



Biomedical Informatics

3190 Graves Hall
333 West 10th Avenue
Columbus, OH 43210
Phone: 614-292-1202
Fax: 614-688-6600

April 13, 2009

Dear Provost Alutto and Committee Members

Enclosed is our proposal to establish an innovation group entitled:
"Computational Modeling of Global Infectious Disease Threats and Policy"

We have established a group of fourteen faculty members across seven colleges. We are distinct from the PHPID as we are focused on modeling of infectious disease processes via computational methods.

We feel that our innovation group is well suited for success in four avenues:

- Expanding collaborative research in an exciting new field.
- Fostering an understanding of the linkages between science and policy in fighting infectious diseases.
- Widening the worldwide presence of the University in infectious disease research and health informatics.
- Securing external funding through individual and collaborative grant applications. For example, we already have a \$15M proposal pending with NIH's MIDAS program.

Please consider our innovation group proposal, complete with research plans, personnel descriptions, funding goals, outreach events timeline, and budget.

I also would like to take this opportunity to thank Dr. Laura Pomeroy and Jacqueline Rudolph for coordinating these efforts.

We welcome any questions you may have about our plans.

Sincerely
Daniel Janies, Ph.D.
Daniel.Janies@osumc.edu

Computational Modeling of Global Infectious Disease Threats and Policy

An innovation group proposal submitted April 13, 2009.

PI: Daniel Janies, Ph.D.
Associate Professor
Department of Biomedical Informatics
Ohio State University Medical Center
Daniel.Janies@osumc.edu
614.292.1202

1. Introduction

The emergence, reemergence, and spread of infectious diseases among animals and humans are extraordinarily complex global problems. Infectious diseases affect not only the realm of public health and medicine, but also evolutionary biology, environmental sciences, public policy and social sciences, mathematics and statistics, and computer science and health information technologies. Meaningful discovery and solutions are likely to emerge at the interface of disciplines. Moreover, interactions among scientists and policy makers are crucial to translate research discoveries into applications.

In October 2008, we submitted a large proposal to establish a center under the NIH-MIDAS¹ program. We expect a response from NIH on this proposal in the coming weeks. In order to keep the momentum of this effort, we propose to create an innovation group. The focus of the innovation group will be two-fold:

- To develop cross-disciplinary means of discovery of the biological, clinical, environmental, and social causes of the spread of infectious diseases via computational modeling of pathogens and hosts.
- To engage present and future scientists and policy makers in dialogue on the interdependence of science and policy in efforts to control infectious diseases.

We will create an interactive environment with personnel from many colleges and departments throughout The Ohio State University by coordinating three events: (1) monthly meetings to identify and initiate novel collaborations, (2) an annual “first principles” working group meeting, and (3) an annual conference to facilitate interactions between researchers and policymakers.

2. Personnel

2.1 Overview

We propose the development of a multidisciplinary team to focus on modeling infectious diseases by integrating raw observations into predictive maps, networks, and models of disease spread. We propose to assemble an innovation group consisting of:

- Infectious disease clinicians, veterinarians, and public health researchers based in the Colleges of Medicine, Veterinary Medicine, and Public Health.

¹ <http://www.nigms.nih.gov/Initiatives/MIDAS>

- Computer scientists drawn from the Department of Biomedical Informatics in the College of Medicine and The Department of Electrical and Computer Engineering in the College of Engineering.
- Ecologists, evolutionary modelers, microbiologists, mathematicians, statisticians, hydrologists, and microbiologists based in the College of Biological, Mathematical, and Physical Sciences.
- Policy researchers, modelers, and educators from the John Glenn School of Public Affairs, which includes an office in Washington, D.C. that facilitates connections to national policy makers.

By actively engaging policy makers, practitioners, and scientists in collaborative activities, the proposed innovation group will not only result in advice to policy makers, but will also infuse policy assumptions and public health concerns into the research discourse and models.

2.2 Organizational Structure and Management Plan

We propose an administrative structure designed around innovation group members. The structure of the group will include these personnel and elements:

- Director
- Key area leaders
- Group coordinator
- Students

We describe the roles and responsibilities of these personnel and elements below. We also diagram their communications structure (Figure 1) among personnel and elements.

