PARTNERSHIPS

ANNUAL REPORT
FISCAL YEAR 2015

WWW.SHLUIOWA.EDU
# TABLE OF CONTENTS

## DIRECTOR’S OFFICE
- Message from the Director ................................................................. 3
- Office of the Director
  - Iowa Laboratory Appraisal Program-CLIA ..................................... 4
  - Genomics ......................................................................................... 6
  - Human Resources ........................................................................... 7
  - Information and Technology ............................................................. 8
  - Organizational Development ............................................................. 9
  - Public Policy .................................................................................... 10
  - Research and Development ............................................................. 11
  - Strategic Communications .............................................................. 13

## ADMINISTRATION AND FINANCE DIVISION
- Administration and Finance
  - Central Services ............................................................................... 15
  - Client Services ................................................................................ 16
  - Education and Outreach ................................................................. 17
  - Facilities ........................................................................................... 19
  - Financial Management .................................................................... 20
  - Grants and Contracts ........................................................................ 20
  - Outreach Programs .......................................................................... 21
  - Safety and Security .......................................................................... 22

## DISEASE CONTROL DIVISION
- Disease Control Division
  - Maternal Screening ......................................................................... 24
  - Blood Lead ....................................................................................... 25
  - Environmental Microbiology .......................................................... 26
  - Microbiology ................................................................................... 28
  - Newborn Screening ......................................................................... 29
  - Serology ........................................................................................... 31
  - Molecular Diagnostics and Virology ................................................ 32

## ENVIRONMENTAL HEALTH DIVISION
- Environmental Health Division
  - Analytical Services .......................................................................... 35
  - Emergency Preparedness .................................................................. 43
  - Field Services ................................................................................... 46
  - Iowa Lakeside Laboratory .................................................................. 48
  - Environmental Laboratory Certification Program........................... 49

## MORE
- Year at a Glance .................................................................................. 50
- Financial Report .................................................................................. 51
- Testing Data ......................................................................................... 52
- Contact Us .......................................................................................... 53
Dear friends,

Each year, this Annual Report highlights a theme reflecting an important aspect of the State Hygienic Laboratory’s work. This year, we have chosen to focus on Partnership, a deceptively complex concept with vital importance to the Hygienic Laboratory’s ability to meet its responsibilities.

On the surface, partnership seems pretty straightforward. After all, the State Hygienic Laboratory is a public agency, established by Iowa’s legislature in 1904 to support the state’s need for science-based information regarding community-based health and environmental concerns. As a result, we routinely work with state and local agencies to provide answers to the questions they have about the nature of a disease or the quality of the environment. Partnership is also a concept inherent in our professions of public and environmental health with a focus on population and community health. However, partnership requires more than simply working together. Webster’s Dictionary tells us that partnership includes “close cooperation...with both specified and joint rights and responsibilities.” If the old maxim that “we are all in it together” is true, then partnership is how we most effectively achieve our common purpose.

The importance of this common purpose, and the need for partnership, became frighteningly apparent this last year when several cases of Ebola were identified in the United States. The spike in public fear resulting from the sudden appearance of this frequently fatal disease refocused attention on the need for national preparedness and emergency response. Issues of disease surveillance and investigation, health communications, legal requirements for screening, and the revamping of workforce training to ensure the accomplishment of best practices in addressing a communicable disease, all emerged in the wake of this outbreak. Each of these elements requires that we develop continuing partnerships between all of those who can achieve an effective response.

Within this report is the detailing of the expertise the Hygienic Laboratory has developed on behalf of Iowa’s system of preparedness and response. However, the value of this expertise will be increased through partnerships with others who share a common vision for the state. It is with this goal in mind that we offer this annual report as an inventory of the State Hygienic Laboratory, and look forward to an expansion of partnerships with other Iowans who share our vision that Iowa is indeed the healthiest state in the nation.

Christopher G. Atchison, Director
IOWA LABORATORY APPRAISAL PROGRAM - CLIA

Two CLIA compliance surveyors traveled more than 26,000 miles throughout Iowa to conduct certification surveys of more than 200 clinical laboratories for the Centers for Medicare & Medicaid CLIA program.

Under the federal Clinical Laboratory Improvement Amendments of 1988, any laboratory or facility that performs laboratory testing of human specimens for the purpose of providing information for the diagnosis, prevention or treatment of disease, or the assessment of the health of human beings, is required to obtain a CLIA certificate and to meet certain requirements. This rule applies no matter whom the facility bills for the service, or whether it provides the service at no charge.

The type of CLIA certificate a laboratory must have depends on the type of testing the laboratory performs.

Laboratories with certificates of compliance or accreditation are subject to routine inspections (surveys) every two years.

For more than 40 years, the Hygienic Laboratory, under contract with the Iowa Department of Inspections and Appeals, has provided the personnel to conduct laboratory surveys for programs required by the Clinical Laboratory Improvement
Act (CLIA) of 1967 and the Clinical Laboratory Improvement Amendment of 1988. Since 2002, the laboratory has also been responsible for the administrative oversight of the CLIA laboratory program and served as the state agency representative for the Center for Medicare and Medicaid Services (CMS) CLIA program.

The total number of health care facilities in Iowa with CLIA certificates increased from 3,080 to 3,112. The number of certificates of compliance and waiver increased, while certificates of accreditation and provider performed microscopy (PPMP) decreased.

**MAJOR ACHIEVEMENTS:**

- Organized and hosted the 2015 CLIA Midwest Consortium Conference at the Hygienic Laboratory’s Center for Advancement of Laboratory Science in Coralville.
- Published four issues of CLIA Corner, a newsletter about federal CLIA requirements.
- Presented “Data Entry Questions and Answers” at the CLIA Midwest Consortium Conference.
- Presented “Top Ten CLIA Deficiencies and Navigating CLIA Websites” to the Mercy Health Network Managers Meeting and the CLMA Annual Spring Meeting.
- Participated in the “Principles of Documentation” presentation at the CLIA Midwest Consortium Conference.
Genomics, the analysis of the sequence, structure and function of the genome, is seen as a significant improvement in personalized health. Knowing and understanding an individual’s genome can enhance individual health through personalized treatments and preventions. The realm of genomics also extends into public health where the potential of predicting the severity of a bacterial, viral infection or genetic disorder represents a central mission of public health: preventing disease.

The purpose of the Office of Genomics is to explore the implications, challenges and opportunities associated with the use of genomic information, focusing on the newborn period. A team of internal and external experts from the fields of medicine, public health and general science help guide this new program.

A recent advance in public health laboratory technology is DNA sequencing using next generation sequencing. NGS data provides more sensitive and specific identification and characterization which improves public health intervention efforts. NGS is poised to dramatically impact multiple public health programs.

The Hygienic Lab is part of the national discussion related to the federal Office for Human Research Protections’ revisions of the rules for protection of human research subjects, known as the Common Rule. Changes to this rule have impact in nearly every field of public health. The Hygienic Lab is reviewing potential recommendations and providing comments as necessary to maintain the quality of the Iowa Maternal and Newborn Screening Programs.

The Hygienic Lab is collaborating with multiple internal and external investigators on projects to answer specific genomic-related questions.

**PRIMARY AREAS OF EMPHASIS:**

- Expanded the scale of data available for analysis in the maternal and newborn period;
- Advanced the understanding of specific disorders identifiable through newborn screening using new DNA-based analysis; and
- Considered the ethical, legal and social implications of using genomic information in the newborn period.
The Office of Human Resources collaborates with laboratory leadership to ensure an engaged, competent and diverse workforce. The office oversees development and administration of policies and programs for recruitment, compensation, development, support and retention.

Human Resources works with staff through all phases of employment from orientation through professional development and retirement.

