

Center for Emerging Infectious Diseases News

As new opportunities have come our way our Center has grown in research projects, personnel, and laboratory space. One purpose of this newsletter is to inform our colleagues and friends of this growth. We thank many of you who have helped us mature as a research Center.

RESEARCH NEWS:

Center researchers have been successful in winning new grants that have helped our Emerging Pathogens team grow. As the team has grown, so has our need for laboratory and office space.

Through the efforts of Dean Jim Merchant, the University has awarded the Center **new laboratory space**. We now have separate laboratory areas for virology, bacteriology, serology, and molecular studies. We have also gained much needed office space for our staff and graduate trainees.



Sept 2005 -The Center's **Emerging Pathogens Laboratory team** (left to right) Meri Good, Mark LeBeck, Daniella Moga, Kendall Myers, Greg Gray, Ghazi Kayali, Jim Gill, Lindsay Bodkins, Margaret Chorazy, Deb Wellman, Kelly Leshner, Norma Miller, Sharon Setterquist, Ana Capuano, Troy McCarthy, Sara Starks. Not shown Tara Smith, Ernesto Ortiz, Ashley Miller



Oct 2005- New team members (left to right) Whitney Baker, Noemi Cruz-Orcutt, and Brenda

clinical specimens for zoonotic pathogens (eg. swine influenza virus). A number of our research studies and new activities are summarized below.

This new laboratory and office space (3100 sq ft) will permit us to manage large prospective cohort studies and to analyze participants' sera for evidence of zoonotic infections. It is also hoped that these facilities will help us procure a training grant for our future graduate students.

To support these studies, the National Institute of Allergies and Infectious Diseases has awarded our Center supplement funding to purchase a **real-time PCR platform**, the iQ Real-Time PCR Detection System. This newly arrived equipment will help us screen numerous

Swine influenza infections in man – Kendall Myers, PhD student in the College of Public Health's (CPH's) Occupational and Environmental Health Department currently pursuing here dissertation has designed and managed a cross-sectional studies of Iowans at risk of zoonotic influenza. Laboratory results conducted by the Emerging Pathogens Laboratory's **Sharon Setterquist** indicate a high proportion of veterinarians and rural farmers have serological evidence of emergent swine influenza virus infections, and are significantly more likely to have been infected than controls. This work has led to an important publication that is scheduled to be released in the **January 1, 2006 issue of the journal *Clinical Infectious Diseases***.

Zoonotic Influenza Study –Through this research study we seek to understand why some people experience animal-to-human transmission of influenza virus. Identifying people at the greatest risk of zoonotic infection is a first step in providing them with special vaccines to prevent such infections and epidemics. Last year we enrolled 805 participants in 29 counties in Iowa and received 50 febrile samples from the participants. We will be testing these samples with our recently acquired Biorad iCycler real-time PCR machine. We are currently completing our first round of follow-up visits. In these visits we are collecting blood samples from participants to see if the participants had sub-clinical infections from zoonotic sources. In the photo above graduate student **Meredith Good** explains a gargle sampling kit to a study participant. More information may be found on the study web site: <http://www.public-health.uiowa.edu/flu/>



National Surveillance for Emerging Adenovirus Infections – As of September 20th, we have received **1038** adenovirus positive samples from 15 different sites in this national study. Using a CDC sequencing strategy that targets a hypervariable region of the adenovirus hexon gene we are able to type wild adenovirus and to examine national prevalence trends. Thus far data are remarkable in that few Adv4 and Adv7 isolates have been detected among civilian populations. Collaborating sites are reporting keen clinical interest in this work. The clinical value of genotyping adenoviruses is apparent for individual patient care (especially during prolonged chemotherapy) and for investigation of possible nosocomial adenovirus outbreaks. Study results are listed at: <http://www.public-health.uiowa.edu/adv/>



Analysis of Hypervariable Genes in *Streptococcus agalactiae*—Tara Smith PhD, (photo at left) has won funding to investigate an area of hypervariable genes in *Streptococcus agalactiae* (group B streptococcus), and determine how different alleles relate to the virulence of individual strains. Ph.D. student **Sarah Starks** worked with Dr. Smith on this project this summer to optimize the PCR reaction in order to amplify and sequence the hypervariable genes. Currently MPH student **Ashley Miller** and **Brenda Boese** are helping with this research project.

