. Doing the same for EvoS will let the current director play a strong role that is a commensurate with his half-salary. In fact, it is likely that Wilson can play a stronger role in grant development than currently possible, once freed of the day-to-day workload of maintaining the program. The timetable for external review of EvoS can be coordinated with these major decisions.
ATTACHMENTS

Center Personnel

List faculty members actively engaged in center’s research or its administration. The Steering Committee consists of Nicole Cameron (Psychology), Leslie Heywood (English), Andreas Pape (Economics), Matthew Parker (Biology), Rolf Quam (Anthropology) and Hiroki Sayama (Bioengineering and Systems Science and Engineering).

List graduate and postdoctoral students directly contributing to the unit who: a) are on the unit's payroll; b) participate through assistantships, fellowships or traineeships; or c) are otherwise involved in center’s research and scholarly activities: Graduate students participate in EvoS in the following ways:

- By earning the graduate certificate in Evolutionary Studies.
- By participating in the newly formed EvoS Graduate Student Association.
- By interacting with EvoS seminar speakers, including the Monday lunch period reserved for graduate students.
- By participating in EvoS-related research programs.

Dozens of graduate students are engaged in this matter, who will not be listed by name.

List (and FTEs) professional, technical, administrative and clerical personnel employed by center.

Hadassah Head (half-time coordinator)

2. Center Productivity During Reporting Period

Note: With so many EvoS faculty participants, it is difficult to list publications and other forms of productivity for the whole program. To given an example, an EvoS pilot research grant was awarded to Prof. Heather Fiumera (Biological Sciences) to initiate a new line of research that led to an RO1 NIH grant. An undergraduate in Prof. Fiumera’s lab recently was awarded a prestigious NSF predoctoral grant to attend graduate school at Stanford University. Can EvoS be credited for some of this success and productivity? Many similar examples could be cited. To keep this report manageable, we site publications and presentations by the director that are directly EvoS related.

Publications


Presentations

February 20 2014: Grand Rounds, Montefiore Medical Center, Bronx, NY
March 5 2014: University of Oslo, Norway
April 4 2014: SUNY Broome Sixth Annual Conference on Applied Ethics
April 11 2014: Northeastern Evolutionary Psychology Society
April 24-5 2014: Capital Region Theological Center two day workshop
June 5 2014: Congress for the New Urbanism symposium on Happy Cities
June 11-14: Englesberg Seminar on Religon (Sweden)
June 18-22: Association for Contextual Behavioral Science workshop on PROSOCIAL
Sept 14 2014: Binghamton Micocosm Expo, Binghamton University
Sept 16 2014: Drexel University LeBow College of Business
Sept 25 2014: Ecodistrict Summit, Washington DC

List all symposia, meetings, and lectures or lecture series directly related to center activity.
• Please visit the EvoS website for a listing of seminars during the 2014 academic year and an video archive of the seminars.
• In addition, a May 12 2014 visit by Rosanne Haggerty was a notable event organized by EvoS in collaboration with President Harvey Stenger and the Sustainable Communities TAE. Haggerty was introduced by President Stenger and myself and spoke about community-based research to an audience of over 60 stakeholders following a dinner at BU’s Event Center.

3. Current Sources of Support/Space
List proposals submitted and grants awarded to participating faculty credited to the center during the reporting period (including sponsor name and amounts). Any additional sources of support to the center should be included, such as internal support, income from service facilities, sale of publications and from other services. Describe the critical role that the center played in the development of each research proposal and grant award submitted through the center.
Annual Operating Budget for the center, including all sources of funds available for center activities.
Description of space currently occupied by center, if applicable.
Please see the attached document provided by the RF office.