**MAJOR ACHIEVEMENTS:**

- Provided opportunities for Iowa students to develop careers in the fields of clinical laboratory science, environmental science, chemistry, biology, microbiology and many other areas.
- Introduced and implemented a new leadership development plan for staff to build key competencies as future leaders.
- Rebranded the staff Reward and Recognition program. Updated and refreshed all recognition nomination forms and created a new lapel pin program to sustain program relevance and meaning to staff.
- Collaborated with division directors on succession planning as a result of the university’s early retirement incentive program.
- Implemented compliance training systems to maintain staff competencies.
- Focused on UI compliance in recruiting, performance management, leave issue practices, conflict resolution and training to assure adherence to UI policy.
- Participated on internal and external planning committees to improve processes.
The Office of Information and Technology supports a complex set of networks providing comprehensive IT services to the three Hygienic Laboratory locations. IT supports around-the-clock laboratory operations, including testing in clinical care, environmental health and emergency preparedness. As part of the state of Iowa’s continuity of operation plans, the Hygienic Laboratory maintains redundant enterprise infrastructure equipment and services at the Coralville and Ankeny facilities.

The Hygienic Laboratory is regulated by many national and state agencies, each with their own data security and confidentiality requirements. These include Clinical Laboratory Improvement Amendments, EPA and CDC. To be compliant with mandated rules and regulations from such agencies, IT operates a rigorous set of security protocols, including firewalls, encryption, controlled access and monitored surveillance systems.

This office leads several efforts at the state and national level to improve the way information flows through automated electronic data exchanges.

**MAJOR ACHIEVEMENTS:**

- Integrated disease testing into the Hygienic Laboratory’s Enterprise Laboratory Information Management System called OpenELIS. The new system provides significant improvements with laboratory workflow including instrument interfacing, electronic result reporting to hospitals and automated disease surveillance connectivity with the Iowa Department of Public Health. In the near future, with the integration of newborn screening, all testing conducted by the Hygienic Laboratory will be integrated into OpenELIS which will lead to an increase in efficiency for the lab and its clients.

- Designed additional features in OpenELIS to manage state monitoring and reporting requirements for samples covered by the Safe Drinking Water Act (SDWA). The new enhancement allows OpenELIS to automatically resend collection kits when samples have positive results; to electronically notify the Iowa Department of Natural Resources when results are elevated; and to manage additional public water supply identification information for compliance monitoring. This project was supported by a two-year EPA Exchange Network grant.
Iowa was one of the first states to participate in a national Laboratory System Improvement Program. The Hygienic Laboratory’s Office of Organizational Development coordinated and launched the Iowa implementation.

The Office of Organizational Development was established in 2014. This office oversees strategic planning, organizational change, quality improvement, performance measurement and systems design. Areas of focus include workforce performance, customer engagement, financial sustainability, improvement and innovation, and subject expertise.

As part of the office, the quality assurance coordinators develop and conduct continuous quality improvement processes that increase the efficiency and effectiveness of operations and services. This includes applying process improvement concepts to quality management systems; collecting and analyzing data; and assuring compliance, training, education and leadership.

**MAJOR ACHIEVEMENTS:**

- Evaluated, updated and transitioned the Strategic Plan to SMART (specific-measurable-achievable-relevant-timely) tactics.
- Held a statewide event with 60 participants to evaluate Iowa’s public health/public health laboratory system as part of the Association of Public Health Laboratories’ Laboratory System Improvement Program (L-SIP).
- Completed training and certifications in Project Management and Lean/Six Sigma.
- Developed informatics reports for operations, finance and data visualization applications.
- Provided leadership through participation in the APHL Knowledge Management committee and its Laboratory Systems and Standards committee, and helped plan for a quality systems conference to be jointly sponsored by APHL and FDA.
- Engaged a culture of continuous quality improvement (CQI) through completion of eight events and seven in-progress projects using peer groups. Projects included opportunities for improvement in daily workflow, such as reducing time or materials needed in a process. These included preparing laboratory media, tracking proficiency testing and reviewing the kit-ordering process.
PUBLIC POLICY

In open forums and “Hill Day” events held at the Iowa capitol, policymakers and state leaders learned about how the Hygienic Laboratory fulfills its statutory public health mission.

The Office of Public Policy strives to provide objective, timely information regarding issues concerning the advancement of the State Hygienic Laboratory’s mission. The office fosters and maintains relationships with government agencies, elected officials and key stakeholders to promote shared understanding and accomplishment.

The office tracks legislation pertinent to Iowa’s public health system; provides educational materials to Iowa policymakers through open forums and Hill Day events; and interfaces with state educational professionals, and environmental and public health partners.

MAJOR ACHIEVEMENTS:

• Represented the Hygienic Laboratory at Hill Day and legislative outreach events.
• Coordinated visits with state and local policymakers, state agencies and higher educational institutions.
• Led and supported initiatives aimed at developing new and existing policy.

Students Luke McKenna and Laura Stowater from Algona Middle School and Algona High School (respectively) pose with State Rep. Tedd Gassman during a STEM Hill Day event at the State Capitol. McKenna and Stowater worked with mentor Dennis Heimdal, environmental lab specialist, on water quality projects in Lake Okoboji.
The Office of Research and Development oversees internal and external efforts to advance the research capabilities of the laboratory. Additionally, the office evaluates and advises the director of the Hygienic Laboratory on emerging methodologies and activities, including test methods, instrumentation and the overall science platform of the laboratory. Externally, the office advises and assists in the development of research agreements with external partners.

Hygienic Laboratory scientists are involved in numerous studies and projects that utilize advanced technologies and apply them to tests and processes. This is known as translational or applied research. The goal of this research is to perform practical studies that can be used to improve the health of Iowans.

The Hygienic Laboratory has a history of participation in applied research activities. For example, staff scientists have developed or modified analytical procedures for measuring toxic compounds or pathogens in air, water, soil, food and clinical samples. They collaborate with researchers at the University of Iowa, other universities and private industry on a variety of topics, including infectious diseases, environmental health, occupational health, birth defects and neonatal health.

Engagement in research is one of the core functions of a Public Health Laboratory.

Jing Bai, clinical lab analyst, prepares lettuce and greens to test them for Cryptosporidium and Cyclospora.
MAJOR ACHIEVEMENTS:

- Partnered with FDA and Iowa Department of Inspection and Appeals for an Illumina MiSeq Next Generation Sequencing instrument and reagents to perform whole genome sequencing on foodborne pathogens in support of the national FDA GenomeTrakr program.
- Developed new real-time PCR assays for detection of Cryptosporidium and Cyclospora in food. The lab is currently conducting surveillance testing of leafy green produce samples obtained from local farmer’s markets. This assay has been identified by the FDA as of high level national importance.
- Performed pre-market, on-site evaluation of the newest Next Generation Sequencer (NGS), the Ion S5 XLS, manufactured by Thermo Fisher/Life Technologies. The product was launched Sept. 1, and studies were presented at the Association of Molecular Pathology Cooperate Workshop in Austin, Texas.
- Designated by CDC as one of 27 official participants in NGS PulseNet. Iowa is one of 20 states targeted to receive additional funding for the purchase of reagents for use in this program.
- Collaborated with Joshua M. Tebbs, Professor, Department of Statistics, University of South Carolina, on an NIH grant application for analysis of chlamydia/gonorrhea data.
- Chosen as one of five laboratories to participate in CDC’s Culture Preservation Project for the analysis of recovery of STEC isolates from various media. Results of the study will be used to formulate national recommendations for laboratories using Culture Independent Diagnostic Tests. The other four sites are in Los Angeles County, Tennessee, Minnesota and at CDC.
- Selected as one of 10 laboratories nationally as a Level 1 Food Emergency Response Network (FERN) surveillance and response laboratory. This includes the disciplines of environmental microbiology, radiochemistry and chemistry in a partnership with the Iowa Department of Agriculture and Land Stewardship.
- Received the CDC Influenza Real-Time RT-PCR Panel QuantStudio DX Instrument (valued at approximately $80,000) for validation. Testing for CDC’s 510k submission is estimated to begin in calendar year 2016.

Anna Yakos, clinical laboratory analyst, tests for MERS.
STRATEGIC COMMUNICATIONS

Ebola, fracking, measles, arsenic in drinking water and a newborn screening children’s book are some of the public health news shared with state and national media outlets.

The Office of Strategic Communications serves as the lead communications section for the agency, and develops the focus and themes for external messaging. It is the primary interface between the Hygienic Laboratory and the local, state and national media; the University of Iowa communication portals; and other external publications. It provides crisis communications during environmental and public health emergencies and manages the Hygienic Laboratory’s electronic and social media accounts.

