



THE JACKSON LABORATORY

*Shaping the future
of human health*

ACCELERATING DISCOVERY

CANCER

The Jackson Laboratory is using the latest research methods and tools to investigate a variety of cancers, including breast, lung, brain, gastric and blood. JAX's National Cancer Institute-designated Cancer Center provides robust support for its innovative research program, which combines patient and experimental data with advanced genomic capabilities to better understand cancer and identify therapeutic targets. The goal is to provide oncologists with precise therapy options for each individual's cancer.

NEUROSCIENCES

JAX is researching all aspects of neurological function, from the brain to sensory input to muscle. Dysfunction of these systems leads to serious diseases and disorders such as Alzheimer's, Parkinson's, schizophrenia, addiction, blindness, amyotrophic lateral sclerosis (ALS) and muscular dystrophy. Investigators are discovering the nuanced mechanisms that develop and maintain neural function, and how they can be disrupted in disease. The research is essential to finding the underlying causes of neurological diseases and to provide the insight necessary to develop early detection screens and effective disease interventions.

IMMUNOLOGY

Immunology research at JAX has uncovered some of the most important functions of our immune system. Since George Snell won the 1980 Nobel Prize for his work investigating the genetics of the major histocompatibility complex, JAX researchers have revealed the complex genetics underlying autoimmune diseases such as Type 1 diabetes and lupus. Current work includes improving the ability to study human immune response in experimental systems, exploring the

complex interplay between the immune system and microbes, including pathogens, and investigating how to provoke an immune response to target and destroy cancer cells.

REPRODUCTION/DEVELOPMENT

JAX researchers pioneered the methods that made in vitro fertilization possible. Now, they are exploring the mechanisms of meiosis and recombination and how defects in these processes can lead to infertility. Also, women who receive radiation therapy for cancer near their reproductive organs are often left with shortened reproductive life spans or complete infertility. As a result, many women are unable to have children even after their cancer has been eliminated or has gone into remission. JAX is exploring how to protect female fertility despite radiation-induced DNA damage so female cancer patients retain the option of having children later in life.

METABOLISM/AGING

Obesity and Type 2 diabetes mellitus (T2D) afflict a large proportion of the aging population — nearly 40% of adults are obese. JAX researchers are studying the genetic differences that underlie susceptibility to T2D, and how various genetic and environmental factors affect human pancreatic islet cells and combine to cause T2D.

As we age, the risks of certain diseases increase over time, including chronic kidney disease (CKD). CKD has increased by 95% over the last 10 years and is recognized as an important risk factor for cardiovascular disease. Researchers at JAX are currently working with a variety of animal species, including bears, to identify key genetic factors that contribute to the decline of function in the aging kidney, how kidney damage might be reversed, and to understand why variations of these factors lead to different outcomes.





EMPOWERING RESEARCH

At JAX, we accelerate the efforts of the global biomedical research community by sharing our research and the innovative tools and solutions we create. Our mammalian genetics and human clinical genomics data resources have become a definitive source for researchers and clinicians worldwide. Each year, thousands of students participate in our comprehensive educational programs. Researchers at over 2,400 organizations in more than 68 countries rely on over 13,000 strains of genetically specialized JAX® Mice. Through this unique combination of research and resources, JAX empowers basic scientific research and drug discovery across the globe.

FARTHER. FASTER.

Mice and humans are strikingly similar — genetically and biologically. Since mice get most of the same diseases we do, their presence in research is vital for the development of new diagnostics, treatments and preventative actions. JAX is a pioneer in studying genetic variation related to human disease through special, genetically varied mouse populations. Intercrossing inbred, genetically defined mouse strains results in collections of mice known as Collaborative Cross and Diversity Outbred populations, in which each mouse is genetically unique, like each human.

With genome sequencing and genetic engineering capabilities, we can create mice with the same mutations human patients have, and even mimic human genetic

variability to show how a variable — a new drug, for example — leads to different responses. Using advanced data analysis techniques, researchers can track the genetics that underlie those differences and use those findings to inform drug development and more accurate clinical trials.

JAX is the world leader in this iterative testing, from human to mouse, and back to human. Our work is driving the development of improved therapies with ever-greater precision and speed. Moving forward, we seek to make sense of biological systems and use our understanding to prevent, treat and cure disease.

60+ PRINCIPAL INVESTIGATORS

JAX faculty lead research teams in cancer, reproductive biology, immunology, metabolic processes and neuroscience.

Our scientists come from laboratories all over the world.

90+ YEARS

JAX was founded in 1929 by a small group of scientists dedicated to the emerging field of genetics.

3,000

Scientists, technicians and support staff

1 MISSION

To discover precise genomic solutions for disease and empower the global biomedical community in the shared quest to improve human health.



EDUCATING CURRENT & FUTURE SCIENTISTS

JAX education programs engage and empower students, researchers, clinicians and educators at all stages of their careers:

- JAX offers high school and undergraduate internships through its annual Summer Student Program, and high school science educators can enrich their careers through a variety of professional development courses.
- JAX collaborates with leading universities to grant doctoral degrees in bioscience, and offers graduate, predoctoral and postdoctoral associates access to unparalleled mammalian genetics and human genomics resources, scientific services, and professional development programs.
- Professional courses and conferences — delivered online, on JAX campuses and at collaborating research centers — attract researchers and clinicians from around the world.
- JAX's Clinical and Continuing Education Program supports healthcare professionals, including primary care providers, who want to integrate the power of genomics into clinical practice.
- JAX's Online MicroLessons and MiniCourses offer introductory self-paced online learning for students, research staff, and the interested public and include the option to acquire a digital badge for display on social media.

OUR LOCATIONS

BAR HARBOR, MAINE

Research | Mouse Production | Research Services

FARMINGTON, CONN.

Clinical Collaboration | Genomic Medicine

SACRAMENTO, CALIF.

Mouse Production | Breeding Services | In Vivo Pharmacology

ELLSWORTH, MAINE

Mouse Production

AUGUSTA, MAINE

Maine Cancer Genomics Initiative

ATSUGI, HINO, TSUKUBA & YOKOHAMA, JAPAN

Mouse Production | Research Support

BEIJING & SHANGHAI, CHINA

Mouse Distribution | Research Support

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Laboratory**

*Leading the search
for tomorrow's cures*