2.2.1 Director

The director shall have the primary responsibilities related to scientific activities and management of the finances of the group. The director oversees the budget and provides for the efficient use and management of the group's resources. The director also serves as principal investigator and thus has primary responsibility to see that the group is meeting its scheduled goals (Tables, 4 and 5). Dr. Daniel Janies, a specialist in public health informatics, will serve as the director of the innovation group.

2.2.2 Key Area Leaders

We propose to have faculty leaders in each of these key areas:

- Computational, Statistical, and Mathematical Research
- International Projects
- Genomics
- Policy Studies

These leaders will plan the working group meetings foster collaborations between disciplines. The key area leaders are listed in Figure 1.

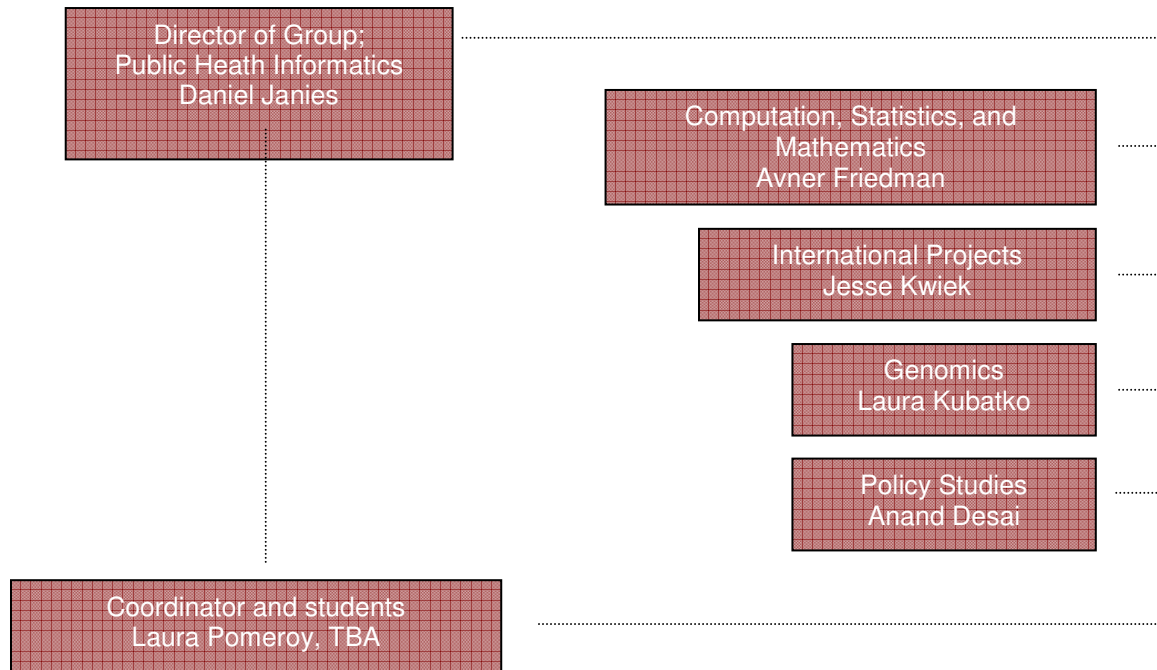


Figure 1. Lines of communication among the Director, the coordinator and students, and the key area leaders of the proposed innovation group.

2.2.3 Project Coordinator and Undergraduate Students

The project coordinator will be responsible for facilitating operational and scientific communications between among members, policy makers, and collaborating scientists. Laura Pomeroy, Ph.D., a post-doctoral researcher in the College of Medicine and the Department of Bioinformatics, will act as the project coordinator. Undergraduate students will assist in coordination and participate in events.

2.3 Faculty Participants

In total, we propose an innovation group consisting of 14 faculty members across seven colleges (Table 1).

Table 1. Faculty members in the proposed innovation group.