MAJOR ACHIEVEMENTS:

- Appointed to the Genetic Alliance Steering and Advisors board, and the Consumer and Community Work Group.
- Created an annual report that highlights areas of specialty and volume of testing.
- Designed and produced a monthly newsletter, marketing materials, a testing guide book and other collateral materials to highlight expertise and activities.
- Redesigned the Disease Control Division’s and Environmental Health Division’s sections of the website, expanding access to the menu of tests.
- Partnered with the UI School of Journalism and Mass Communication in a graduate student capstone project for an interactive display in the UI Mobile Museum, a University of Iowa outreach program.
- Created a branding campaign, logo and supporting materials for the Center for the Advancement of Laboratory Science (CALS).
- Implemented online payment capabilities for CALS.

University of Iowa employee and graduate student Robyn Miessler-Kubanek stands by the interactive display she created for the UI Mobile Museum.
The Division of Administration and Finance is responsible for the management of the business practices (Financial Management, Grants and Contracts, Outreach, and Safety and Security), all Hygienic Laboratory facilities (including the Center for the Advancement of Laboratory Sciences), and the pre- and post-analytic processes related to laboratory testing (Central Services, Client Services, and Central Accessioning and Receiving). It also oversees multiple education, training and STEM programs presented at or sponsored by the Hygienic Laboratory.

Business management for the laboratory is centralized in the Coralville laboratory. Staff that oversee the pre- and post-analytical processes are located in the Coralville, Ankeny and Milford laboratories.
CENTRAL SERVICES

To carry out the Hygienic Laboratory’s public health mission, staff traveled approximately 214,028 miles in fiscal year 2015. Central Services coordinated the lease of UI Fleet vehicles, as well as the many other functions that keep the laboratory rolling.

Central Services creates and distributes analytical test collection kits to clients throughout Iowa and other states. Staff provides support for the entire laboratory by purchasing, tracking and distributing supplies necessary for laboratory testing. They also process both incoming and outgoing packages and correspondence.

Team members are certified in Hazmat shipping requirements for select packages, and specially trained personnel perform necropsy work to assist with rabies testing.

Central Services is also responsible for scheduling the leased University of Iowa Fleet Service vehicles used by staff.

Deb Bryant, a clerk in her 43rd year with the Hygienic Laboratory, poses with UPS driver Paul Yoerger after receiving a daily laboratory shipment.
CLIENT SERVICES

All clinical and environmental specimens that are tested by the Hygienic Laboratory are accessioned and tracked by Client Services.

The Client Services section consists of the support services areas of the laboratory that relate to customer service. The 23 staff members work in the areas of data entry, customer service contact (price quotes, kit orders, results, billing), receptionists, and, in Ankeny, Central Services.

Client Services also includes Central Accessioning, which receives and processes every clinical and environmental sample that arrives at the laboratory; Glassware Wash, which cleans and sterilizes glass equipment; and Media Prep, which prepares the sterile material used to help identify bacteria and viruses.

Many staff members have direct contact with clients either in person, on the phone or through electronic contact such as e-mail.

The Client Services section completed data entry of 100,049 clinical samples and 64,686 environmental samples. Central Accessioning logged 164,735 laboratory tests into the database with verification by the Client Services staff.

**MAJOR ACHIEVEMENTS:**

- Combined the data entry and client services duties under one supervisor, allowing data entry staff to be cross trained in all disciplines of both clinical and environmental data entry and verification.
- Hired a Support Services supervisor to provide oversight over the customer service needs.
- Assisted in the development of the clinical version of OpenELIS, which went live in March 2015.
- Provided oversight of all the Iowa DNR projects that occurred from March to October to ensure that kit orders and results were provided to DNR staff.
- Began scanning all collection forms to allow on-line access and eliminate paper copies. This will become a part of the OpenELIS system so staff may easily access and view collection forms while they are working on samples. It also will allow clients to view the collection form through our on-line web portal where they receive their test results.

Emy Rivera, laboratory assistant, packages glassware that was sterilized in the washroom and will be delivered to the laboratory to be used in testing.
EDUCATION AND OUTREACH

More than 39,860 people across the nation and 17,700 people in Iowa participated in education and training sponsored by the State Hygienic Laboratory.

Public health professionals, laboratorians, first responders and others in the health fields attend training sessions at the Hygienic Laboratory. Training topics encompass emergency preparedness, environmental regulations, food safety, influenza and newborn screening.

STEM (Science, Technology, Engineering and Math) education creates a foundation for the future workforce. Many educational programs offered by the Hygienic Laboratory are created for students in grades K-12, including hands-on interactive learning and a Student Mentorship Program for junior high and high school students. This section also manages internships for college students, fellowships for post-graduate students and externships for teachers.

Barry Brill, from Woodward-Granger Community School District, pours water collected from a Limnology site visit into testing bottles as part of his externship.

MAJOR ACHIEVEMENTS:

- Showcased the laboratory in the University of Iowa Mobile Museum, which traveled 4,498 miles across Iowa to 34 events, attracting 8,257 visitors during this fiscal year.
- Hosted 14 STEM events with 469 participants, and participated in an additional nine STEM events throughout the state with over 9,100 participants.
- The iExploreSTEM festival, which originated at the Hygienic Laboratory, was held in 45 locations throughout Iowa, with 14,970 participants.
- Hosted three science teachers for the Real World Externships for Teachers Program.
- Hosted 17 interns, one public health associate fellow and one environmental fellow.
- Staff mentored six junior high/high school students with science projects through the Student Mentorship Program.
- Coordinated the Ambassador Program, working with State Rep. Dave Jacoby who served as the sixth State Hygienic Laboratory Ambassador.
- Partnered with businesses to develop the STEM Innovator Institute, a model for engaging K-12 schools in innovation and entrepreneurship through a community-driven, problem-based, interdisciplinary approach to learning framed in a STEM context.
CENTER FOR THE ADVANCEMENT OF LABORATORY SCIENCE (CALS)

In its first year of operation, CALS hosted more than 5,019 people who attended 246 events.

CALS is a public venue intended for use by environmental and public health stakeholders, educational groups, and community businesses and organizations that need meeting space or access to a fully functional public health laboratory.

CALS is located in the Coralville laboratory, and is comprised of a conference center and a training laboratory. The Hygienic Laboratory has a long history as a national leader in public health education and training, and, through CALS, provides training for the current public health workforce and recruiting for the workforce of tomorrow.

The new Center began hosting meetings and events on July 9, 2014 starting with an Iowa State Board of Health meeting.

MAJOR EVENTS:

- Iowa State Board of Health Meeting
- FBI Forensic Photography Training
- State Hygienic Laboratory Ambassador Reception
- Southeast Iowa Regional STEM Council Board Meeting
- Newborn Screening Education Retreat – UIHC Pediatrics/Genetics
- Iowa Climate Statement 2014: Impacts on the Health of Iowans Meeting
- Iowa Food Safety Microbiology Workshop
- Iowa Climate Science Educators’ Forum
- Iowa Laboratory Benchmarking Group Quarterly Meeting
- Sentinel Lab Rule Out of Potential Agents of Bioterrorism: Wet Workshop
- Diagnostic Medical Parasitology Update Workshop – Taught by Lynne Garcia, MS, MT(ASCP), CLS(NCA), BLM(AAB), F(AAM), world-renowned diagnostic parasitologist
- Clinical Laboratory Management Association (CLMA) Conference
- 2015 CLIA Midwest Consortium Conference
- CDC Rapid Methods Course for the Biological Laboratory Response Network
The Facilities section is responsible for overseeing and coordinating the infrastructure and operation of the laboratory building. These duties include coordinating the lab’s specialized heating, ventilation and air conditioning, and space planning, among others. This oversight ensures that laboratory operations are not interrupted due to facility failures, that the working environment is safe for staff, and that the environment outside of the Hygienic Laboratory stays safe.

Facilities staff works closely with the University of Iowa to support the proper functioning of laboratory systems, 24 hours a day, 365 days a year. In addition to the major building systems, this section is responsible for small repair and improvement tasks throughout the building.

**MAJOR EVENTS:**
- Supported the activation of the research campus air-cooled chiller system.
- Worked with University of Iowa Landscaping to responsibly manage the surrounding native prairie.
- Oversaw the design and installation of a customized interlock system for the Microbiology autoclave.

