

ANNUAL REPORT: June 1, 2011 – May 31, 2012
(i.e., Summer 2011, AY 2011-2012)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: Jim Nakas

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

	Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
SUMMER:	EFB 999	PhD Research	4	4	--
FALL:	EFB 301	Latin for Scientists	1	36	--
	EFB 303	Microbiology (with Castello)	4	50	2
	EFB 498	Res. Prob./EFB	3	1	1
	EFB 999	PhD Research	12	4	--
SPRING:	BTC 498	Res. Prob. Biotechnol.	2	1	1
	EFB 403	Microbiol. Dis. Fish & Wldlf.	1	13	--
	EFB 498	Res. Prob./EFB	3	1	1
	EFB 505	Microbial Ecology	2	12	--
	EFB 899	PhD Research	5	3	--

NOTE: PLEASE INDICATE WHICH COURSE(S) HAD A SERVICE-LEARNING COMPONENT AND BRIEFLY EXPLAIN THE NATURE OF THIS COMPONENT. For examples of service-learning in courses, see: <http://www.esf.edu/students/service/courses.htm>. Service-learning is a form of structured experiential education in which students engage with the community to be active learners, to enrich their sense of civic responsibility, and to explore practical application for course content. Faculty oversight, reflective thinking, and reciprocity are key components of service-learning. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

Regarding a service-learning component, I would include both Microbiology (EFB 303) and the Microbiological Diseases of Fish and Wildlife courses. I have added a sexually transmitted disease component to the former which should fall under the “practical application” criterion mentioned above. Students learn the disease symptoms of gonorrhea, syphilis, herpes, AIDS, and *Chlamydia* and a course of action if they develop these symptoms. I do not believe there is another course component like this at ESF and students have commented how informative this component was to them. STDs are an unfortunate presence in the social lives of our students and this component provides needed information on both transmission and treatment.

EFB 403 is totally dedicated to diseases of fish and wildlife with a different disease highlighted each week during the semester. Particular attention is given to diseases transmissible from the environment/animals to humans such as Lyme disease, anthrax, botulism, West Nile Virus, Hanta Virus, and transmissible spongiform encephalopathies (mad cow disease, chronic wasting disease in deer). These diseases have obvious “practical applications” and emphasis is provided on “dos” and “don’ts” to avoid transmission and seeking treatment. Additional practical information is provided on precautions to take when in proximity to infected animals as well as preventing the spread of disease within wildlife populations.

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>
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Include under #1

3. Continuing Education and Extension (short courses, workshops, etc.)

None

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
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None

II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student's official advisor 10 and unofficial advisor ?

B. Graduate Students: (Name, degree sought, starting date, month & year; if a degree was completed, please give date and full citation for the thesis or dissertation).

MAJOR PROFESSOR

- 1.) Wenyang Pan, PhD, Fall 2007
- 2.) Rosanna Stoutenburg, PhD, 2007
- 3.) Andrew Henwood, PhD, 2002 (part-time student, full-time employee at Bristol-Myers Squibb)

CO-MAJOR PROFESSOR

None

MEMBER, STEERING COMMITTEE (other than those listed above)

None

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

- 1.) Examiner, PhD Defense, Daniel Nicholson (Ray Francis), Bioprocess Engineering, February 2012
- 2.) Examiner, PhD Defense, Bo Zhang (William Powell), EFB, May, 2012
- 3.) Examiner, M.S. Defense, Shen Yang (Giorgos Mountrakis), ER&FE, August, 2011
- 4.) Examiner, M.S. Defense, Alexander Mueller (Chris Nomura), Chemistry, June, 2011
- 5.) Chairperson PhD Defense, Mr. Bernard Randrianarisoa (Robert Meyer), Wood Products Engineering, December, 2011.

III. RESEARCH COMPLETED OR UNDERWAY

A. Departmental Research (unsupported, boot-legged; title - % time spent)

None

B. 1. Grant-supported Research (source, subject, amount - total award and current year, award period starting and ending dates; list graduate research assistants supported by each grant)

Source: Blue Highway (Welch Allyn, NYSERDA)

Subject: Polyhydroxyalkanoates (PHAs)

Amount: \$350,000

Dates: 2008-2012

Graduate students supported at this time: Wenyang Pan

2. Research Proposals pending (include information as in B.1., above)

None

3. Research Proposals submitted, but rejected (include information as in B.1, above)

None

IV. PUBLICATIONS (Full bibliographic citation, i.e., do not use "with Jones," or "Jones, et al."; please list only publications published, in press, or actually submitted during this reporting period --- **do not list manuscripts in preparation**).

A. Refereed Publications

- 1.) Stoutenberg, R.O., J.O. Perrotta, and J.P. Nakas. 2011. Overcoming inhibitors in a hemicellulosic hydrolysate: improving fermentability by feedstock detoxification and adaptation of *Pichia stipitis*. J. Indus. Microbiol. Biotechnol. 38: 1939-1945.
- 2.) Pan, W., J.A. Perrotta, A.J. Stipanovic, C.T. Nomura, and J.P. Nakas. 2012. Production of polyhydroxyalkanoates by *Burkholderia cepacia* ATCC 17759 using a detoxified sugar maple hemicellulosic hydrolysate. J. Indus. Microbiol. Biotechnol. 39: 459-469.)
- 3.) Zhu, Chengjun, C.T. Nomura, J.A. Perrotta, A.J. Stipanovic, and J.P. Nakas. 2012. The effect of nucleating agents on physical properties of poly-3-hydroxybutyrate (PHB) and poly-3-hydroxybutyrate-co-3-hydroxyvalerate (PHB-co-HV) produced by *Burkholderia cepacia* ATCC 17759. Polymer Testing 31: 579-585.
- 4.) Pan, W., C.T. Nomura, and J.P. Nakas. 2012. Construction of statistical models for the estimation of inhibitory effects of hemicellulose wood hydrolysate on PHA production by *Burkholderia cepacia* ATCC 17759 using response surface methodology. Process Biochemistry (submitted).
- 5.) Patent: Nakas, J.P., C. Zhu, J.A. Perrotta, and C.T. Nomura. 2011. Methods for producing polyhydroxyalkanoates from biodiesel-glycerol. US Patent and Trademark Office, submitted Nov.24, 2011.