Faculty	College
Umit Catalyurek	Medicine Engineering
Meg Daly	Biological, Mathematical and Physical Sciences
Anand Desai	John Glenn School*
Avner Friedman	Biological, Mathematical and Physical Sciences
Rebecca Garabed	Veterinary Medicine
Armando Hoet	Veterinary Public Health Veterinary Medicine
Motomu Ibaraki	Biological, Mathematical and Physical Sciences
Daniel Janies	Medicine
G. Steven Krakowka	Veterinary Medicine
Laura Kubatko	Biological, Mathematical and Physical Sciences
Jesse Kwiek	Medicine Biological, Mathematical and Physical Sciences
Song Liang	Public Health
Steven Lower	Biological, Mathematical and Physical Sciences
Shu-Hua Wang	Medicine

*The John Glenn School reports directly to OAA

2.4 Students and Trainees

Undergraduate students, graduate students, and post-doctoral researchers will be mentored through direct involvement in research. In addition, they will be invited to participate and present at the working group meetings (see section 4.2) and policy workshops (see section 4.3.2).

2.5 Summary

These faculty, researchers, and students represent a diverse group with a wide range of research disciplines. Although they are from different colleges many faculty members already work together. Through the innovation group, we hope to strengthen existing collaborations and catalyze new collaborations.

3. Funding Sources

3.1 External Funding

Faculty in the proposed innovation group have a strong record of obtaining external funding through a variety of grants. Sources and amounts of current and pending support are listed in tables 2 and 3, respectively.

Table 2. Current Funding for Faculty Members in the proposed innovation group

Source	Amount	Faculty
Department of Energy	\$717,900	Catalyurek
NSF	\$400,000	Catalyurek
Dayton Area Graduate Studies Institute	\$63,071	Catalyurek
NSF	\$56,000	Daly
NSF	\$239,847	Daly
NSF	\$556,063	Daly, Janies
Health Policy Institute of Ohio	\$ 33,793	Desai
Ohio Department of Health	\$ 20,000	Desai
Ohio Department of Health	\$ 30,000	Desai
HCNO	\$ 100,000	Desai
NSF	\$3,622,853	Desai
NSF	\$1,400,457	Friedman
Ohio Department of Health	\$14,950	Hoet
USDA/Animal Health Funds	\$15,000	Hoet
PHPID - Pilot Grant	\$50,000	Hoet
Canine Research Funds	\$15,000	Hoet
Ohio Department of Public Health	\$50,000	Hoet
Mitsubishi Materials Corp	\$81,000	Ibaraki
Kurita Water Industries Ltd.	\$64,000	Ibaraki
Taisei Corp	\$20,000	Ibaraki
National Geospatial-Intelligence Agency	\$749,990	Ibaraki
DARPA	\$1,206,000	Janies
Google.org	\$25,000	Janies
NIH/NIAID	\$250,000	Krakovka
Merial	\$42,540	Krakovka
Merial	\$30,800	Krakovka
NSF	\$980,012	Kubatko
NSF	\$226,946	Kubatko
NSF	\$54,454	Kubatko
OSU Initiative in Population Research	\$15,116	Kubatko
NIH/NIAID	\$248,000	Kwiek
OSU PHPID Pilot Grant	\$10,000	Kwiek
NIH/NIAID	\$369,000	Liang
Water Env't Research Foundation	\$113,000	Liang
PHPID	\$100,000	Liang
CWC/PHPID	\$100,000	Liang
NSF	\$350,000	Lower
NSF	\$100,000	Lower
Department of Energy	\$437,000	Lower
NSF	\$505,000	Lower
NSF	\$453,000	Lower
NIH	\$430,000	Lower
Oxford Immunotec Ltd.	\$63,726	Wang
Oxford Immunotec Ltd.	\$31,112	Wang
Oxford Immunotec Ltd.	\$26,883	Wang

In many cases, the external funding represents collaborations among members of the proposed innovation group. For example, an application has been submitted to NIH-MIDAS for funds to support collaborative research among nine faculty members to perform cross-disciplinary research in the modeling of the infectious diseases, public policy, and the implications of policy implementation (see first entry in Table 3). Furthermore, Dr. Janies and Daly share a Tree of Life Grant from NSF. Dr. Pomeroy and Dr. Janies (Medicine) are also working closely with Dr. Ibaraki (Earth Sciences) and Dr. Liang (Public Health) on multidisciplinary approaches to water borne diseases. Dr. Kwiek and Janies are collaborating in maternal child transmission of HIV in Africa and are prepare applications for NIH-RO1 and Center for Aids Research funding. Dr. Catalyurek and Janies have pending NSF grants to support workflow software for phylogenetic mapping of the spread of infectious diseases such as the supramap project².

