

Microbiology and a Healthy World

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Microbiology and a Healthy World

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management			1%	
135	Aquatic and Terrestrial Wildlife			10%	
136	Conservation of Biological Diversity			3%	
201	Plant Genome, Genetics, and Genetic Mechanisms			7%	
212	Pathogens and Nematodes Affecting Plants			20%	
311	Animal Diseases			19%	
313	Internal Parasites in Animals			22%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins			11%	
723	Hazards to Human Health and Safety			7%	
Total				100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	3.7	0.0
Actual	0.0	0.0	3.9	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	56064	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	862545	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	1574764	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

Investigators in this program conducted studies to investigate the role of microbes in maintaining a healthy world in the following subprograms. 1. Human health: activities include development of an effective anti-poxvirus drug for use in treating or preventing human disease caused by pathogenic poxviruses and investigation on proteins involved in baculovirus DNA replication and structure. 2. Plant pathogens: activities include studying the roles of the untranslated regions (UTRs) of the genomic RNAs of the positive strand RNA viruses Turnip yellow mosaic virus (TYMV) and the mosquito-borne flaviviruses dengue virus and West Nile virus and development of an agrobacterium oncogene silencing strategy to produce plants resistant to crown gall. 3. In the food and water safety subprogram, research sought to characterize and evaluate the probiotic potential of exopolysaccharide (i.e. biopolymer) producing Lactic acid bacterial (LAB) strains. 4. Microbes and environmental health: The main focus is investigating the SAR11 clade, which will contribute to the health and productivity of the oceans. 5. Fish health: Investigators conducted extensive investigations on microbial pathogens of fishes.

2. Brief description of the target audience

Salmonid industry
iomedical researchers
oceanographers
climatographers
agricultural producers
virologists

V(E). Planned Program (Outputs)**1. Standard output measures****Target for the number of persons (contacts) reached through direct and indirect contact methods**

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	600	2800	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)**Patent Applications Submitted**

Year	Target
Plan:	0
2007:	0

Patents listed**3. Publications (Standard General Output Measure)****Number of Peer Reviewed Publications**

	Extension	Research	Total
Plan			
2007	0	24	24

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

SCHOLARLY excellence in referred articles, book chapters, and books; participation on professional boards and panels, as well as science panels.

Year	Target	Actual
2007	0	30

Output #2**Output Measure**

CARRY OUT STUDIES TO DECIPHER GENOMES, GENETICS AND MECHANISMS OF BACTERIA AND VIRUSES AND OTHER MICROORGANISMS – identify aspects of biology and biotechnology of viruses and bacteria that affect human health

Year	Target	Actual
2007	3	3

Output #3**Output Measure**

CARRY OUT STUDIES TO DECIPHER GENOMES, GENETICS AND MECHANISMS OF PLANTS AND ANIMALS – identify characteristics of food and water systems

Year	Target	Actual
2007	1	1

Output #4**Output Measure**

PROVIDE ADDITIONAL UNDERSTANDING FOR PLANT AND ANIMAL PROTECTION FROM DISEASES AND PESTS – identify genetic mechanisms of plant pathogens – describe characteristics of and changes due to zebrafish and salmonid diseases

Year	Target	Actual
2007	5	5

Output #5**Output Measure**

EFFECTS ON AND PROTECTION OF ENVIRONMENTAL HEALTH – identify marine microbial expressions of environmental health

Year	Target	Actual
2007	1	1

V(G). State Defined Outcomes

O No.	Outcome Name
1	<p>UNDERSTAND ROLE OF PROTEINS AND MOLECULAR BIOLOGY TO MITIGATE DISEASE - Experiments will increase peer understanding of the structure, function and regulation of the VV G1L proteinase and the role that it plays during the assembly and maturation of infectious progeny virions - Experiments will increase peer understanding of the role a number of critical proteins play in baculovirus genome replication and processing. - understand the molecular mechanisms of quorum sensing function and consequences of these distinct properties, which will have important implications for the development of antivirulence strategies as well as for the particular role of each signaling system in <i>P. aeruginosa</i> group behavior and pathogenesis. - gain more detailed knowledge about the molecular biology of RNA viruses affecting corals, animals and humans, e.g., early stages of viral infection, Trojan horse model, translational enhancer sequences, dicistronic expression. - peers learn how the GALLS protein participates in gene transfer to plants and its role in plant transformation - researchers will assess chromatophore cells for their use as a living sensor for rapid detection of food- and water- associated pathogenic bacteria and their toxins. - learn about new microorganisms and the mechanisms by which microorganisms acquire and utilize foreign DNA</p>
2	<p>Scientists learn to use SAR11 for investigations aimed at understanding how plankton cells use light dependent proton pumps, and impact the efficiency of carbon cycling in the ocean surface.</p>
3	<p>Fish health managers and veterinarians gain information on host and geographic range, pathogenesis, taxonomy, modes of transmission, and treatment of infectious and toxicological diseases of importance to wild and cultured fishes, particularly those afflicting fishes in the Pacific Northwest region and how to minimize the impact of these diseases.</p>
4	<p>Application of new assays and technology will help combat viruses - .assay development and biochemical details of proteolysis will support ongoing rational drug design and high throughput screening efforts designed to develop G1L inhibitors as potential antiviral drugs. - assist in the continued application of baculovirus technology to a variety of investigations that have become so dependent upon the use of this remarkable group of viruses. - information about molecular biology of RNA viruses could be used in designing new approaches for combating pathogenesis by these viruses.</p>
5	<p>the knowledge about atmospheric carbon and carbon sequestered in oceanic waters will enable more accurate models for the global carbon cycle</p>

Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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V(H). Planned Program (External Factors)

External factors which affected outcomes

Economy

Appropriations changes

Public Policy changes

Competing Public priorities

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Before-After (before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}