The Hygienic Laboratory in Coralville is designed with open floor plan to promote collaboration.
FINANCIAL MANAGEMENT

More than 17,000 bills and invoices are processed by Financial Management each year.

The finance section is responsible for the management of the $24 million State Hygienic Laboratory operation, including overseeing revenues and expenses to accomplish the objectives of the laboratory. This accounting, billing, purchasing, financial analysis, and revenue- and expense-stream management section of the laboratory provides financial transaction support for more than 4,000 clients and distributes more than 17,000 bills and invoices per year.

MAJOR ACHIEVEMENTS:

- Implemented Strata Decision software for FY16 operation budget.
- Completed major development design on StrataJazz Management Reporting and Decision Support System.
- Moved all environmental and disease-testing billing to the Telcor accounting system (formerly on a legacy in-house system).
- Initiated an in-house seminar series on financial topics for managers and supervisors.

GRANTS AND CONTRACTS

Outside funding for all 11 core functions of a public health laboratory – from disease surveillance and data management to preparedness and laboratory improvement – is overseen by Grants and Contracts staff.

The Grants and Contracts section coordinates pre- and post-award administrative functions for internal (University of Iowa) and external funding sources. These external sources include state agencies, federal agencies, and various other public and private sources of funding.

State agency partners include the Iowa Department of Natural Resources, the Iowa Department of Public Health, the Iowa Department of Inspections and Appeals, and agencies in other states.

Federal and national partners include the Centers for Disease Control and Prevention, the Food and Drug Administration, the Environmental Protection Agency, the US Department of Agriculture and the Association of Public Health Laboratories.

MAJOR ACHIEVEMENTS:

- Oversaw processing of more than 80 sponsored projects.
- Established, and hired, an additional Grants and Contracts full-time position to help support grant and contract processing. This position provides back-up to assure continuous service to internal and external customers.
OUTREACH PROGRAMS

With clients in each of Iowa’s 99 counties, the Outreach program manager travels to all corners of the state, meeting with environmental and public health clients to share new testing information and collect customer feedback.

The Outreach section carries out the Hygienic Laboratory’s service, education and research mission by increasing understanding and use of the state’s public health and environmental laboratory system. Strategic planning, process improvement, market research and analysis, and customer feedback are key parts of the section.

The Outreach program manager is the liaison between the laboratory and clients.

MAJOR ACHIEVEMENTS:

- Met with more than 250 external customers through regional meetings and onsite visits to Iowa DNR field offices, public water suppliers, environmental laboratories, local public and environmental health agencies, and major regional hospital and clinical laboratories throughout Iowa.
- Coordinated the update, redesign and distribution of the 2015 Iowa DNR Guidebook – a 132-page laboratory user’s guide designed for IDNR field staff and central office staff.
- Coordinated the launch of a pilot program to provide Blackhawk County Health Department with CLIA oversight and administration of its public health laboratory. This allows the Hygienic Laboratory to assist local laboratories with expertise and management.

Ankeny staff who organized an open house and Coralville colleagues gather during the event.
SAFETY AND SECURITY

The Hygienic Laboratory is one of the nation’s select Tier 1 public health laboratories, which requires an extra measure of laboratory safety and security.

The Safety and Security section is responsible for ensuring that all sections of the laboratory are compliant with protocols required by the Hygienic Laboratory’s CDC Tier 1 Select Agent (high infectious pathogens) classification, Laboratory Response Network assignment, OSHA regulations, EPA Certification and University of Iowa requirements.

The section provides oversight, investigation and implementation of corrective actions to ensure the safety and security of the staff, students and guests.

Safety and Security is responsible for inspections, including review and tracking of injuries for the three laboratories. Oversight also assures that staff follow biosafety best practices.

Jennifer Elwood, clinical laboratory technical specialist, checks mycology plates for growth of fungal cultures.
The primary mission of the Disease Control Division is to test human specimens, food and water for diseases of public health significance in support of the citizens of Iowa. The division supports numerous programs to prevent and control communicable disease, participate in epidemiologic investigations of disease outbreaks and serve as a reference laboratory for the clinical testing. These testing services help prevent the spread of disease in Iowa through the detection of infectious organisms, newborn screening for genetic disorders and maternal screening.
MATERNAL SCREENING

Non-invasive prenatal testing is available to all women in the state through the Iowa Maternal Prenatal Screening Program.

The Maternal Screening section supports the Iowa Maternal Prenatal Screening Program, offering several screenings that provide patients and health care providers with information about pregnancy and the developing fetus.

Screenings are available to all Iowa women during pregnancy and are designed to identify women with an increased risk of having a baby with Down syndrome (trisomy 21), Edward syndrome (trisomy 18) or an open neural tube defect (e.g. anencephaly or spina bifida). They may also identify women at increased risk of having a baby with other kinds of birth deficiencies, or women at risk of developing a problem later in pregnancy. If an abnormality is identified, the woman’s medical provider is notified and may choose to perform additional testing. Genetic counselling is also made available for parents to help them make informed decisions about the pregnancy.

Karen Ciesielski, clinical lab analyst, examines a specimen for the Maternal Screening process.

TOP TESTS

- QUAD SCREEN
- INTEGRATED SERUM SCREEN
- AFP ONLY
- FIRST TRIMESTER ONLY
- AFP CONFIRMATORY

TOTAL TESTS - 8,747
The Hygienic Laboratory is the central testing laboratory for Iowa Department of Public Health’s Childhood Lead Poisoning Prevention Program. As such, the Blood Lead section tests for the presence of lead in humans and is the state’s reference laboratory for confirmation of all capillary lead screening results.

The two specialized instruments used to screen blood specimens are a graphite furnace atomic absorption spectrometer and an inductively coupled plasma mass spectrometer. Results from these instruments are then analyzed by laboratory scientists to confirm the level of lead from venous blood specimens.

Recent technological advancements in point-of-care testing allows many health care providers to perform lead testing. However, because of the significant public health threat from lead poisoning, the Hygienic Laboratory maintains the capability to provide this confirmatory testing for the Iowa Department of Public Health (IDPH).

More than 9,000 Iowa children were tested for exposure to lead this year.

Whole blood specimens are loaded into vials to test for lead exposure in children.
ENVIRONMENTAL MICROBIOLOGY

Many of the food-borne and water-borne pathogens that were in the news last year were part of Hygienic Laboratory testing. Cryptosporidium and Cyclospora parasites, Salmonella, E.coli O157:H7 and Listeria monocytogenes were some of the headliners during fiscal year 2015.

Environmental Microbiology is the study of microorganisms – fungi, bacteria and viruses – in the environment. Microorganisms are abundant and essential in the environment, but some are harmful to humans. Microbial contaminants that infiltrate our natural resources or food supply can lead to widespread illness.

The Environmental Microbiology section provides analytical services to detect potentially harmful microorganisms in food, water and soil. Such analyses are used in outbreak investigations to pinpoint the source of contamination and to assess the environmental impact from exposure to microbial contaminants. Confirmation of exact microorganism strains is critical in implementing appropriate remediation.

Laboratory testing is provided in support of statewide water surveillance programs to assess the overall safety of public and private drinking water supplies, surface waters (lakes and ponds), and recreational waters (pools and spas). Pathogen analyses in water, food and environmental samples are expanding with emphasis on Cryptosporidium, Legionella, Salmonella and Listeria.

John Kempf, environmental laboratory specialist, processes filters for Cryptosporidium and Giardia parasite testing in water.
MAJOR ACHIEVEMENTS:

- Became certified to perform Cryptosporidium testing in support of the EPA Long Term 2 Enhanced Surface Water Treatment Rule Round 2. The laboratory was awarded the state of Missouri’s Cryptosporidium testing contract (five years) for this rule. This rule and supporting surveillance activities were developed to reduce disease incidence associated with this parasite and other disease-causing microorganisms in drinking water.

- Confirmed the source of a foodborne outbreak in Johnson County, Iowa, so remediation could be initiated and further illness prevented. Environmental surface samples taken from the suspected facility were proven to have the same Salmonella Enteritidis strain found in clinical specimens.

- Tested more than 500 samples from three Iowa beaches for measurement of E.coli per dry weight gram. These samples were submitted by the Iowa Department of Natural Resources to try to pinpoint the source of contamination.