Streptococcus suis studies - We are planning a new study here at CEID focusing on *Streptococcus suis*. This is a bacterium that is related to group A and B streptococci, but whose main host is swine. In swine, it can cause serious disease and death. In humans, it has been shown to cause meningitis, typically in people who work in close contact with swine (farmers, often butchers). A recent outbreak of this bacterium in China resulted in at least 200 infections, with 38 deaths reported as of early August. However, to date, there have been no human cases of *S. suis* diagnosed in the United States, despite the fact that virulent *S. suis* is present in the swine population. We plan to study a subset of sera collected for the zoonotic influenza and other studies in order to determine whether individuals in these populations may have been previously infected with *S. suis*.

Occupational risk of avian influenza infection among Peruvian poultry workers - Graduate student **Ernesto Ortiz** (photo at right) has designed an epidemiological study to evaluate Peruvian poultry workers for previous infections with avian influenza. Study approvals included three institutional review boards and the Ministry of Health of Peru. Ernesto will be going back to Peru in December to do the recruitment and blood sampling of the poultry workers with the assistance of NMRCD in Lima, Peru.



Vaccine Trials – Dr. Gray recently facilitated bringing two vaccine trials to the University of Iowa. Center students and staff are collaborating with staff from the Preventive Interventive Center to run the studies. **Randomized, Double-blind, Placebo Controlled Trial to Evaluate the Efficacy of Fluviral® Influenza vaccine in Human Adults 18 to 49 Years of Age, Protocol, No. IDB-707-106** – Center staff recently enrolled 50 volunteers in a large, national evaluation of an inactivated influenza vaccine. The study will enroll another cohort next winter.

Randomised, Double Blind, Multicentre, Placebo Controlled Phase III Study of the Safety and Tolerability Following Administration of Live Attenuate JE Vaccine (ChimeriVax®- JE) – this promising new recombinant vaccine will be offered to volunteers this fall. Participants will be followed for six months.



Vaccine team members include **Regina Arthur, Whitney Baker, Kathy Brake, Mary Cherrico, Deb Feddersen, Jim Gill, Meredith Good, John Hawkins, Neal Kohatsu, Georgia MacBeth, Daniella Moga, Kelly O’Berry, Ernesto Ortiz, Preeti Satyanarayana, and Phil Van De Griend.**

Avian influenza among Iowa’s DNR workers and hunters – Jim Gill, MD, PhD has designed a pilot study to evaluate exposure of Iowa DNR workers and Iowa duck hunters to avian influenza virus carried by wild ducks and geese. Serum samples from 39 duck hunters and 69 DNR employees are being tested for neutralizing antibodies against all HA subtypes of avian influenza in North America by the sophisticated high through-put microneutralization assay. We are also isolating avian influenza virus from wild ducks and geese captured or killed in Iowa.

Iowa Beach Study – This summer the Center collaborated with the University Hygienic Laboratory, Iowa’s Department of Natural Resources, and the other professionals in the University of Iowa’s College of Public Health in studying the association of beach activities, fresh water beach water quality, and self-reported gastrointestinal illnesses. Over 1000 subjects were enrolled via student interviewees at Lake McBride and the Coralville Reservoir. Study participants filled out web-based surveys to track their symptoms after visiting the beaches in Iowa. Investigators include: **Michael Wichman, Eric O’Brien, Pete Weyer, Bill Field, David Riley, Nancy Hall, Greg Gray, Tara Smith, and Troy McCarthy.**



Cross-sectional pilot study to Identify Prevalence of Zoonotic Influenza among Swine and Poultry Confinement Workers– Dr. Alex Ramirez (Iowa State University) is working closely with **Ana Capuano** and **Dr. Greg Gray** in analyzing the swine influenza serology results from his MPH practicum study. 53 subjects participated in this study. Data suggest that swine workers can markedly reduce their risk of infection from swine viruses simply by wearing gloves. Dr Ramirez is drafting a manuscript regarding this work.