The innovation group will foster such collaborations and permit future joint applications, research opportunities, and communication between individuals whose research overlaps.

Table 3. Pending Funding for Faculty Members in the proposed innovation group

Source	Amount	Faculty
NIH-Midas	\$14,969,642	Catalyurek, Desai, Hoet, Ibaraki, Kwiek, Friedman, Janies, Liang, Wang
NSF	\$1,024,395	Catalyurek
NSF	\$2,836,816	Catalyurek
NSF	\$499,999	Catalyurek, Janies
NSF	\$375,625	Catalyurek
NSF	\$310,240	Catalyurek
NSF	<\$10,000	Daly
NSF	<\$10,000	Daly
NSF	\$1,500,000	Friedman
NSF	\$992,629	Janies
National Geospatial-Intelligence Agency	\$750,000	Ibaraki, Janies, Liang
Third Frontier Program (Cakmak)	\$175,000	Krakovka
USDA CSREES	\$147,454	Krakovka
NHS/PHS (Grundfest-Broniatowski)	\$25,000	Krakovka
NSF	\$188,375	Kubatko
NSF	\$71,000	Kubatko
NIH	\$1,975,310	Kwiek, Janies

Due to the large number of grants secured (Table 2) and the addition pending funding sources (Table 3), the proposed innovation group shows evidence of financial sustainability after the initial three-year funding period. In specific, the pending proposal to the NIH-MIDAS program would provide \$15M in funding for a collaborative center in infectious disease research and modeling.

² <http://supramap.osu.edu>

3.2 Licensing and Commercialization Potential

Faculty members in the proposed innovation group are working on software and anti-viral targets that would have the potential for commercialization and licensing. For example, Dr. Rebecca Garabed is currently developing software to probe pathogen transmission among livestock populations. In addition, Dr. Jesse Kwiek has proposed research to develop novel anti-HIV targets that show promise to have an impact on antiviral drugs and other medicinal treatments. Also, Dr. Janies has submitted two invention disclosures on methods for phenotype-genotype correlation and phylogenetic and geographic mapping of infectious diseases. Together, research undertaken by members of the proposed innovation group has potential for licensing and commercialization.

3.3 Summary

Based on the current funding secured by proposed Group members, which amounts to over \$14.3M (Table 2), and the ambitious pursuit of additional funds (Table 3), it is evident that the proposed innovation group will work to generate external funding. These funds will lead to the financial sustainability of the proposed group.

4. Research and policy development

4.1 Interdisciplinary Focus

We will create an environment where researchers from across the biological, medical, earth, social, and political sciences can work on common ground with mathematical and visual modelers to solve important problems of global impact such as infectious diseases that threaten public health. The model based approach of this group distinguishes us from the laboratory based approaches embodied by the existing PHPID-TIE. In essence we will keep the momentum created across campus by the submission of the NIH-MIDAS, NGA, NSF and other proposals by creating a working group and holding workshops.

4.2 Annual Working Group Meeting

The proposed innovation group approach will create the multidisciplinary approach by establishing an annual “first principles” workshop. In this forum, the basics of both the scientific knowledge of the pathogens and the modeling methods used to study the pathogen systems will be described. When appropriate, we will invite an external researcher to introduce fresh ideas into the group. The morning will be dedicated to sharing fundamental information about each study system. The afternoon will consist of guided discussion of current approaches, funding and publication strategy, and policy issues.