4. New Budget Request and Justification (if applicable)
   a. Describe and justify any requested funds for the period July 1, 2015-June 30, 2016.
      In view of the major decisions being made for EvoS, we request the standard allocation of 2K for the next academic year, which will be used to develop the initiatives listed in Section II.
   b. Describe how center is reducing reliance on internal support. The future of EvoS as an IAS is intrinsically bound to the future of EvoS as an undergraduate and graduate curriculum program. The case that I am presenting to the higher administration is that if transdisciplinarity is to be taken seriously, then transdisciplinary programs must be supported in the same way as academic departments, which means a core of intramural support that provides a stable foundation for seeking external support. We don’t expect academic departments to rely exclusively on external support, even though we do expect at least some departments to pay their way with grants over the long term. With this in mind, EvoS is seeking external funding to support its core program (see attached white paper on STEM education) in addition to a diversity of research projects, as described in section II.
Using an Expanded View of Evolution to Achieve the Core Goals of STEM Education

A white paper to explore external funding opportunities for EvoS

David Sloan Wilson
SUNY Distinguished Professor of Biology and Anthropology, Binghamton University
Director of EvoS, BU’s Campus-wide Evolutionary Studies Program
President, Evolution Institute

January 26 2015 draft
“The material I have learned in this class will definitely remain with me as I finish my schooling and head onto my career path...Having seen the numerous fields that evolutionary theory can be applied to, I do not believe that I will ever look at anything the exact same way that I did prior to this course.”

“When people ask me about this class, the first thing that comes to my mind is that it is “the EVERYTHING class.” This may sound silly or nonsensical, but my point is that everything we learn is so applicable to a variety of disciplines. And that is just the beauty of it. I walked into this class slightly uncertain of my future career goals. I walked out with the unique opportunity to conduct research in a field that is applicable to anything and everything that has interested me.”

“Each day in class I was able to take something that we talked about and apply it to my life outside of the classroom. Often times, I recall going back to my friends and explaining “something so awesome” that we talked about.”

“Everything that I learned in this class will definitely stick with me throughout my life. It sounds cheesy and cliché, but I still reference even some of the articles that we read....”

“The concepts I learned throughout this course are things I will actually keep throughout my life....You subscribe to a new way of thinking and viewing life.”

“I had never even thought about some of the connections that this class exposed me to, and it really has made me think of the world in a different light.”

“Overall, this class has changed my view of evolution. It will undoubtedly affect my research interests and academic career for the rest of my life.”

“I believe that due to this versatility I will continue to utilize the information I have learned beyond the realm of this course and apply it when I can.”

“The relevance evolutionary theory has in relation to other subjects is definitely one of the most important concepts I will take away from this class.”

“Because of this radical re-shifting in my thought process, I truly think that some of the concepts learned in this class will stick with me for a while.”

These passages are from student evaluations of a course titled “Cultural Evolutionary Theory” (Biology 452), which was taught at Binghamton University in spring 2014. The course teaches evolution as a theory that goes beyond genetic evolution to include other mechanisms of inheritance, including epigenetic mechanisms, forms of social learning found in many species, and forms of symbolic thought that are distinctively human. This approach expands evolutionary theory beyond its traditional domain in the biological sciences to include all of the human-related disciplines, including the humanities in addition to the sciences and the applied sciences in addition to the basic sciences.

Teaching an expanded view of evolution has a transformative effect on the students, which they express in their own words in their course evaluations. If the course were merely successful at teaching evolution, this would be an important accomplishment in its own right. But the comments clearly indicate that something even more important was accomplished—in addition to effectively teaching evolution, the course achieved some of the core goals of STEM education.

What are the core goals of STEM education? A short list includes the following.

• To develop successful methods for teaching and learning science, technology, engineering, and mathematics.
• To make STEM learning accessible to a culturally diverse student population.
• To make STEM learning transferable across topic domains.
• To make STEM learning relevant to the future careers and everyday lives of students.
• To make STEM learning relevant to the solution of real-world problems.

The idea that a certain approach to teaching evolution can help to achieve the core goals of STEM education is relatively novel within the STEM research community, but it has been under development for over ten years at Binghamton University and has given rise to a worldwide consortium of programs inspired by our example. In addition, a long view of intellectual history indicates that the approach pioneered at Binghamton can and should become the norm for trans-disciplinary education everywhere. The question is not whether it should take place but how fast it can be catalyzed.

A Long View of Intellectual History

A naïve view of science imagines that theories are created from a common stock of observations. First we see and then we theorize. Theories that do the best job of explaining the observations are accepted, only to be challenged by another round of theories. Every inning of this scientific sport brings our knowledge of the world closer to reality.