White-tailed Deer, Mosquitoes, and the Ecology of West Nile Virus - Jim Gill, MD, PhD, and Kaitlin Rainwater, a CDC Emerging Infectious Disease Fellow at the UHL, have designed a study to see if white-tailed deer are possible amplification hosts for West Nile virus. Nearly 700 deer serum samples were collected from federal, state, and county lands throughout Iowa last fall. These samples will be analyzed by blocking ELISA for antibodies against WNV. This spring and summer mosquitoes will be collected from these same public areas and analyzed for host blood and WNV. An unexpected finding, thus far, has been the discovery of a possible new and unknown flavivirus circulating in deer in the Iowa City region.

TEACHING/TRAINING:

Laboratory trainees -

This summer we hosted four trainees in the Emerging Pathogen Laboratory. (Left to right) **Kelly Leshner** (Univ of Iowa), **Rebecca Milburn** (Azusa Pacific University) **Scott Teesdale** (Univ of Iowa), and **Jill Dinkla** (Luther College).



This fall another group of students are learning laboratory techniques: **Lindsay Bodkins** (Univ of Iowa), **Ghazi Kayali** (PhD student), **Ernesto Ortiz** (MPH student), and **Daniella Moga** (Fogarty scholar from Romania).



Zoonotic Disease Summer Course – Last summer, the Center, in collaboration with the University Hygienic Laboratory (UHL) and ISU, offered a 2-semester hour, 5-day course to introduce students to the epidemiology and control of zoonotic diseases. The courses involved considerable field and laboratory work (eg. mosquito & tick collection and identification, water sampling).



Course materials include readings, lectures, field studies, and laboratory exercises. Instructors included **Jim Gill, Kelley Donham, Greg Gray, Wayne Rowley** (ISU), **Ken Platt** (ISU), **Nancy Hall** (UHL). Photographs: Left graduate student Diana Von Stein inspects a CDC light trap for mosquitoes. Above: The class after a tour and meetings at West Liberty Foods.

New Courses - Two new courses have been approved by the Epidemiology faculty. **“Infectious Causes of Chronic Disease”** will be offered in spring semesters (possibly beginning in 2006), and will focus on the evidence for and against the role various microbial agents may play in the development of chronic disease, including heart disease, diabetes, and autoimmune diseases, among others. **“Molecular Epidemiology”** will be offered in the fall, and will cover many of the essential techniques in molecular biology and their applications to epidemiological research. Both courses will have a focus on case studies and the primary literature, and will be taught by **Dr. Tara Smith**. A course in **Public Health Biology** is also in development...stay tuned!

Respiratory Disease Workshop in Cluj-Napoca, Romania –Our list of friends, colleagues and future collaborators has significantly grown after **Sharon Setterquist** and **Greg Gray** were invited to participate in the 75th anniversary celebration of the Iuliu Moldovan Institute of Public Health. Sharon and Greg presented the workshop to about 25 Romanian virologists and epidemiologists. During our visit we were given tours of the Institute of Public Health and the veterinary school. We also were graciously driven to Bran’s Castle. Our lectures, as well as those by Drs. Ioan Bocsan, and Alex Coman, were well received, thanks to the hours of translation performed by Dr. Alex Coman (teaching in photo above), a former UI Fogarty scholar. This visit may lead to future collaborations.



Tropical Infectious Disease training - Graduate students **Lindsay Schultz, Ashley Miller, Ingrid Trevino, and Ernesto Ortiz** invested their summer in studying infectious diseases. Lindsay and Ashley worked with researchers at Navy Medical Research Unit No. 3 in **Cairo, Egypt**. Ingrid and Ernesto worked with researchers at the Navy Medical Research Center Detachment in **Lima, Peru**. The students received various travel assistance from UI’s MPH program, the Center for International Rural and Environmental Health, and the Global Health Studies Program. These experiences likely have helped students in their public health careers. Ashley Miller has been offered a position in the **US Navy laboratory in Jakarta Indonesia** when she graduates this winter.

Ingrid Trevino has recently won an interview with the **CDC’s Epidemiology Intelligence Service**. Photo above (left to right Ashley, Lindsay, and Tina Parker (former UI grad now on staff at the lab in Egypt.)

