U.S. Department of Health and Human Services

National Institutes of Health
Office of AIDS Research

www.oar.nih.gov

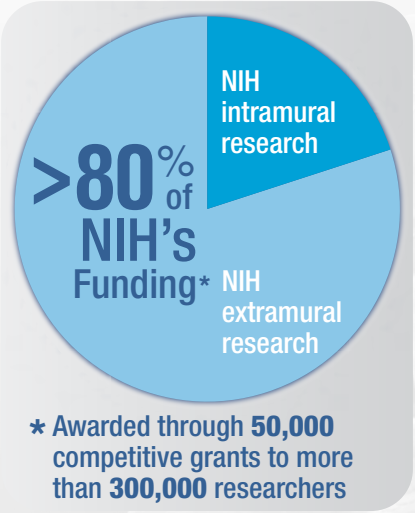
The National Institutes of Health (NIH) and NIH AIDS Research

NIH: Turning Discovery Into Health

The NIH, a part of the U.S. Department of Health and Human Services (HHS), is the Nation's primary medical research agency — making important discoveries that improve health and save lives. The NIH is the world's leading provider of funds for basic, preclinical, clinical, behavioral, and translational research overall. NIH research has supported significant advances in biomedical research in the past 50 years, including:

- Vaccine development
- Research advances to decrease mortality and morbidity
- Advances in the diagnosis, treatment, and care of various diseases
- Targeted drug therapies that save lives with fewer side effects
- Advances in genetic research and personalized medicine

The NIH headquarters for the Office of the Director (OD) and the Institutes and Centers (ICs) are located in Bethesda, Maryland, USA. The NIH has more than 75 buildings in a campus-like environment on more than 300 acres. Cutting-edge research is performed on campus in state-of-the-art laboratory facilities, with more than 80% of NIH's funding awarded through 50,000 competitive grants to more than 300,000 researchers at more than 2,500 universities, medical schools, and other research institutions in every state and around the world. About 10% of the NIH's budget supports projects conducted by nearly 6,000 scientists in its own laboratories, most of which are on the NIH campus in Bethesda, Maryland.



Information about the NIH and its programs can be found at http://www.nih.gov.

Major Components of the NIH

The major components of the NIH include the OD and 27 ICs. Each has its own specific research agenda, often focusing on particular diseases or body systems. All but three of these components receive their funding directly from Congress, and administer their own budgets. NIH leadership plays an active role in shaping the agency's research planning, activities, and outlook.

The Office of AIDS Research (OAR), located in the OD, Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI), has the primary responsibility for planning and coordinating HIV/AIDS research across the NIH. Because HIV/AIDS transcends every area of basic science and clinical medicine, the NIH HIV/AIDS research program involves nearly every NIH IC.

Information about the Office of the NIH Director can be found at http://www.nih.gov/icd/od.

Information about the NIH Director can be found at http://www.nih.gov/about/director.

Information about the NIH OAR can be found at http://www.oar.nih.gov/.

Information about the NIH ICs can be found at http://www.nih.gov/icd.

NIH Intramural Research Program (IRP)

The IRP is the internal research program of the NIH with a mission of science in pursuit of fundamental knowledge about living systems and the application of that knowledge to extend healthy life and reduce illness and disability throughout the world. With 1,200 principal investigators (PIs) and more than 4,000 postdoctoral fellows in basic, translational, and clinical research, the IRP is the largest biomedical research institution in the world. Intramural researchers are part of individual Laboratories, Branches, or Centers, which are organized around common thematic research goals and approaches, much like a department or center at an academic institution. Within these larger structures, PIs run Sections or Units devoted to their independent research aims. Core facilities, supported by Staff Scientists and Staff Clinicians, are among the shared resources available to IRP researchers.