Introductory talks will include topics such as:

- Basic biology of each pathogen studied by innovation group members (e.g., influenza, methicillin-resistant *Staphylococcus aureus* (MRSA), Schistosomiasis, foot and mouth disease, malaria)
- Ecological, epidemiological, and policy modeling
- Pathogen evolution
- Basic environmental concepts (e.g. hydrology, biofilms)
- Policy research on public and environmental health

Guided discussions will occur, with talking points established before the working group. These will be chosen with the following goals:

- Encourage collaboration among faculty in modeling research
- Strategize to expand external funding
- Outline potential manuscripts or review papers to be written within the group format
- Establish goals for the interaction with policymakers that can lead to the creation of new public health policy directives
- Leveraging resources such as the Ohio Supercomputer Center

4.3 Policy Development

4.3.1 Faculty Involvement

Faculty in the proposed group has been involved in policy development in the past, and continue to work to these ends. For example, Dr. Anand Desai, a professor in The John Glenn School, is directly involved in policy development and research. He works with state and local agencies for evaluation of the provision of public services and programs. He has provided testimony to the Ohio Legislature (Senate Finance Sub-committee) on the consequences of potential reductions in Medicaid Funding for Ohio. In addition, he has worked with Federal agencies to evaluate existing programs. He is currently working with a number of counties in Ohio on preparedness for a potential outbreak of pandemic influenza. Dr. Desai will assist members of the proposed innovation group to collaborate with policy makers to help them understand the implications of the scientific work.

Dr. Shu-Hua Wang is the Medical Director of the Ben Franklin Tuberculosis Program and participates in tuberculosis policy for Franklin County.

Dr. Janies is a member of the Columbus Ohio Health Intelligence Team (HIT), a local initiative of Columbus Public Health, the Franklin County Board of Health and Central Ohio Trauma System³. Key HIT members include local and state public health experts, hospital administrators, nurses, physicians, veterinarian, fire prevention and other first responders, federal anti-terrorism and other law enforcement officers, academic and industry scientists, and representatives of the utilities, media, and banking industries of the private sector. HIT was formed to prepare for and respond to pandemic influenza.

³ <http://columbuspandemicflu.com/local.html>

However, much of the planning is applicable to a wide variety of public health concerns, terrorism threats, and natural disasters.

Dr. Janies was called to testify to the United States Senate in October 2007 in a hearing entitled *Forestalling the Coming Pandemic: Infectious Disease Surveillance Overseas*⁴. Furthermore, he has kept in touch with many of the policy makers he met in Washington and will invite them to participate in the events of the innovation group.

4.3.2 Annual Policy Workshop

We will hold an annual policy workshop in October where proposed innovation group members can interact with individuals from governmental and not-for-profit organizations to encourage dialogue on the interrelationships of science and policy.

Specifically we will work working with two continuing education programs of the John Glenn School: the Management Advancement for the Public Service program that offers training for support staff, supervisors, managers, and executives in the public and not-for-profit sectors and the Ohio City and County Management Association (OCMA), which coordinates with professional leaders of local government. Proposed innovation group faculty and postdoctoral researchers will design presentation content, discussion sessions, and hands-on practicum in subjects such as:

- The role of modeling of infectious disease outbreaks in preparedness plans.
- Implementing optimal control strategies for infectious diseases.
- How community factors influence the spread of infectious diseases.
- Current topics such as infectious outbreaks and health informatics.

We will invite guest speakers to introduce novel ideas from a national or international perspective.

4.4 Summary

We are committed to opening a two-way discussion through these events. The most important advances that can occur from scientific knowledge are their application to the formation of public policy. Similarly, fostering an understanding of the realities of public health policy making is exceedingly valuable background knowledge for the development of effective models of the spread of infectious diseases.

5. International Presence

5.1 International research focus

Research on the spread of infectious diseases is relevant to security, public health, and economic welfare at home and abroad. The enormity and reality of the threat has been well substantiated, through recurrent global events such as: influenza pandemics, newly emergent zoonotic viruses such as the agent of Severe Acute Respiratory Syndrome, persistent burdens on the global human community including malaria, tuberculosis, schistosomiasis, Human Immunodeficiency Virus infection and Acquired Immune

⁴ http://hsgac.senate.gov/public/_files/JaniesTestimony.pdf

Deficiency Syndrome, and deliberate attacks using infectious threats such as *Bacillus anthracis*.