Biodefense Training - **Sam Messer**, MPH student, spent his summer at the world renowned US Army Medical Research Institute for Infectious Diseases at Fort Detrick, MD. Sam’s worked with leading toxin experts in adapting new diagnostic technologies, work which will likely lead to coauthorship on three manuscripts.

Sam and **Ashley** gave a wonderful seminar regarding the many logistical details and discoveries they experienced during their summer MPH practicum experiences. The 50 minute seminar was digitally recorded: http://video.public-health.uiowa.edu/ramgen/MPH_seminar/MPH_SEM

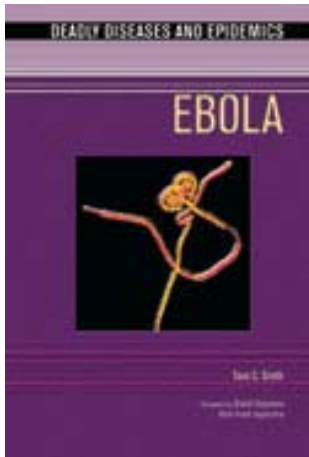
NEW RESEARCH AREAS UNDER DEVELOPMENT

Adenoviruses as Indicators of the Source of Fecal Contamination in Freshwater (Gray)

Avian Pneumovirus a Human Pathogen (Gray - Collaboration with Univ. of MN)

Are Romanian Swine Workers at Increased Risk of Infection With Zoonotic Influenza Virus? (Gray – Collaboration with Romanian Researchers)

Molecular Characteristics of Non-O157:H7 Shiga-Toxin Producing E. coli (Smith Collaboration with University Hygienic Laboratory)



JUST PUBLISHED:

Smith TC. Ebola. Chelsea House Publishers: Philadelphia, PA. 2005

Loftis AD, **Gill JS**, Schriefer ME, Levin ML, Eremeeva ME, and Gilchrist MRJ. Detection of *Rickettsia*, *Borrelia*, and *Bartonella* in *Carios kelleyi* (Acari: Argasidae). J. Med. Entomol. 2005;42:473-480.

NEWLY ACCEPTED MANUSCRIPTS:

Metzgar D, Osuna M, Yingst S, Rakha M, Earhart K, Elyan D, Esmat H, Darwish M, Kajon A, Wu J, **Gray G**, Ryan M, Russell K. PCR analysis of Egyptian respiratory adenovirus isolates: Species, serotypes, and coinfections. J Clin Microbiol 2005; in press.

Myers KP, Olsen CW, **Setterquist SF**, **Capuano AW**, **Donham KJ**, **Thacker EL**, Merchant JA, **Gray GC**. Evidence of Swine Influenza Virus Infection Among Swine Workers. Clin Infect Dis 2005: in press.

Gray GC, **Capuano AW**, **Setterquist SF**, **Sanchez JL**, Neville JS, **Olson JG**, **LeBeck MG**, **McCarthy T**, Abed Y, and Boivin G. Human metapneumovirus infections and genomic variation in Latin America. Emerg Infect Dis 2005: in press.

NEW RESEARCH PROJECTS:

Ernesto Ortiz (PI and graduate student) 7/1/05-5/31/07

Occupational risk of avian influenza infection among Peruvian poultry workers

Gregory C. Gray (PI) 10/1/05-9/30/06

A Randomized, Double-blind, Placebo Controlled Trial to Evaluate the Efficacy of Fluviral® Influenza vaccine in Human Adults 18 to 49 Years of Age, Protocol, No. IDB-707-106

Gregory C. Gray (PI) 10/1/05-9/30/06

Randomised, Double Blind, Multicentre, Placebo Controlled Phase III Study of the Safety and Tolerability Following Administration of Live Attenuate JE Vaccine (ChimeriVax®- JE)

PROPOSALS UNDER REVIEW:

James Gill (PI) 6/1/05-5/31/10

Avian Influenza Virus Infection in Wildlife Professionals and Waterfowl Hunters

Response to NIH-NIAID-PA-03-080

Gregory C. Gray (PI) 4/01/06-3/31/11

Prospective Studies of Avian Influenza Transmission in Asia

Response to NIH-NIAID-PA-04-119

Tara C. Smith (PI) 4/01/06-3/31/08

Tara C. Smith (PI) 4/01/06-3/31/08

Investigation of Influenza Virus Transmission by Flies

Response to NIH-NIAID-PA-04-199

Gideon D. Zamba (PI) 10/1/05-9/30/08

Analytical syndromic surveillance tool for ILI & intentional biological releases

Role: Co-Investigator

Patricia Donohoue (PI) 7/1/06-6/30/07

Investigation of a Viral Etiology for Human Obesity

Role: Co-Investigator

More complete center grant / contract activity may be found at the Center web site:

<http://www.public-health.uiowa.edu/CEID/Projects.htm>

MEDIA COVERAGE:

Gray, Smith, Gill Radio Talk Show Guests, Oct. 5 - Our Center's work was featured in a radio show Talk of Iowa on Oct 5th. Tara Smith, Jim Gill, and Greg Gray discussed emerging infectious diseases (photo at right). Recorded link:

http://wsui.uiowa.edu/talk_of_iowa.htm



Local Television Coverage of Influenza Vaccine Trial –

http://www.kcrg.com/article.aspx?art_id=97954&cat_id=123#

Radio Iowa Interview - Alex Rameriz and Greg Gray provided material for a radio program regarding influenza for Radio Iowa: <http://www.radioiowa.com/gestalt/go.cfm?objectid=9D9F0C97-26B3-47F3-9511D025FCDF64AF>

Good Hygiene Is Best Defense Against Avian Flu - (Council Bluffs Daily Nonpareil, 10/22/2005) Basic hygiene practices can help to minimize the effects of a flu outbreak. "We don't want to panic the public," said GREGORY GRAY of the University of Iowa, "We need to let the public know what to do if it (an outbreak) occurs. Get vaccinated. Practice good hygiene measures, such as hand washing with soap. Don't go to work if you're sick because you could spread the virus to other workers." People who work around swine should become better educated about the flu virus and practice good hygiene measures, including wearing gloves when handling swine, Gray said. There must also be a "priority access to vaccine" for these workers, he said. Gray was in Council Bluffs last week to discuss concerns about avian, or bird, flu as part of an Educational Outreach Program presentation at Western Iowa Community College. http://www.zwire.com/site/news.cfm?newsid=15433586&BRD=2703&PAG=461&dept_id=555106&rfi=6

Bird Flu - Ready or Not? - (The Gazette, Cedar Rapids and Iowa City, 10/23/2005) - With the threat of avian flu crossing the globe, is Iowa ready for what could be another widespread outbreak? "I'd say no one is prepared for this pandemic," said GREGORY GRAY, director of the Center for Emerging Infectious Diseases at the University of Iowa. "I know of no public health official who'd say we're ready right now." Link:

<http://ee.gazetteonline.com/Repository/ml.asp?Ref=VEEdLzlwMDUvMTAvMjMjQXlwMDEwMg==&Mode=HTML&Locale=english-skin-custom>

UPCOMING EVENTS:

Dates	Travel
Nov 10-11 th	Conference on "Emerging Infections in Clinical Practice and Emerging Health Threats" www.med.umn.edu/cme/courses/Emerginf05.html
Nov 22 nd	Avian flu workshop, Ames
Mar 19-22	5th Biannual International Conf on Emerging Infectious Diseases - Atlanta, GA http://www.iceid.org/ abstracts due Nov 18th
Mar 22-25	International Symposium on Emerging Zoonoses (http://www.isezconference.org/programinfo.htm)
July 10-13	International Society for STD Research Amsterdam, Netherlands July 10-13 2005. http://www.isstdr.org/

The Center for Emerging Infectious Diseases greatly appreciates your collaboration.

Please help us make the Center useful to you. Let me know if you have ideas to share, grant proposals to draft with others, opportunities for students, or email news that would be appropriate for such periodic email messages such as this. Please also let me know if you have recommendations to improve our Center web site. <https://www.public-health.uiowa.edu/CEID/>

My best,
Greg

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