



## **APUA's International Surveillance of Reservoirs of Resistance (ISRAR)**

A collaboration with NBACC's National Biological Threat Characterization Center (NBTCC)

### **Project Description:**

APUA's *International Surveillance of Reservoirs of Resistance (ISRAR)* project is a collaboration with the U.S. National Biodefense Analysis and Countermeasures Center's (NBACC) National Biological Threat Characterization Center (NBTCC). The project entails collection and characterization of environmental and veterinary commensal organisms from various countries and subsequent uploading of the data to the ROAR isolate database ([www.ROARproject.org](http://www.ROARproject.org)). The goals are: (1) to investigate the potential for a surveillance system capable of tracking and analyzing patterns of antibiotic resistance in commensal bacteria over a multi-year period on a global scale and (2) to support biological defense efforts by enabling a more complete assessment of the threat potential of the genotypes and phenotypes of resistant bacteria found in the global biome. The latter possess the potential for being utilized as enhancers of agents of biological terrorism.

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### **Progress as of May 2010:**

#### ***APUA bench, field and public health skills propel international biosecurity project***

The ISRAR project has entered its third year of collaboration with the U.S. NBACC's National Biological Threat Characterization Center (NBTCC). A pilot phase, organized to establish collaborative contracts with APUA-Chapter countries, has succeeded in collecting, identifying, and performing susceptibility testing on over 1200 isolates to date. The data from the ISRAR isolate collection are derived from seven countries: Bangladesh, Georgia, India, Turkey, South Africa, South Korea, and Vietnam and include species of *E. coli*, *Streptococcus*, *Staphylococcus*, *Aeromonas*, *Pseudomonas*, *Acinetobacter*, *Salmonella* and *Stenotrophomonas*. Antibiotic resistance profiles are currently being incorporated into APUA's Reservoirs of Antibiotic Resistance (ROAR) isolate database.

The ROAR website ([www.ROARproject.org](http://www.ROARproject.org)), consists of an isolate database as well as an annotated library. The database is currently undergoing reconstruction to permit the entry of genetic data anticipated from this study. The literature library is actively being updated and now contains over 1100 entries on antimicrobial resistance in commensal and environmental bacteria. APUA invites investigators to submit their isolate-based phenotypic and genotypic

data to this online web resource. For further details, please contact [bonnie.marshall@tufts.edu](mailto:bonnie.marshall@tufts.edu)

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### **Progress in 2009:**

#### ***International biosecurity project draws on APUA bench, field work, and public health skills***

In collaboration with the NBACC's National Biological Threat Characterization Center (NBTCC), APUA continues to collect and analyze environmental and veterinary commensal organisms that may serve as reservoirs for antibiotic resistance in non-pathogenic bacteria. This project investigates the potential for a surveillance system capable of tracking and analyzing patterns of antibiotic resistance in commensal bacteria over a multi-year period on a global scale. This surveillance system will fill an existing void for global public health assessments by providing the specimens and data needed to better understand the diversity of resistance genes and the potential emergence of novel genotypes. This goal also supports biological defense efforts as it allows for a more complete assessment of the threat potential of the genotypes and phenotypes of resistant bacteria found in the global biome which have the possibility of being utilized as enhancers of agents of biological terrorism.

During the initial phase, ~700 soil, water and animal isolates of *Escherichia coli*, *Staphylococcus*, *Streptococcus/Enterococcus* and *Salmonella* were collected and characterized from Georgia, India, South Korea, Turkey and Uganda. The ISRAR project employs APUA's basic bench capacity, as well as the organization's global network and public health staff and databases at APUA headquarters. In efforts to expand collection to more countries, ISRAR project manager, Dr. Anibal Sosa, recently visited laboratories in Vietnam and South Africa. These countries will engage in collection of isolates from watersheds and large tributaries, with a focus on *Pseudomonas*, *Aeromonas*, *Acinetobacter*, and *Stenotrophomonas*. In collaboration with Tufts University School of Medicine, all species will be speciated and tested for antimicrobial susceptibility. Strains will then be transported to collaborators in the Center for Microbial Ecology at Michigan State University for microarray and rapid whole genome sequencing.

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### **Progress in 2008:**

#### ***Global Surveillance Project Begins Isolate Collection***

As part of the USAMRIID project "International Surveillance of Reservoirs of Antibiotic Resistance (ROAR): Pilot for Global Surveillance System in Selected Countries," APUA Project Manager, Anibal Sosa, recently visited microbiology laboratories in Uganda, Turkey, Georgia, South Korea and India for the purposes of laboratory and protocol evaluations.