- Developed a sampling plan with the Iowa Department of Inspection and Appeals (IDIA) as part of the FDA ISO17025 food accreditation requirement. Samples from such products as apple cider, gelatin, salsa, ice, bottled water, fish and environmental sponges were collected by IDIA from food manufacturing facilities across Iowa to be tested throughout the year for a variety of microbiological contaminants, including Salmonella, E.coli O157:H7, Listeria monocytogenes, coliform bacteria and E.coli.

- Developed two new molecular assays for the detection of Cryptosporidium and Cyclospora parasites which were used to test about 200 fresh produce and herb samples from retail and farmers markets in Iowa.

TOP TESTS

- PUBLIC WATER SUPPLY: COLIFORM BACTERIA (SAFE DRINKING WATER ACT)
- PRIVATE WELL: COLIFORM BACTERIA
- PRIVATE WELL: NITRATE
- POOL: COLIFORM BACTERIA
- WASTEWATER AND SURFACE WATER: E.COLI

TESTING VOLUME = 38,119
MICROBIOLOGY

It now is quicker and more efficient to analyze bacterial isolates because of the work this year by the Microbiology team and its partners.

Microbiology is the study of microorganisms in humans that are, or may be, the cause of illness.

Specialized testing is performed in several areas: bacteriology, parasitology, mycobacteriology (tuberculosis) and mycology (fungi).

The Microbiology section supports IDPH, all county health agencies and hospitals throughout the state by isolating, identifying and characterizing pathogens that are of public health significance. The section also performs all rabies testing associated with human exposure and performs enteric pathogen serotyping. It uses Pulsed Field Gel Electrophoresis to determine the DNA fingerprint of bacteria, and is a member of the CDC’s PulseNet, which uses these fingerprints to detect and define local and multi-state foodborne outbreaks.

Selected section staff participate in the CDC Laboratory Response Network, which responds quickly to biological, chemical and radiological threats and other high priority public health emergencies. They are able to perform confirmatory testing of suspect agents of bioterrorism.

MAJOR ACHIEVEMENTS:

- Participated in a CDC national study to evaluate isolate recovery from specimens tested by culture independent molecular assays.
- Developed a unique extraction procedure with our molecular partners that allowed significant volumes of bacterial isolates to be analyzed quickly and more efficiently.

Enteric serotyping checks for Salmonella.
NEWBORN SCREENING

The Iowa Newborn Screening Program added to its screening panel the first condition to directly use a DNA target as the marker for the disorder, and it is also the first condition for which a cure is available.

The Newborn Screening section identifies infants at risk for more than 50 inherited metabolic diseases by testing a small blood spot obtained from a simple heel-stick shortly after birth. At this age, most infants with an inherited condition show no obvious signs of disease. However, with special tests, the Iowa Newborn Screening Program can identify an infant who may be at risk, and alert the doctor and caregivers of the need for immediate medical treatment for the infant.

With early diagnosis and medical treatment, complications from these serious, but uncommon, conditions can usually be prevented. The goal is to identify the disorder before the disorder has time to cause damaging health effects.

The Iowa Newborn Screening Program is part of the Iowa Department of Public Health, and is a collaborative effort between the IDPH, the State Hygienic Laboratory, the University of Iowa Children’s Hospital, Central Delivery Service of Iowa, and Iowa birthing and newborn care providers. In addition to Iowa, the Hygienic Laboratory provides newborn screening testing for North Dakota and South Dakota.

A Newborn Screening technician uses a single-hole punch for testing as part of the method performance process.
MAJOR ACHIEVEMENTS:

- Screening for Severe Combined Immunodeficiency (SCID) was integrated into the Iowa newborn blood spot screening panel on July 1, 2014. SCID represents a fundamental change in comparison to the other conditions that are screened for. It is the first condition to directly use a DNA target as the marker for the disorder, and it is also the first condition for which a cure is available.
- In addition to laboratory activities, education and outreach activities were a focus of the newborn screening program. The program visited six hospitals (representing nearly 30 percent of births in Iowa) to provide information and training in best practices for newborn screening blood spot collection.
- The Iowa Newborn Screening Program was selected to be a part of the Association of Public Health Laboratory’s NewSTEPs pilot Collaborative Improvement and Innovation Network (CoIIN) for Timeliness in Newborn Screening. This project aims to strengthen relationships at hospitals and provide education for best practices with the intent of improving response time for babies born in Iowa, and eventually for all babies born in the US.

In fiscal year 2015, the Iowa Newborn Screening Program screened babies born in Iowa, North Dakota and South Dakota.
SEROLOGY AND MATERNAL SCREENING

Approximately 50 different assays are currently performed in the Serology section.

Serologic testing is used to diagnose some acute, recent or chronic infectious diseases by detecting antigens or antibodies in the blood. In some cases, when the suspected etiologic agent is impossible, difficult or dangerous to grow in cultures in a routine diagnostic laboratory, serology is the safest, most practical testing method. Monitoring antibody levels that the body produces in response to exposure is important in the medical care of the patient, as well as in stopping the spread of disease from person to person.

The most commonly performed assays help diagnose syphilis, HIV and latent tuberculosis infection. Measles and mumps exposure, as well as mosquito and tick-borne diseases, are some of the commonly requested tests in support of epidemiological investigations performed by the Iowa Department of Public Health. Testing for latent tuberculosis using the QuantiFERON Gold assay continues to increase as more Iowa colleges and universities implement M. tuberculosis screening as an admission requirement for international students from potentially high-risk TB areas of the world.

MAJOR ACHIEVEMENTS:

- Performed over 900 Quantiferon Gold tests in support of several universities and colleges across Iowa.
- Supported IDPH in testing potentially exposed individuals associated with the measles outbreak in early 2015.

Molly Bradshaw, clinical lab technical specialist, performs the complement fixation method to test for respiratory fungal diseases.
Molecular testing techniques have significantly increased the overall sensitivity and specificity of detection of bacteria and viruses that cause disease. The Molecular Diagnostic and Virology section works in close partnership with the Iowa Department of Public Health to target diseases of public health significance – highly communicable diseases that require intervention to reduce or stop their spread. Such diseases include legionellosis, viral meningitis, mumps, herpes and chicken pox.

The section also tests specimens related to disease outbreaks, such as whooping cough (pertussis) and norovirus, the primary cause of gastroenteritis outbreaks in Iowa. The Hygienic Lab is the only lab in the state that performs confirmatory norovirus tests. Identification of these viruses allows state outbreak investigators to optimally target remediation and prevention strategies.

Testing is also performed in support of various surveillance programs: viral respiratory diseases and sexually transmitted diseases through IDPH, and arbovirus surveillance partnership with IDPH, Iowa State What illnesses are circulating in Iowa? The Molecular Diagnostics and Virology section tracks – with its public health partners – the incidence and location of many infectious diseases and viruses, including viral respiratory diseases, sexually transmitted diseases and arbovirus.

Clinical lab analysts Kris Eveland (foreground) and Erik Twait prepare specimens for influenza testing. Lab analysis helps identify prevalent strains of influenza circulating in Iowa.
University and local public health departments.

- Viral respiratory disease surveillance informs the medical community of when and where influenza is circulating in the state and if these strains match the current vaccine.
- Sexually transmitted disease surveillance provides testing for the diagnosis of chlamydia and gonorrhea infections, ensuring patients receive proper treatment to prevent further spread of infection and providing reliable surveillance data.
- Arbovirus surveillance tests mosquitoes and humans for West Nile Virus and alerts public health officials when mosquito-borne illnesses are circulating, which allows them to implement methods of infection prevention.

**MAJOR ACHIEVEMENTS:**

- Added testing protocols to perform subtyping for influenza B strains.
- Performed diagnostic testing in support of several IDPH epidemiological outbreak investigations.
- Supported the CDC’s viral respiratory surveillance program in the annual battle against seasonal influenza.
The Environmental Health Division routinely monitors private and public drinking water, streams, groundwater, air, soil and food for contaminants of potential environmental and public health concern. It also responds to environmental and man-made emergencies – such as compromised water supplies due to chemical spills and flooding – with testing needed to protect public health. Services include testing samples submitted by the general public, numerous local health departments and state agencies.
Inorganic elements are minerals and metals found in the environment, some of which are harmful to human and animal health, even with minimal exposure. Some inorganic compounds occur naturally in the environment, such as metals found in soil and rock, while others are present due to human activities, such as crop fertilization or the use of lead in paint prior to 1978. Detection of these elements is important because mitigation techniques can then be implemented to reduce potentially dangerous exposure.