During an epidemic, disease and host migrations traverse political borders. In order to truly understand infectious disease dynamics worldwide, we must work with the international scientific and public health communities to make advances.

5.2 Global partnerships

Faculty in the proposed innovation group have a number of collaborative relationships with individuals worldwide, which can provide the foundation for long-term international partnerships.

5.2.1 Africa

Researchers in the proposed innovation group collaborate with African students, researchers, and public health workers. These efforts are led by Jesse Kwiek and Avner Freidman and are detailed below.

- Long-term collaboration with the Malawi College of Medicine to study means to prevent HIV-1 mother-to-child transmission, via Jesse Kwiek, which has resulted in eight papers with his Malawian colleagues. Dr. Kwiek travels frequently between OSU and Malawi for research on the implementation of novel pediatric HIV testing strategies in a rural Malawian hospital, with a goal of enabling rural hospitals to conduct HIV tests. If their research methods are validated, the work will likely have policy implications in Malawi.
- Dr. Avner Friedman, has recently been awarded an NSF grant to enhance mathematical biology in Africa. The MBI will host two graduate students from Africa each year over the next three years. These researchers will train in mathematical biology most relevant to infectious diseases in Africa such as HIV/AIDS, tuberculosis, and malaria. The MBI also hosts researchers from many international institutions; currently, Dr. Edward Lungu is visiting from Botswana for a year and plans to return often for collaboration. In addition, Dr. Friedman has funds to run two annual workshops in Africa to cover disease modeling.

5.2.2 Asia

A project investigating Schistosomiasis and its natural hosts in Asia provides the scientific basis for existing collaboration between proposed Group members. This work also provides a context for external collaborations, which are pioneered by Drs. Ibaraki and Liang.

- Dr. Ibaraki is currently working with researchers in institutions and universities in Japan who are conducting research on zoonotic diseases including schistosomiasis. These researchers include Dr. Satoshi Nakamura of the Research Institute, International Medical Center of Japan, Dr. Naoko Nihei of the National Institute of Infectious Diseases, and Dr. Yasuhide Saito of Azabu University.

- Dr. Liang works with a number of individuals in China, including Dr. Jiagang Guo and his team from Department of Schistosomiasis, National Institute of Parasitic Disease of China CDC, and Dr. Honggen Chen and his team from Jiangxi Institute of Parasitic Disease. In addition, field workers include public health professionals from Duchang Anti-Schistosomiasis Station of Jiangxi Province.
- Dr. Janies has taught a special course on influenza genomics, organized by the US Department of State to a delegation of the Indonesian Ministry of Health.

5.2.3 Other Partnerships

In addition to the unique partnerships listed above, faculty in the proposed innovation group have personal working relationships with researchers throughout the world, including three in Asia, two in Canada, eight in Europe, and four in South America.

Proposed Group members also participate in non-traditional global collaborations, facilitated by computing methods and the internet. This is necessary since lack of knowledge of viral and host diversity is a source of concern for the spread and emergence of disease. Although the technology to monitor the spread and evolution of pathogens based on genomic data is advancing rapidly, international cooperation in data sharing is still evolving. Not all viruses that are isolated are sequenced, and not all viral genomes that have been sequenced are shared. To combat these problems, Dr. Janies and colleagues have made sharing of methods, computing capacity, and user knowledge top priorities by establishing a computing service for other researchers.

Dr. Janies also taught courses to students on phylogenetics as applied to disease from the United States, Brazil, and Argentina. The overarching goal of these efforts is to build communities of researchers and public health officials who share data and expertise to fight infectious diseases.

5.3 Summary

Faculty in the proposed innovation group have both individual and group based working relationships with a number of individuals throughout the world in order to advance scientific concepts, methods of teaching, public health practices, and the sharing of both data and expertise. However, international involvement is not only limited to collaborations; faculty in the proposed group have a global view of the spread of infectious disease in their research questions.