Well-known HIV and HIV-related accomplishments of the IRP infectious disease laboratories include the following:

- Identifying a promising HIV vaccine target (2012)
- Visualizing a viral infection as it happens (2012)
- Hitting HIV hard with Highly Active Antiretroviral Therapy (HAART) (1985+)

Clinical trials have been a key feature of the IRP program, which excels in the type of basic and clinical research needed to advance biomedical knowledge that culminates in cures and therapies providing the foundation for health research worldwide. Some IRP clinical trials have tested research concepts so nascent that no scientific literature existed that could support a traditional grant application. In other cases, the advances arose from years of basic and clinical research only made possible by the equipment, expertise, and research freedom available in the IRP.

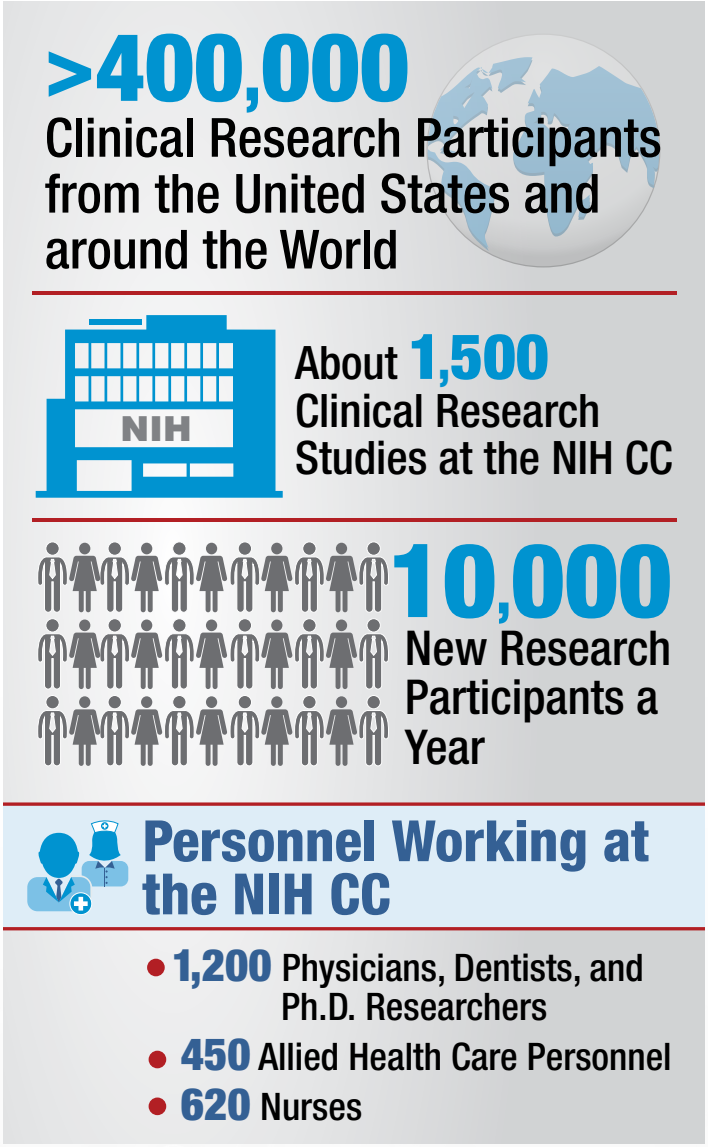
Information about the NIH IRPs can be found at http://irp.nih.gov.

Information about IRP clinical trials can be found at http://www.nih.gov/health/clinicaltrials.

To search for a specific IRP clinical trial, visit the NIH Clinical Trials Database at http://clinicalstudies.info.nih.gov.

The NIH Clinical Center (CC)

An important part of the NIH IRP is the NIH CC. Opened in 1953 and located in Bethesda, Maryland, on the NIH main campus, the NIH CC is the world's largest clinical research hospital.



The NIH CC works to rapidly translate scientific observations and laboratory discoveries into new approaches for diagnosing, treating, and preventing disease. Research at the CC has led to advances in the development of chemotherapy for cancer, the first gene therapy, the first treatment for AIDS, and disease outbreaks such as Ebola.