B. Non-refereed Publications

None

B. Papers Presented at Science Meetings (give title, date, occasion, and location)

Pan, W., C.T. Nomura, and J.P. Nakas, 2012. Detoxifying hemicellulosic hydrolysates for fermentation. Am. Soc. Microbiol. Nat. Mtg., San Francisco, CA, June 22, 2012.

D. Public Service Presentations (lectures, seminars, etc. to and for the public; give group or occasion, date(s), and attendance)

LaFayette Optimists, LaFayette, New York, Fall 2011, attendance 50 (approx.), "Rabies in the Environment".

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local):

None

2. Industrial and Commercial Groups, etc.

None

B. Unfunded Service to Governmental Agencies, Public Interest Groups, etc.

None

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)

None

B. 1. Activities in Professional Organizations (offices held, service as chairman, member, participant or consultant)

2. Professional Society Membership

American Society for Microbiology

3. **Other Professional Activities**

a. Editorial activity

Journal (s)

Responsibility

Other (books, symposia, etc.)

b. **Reviewer**

Journal(s)

No. of manuscripts

a) BioResources

1

b) Biomass Conversion
and Biorefinery

1

c) Bioresource Technology

1

Agency

No. of proposals

Other

c. Participation (workshops, symposia, etc.)

Name of workshop, etc.

Date

Place

C. Further Education/Re-training Undertaken, Leaves, Workshops, etc.

D. Foreign Travel (Where, When, Purpose)

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

B. College-level

1.) Chairperson, Institutional Biosafety Committee

2.) Director, SUNY Center for Applied Microbiology

C. University-wide, including Research Foundation

None

VIII. SUMMARY OF SIGNIFICANT ACTIVITIES AND ACCOMPLISHMENTS DURING THIS REPORTING PERIOD, ESPECIALLY THOSE MOST NOTEWORTHY AND RELATIVE TO THE COLLEGE'S AND DEPARTMENT'S MISSION. One paragraph on each of the following would be most helpful: this past year, what have you done for our students, department/college, and self professionally? NOTE: The information in this section (along with the supporting specific information elsewhere in this report) should be your strongest case for being considered for a discretionary raise, which I'll continue to award based on your contributions to the department and college this reporting period.

Students: I continued to make my laboratory available to undergraduates interested in microbiology and who wish to pursue research interests in microbiology. I usually assign undergraduates to work with a specific graduate student whom they will assist in all aspects of their thesis research. This will usually include experimental design, using sophisticated equipment for data collection, and data analysis and data organization for inclusion in publications. Three undergraduate students worked in my laboratory during this past year.

Department/College: Produced a five year summary report on the SUNY-Center for Applied Microbiology (2005-

2011) which describes the Center's membership, publications, grants received, near term/long term goals, and future plans. To date, the Center members (generally 6 but now 5 with the departure of John Fieschko) have garnered over \$7M in sponsored research funds and published 56 papers (11 per year) in high-end journals. This report, now available, will be distributed to potential corporate collaborators as well as the research foundation identifying ESF and specifically EFB as a center of excellence in applied microbiology.

Self: Submitted a new patent application to the USP&TO on Nov.24th, 2011 (cited above) on our work on polyhydroxyalkanoates (PHAs). This is our second patent application; the first resulted in an European patent (Eur. Pat. # 1585821) issued for PHA production from wood-based feedstocks. Our most recent submission is for PHA production from biodiesel-glycerol, another renewable feedstock. The application was partially sponsored by financial support from corporate interests.

IX. A. FUTURE PLANS, AMBITIONS, AND POTENTIAL CONTRIBUTIONS FOR YOUR OWN PROFESSIONAL DEVELOPMENT AND THE ENHANCEMENT OF THE PROGRAM IN ENVIRONMENTAL AND FOREST BIOLOGY (brief summary)

We plan on polymerizing the PHA polymers produced from glycerol into extremely large polymers, known as star polymers, which has not been previously reported for PHAs. The characteristics of these materials are difficult to predict at this time but offer some intriguing possibilities in future applications.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2009

a. Course(s) to be offered

None

b. Proposed research activity

Converting PHAs into very large polymers ("star polymers") and determining mechanical properties

c. University, professional society, and public service

2. Fall Semester 2009

a. Course(s) to be offered

Microbiology
Latin for Scientists

b. Proposed research activity

PHAs

c. University, Professional society, and public service

- i) Institutional Biosafety Committee
- ii) Director, SUNY-Center for Applied Microbiology

3. Spring Semester 2010

a. Course(s) to be offered

- i) Microbial Ecology
- ii) Microbiological Diseases of Fish and Wildlife

b. Proposed research activity

PHAs

c. University, professional society, and public service

- i) Institutional Biosafety Committee
- ii) SUNY Center for Applied Microbiology