6. Bioinformatics Jobs in Ohio

Almost half of the members in the proposed innovation group are members of The Ohio State University Medical Center (OSUMC), which is one of the leading forces in the Central Ohio economy. Job creation, especially in computing domains such as bioinformatics, is central to Ohio policymakers' strategy to align Ohio's research and technology portfolio for statewide economic impact. Our innovation group proposal reinforces this strategy. For example, the Ohio Supercomputer center and the Department of Biomedical Informatics have been collaborating in the acquisition planning and use on of a new state funded supercomputer focused on infectious disease

research⁵. An OSU innovation group that aligns to this investment in high performance computing will allow us to attract the best talent and research funding⁶.

The department of Biomedical Informatics is also taking the lead in hosting the annual Ohio Collaborative Conference on Bioinformatics⁷ on the OSU campus in June 2010. The conference will bring together over 300 researchers, students, government officials, and representatives of industry for two days of symposia, tutorials, and strategy sessions on job creation in Ohio. The overarching goal of the conference is to showcase and attract talent and funding to Ohio in bioinformatics. We are currently seeking for funding for this conference independent of the innovation group.

7. Timeline

We will hold monthly meetings for OSU faculty, staff, and students. Meetings will take a rotating format: each faculty member will have the venue to highlight their research efforts to identify areas of overlap and collaboration between innovation group members. These meetings will be used to encourage collaborations in research, grant writing, publications, and other outreach activities. In addition, we propose annual working group meetings (see section 4.2) and policy workshop meetings (see section 4.3.2).

Table 4. Timeline for Biannual Meetings.

Time	May 2010	Oct 2010	May 2011	Oct 2011	May 2012	Oct 2012
Event	Working Group	Policy Workshop	Working Group	Policy Workshop	Working Group	Policy Workshop

⁵

<http://columbus.bizjournals.com/columbus/stories/2009/02/02/story7.html?b=1233550800^1770332>

⁶ <http://www.hpcwire.com/industry/academia/Ohio-Supercomputer-Center-to-Boost-State-Bioscience-Efforts-40313457.html>

⁷ <http://www.occbio.org>

8. Metrics to Effectiveness

The director of the proposed innovation group will conduct annual reviews to measure the effectiveness of the group. Predetermined metrics, as described in Table 4, will be used to assess impact.

Table 5. Milestones, Action Items, and Measures of Impact

Milestone	Activity	Timeline	Measure of Impact
Create an environment of cross-disciplinary disease research	Host a “First Principles” Working Group (see section 4.2)	Annually during years 1 – 3	Progress reports Resulting collaborations Grant applications Number of joint publications Publication quality (impact factor of journal) Number of students and trainees present Website hits
Foster understanding of the interrelationships of science and policy in infectious diseases	Events Courses Hearings Media Reports	Continuously during years 1 – 3	Number of presentations Publication number Publication quality (impact factor of journal) Number of publication citations Media coverage Number of policy makers reached Website hits
Build international collaborations to study infectious disease science and policy	Research projects advance, policy changes are made.	Continuously during years 1 – 3	Resulting collaborations Grant applications Number of joint publications Publication quality (impact factor of journal) Number of publication citations
Host OCCBIO at OSU	A meeting of scientific, government, and industry leaders in bioinformatics	June 2010	Attendance Number of presentations Quality of presentations Resulting collaborations

9. Summary

Infectious disease research is naturally interdisciplinary and combines the fields of medicine, biology, microbiology, veterinary medicine, public health and policy, earth and environmental sciences, mathematics, and computer science. To make advances – both within the basic sciences and in the applications to public policy – researchers must collaborate across disciplines. By the creation of the interdisciplinary group focused on modeling many aspects of pathogens, as proposed here, The Ohio State University can lay the foundations that will permit novel research across the colleges, improve public policy, foster international and national collaborations, increase in funding, deepen the talent pool in Ohio in health informatics, and achieve better health at home and abroad.

10. Budget

May Working Group Meeting

To be held at The Blackwell on the OSU campus. We estimate that 50 people will attend from OSU and one guest speaker from outside OSU.