Currently, about 1,500 clinical research studies are in progress at the NIH CC. Many focus on rare diseases, which often are not studied anywhere else. Other studies include clinical trials, predominantly Phase I and II studies, which often are the first tests of new drugs and therapies in people. The CC sees 10,000 new research participants a year and more than 400,000 clinical research participants from the United States and around the world.

Some 1,200 physicians, dentists, and Ph.D. researchers; 620 nurses; and 450 allied health care personnel work at the NIH CC. The collaborative environment of the NIH CC makes it possible for investigators to make referrals for immediate testing and confer with peers across research interests to identify the best approach for diagnosing and treating patients.

Facilities to support patients at the CC include The Children's Inn (http://www.childrensinn.org), open 365 days a year; a school teaching kindergarten through high school for young patients (http://clinicalcenter.nih.gov/participate/_pdf/childrensschool.pdf); and the Edmond J. Safra Family Lodge (http://clinicalcenter.nih.gov/familylodge) for families and loved ones of adult patients.

Information about the NIH CC can be found at http://clinicalcenter.nih.gov.

The Vaccine Research Center (VRC)

Another key component of the NIH IRP is the Dale and Betty Bumpers VRC, a part of the National Institute of Allergy and Infectious Diseases (NIAID). The VRC's mission is to conduct research that facilitates the development of effective vaccines for human disease. The primary focus of research is the development of vaccines for HIV/AIDS; however, vaccines for other diseases, including Ebola, Marburg, and influenza are being studied.

Additional activities at the VRC include, but are not limited to:

- Basic research to establish mechanisms of inducing long-lasting protective immunity against HIV and other pathogens
- The conception, design, and preparation of vaccine candidates for HIV and related viruses
- Laboratory analysis, animal testing, and clinical trials of such candidates.

The VRC conducts a comprehensive program of research on the NIH main campus and works with scientists in academia as well as clinical and industrial laboratories through national and international collaborations. The VRC seeks industrial partners for the development, efficacy testing, and marketing of vaccines and focuses on the development of new methodologies and training opportunities that will benefit vaccine researchers of numerous human diseases, including HIV.

Information about the VRC can be found at http://www.vrc.nih.gov.

NIH Clinical Trials Networks

The HIV/AIDS Clinical Trials Networks are managed by the NIAID and co-funded by multiple ICs. These networks have been designed to address five HIV/AIDS scientific priorities:

1. **Therapeutics: AIDS Clinical Trials Group (ACTG)**—Therapeutics for HIV/AIDS and HIV-associated infections in adults (including HIV cure, as well as co-occurring noninfectious and infectious diseases, including hepatitis and tuberculosis), https://actgnetwork.org/
2. **Children and Mothers: International Maternal, Pediatric, Adolescent AIDS Clinical Trials (IMPAACT)**—HIV/AIDS and HIV-associated infections in children and mothers, https://www.nichd.nih.gov/research/supported/pages/impaact.aspx
3. **HIV Prevention: HIV Prevention Trials Network (HPTN)**—Integrated strategies to prevent HIV infection, http://www.hptn.org/index.htm
4. **HIV Vaccines: HIV Vaccine Trials Network (HVTN)**—Vaccines to prevent HIV infection, http://www.hvtn.org/en.html
5. **Microbicides: Microbicides Trials Network (MTN)**—Microbicides to prevent HIV infection, http://www.mtnstopshiv.org/

In addition to the series of networks managed by the NIAID, several clinical trial networks are supported by key NIH ICs:

- **Adolescents: Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN)** supported by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), National Institute of Mental Health (NIMH), and National Institute on Drug Abuse (NIDA), develops and conducts behavioral, community-based translational, prophylactic, therapeutic, microbicide, and vaccine trials both independently and in collaboration with existing research networks and individual investigators, in HIV-infected and HIV-at-risk pre-adolescents, adolescents, and young adults up to age 25. https://www.nichd.nih.gov/research/supported/pages/atn.aspx
- **AIDS Defining Cancers: AIDS Malignancy Clinical Trials Consortium (AMC)** supported by the NCI, supports clinical trials for treatment and management of AIDS-related cancers. http://pub.emmes.com/study/amc/public
- **Drug Abuse: National Drug Abuse Treatment (NDAT) Clinical Trials Network** supported by the NIDA, conducts studies to develop, validate, refine, and deliver new treatment options for patients in community treatment programs. http://www.drugabuse.gov/ctn