Testing is conducted for state agencies, public water supplies, county public health departments, businesses and private citizens. The Inorganic Chemistry section can determine the presence of inorganic elements in air, groundwater, drinking water, surface water, wastewater, soil, sludge, vegetation and food. Tests conducted on these matrices can determine the presence of arsenic, cadmium, mercury, lead and many other metals in the environment. Samples from public and private (well) water supplies are analyzed for levels of nitrate, nitrite, total coliform and *E.coli* bacteria. Testing for lead in dust, paint, soil, pottery and food products is performed to help identify sources of lead exposure.

Inorganic Chemistry processes samples with short holding times (within 48 hours of collection) to determine the presence and levels of orthophosphate, nitrite and nitrate. Determination of levels of oil and grease in waste streams is determined at the Coralville laboratory.
MAJOR ACHIEVEMENTS:

- Through a grant from the US Food and Drug Administration, the Ankeny laboratory continued development and implementation of a processed food testing program in coordination with the Iowa Department of Inspections and Appeals.
- The laboratory attained an additional ISO 17025 accreditation for the processed food testing program from the American Industrial Hygiene Association – Laboratory Accreditation Program (AIHA-LAP) Food program (FoodLAP).

PUBLISHED:

**ORGANIC CHEMISTRY**

The Hygienic Laboratory was the first state environmental and public health laboratory to achieve approval status to test for all 28 chemicals identified in the EPA Unregulated Contaminants Monitoring Rule 3 (UCMR3).

Human activities often have a significant impact on the environment. Contaminants that infiltrate our natural resources can be detrimental to the health of both humans and animals. The Organic Chemistry sections analyze air, soil, water, vegetation and food to identify and measure potentially toxic organic compounds, such as plasticizers, pesticides, personal care products, pharmaceuticals and industrial chemicals.

Testing is conducted for state agencies, public water supplies, county public health departments, businesses and private citizens. Routine environmental monitoring is conducted to evaluate the ongoing health of Iowa’s environment, while responsive testing is conducted to determine the risk of human and animal exposure in the event of environmental catastrophes.

Analysis for organic compounds is conducted using highly specialized methods and instrumentation in order to detect very low levels of organic compounds. New

<table>
<thead>
<tr>
<th><strong>MAJOR ACHIEVEMENTS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Through a grant from the US Food and Drug Administration, the laboratory continued development and implementation of a processed food testing program in coordination with the Iowa Department of Inspections and Appeals. Ultimately the laboratory intends to attain ISO 17025 accreditation for processed food testing.</td>
</tr>
<tr>
<td>• As part of the Groundwater Monitoring Program, the Liquid Chromatography Section has been working on the determination of Triazine Pesticides and their degradates in water in support of research being done in Iowa to detect low levels of the herbicide Atrazine and its breakdown products. Atrazine is an herbicide that is used extensively on corn crops in Iowa and is frequently detected in ground and surface water. This project utilizes EPA Method 536 which uses Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS), a state of the art and relatively high-cost technology.</td>
</tr>
<tr>
<td>• Many months of collaboration between environmental laboratory, information technology and a commercial firm culminated in implementation of customized instrument interfacing software to electronically input and automatically evaluate data exported from analytical instrumentation to the laboratory’s information management system.</td>
</tr>
<tr>
<td>• As part of the three-year monitoring cycle, the Gas Chromatography section continued to provide testing for public water supplies for chemicals listed by the US EPA Unregulated Contaminants Monitoring Rule 3 (UCMR3). The Hygienic Laboratory was the first state environmental and public health laboratory to achieve approval status to test for all 28 chemicals identified in the EPA Rule.</td>
</tr>
<tr>
<td>• Mentored a high school student, Lily Fuger from Central Lee High School in Donnellson, Iowa, for determining leaching of bisphenol A from coated metal food containers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PUBLISHED:</strong></th>
</tr>
</thead>
</table>
testing methods are implemented as new threats emerge, such as the possible presence of hormones and steroids in drinking water.

Organic Chemistry sections of the lab include Gas Chromatography Analysis and Liquid Chromatography Analysis, so named for the technology used in the analyses of various samples to determine organic contaminants. A gas chromatograph is used to analyze relatively low molecular weight organic compounds that can be vaporized by heating, while a liquid chromatograph can detect extremely low levels of compounds that have a higher molecular weight and are not as easily vaporized.
Radionuclides can be harmful to human health if inhaled or ingested. They are commonly present at low concentrations in geological formations, produced at low levels through interactions between the atmosphere and cosmic radiation, and are produced artificially through human activities, such as power generation, medical therapy and heavy industry. The Radiochemistry section primarily performs analyses of water and soil to determine radioactivity concentrations, but is also capable of analyzing air, food, milk, urine and foliage. The section is also prepared to handle radiation emergency response incidents by performing drills and maintaining the lab in a constant state of readiness.

Methods that were developed and validated at the Hygienic Laboratory to measure the radioactivity in hydraulic fracting flowback wastewater were approved and published by the Environmental Protection Agency.
MAJOR ACHIEVEMENTS:

- Methods that were developed and validated at the Hygienic Laboratory to measure the radioactivity in hydraulic fracturing flowback wastewater were approved and published by the Environmental Protection Agency as “Development of Rapid Radiochemical Method for Gross Alpha and Gross Beta Activity Concentration in Flowback and Produced Waters from Hydraulic Fracturing Operations.” Office of Research and Development Washington DC. EPA/600/R-14/104, July 2014.
- Continued investigating other environmental matrices from hydraulic fracturing areas, such as water and sediment, for environmental contamination.
- Implemented several methods for alpha spectroscopy analysis.
- Mentored a high school student, Mallory Wills from Central Lee High School in Donnellson, Iowa, for a radon science project.

PUBLISHED:

The Hygienic Laboratory and the American Industrial Hygiene Association celebrated 40 continuous years of accreditation by AIHA at both its Coralville and Ankeny sites.

The Industrial Hygiene program performs occupational health testing for the Bureau of Labor to support the Iowa Department of Workforce Development and the Iowa Occupational Safety and Health Administration programs (Iowa OSHA). Testing for these programs is performed in both the Ankeny and Coralville labs and consists of testing air filters for both inorganic and organic chemicals to assess occupational exposures to chemicals and fumes in the work place.

**INDUSTRIAL HYGIENE**

**TOP INDUSTRIAL HYGIENE TESTS**

- METALS-METHOD NIOSH 7300
- VARIOUS ORGANIC SOLVENTS IN AIR BY GAS CHROMATOGRAPHY
- SILICA-OSHA METHOD ID-142
- FORMALDEHYDE

**TOTAL CORALVILLE TESTS - 288**
**TOTAL ANKENY TESTS - 177**

Lynn Aldridge, environmental lab analyst, processes mixed cellulose ester (MCE) filters to be analyzed for airborne metals in workplace environments.
The Hygienic Laboratory also tests for asbestos, a group of similar minerals with separable, long, thin fibers. It is a natural mineral fiber that was used in products primarily because of its fire-retardant capability and strength. Asbestos has long been suspected as a health threat to humans, because the fibers can be inhaled and are difficult to remove from the lungs.

Asbestos testing is performed for businesses, state agencies and individuals. Materials that are frequently tested for asbestos include roofing, flooring and other items used in construction.

A piece of floor tile, which will be tested for asbestos, is broken in two as a first step in the process.
**EMERGENCY PREPAREDNESS AND RESPONSE**

The laboratory was certified to perform testing using the Department of Defense Emergency Use Authorization Assay for Ebola Virus Disease.

Emergency preparedness and response is one of the 11 core functions and capabilities of state public health laboratories. The Hygienic Laboratory responds to credible threat events involving unknown substances; public health and environmental emergencies, including potential biological or chemical threats; pandemic influenza; disease outbreaks (e.g., Ebola); and environmental or natural disasters (e.g., chemical spills, flooding).