The problem with this view is that the common stock of observations is nearly infinite. We cannot possibly attend to everything so a theory—broadly defined as a way of interpreting the world around us—is required to tell us what to pay attention to and what to ignore. We must theorize to see. A new theory doesn’t just reinterpret old observations. It also calls attention to new observations to which previous theories were literally blind.

The historical significance of evolutionary theory is that it provided an explanatory framework capable of unifying the study of all living processes, including topics as seemingly disparate as the fossil record, the geographical distribution of species, comparative anatomy, and the many wonderful contrivances that adapt organisms to their environments. The explanatory power of evolutionary theory was expressed by the geneticist Theodosius Dobzhansky when he stated in 1973 that “Nothing in biology makes sense except in the light of evolution.” The many technological advances that have taken place since then bring the common stock of observations even closer to the infinity point than during Darwin’s day. Evolutionary theory is proving itself as a unifying theoretical framework in the biological sciences now more than ever. The idea of teaching or conducting research in biology without the help of evolutionary theory would be inconceivable.
The study of evolution in relation to human affairs followed a different path than the biological sciences. The reasons are complex but two major factors can be identified. First, evolution became associated with social policies that attempt to justify inequality, which color the term “Social Darwinism” to this day. Second, with the re-discovery Mendel’s work early in the 20th century, the study of evolution became highly gene-centric. Darwin knew nothing about genes and described evolution in terms of variation, selection, and heredity. Heredity is a resemblance between parents and offspring, caused by any mechanism. Genes provide one mechanism of heredity but there are others, including epigenetic mechanisms (trans-generational changes in gene expression rather than the presence and absence of genes), forms of social learning found in many species, and forms of symbolic representations (including but not restricted to language) that are distinctively human.

For these and other reasons, most branches of human-related knowledge developed without much reference to evolutionary theory during most of the 20th century. While each branch became sophisticated in its own right, the branches did not become unified in the same way as the branches of the biological sciences. Only during the last part of the 20th century did the study of evolution in relation to human affairs start to get back on track. Terms such as “evolutionary psychology”, “evolutionary anthropology”, and “evolutionary economics” were coined during this period, signifying an effort to rethink these disciplines from a modern evolutionary perspective.

The unification of the human-related disciplines from an evolutionary perspective is now in full swing, although it still comprises only a small fraction of the worldwide academic community. The 21st century will be seen as a period of synthesis for human-related knowledge similar to the synthesis of biological knowledge during the 20th century (which continues). However, developments at the level of scientific research and scholarship are not yet reflected in higher education. At virtually all colleges and universities worldwide, evolution is taught as a biological topic and is restricted to genetic evolution.

That is why students in the “Culturally Evolutionary Theory” class, who were drawn from at least a half dozen majors, were so amazed by what they learned. Most of them were juniors and seniors but none of their previous classes—including classes taught in the biology department such as “Mechanisms of Evolution”, portrayed evolution as a theory that goes beyond genetic evolution and applies to all human-related subjects in addition to the rest of life. Their excitement is similar to what Darwin experienced when his simple trio of ideas—variation, selection, and heredity—started to unify all of the branches of knowledge available to him at the time. The question is not whether this type of education should take place, but how fast it can be catalyzed.

The Approach Pioneered at Binghamton University

Initiated in 2003, EvoS (for Evolutionary Studies and pronounced as one word) was the first program to teach the expanded view of evolution at a campus-wide scale. It began under a rubric for interdisciplinary studies called an Integrated Curriculum (IC), which was envisioned as a course of studies that could be taken by any student in parallel with his or her major. An IC is similar to a Minor except that it is more permissive of double counting, enabling busy students who might already be double majoring or adding a minor to become involved. Thanks to this rubric, EvoS became available to every student at BU at its inception (we are currently transitioning to a Minor program for a number of reasons that do not bear upon the essence of the program).