The NIH Extramural Research Program

As mentioned previously, more than 80% of NIH funding supports extramural research—critical research conducted off the NIH main campus. Extramural research grants are competitively awarded, based on a dual-level peer-review process, to highly meritorious applications from new and early-stage investigators as well as to experienced investigators. The NIH awards provide financial support in the form of grants, cooperative agreements, and contracts. The NIH grants support specific research, as well as research-related activities, including fellowships and training, career development, scientific conferences, resources, and construction. This assistance supports the advancement of the NIH mission of enhancing health, extending healthy life, and reducing the burdens of illness and disability. The *NIH Guide for Grants and Contracts*, the official publication for NIH medical and behavioral research grant policies, guidelines, and funding opportunities, can be accessed at http://grants.nih.gov/grants/guide.

Information about NIH grants can be found at http://grants.nih.gov.

The NIH HIV/AIDS Research Program

The NIH conducts and supports a comprehensive program of basic, behavioral, clinical, and translational research on HIV/AIDS disease and its associated coinfections, comorbidities, and other complications. AIDS research is coordinated by OAR and carried out by nearly all of the NIH ICs, in both intramural and extramural programs.

The NIH HIV/AIDS Research Program

- Largest public investment in AIDS research in the world
- Encompasses nearly all NIH ICs
- Comprises a comprehensive research portfolio
- Includes research and/or training projects in more than 100 countries

NIH Office of AIDS Research (OAR)

Established in 1988, the NIH OAR, a component of the NIH OD, DPCPSI, plans, coordinates, evaluates, and develops the priorities and budget for the NIH HIV/AIDS research program. The NIH AIDS research budget is the largest and most significant public investment in HIV/AIDS research in the world.

The NIH OAR identifies the highest overarching NIH HIV/AIDS research priorities and public health challenges that require focused attention; manages and facilitates multi-Institute and trans-Institute activities to address those needs; fosters research by designating funds and supplements to pilot program areas; sponsors reviews or evaluations of research programs; facilitates international HIV/AIDS research and training; and supports initiatives to enhance the dissemination of research findings. Each year, the OAR develops the *Trans-NIH Plan for HIV-Related Research* (http://www.oar.nih.gov/strategicplan). The Plan is used to: (1) frame the development of the NIH AIDS research budget; (2) determine the use of NIH AIDS-designated dollars; (3) track and monitor HIV/AIDS research expenditures; and (4) inform the public, the scientific community, Congress, and the AIDS-affected communities about the NIH HIV/AIDS research agenda.

The NIH OAR establishes a unified NIH HIV/AIDS research agenda through:

- An annual trans-NIH strategic planning process that identifies the highest scientific priorities and opportunities to address the changing epidemic
- Development of an annual trans-NIH AIDS budget, based on the Strategic Plan
- Ongoing trans-NIH coordination, management, and evaluation of the HIV/AIDS portfolio
- Facilitation and implementation of domestic and international AIDS research collaborations

Through its annual comprehensive trans-NIH planning, budgeting, and portfolio assessment processes, the OAR sets scientific priorities, enhances collaboration, and ensures that NIH research dollars are invested in the highest overarching research priorities within the scientific areas of Natural History and Epidemiology; Etiology and Pathogenesis; Microbicides; Vaccines; Research Toward a Cure; Behavioral and Social Science; Therapeutics; Training, Infrastructure, and Capacity Building; and Information Dissemination. The Plan also addresses research in special populations, including Women and Girls, Racial and Ethnic Populations, and Research in International Settings.

Information about the NIH OAR can be found at http://www.oar.nih.gov/.