Confirmatory or rule-out testing is performed on clinical isolates to identify potential agents of bioterrorism. Emergency preparedness and response at the State Hygienic Laboratory encompasses the Laboratory Response Network, the Food Emergency Response Network and the Radiological Emergency Response Team.

### MAJOR ACHIEVEMENTS:

- Conducted a bioterrorism “Wet Workshop” for 21 sentinel laboratorians.
- Provided funding for the statewide courier system, in which 11,900 routine specimens and 189 urgent specimens were delivered to the State Hygienic Laboratory. A rapid response time compared to specimens sent via alternative shipping methods is possible because of the courier system.
- Conducted and participated in several exercises with first responders and other emergency preparedness partners.
- Tested clinical isolates from sentinel laboratories throughout Iowa for substances of potential public health threat.
- Hosted the CDC’s Rapid Methods workshop.

Laboratorians practice how to identify potential agents of bioterrorism as part of a preparedness workshop hosted by the Hygienic Laboratory.
The Food Emergency Response Network provides national surveillance to help detect threats to the American food supply. The State Hygienic Lab is a FERN member laboratory and provides testing support for all three disciplines (chemistry, microbiology, and radiochemistry). Funding is received from the US Food and Drug Administration Chemistry Cooperative Agreement Program (cCAP) for chemical response. The US Department of Agriculture provides funding for microbiological food surveillance and response.

**MAJOR ACHIEVEMENTS:**

- Implementation of new testing procedures that permit screening of large numbers of pesticides in food samples.
- Testing of food samples submitted by the Iowa Department of Inspection and Appeals for pesticides, toxic metals, and microbiological agents.
- Implementation of a proficiency testing program to assess current testing procedures for chemical and microbiological contaminants in food products.
- Participation in numerous proficiency testing challenges initiated by the FDA for determination of chemical contaminants in food products.
- Validation and implementation of an FDA procedure to test for total arsenic and arsenic species in fruit juice and rice.
- Participation in exercises with other state laboratories to evaluate and validate testing procedures developed by FDA laboratories.

The FERN section validated and implemented an FDA procedure to test for total arsenic and arsenic species in fruit juice and rice.

This year, 109 health alerts, testing information, and educational news were sent via the LRN to partners in environmental and public health, federal agencies, health care, and national and international laboratories.

The State Hygienic Laboratory is a member of the Laboratory Response Network, a diverse and integrated network of local and state public health, clinical, federal, military, veterinary, environmental, and international laboratories that can respond to public health emergencies, including biological and chemical terrorism. The LRN was established in 1999 through a collaborative effort of the Centers for Disease Control and Prevention, the Federal Bureau of Investigation and the Association of Public Health Laboratories. LRN activities are supported through the Public Health Emergency Preparedness (PHEP) cooperative agreement.

**FOOD EMERGENCY RESPONSE NETWORK (FERN)**

The Food Emergency Response Network provides national surveillance to help detect threats to the American food supply. The State Hygienic Lab is a FERN member laboratory and provides testing support for all three disciplines (chemistry, microbiology, and radiochemistry). Funding is received from the US Food and Drug Administration Chemistry Cooperative Agreement Program (cCAP) for chemical response. The US Department of Agriculture provides funding for microbiological food surveillance and response.

A sample of tomato-based hot sauce is spooned from the container in preparation to test it for pesticide contamination.
The RERT is part of Iowa’s Radiological Emergency Response program. This group provides field monitoring, technical consultation and initial accident assessment in coordination with the Iowa Department of Public Health.

The team also works with Iowa Homeland Security and Emergency Management Division (HSEMD) to prepare for the unlikely event of an act of terrorism or an accident at one of the four nuclear power plants in or near Iowa. The RERT and Radiochemistry Laboratory’s role is to evaluate the extent to which radioactive materials have been released from an incident.

Federal guidelines require emergency planning for areas within both a 10-mile and a 50-mile radius of a nuclear power station. The Laboratory also provides the following services:

- Field surveillance and monitoring of radiation levels, including coordination of environmental sampling with state and federal agencies;
- Dose assessment in support of IDPH;
- Laboratory analysis and support of environmental sampling and radiological monitoring activities during the emergency and post emergency;
- Maintenance and communication of data relating to radiation exposure and contamination; and
- Technical expertise to local emergency response personnel for monitoring and decontamination of evacuees.

MAJOR ACHIEVEMENTS:

- Participated in seven drills: four drills at Duane Arnold Energy Center, Palo, Iowa, and three at Ft. Calhoun Nuclear Station in Nebraska. (Drills are non-federally evaluated practice events, generally held quarterly.)
- Participated in a rehearsal and evaluated exercises for the Ft. Calhoun Nuclear Station. (A rehearsal is considered a practice before a federally evaluated exercise.)
- Performed initial evaluation and implementation of the RadResponder Network. This network assists in rapidly recording, sharing and aggregating large quantities of data during a radiological emergency.

As part of a preparedness drill, an environmental lab analyst uses a Geiger counter to check levels of radioactivity on a sample.
FIELD SERVICES

ENVIRONMENTAL HEALTH DIVISION

The Ambient Air Quality section provides technical expertise, equipment calibration and maintenance for monitors that sample and analyze Iowa’s ambient (outdoor) air quality. These monitors – along with monitors maintained in public health departments by Linn and Polk counties – form a surveillance network covering all major population and industrial centers in Iowa.

The state of Iowa requires ambient air monitoring as part of the Clean Air Act. The Hygienic Lab’s Ambient Air section fulfills this requirement through a contract with the Iowa Department of Natural Resources.

Data from more than 100 monitors at 29 sites in 16 Iowa counties is available in the Ambient Air section of the Hygienic Laboratory’s website. Real-time data is highlighted and provides concentration information about many pollutants in Iowa’s air. Many of these monitors have been active for several decades.

Data that is collected by Air Quality staff is submitted to the Iowa DNR and EPA, and used for research and enforcement, keys to Iowa having some of the cleanest air in the country.

MAJOR ACHIEVEMENTS:

- Added communication abilities to the gravimetric network of filter-based samplers to ensure the sampler is collecting without a visit by a field analyst. This improves efficiency in departmental operations.
- Installed an air monitoring trailer at the Coralville Lab for field analyst training and guest tours.
Limnologists collect and analyze samples of surface water, wastewater and groundwater throughout Iowa. They examine the physical, chemical and biological characteristics and processes of aquatic systems and their watersheds. The data from this work is used to assess long-term trends in water quality throughout the state.

The environmental specialists in the Limnology section are among the very few taxonomic experts in the Midwest who identify, describe and classify organisms. Most of their work is devoted to sampling Iowa's surface waters (primarily rivers and streams) and evaluating both water quality and the impact of human activity.

**MAJOR ACHIEVEMENTS:**

- Collected samples from 61 ambient stream sites each month. Analyses included nutrients, such as nitrogen and phosphorus; bacteria, such as E. coli; several forms of solids; and neonicotinoid pesticides.
- Conducted approximately 100 bioassessments throughout the state. These assessments generally require several staff members to complete sampling of each site for water, fish and benthic macroinvertebrates, and a comprehensive physical habitat assessment.
- Completed sampling of selected cold water streams in northeast Iowa for nutrient analysis. Full bioassessments were completed for four streams in northeast Iowa. Continuous monitoring of temperature and dissolved oxygen using data loggers also was required for these streams.

**TOP LIMNOLOGY TESTS**

- **Chlorophyll**
- **Field pH**
- **Flow**
- **Field Temperature**
- **Field Dissolved Oxygen**

**MAJOR ACHIEVEMENTS:**

- Collected samples from 61 ambient stream sites each month. Analyses included nutrients, such as nitrogen and phosphorus; bacteria, such as E. coli; several forms of solids; and neonicotinoid pesticides.
- Conducted approximately 100 bioassessments throughout the state. These assessments generally require several staff members to complete sampling of each site for water, fish and benthic macroinvertebrates, and a comprehensive physical habitat assessment.
- Completed sampling of selected cold water streams in northeast Iowa for nutrient analysis. Full bioassessments were completed for four streams in northeast Iowa. Continuous monitoring of temperature and dissolved oxygen using data loggers also was required for these streams.