Most colleges and universities have at least some faculty who have already adopted the expanded view of evolution in their research and teaching. EvoS gave those at BU a social identity, gathered their courses together to form the initial course offerings, and provided modest resources to develop new courses, stimulate trans-disciplinary research, and interest other faculty in becoming involved. A 100-level course for non-majors titled “Evolution for Everyone” reached students at the beginning of their academic careers. A seminar series titled “Current Topics in Evolutionary Theory” brought ten speakers to campus every semester, who spoke on the length and breadth of biological and human-related topics from an evolutionary perspective. One talk on molecular biology might be followed by another on moral philosophy, bird phylogeny, or the rise and fall of empires. A 2-credit course built around the seminar series involves reading one or more articles from the primary academic literature, writing an essay on the reading, attending the seminar, and attending an extended discussion following the seminar. Students are required to take this course twice to earn the EvoS certificate, which means that they are exposed to 20 different topics at a high level from an evolutionary perspective in addition to their other coursework. Students frequently report that this course is the intellectual highpoint of their time in college.

The interactions among faculty and graduate students that take place under the auspices of EvoS are a powerful incubator for trans-disciplinary research, which in 2007 resulted in the designation of Evos as an Institute for Advanced Studies in addition to an undergraduate curriculum program. Pilot research incubated by EvoS has led to numerous NSF and NIH grants. One research extension of EvoS that involves extensive undergraduate participation is the Binghamton Neighborhood Project (BNP), which uses the Binghamton area as a field site for basic and applied human-related research from an evolutionary perspective. Field studies are essential in evolutionary research because the properties of species can only be understood in relation to their environments. Yet, people are seldom studied from all walks of life, as they go about their daily lives, and the most field-oriented disciplines, such as sociology and cultural anthropology, have also tended to be the most avoidant of evolutionary theory in the past. Thus, field-oriented research on humans from an evolutionary perspective provides a new model for community-based research and action. BNP research projects have been published in top-tier journals such as PLoS ONE, Behavioral and Brain Sciences, and the Journal of Personality and Social Psychology. The same projects have improved the quality of life in the Binghamton area in a practical sense, have engaged Binghamton University students in their community, and have contributed positively to university-community relations.

Currently its 11th year, EvoS is an established program on campus that reaches hundreds of students via single courses and the multi-course Integrated Curriculum. It also provides a model for similar programs at other institutions. The first sister program was initiated at SUNY New Paltz in 2007. A Phase II NSF CCLI grant was received in 2008 to develop these programs and to stimulate the creation of additional programs. Today, the EvoS Consortium has its own website and e-journal. The consortium includes approximately six full-fledged programs comparable to BU and SUNY-New Paltz and approximately forty incipient programs in various stages of development. The newest full-fledged program is located at the University of Alabama, demonstrating that the EvoS concept can work in the deep south. A sizeable academic literature has accumulated, including a special issue of the premier journal for evolution

In a parallel development, David Sloan Wilson, who directs EvoS-Binghamton, also helped to create the Evolution Institute in 2007, which is the first think tank to formulate public policy from an evolutionary perspective. Although the EI is an independent 501 (c) 3 organization with no formal tie to Binghamton University, it is conceptually closely aligned with EvoS. The EI strives to do for the world of public policy what EvoS strives do for the world of higher education. One project that was jointly funded by EvoS and the EI (although currently supported entirely by the EI) is the online magazine *This View of Life*, which reports on the expanded view of evolution to a general audience.

To summarize, Binghamton University is already known for catalyzing the expanded view of evolution in higher education through its own EvoS program and its role (along with SUNY New Paltz) in creating the EvoS Consortium. This provides the foundation for future externally funded catalytic efforts.

### Funding Needs and Opportunities

Although the previous section highlighted the success of EvoS programs at BU and elsewhere, it is also important to acknowledge the challenges. Student interest is almost never a problem; glowing evaluations similar to those that began this document are typical of EvoS programs everywhere. But establishing an EvoS program sometimes encounters resistance at the level of faculty and administrators. Of course, establishing any curriculum program can be difficult and the complex history of evolutionary theory in relation to human affairs recounted earlier can surface at any time. Sometimes objections come from faculty in human-related areas who associate evolution with Social Darwinism and genetic determinism. Sometimes they come from biologists who feel strongly about restricting the study of evolution to genetic evolution. It is impossible to predict the outcomes of these complex interactions. In some cases earnest efforts have failed to establish an EvoS program. Other efforts breezed through the process of program development in unexpected places, such as the University of Alabama.