Key NIH Institutes and Centers Conducting AIDS Research

National Cancer Institute (NCI)

The NCI supports and conducts a broad range of HIV/AIDS research, with a focus on AIDS-associated and non-AIDS-defining malignancies. NCI-funded researchers have reported landmark findings, including:

- Co-discovery of HIV
- Development of the first HIV blood test
- Development of and clinical testing of the first AIDS drugs
- Development of improved therapies for HIV-associated cancers, including Kaposi sarcoma and non-Hodgkins lymphoma

Although the development of anti-HIV therapy has lowered the incidence of AIDS-defining cancers substantially, the number of non-AIDS-defining cancers has been increasing as people infected with HIV live longer and the HIV-infected population overall increases in age. Cancer is now one of the leading causes of death for people infected with HIV. The NCI supports a wide range of basic, translational, and clinical research on malignancies associated with HIV infection, including research initiatives to address the increasing number of AIDS-defining malignancies in the developing world.

To learn more about NCI's HIV/AIDS research, visit http://oham.cancer.gov.

The publication, *HIV/AIDS Research at the NCI: A Record of Sustained Excellence,* can be found at http://oham.cancer.gov/objects/pdf/brochure.pdf.

Information about the NCI is available at http://cancer.gov.

National Heart, Lung, and Blood Institute (NHLBI)

As the HIV population has aged, the prevalence of chronic HIV-related cardiovascular, lung, and blood diseases has been observed. The mission of the NHLBI AIDS program is to support and facilitate research and training to address the emerging medical challenges facing the evolving HIV population. The NHLBI is particularly interested in encouraging collaboration among HIV specialists and heart, lung, and blood specialists to further expand knowledge about HIV-associated coronary artery disease, heart failure, hypertension, sudden cardiac death, smoking cessation, chronic obstructive lung disease, and pulmonary hypertension. In addition, the NHLBI is expanding its research portfolio on blood diseases and transfusion medicine. The NHLBI is also supporting research to eliminate HIV-1, including cell-based approaches such as hematopoietic stem cells and the elucidation of mechanisms by which such approaches yield sustained or a lifelong cure of HIV disease.

Information about the NHLBI is available at http://www.nhlbi.nih.gov.

National Institute on Aging (NIA)

The NIA supports research to improve the care of older adults with HIV/AIDS. The increasing prevalence of HIV in older Americans is due in large part to the improved survival of individuals receiving therapy. In addition, older adults account for a notable proportion of new infections each year, often as a result of underestimating infection risk for what has historically been considered a "young person's disease." Older adults with HIV are at risk of developing a variety of comorbid conditions, including cardiovascular disease, dyslipidemia, insulin resistance, diabetes, and cognitive impairment.

NIA's research addresses aging-related factors that contribute to the pathogenesis, disease progression, treatment, quality of life, and access to care among older HIV-infected individuals, within the context of NIH's overarching priorities for HIV/AIDS research. The NIA also supports basic HIV/AIDS research relevant to older adults, including studies of immune function and host defenses with aging. In addition, the NIA supports research on interactions with HIV, other diseases, social structural variables, and population aging in low-income countries to understand health, functional status, and social conditions and their impact on physical and psychological well-being.

Information about the NIA is available at http://www.nia.nih.gov.

National Institute on Alcohol Abuse and Alcoholism (NIAAA)

The NIAAA supports epidemiologic, behavioral, and biomedical research to explore the complex and intertwined issues of alcohol abuse and HIV/AIDS. Alcohol use and misuse increase susceptibility to HIV infection, change early expression of HIV and viral immunity, decrease adherence to antiretroviral (ARV) medications, and speed disease progression. Alcohol abuse may affect rates of HIV transmission through both behavioral and biological mechanisms.

Alcohol use also plays an important role among individuals aging with HIV. NIAAA-supported research includes, but is not limited to:

- Understanding the ecology and clinical epidemiology of alcohol use, abuse, and dependence in HIV-infected populations
- Understanding the role of alcohol in disease progression and premature mortality related to co-occurring disease processes such as organ and tissue inflammation and immune response
- Developing and testing interventions to decrease risky sexual and substance use behaviors and disseminate interventions in a wide range of settings
- Improving medication adherence in alcohol using and abusing, HIV-infected individuals

Information about the NIAAA is available at http://www.niaaa.nih.gov.