**TOTAL LIMNOLOGY TESTS - 9,184**

Limnologist Katie Spoelstra tosses a collection bottle tethered by a rope into the North River near Norwalk to catch a water sample that will be used for water quality testing.
The Water Chemistry Laboratory at the Iowa Lakeside Laboratory – Regents Resource Center is a satellite environmental laboratory located in Milford, Iowa. It conducts analytical testing on both public and private drinking water, groundwater, surface water and wastewater samples.

Lakeside’s newest building is the Waitt Lab, a gift of the Friends of Lakeside Lab. Opened in 1998, it contains the Bovbjerg Water Chemistry Laboratory, two classrooms, several offices and Andrea’s Atrium, which is used for receptions and gatherings.

Staff provides educational and outreach services for area students and citizens, for college students and interns through classes offered at Iowa Lakeside Lab and area community colleges, and for local water testing facilities.

**MAJOR ACHIEVEMENTS:**

- Supported the installation of a scientific research buoy on Lake West Okoboji as part of the Global Lakes Ecological Observation Network (GLEON). The buoy links data from West Okoboji with lakes around the world, providing benefits to both the global scientific and Okoboji communities by continuously monitoring water quality and weather data.
- Provided mentoring and technical support to college students enrolled in Iowa Lakeside Laboratory’s Limnology summer course. Support was also given to northwest Iowa middle school students involved with the Hygienic Laboratory’s Student Mentorship Program. Students displayed their projects at local and state venues, including the state capitol.
- Continued to increase testing capabilities under the Clean Water Act and Safe Drinking Water Act standards to better serve northwest Iowa’s water quality needs.
- Performed outreach programs and presentations to 16 groups, including nearly 250 students.
- Continued partnership with the Friends of Lakeside - Cooperative Lakes Area Monitoring Project (CLAMP). This program, in its 17th year of monitoring the water quality of Dickinson County lakes, reports data throughout the summer at www.clamp1909.blogspot.com.
ENVIRONMENTAL LABORATORY CERTIFICATION PROGRAM

Over the past 30 years, the Laboratory Certification program has grown to its 2015 level of 184 laboratories that it certifies to test wastewater, drinking water, solid waste and samples that may threaten the environment.

Public water providers in the United States are required to monitor their drinking water to determine if consumers are adequately protected from microbiological, chemical and radiochemical contaminants. Similarly, wastewater treatment facilities perform analysis to assure that the wastewater is properly treated to protect the environment from bacteria, pathogens and other pollutants.

The Hygienic Laboratory provides laboratory certification assessments and management for the Iowa Department of Natural Resources. The Laboratory Certification Program has developed over the past 30 years to provide a comprehensive list of testing parameters and fields of testing for laboratory certification.

A laboratory is certified to perform a specific method for a specific analyte or analyte group. The program also provides the opportunity for a testing laboratory to become certified for a specific analyte group across multiple environmental programs. For example, a lab may acquire certification for inorganic chemicals (IOCs) within the wastewater, drinking water and contaminated sites programs.

There are 184 laboratories certified in the program in 2015. Certified laboratories include municipal and city water plants, water treatment facilities and commercial laboratories. Approximately 150 laboratories perform only wastewater testing. The remainder test for drinking water or a combination of drinking water and wastewater. Some laboratories are commercial labs that are located outside of the state, but perform work in Iowa.

Certification in Iowa is on a two-year cycle with most laboratories receiving an onsite inspection once during that two-year period. Some laboratories, especially out-of-state laboratories that are certified in their home state, can be certified for Iowa based on reciprocity with their state’s certification or accreditation in the National Environmental Laboratory Accreditation Program. Through reciprocity, a laboratory may not require an onsite inspection.
YEAR AT A GLANCE

**JULY**
Rep. Dave Jacoby (right) poses with Director Christopher Atchison during a celebration in which Jacoby was named as the State Hygienic Laboratory’s 2014-2015 Ambassador.

**AUGUST**
Lily Fuger of Central Lee High School tests for levels of BPA in drinking glasses as part of her Student Mentorship project with the Hygienic Laboratory.

**SEPTEMBER**
A grandfather’s inquiry leads to testing performed by the Hygienic Lab for fungicides sprayed near a Missouri school.

**OCTOBER**
New restaurant inspectors and instructors from Iowa Department of Inspection and Appeals, and Environmental Microbiology staff pose during a break from a course that teaches food microbiology concepts, procedures and techniques.

**NOVEMBER**
To reduce the reporting time from days to just hours, IDPH’s John Satre and Swathi Ramasahayam worked with the Hygienic Laboratory’s IT staff to complete a multi-year project to implement Electronic Laboratory Reporting.

**DECEMBER**
Laboratory technicians in the United States Army Medical Research Institute of Infectious Diseases (USAMRIID) conduct Ebola research.

**JANUARY**

**FEBRUARY**
Mallory Wills from Central Lee High School works with Marinea Mehrhoff in Radiochemistry, on her Student Mentorship project focused on radon levels in well water from Lee County.

**MARCH**
Kizer Friedley and the Hygienic Laboratory begin teaming up with the Black Hawk County Health Department for CLIA oversight. Kizer works with the Hygienic Laboratory’s Wade Aldous who serves as the health department’s CLIA director.

**APRIL**
Representatives from Iowa’s public health system and Hygienic Laboratory staff hold green cards to give the state’s laboratory system an “Optimal” rating during a Laboratory Systems Improvement Program.

**MAY**
“Our Special Family” is published. The children’s book was written by a mother of two children with biotinidase deficiency, which was detected by the Iowa Newborn Screening Program.

**JUNE**
Krystle Stehno, a mathematics instructor from Williamsburg Community Schools, prepares a sample for testing in the Environment Health Section.

### Total Operating Revenue - $24,010,078
- **Fee for Service/Contract Revenue**
  - 61%  
  - $14,694,731
- **State Appropriation**
  - 18%  
  - $4,402,615
- **Other State Funding**
  - 1%  
  - $76,234
- **Grants and Contracts**
  - 19%  
  - $4,598,060
- **Facilities and Administration Cost Recovery**
  - 1%  
  - $238,438

### Total Expenses (Cash Basis) - $24,561,155
- **Personnel**
  - 63%  
  - $15,368,499
- **Supplies, Services & Repairs**
  - 26%  
  - $6,403,335
- **Capital Assets**
  - 5%  
  - $1,330,702
- **Fees, Leases & Overhead**
  - 2%  
  - $553,731
- **Facilities and Administration Cost**
  - 3%  
  - $618,776
- **Travel**
  - 1%  
  - $286,112
Tests Performed by the State Hygienic Laboratory
For Iowa — Fiscal Year 2015 = 560,356

IOWA TESTING VOLUME

- Clinical samples received: 80,113
- Clinical analyses performed: 100,909
- Environmental samples received: 57,329
- Environmental analyses performed: 129,338
- Newborn screening samples received: 41,360
- Newborn screening analyses performed: 330,109
- Total samples received: 560,356
- Total analyses performed: 178,802

TOTAL TESTING VOLUME NATIONWIDE (INCLUDES IOWA)

- Clinical samples received: 82,122
- Clinical analyses performed: 103,706
- Environmental samples received: 65,832
- Environmental analyses performed: 146,304
- Newborn screening samples received: 68,647*
- Newborn screening analyses performed: 520,446*
- Total samples received: 216,601
- Total analyses performed: 770,456

*Includes statewide testing for North Dakota and South Dakota
State Hygienic Laboratory at the University of Iowa

CORALVILLE
Ui Research Park
2490 Crosspark Road
Coralville, Iowa 52241-4721
Phone 319 335 4500
Phone 800 421 IOWA
Fax 319 335 4555

ANKENY
Iowa Laboratories Facility
2220 South Ankeny Boulevard
Ankeny, Iowa 50023-9093
Phone 515 725 1600
Fax 515 725 1642

LAKESIDE LABORATORY
1838 Highway 86
Milford, Iowa 51351-7267
Phone 712 337 3669
www.lakesidelab.org

www.shl.uiowa.edu
The State Hygienic Laboratory at the University of Iowa protects and improves quality of life by providing reliable environmental and public health information through the collective knowledge and capabilities of our organization.