Even after a program is established and has proven itself in educational terms, it can be difficult to maintain on the basis of intramural funding. The deep structure of most universities favors the traditional disciplinary boxes, no matter how much trans-disciplinarity is proclaimed as a virtue and goal. An EvoS program should have the same kind of stable internal support as an academic department, but this is not the case for EvoS Binghamton or any other EvoS program. Stressing the need for stable intramural support does not deny the need for external funding. Science departments are expected to bring in external funding but not in a way that impacts their educational mission on a short-term basis.

With these comments in mind, here is a preliminary list of external funding priorities for EvoS-Binghamton and the EvoS consortium. All of them are predicated on baseline intramural support for EvoS.

1. **Developing methods and programs to teach the expanded view of evolution.** The focus on evolution is an important funding priority its own right. It was on this basis that we received our Phase II NSF CCLI grant in 2008-2010.

2. **Using an expanded view of evolution to achieve the core goals of STEM education.** This might provide an exceptionally strong hook for external funding, because there is more funding for STEM education than for evolution education per se. As previously stated, the idea that a particular way of teaching evolution can be relevant to STEM pedagogy is relatively novel within the STEM research community and therefore might stand out, as well it should.

3. **Documenting the impact of EvoS training on thinking skills, cross domain learning, career trajectories, and other educational outcomes.** It should be possible to study and validate the transformation of thought that the students report in their course evaluations. We have made some progress along these lines using a variety of methods. An “Evolution Acceptance and Literacy Survey (EALS)” was developed as part of the NSF grant and has been used as a before-and-after course assessment tool. Student essays have been analyzed using rubrics for rating critical thinking and a text analysis program called Linguistic Inquiry and Word Count (LIWC) that measures the frequency of words involved in cognitive operations. An experiment using students enrolled in the “Evolution for Everyone” course demonstrated that the course improved students’ critical thinking and enhanced their ability to employ evolutionary reasoning across domains. We have attempted a comparison of EvoS students and a matched sample of non-EvoS students, which ran into methodological difficulties and needs to be repeated. To illustrate some of the difficulties, consider an English major who is turned on by “Evolution for Everyone” and decides to take a more advanced science course such as “Mechanisms of Evolution” that he or she would not have taken otherwise. The student is challenged by it and earns a middling grade. That student’s grade compared to the rest of the class, composed largely of better prepared biology majors, does not adequately measure the impact of evolutionary training on the student. The bottom line is that more needs to be done to assess the impact of EvoS training that comes through so clearly in the student self-reports.

4. **K-12 Education.** The expanded view of evolution can easily be extended to K-12 education and to some extent already has been. As with our approach to higher education, teaching evolution goes hand in hand with using evolution to teach other subjects and more generally designing environments that are optimized for learning. A title that conveys both themes is “Teaching Evolution and Using Evolution to Teach”.

5. **Neighborhood Projects.** A number of funding initiatives can build upon the BNP’s distinctive approach to community-based research and action. The expanded evolutionary view requires people from all walks of life to be studied in the context of their everyday lives. This is the best basic science but it is also the most relevant science for improving the quality of life in a practical sense. In other words, there is a positive tradeoff between basic and applied science rather than the negative tradeoff that is typically imagined. Students who find it difficult to engage in basic science alone can become strongly engaged when they see how it can be used to solve problems such as improving neighborhoods or improving the educational outcomes of at-risk youth. An existing course
titled “Becoming an Everyday Scientist” is already starting to do this and the effort could be greatly enhanced with external funding. This approach is consistent with John Dewey’s emphasis on experience and education.

**Collaborators**
EvoS-Binghamton currently includes over 90 faculty participants representing virtually all academic units on campus, who combine their disciplinary expertise with a unified theoretical framework. They can be drawn upon as needed for any particular funding initiative. A good start has been made in the creation of a multi-institution consortium that should be built upon if possible. The Evolution Institute provides a conduit from the world of evolutionary science to the world of public policy formulation. An academic journal for both faculty and undergraduate publications already exists as part of the EvoS Consortium and This View of Life provides a communication outlet for the general public. These are the resources that are available for external funding initiatives.

**Literature relevant to EvoS**
The online EvoS Journal publishes articles on evolutionary pedagogy at the college level. It also functions as a journal for undergraduate student publications. Now in its 6th year, its publications will not be listed separately.