National Institute of Allergy and Infectious Diseases (NIAID)

The NIAID is the largest Federal institute for HIV/AIDS research. NIAID-supported investigators have made groundbreaking scientific discoveries that have led to significant progress in the fight against HIV/AIDS. These achievements include, but are not limited to:

- Identification of HIV protease inhibitors
- Clinical trials that have proven the substantial HIV preventive value of medically supervised, voluntary adult male circumcision; treating HIV-infected pregnant women to prevent virus transmission to infants; daily ARV medication among men who have sex with men (MSM) and transgendered women at high risk for HIV infection; and substantial benefits of early treatment to HIV-infected individuals
- First HIV vaccine to demonstrate a modest protective effect
- Identification of antibodies capable of preventing most HIV strains from attaching on their cellular targets

The NIAID conducts and supports an extensive range of basic and clinical domestic and international research to:

- Further the understanding of HIV and how it causes disease
- Identify new tools and strategies to prevent HIV infection, including a preventive vaccine, microbicide, and pre-exposure prophylaxis (PrEP)
- Develop new and improve effective treatments for HIV-infected individuals with related coinfections and noninfectious comorbidities
- Conduct HIV cure research

Information about the NIAID is available at http://www.niaid.nih.gov.

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

The NIAMS supports research on skin immunity and integrity and chronic diseases of muscle and bone related to HIV-associated comorbidities and inflammatory conditions. Advances in degenerative muscle and bone conditions are particularly relevant to an aging HIV/AIDS patient population. NIAMS-sponsored HIV-related research includes, but is not limited to:

- Barrier and immune function in skin
- The molecular mechanisms of muscle degeneration in HIV-infected and aging populations, and how it may be reversed
- The effects of HIV infection, antiretroviral therapy (ART), and aging on bones

In addition, the NIAMS manages the Patient-Reported Outcomes Measurement Information System (PROMIS), which is developing new ways to measure patient-reported outcomes, such as pain, fatigue, physical functioning, emotional distress, and social role participation across a variety of chronic diseases.

Information about the NIAMS is available at http://www.niams.nih.gov.

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

The NICHD supports and conducts research related to the unique features of HIV infection and AIDS in women, pregnant women, infants, children, adolescents, young adults, and families.

Areas of focus for the NICHD research include investigation of the biologic mechanisms of sexual transmission of HIV in the female genital tract; HIV interaction with endogenous and exogenous hormones; demographic and population-based studies related to sexual behavior; the interrelationship between HIV, pregnancy, and contraception; and research on HIV-exposed children and orphans. In addition, NICHD's research addresses:

- Prevention of mother-to-infant transmission of HIV
- Behavioral interventions for children, adolescents, and adults to prevent or reduce exposure to HIV infection

- The impact of HIV infection and ART on nutrition, metabolism, growth, sexual maturation, neurodevelopment, and the neurologic function of children; and the needs of the increasing numbers of children with HIV who are surviving into adolescence and beyond
- The long-term safety of fetal and neonatal exposure, including exposure through breastfeeding, to ARV drugs in HIV-exposed but uninfected children and for HIV-infected women who received drugs during pregnancy and breast-feeding
- Biological characteristics of being female and how the female physiology and anatomy affect disease and treatment
- The pharmacokinetics and safety of new drugs, including novel longer acting formulations that can assist in addressing adherence challenges in children, adolescents, and pregnant women
- Implications of under- and over-nutrition or both on pharmacokinetics and pharmacodynamics of ART in women, infants, and children
- Strategies to identify adolescents and young adults at risk for HIV infection, increase HIV testing for youth, and link infected youth to medical care
- Interventions in youth to improve adherence to medications for the treatment and prevention of HIV infection
- Intervention research in youth and women from primary prevention—including HIV preventive vaccine, microbicide, and PrEP trials—for HIV at-risk youth in the community, to secondary and tertiary prevention with clinical management of HIV infection among youth along the entire HIV care continuum. Secondary and tertiary prevention research investigates novel treatment strategies and regimens, drug adherence, risk reduction interventions, and linkage and engagement to care strategies that can lead to optimal ART initiation and virologic suppression outcomes
- Studies of the interactions of desires and behaviors for family planning and prevention of HIV transmission/acquisition

Information about the NICHD is available at http://www.nichd.nih.gov.