	Year One	Year Two	Year Three
Venue	\$750.00 ⁸	\$750.00 ⁸	\$750.00 ⁸
Materials (folders, photocopies, etc.)	\$15 per person Annually: \$765.00	\$15 per person Annually: \$765.00	\$15 per person Annually: \$765.00
Food	\$40.50 per person Annually: \$2065.50 ⁸	\$40.50 per person Annually: \$2065.50 ⁸	\$40.50 per person Annually: \$2065.50 ⁸
Guest Speaker Travel/Lodging	\$2500	\$2500	\$2500
Annual Total	\$5980.50	\$6080.50	\$6080.50

October Policy Workshop

To be held in a conference room in the BRT on the OSU campus. We estimate that 50 people will attend from OSU, 10 external policy officials, and one guest speaker from outside OSU.

	Year One	Year Two	Year Three
Venue	Free since members are a part of OSUMC ⁹	Free since members are a part of OSUMC ⁹	Free since members are a part of OSUMC ⁹
Materials (folders, photocopies, etc.)	\$15 per person Annually: \$915.00	\$15 per person Annually: \$915.00	\$15 per person Annually: \$915.00
Food	Breakfast ¹⁰ : \$6.75 Lunch ¹⁰ : \$7 p. person Snacks ¹⁰ : \$2.75 20% Fee ¹⁰ : \$201.30 Annually: \$1207.80	Breakfast ¹⁰ : \$6.75 Lunch ¹⁰ : \$7 per person Snacks ¹⁰ : \$2.75 7% Increase ¹⁰ : \$70.45 20% Fee ¹⁰ : \$215.39 Annually: \$1292.34	Breakfast ¹⁰ : \$6.75 Lunch ¹⁰ : \$7 per person Snacks ¹⁰ : \$2.75 7% Increase ¹⁰ : \$75.39 20% Fee ¹⁰ : \$216.38 Annually: \$1373.66
Guest Speaker Travel/Lodging	\$2500	\$2500	\$2500
Annual Total	\$4628.80	\$4707.34	\$4788.66

⁸ Rates for the Blackwell confirmed by Rita Long and price locked if meetings for all three years are booked in May 2010.

⁹ For conference rooms in the BRT; confirmed by Lindsay in OSUMC Room Scheduling.

¹⁰ From University Catering; 20% service charge and estimated 7% increase in charges per year as estimated by Catering staff.

¹¹ For 5% effort of a post-doctoral researcher.

Monthly Internal Meetings

To be held in an OSU meeting room to encourage collaboration between innovation group members. We estimate that 50 people from OSU will attend, including innovation group members and individuals in their research groups.

	Year One	Year Two	Year Three
Food	Coffee Service ¹⁰ : \$1.75 Cookies ¹⁰ : \$1 / person 20% Fee ¹⁰ : \$27.50 One Meeting: \$165.00	Coffee Service ¹⁰ : \$1.75 Cookies ¹⁰ : \$1 / person 7% Increase ¹⁰ : \$9.63 20% Fee ¹⁰ : \$29.43 One Meeting: \$176.56	Coffee Service ¹⁰ : \$1.75 Cookies ¹⁰ : \$1 / person 7% Increase ¹⁰ : \$10.30 20% Fee ¹⁰ : \$37.49 One Meeting: \$188.92
Annual Total	\$1980.00	\$2118.72	\$2267.04

Salary

	Year One	Year Two	Year Three
Project Coordinator ¹¹	\$1406.00	\$1448.00	\$1492.00
Undergraduate	\$4984.00	\$5134.00	\$5288.00
Annual Total	\$6390.00	\$6582.00	\$6780.00

Annual Totals

	Year One	Year Two	Year Three
Total	\$19,079.30	\$19,488.56	\$19,916.20

⁸ Rates for the Blackwell confirmed by Rita Long and price locked if meetings for all three years are booked in May 2010.

⁹ For conference rooms in the BRT; confirmed by Lindsay in OSUMC Room Scheduling.

¹⁰ From University Catering; 20% service charge and estimated 7% increase in charges per year as estimated by Catering staff.

¹¹ For 5% effort of a post-doctoral researcher.