National Institute of Dental and Craniofacial Research (NIDCR)

The NIDCR supports studies on the oral manifestations and oral malignancies of HIV/AIDS. HIV-related oral opportunistic infections, coinfections, and malignancies represent early diagnostic indicators of HIV infection, disease progression, immunosuppression, optimal or suboptimal therapies, drug resistance, and treatment compliance. The NIDCR AIDS and Immunosuppression program supports global, basic, translational, and clinical research, with special emphasis in the following areas:

- Pathogenesis of HIV-related oral complications and cancers due to infections from HIV and oral opportunistic viruses, bacteria, and fungi
- Molecular, cellular, immunological, and genetic mechanisms that mediate HIV-associated oral comorbidities and coinfections
- Oral immune system plasticity linked to chronic HIV infection, oral coinfections, inflammation, immune activation, immune reconstitution inflammatory syndrome (IRIS), microbiome, microbial translocation, virome, and mycobiome
- Novel oral therapeutic approaches for people living with HIV/AIDS who are coinfected with pathogens causing oral lesions, diseases, and oral cancers
- Prevention strategies against oral HIV exposure and transmission and against AIDS-related oral pathogens
- Oral mucosal prophylactic vaccines against HIV and other oral pathogens, oral immunotherapies, oral topical formulations, or biological modifiers to prevent or control infectious diseases in the oropharyngeal cavity
- Immunology, structure, biology, host genetics and epigenetics, physiology, and biochemistry of the oral mucosa regarding susceptibility or resistance to HIV infection, replication, and transmission, and to AIDS-related oral pathogens
- Approaches to eliminate persisting HIV and opportunistic pathogens from oral reservoirs in infected individuals treated with ART
- Oral specimen-based diagnostics for HIV and other oral viral, fungal, and bacterial pathogens causing oral lesions and diseases
- Training linked to the research areas listed above

Information about the NIDCR and AIDS and Immunosuppression program is available at http://www.nidcr.nih.gov.

National Institute on Drug Abuse (NIDA)

The NIDA supports a broad range of research to reduce the spread of HIV among drug abusers and their partners and minimize the associated health and social consequences of the disease. Both injection and noninjection drug use are linked with HIV incidence and transmission through high-risk injection and sexual behaviors and for HIV-infected decreased retention on ARV therapy and concomitant

lack of sustained viral suppression. NIDA's domestic and international HIV/AIDS research priorities include:

- Conducting research to better understand the etiology, pathogenesis, and spread of HIV/AIDS among drug-abusing populations
- Improving HIV treatment outcomes for drug abusers through a better understanding of drug-drug interactions between drugs of abuse, HIV therapy, and medications used to treat substance abuse and co-morbid conditions
- Developing the most effective strategies to coordinate and improve treatment and services for HIV, drug abuse, coinfections (e.g., hepatitis C virus [HCV]), and co-morbid conditions such as neurological, cardiovascular, renal, endocrine complications, and frailty
- Using implementation science to identify the most successful and cost-effective prevention strategies to reduce HIV acquisition and transmission in various drug user risk groups and cultures
- Expanding HIV/AIDS treatment as HIV prevention (i.e., seek, test, treat, and retain), with continued focus on criminal justice populations and expanded efforts focused on adolescents and young adults
- Improving the HIV continuum of care for drug-using populations, with special focus on long-term retention in care and sustained viral suppression
- Reducing health disparities—with particular focus on drug-using black MSM who have a high incidence of HIV infection
- Implementation science research on combination, integrated prevention for drug-using populations that combines biomedical and behavioral interventions, including integration of drug abuse treatment with HIV treatment, use of PrEP and PEP, and harm reduction services
- Research on the effects of drugs of abuse on the establishment and persistence of HIV latency and reservoirs in the brain and throughout the body (e.g., gut and lung)

Information about the NIDA is available at http://www.drugabuse.gov.

NIDA's "Learn the Link" site: http://hiv.drugabuse.gov/english/learn/overview.html

National Institute of Environmental Health Sciences (NIEHS)

The NIEHS' research on HIV/AIDS provides unique insights into viral molecules and the impact of HIV therapies on the host, especially in relation to adverse effects of therapies that impact normal cellular metabolism. The NIEHS-supported HIV/AIDS research includes, but is not limited to:

- Studies on antiviral therapies and their associated side effects and toxicities, with emphasis on mitochondrial function
- Investigations on the impact of DNA damage downstream of viral reverse-transcriptase inhibitors (RTIs) on cell cycle
- Uses of structural and biophysical approaches for characterization of the conformational maturation pathway of HIV reverse transcriptase (RT)

Information on the NIEHS is available at http://www.niehs.nih.gov.

National Institute of General Medical Sciences (NIGMS)

The NIGMS supports research to answer critical scientific questions in cell biology, biophysics, genetics, developmental biology, pharmacology, physiology, biological chemistry, biomedical technology, bioinformatics, and computational biology, along with selected aspects of the behavioral sciences.

For more than 25 years, the NIGMS has supported the structural characterization of HIV enzymes and viral proteins. This support has been instrumental in the development of ART, such as protease inhibitors. The NIGMS continues to support the characterization of viral proteins and has expanded its program to include complexes of cellular and viral components. Currently, the NIGMS, along with the NIAID, supports five research centers to study the biology and life cycle of HIV at the molecular level. The research centers integrate a variety of techniques from cell biology, structural biology, and biochemistry to capture in unprecedented detail the three-dimensional structures of HIV proteins bound to human cellular components, such as proteins or DNA. The structural information will help elucidate how the various components interact and reveal new approaches for disrupting those interactions, potentially leading to new targets for HIV therapies, microbicides, or vaccines.

Information about the NIGMS is available at http://www.nigms.nih.gov.

National Institute of Mental Health (NIMH)

The NIMH, Division of AIDS Research (DAR), supports a broad range of HIV/AIDS-related research to reduce the incidence of HIV/AIDS worldwide and to decrease the burden of living with HIV/AIDS. DAR-supported research encompasses a broad range of studies that include basic and clinical neuroscience of HIV infection to understand and alleviate the consequences of HIV infection of the central nervous system (CNS), and basic and applied behavioral science to prevent new HIV infections and limit morbidity and mortality among those infected. DAR places a high priority on interdisciplinary research across multiple populations, including racial and ethnic minorities, over the lifespan. NIMH's research priorities include, but are not limited to:

- Expanding approaches to integrate behavioral science with effective biomedical strategies for HIV prevention
- Advancing the development and testing of HIV interventions delivered beyond the individual level, by incorporating appropriate context into intervention development and testing
- Developing strategies to increase HIV-testing and improving linkage to care and timely treatment initiation
- Developing and testing interventions to improve HIV treatment outcomes through optimal treatment adherence and sustained engagement in care
- Supporting implementation science and operations research to enhance dissemination strategies and public health impact of effective HIV interventions
- Examining the evolving pathophysiologic mechanisms of HIV-associated neurocognitive disorders (HAND) in the setting of long-term ART, and development of novel therapeutic approaches to mitigate CNS complications of HIV infection
- Supporting the use of state-of-the-art genetic approaches to identify and validate viral and host genetic factors that influence the pathophysiology of HAND
- Defining and characterizing HIV persistence in the CNS in the context of suppressive ART, and fostering translational research to enable therapeutic eradication of HIV from the brain

Information about the NIMH is available at http://www.nimh.nih.gov.

National Institute on Minority Health and Health Disparities (NIMHD)

The NIMHD leads scientific research to improve minority health and eliminate health disparities. To accomplish this, the NIMHD plans, reviews, coordinates, and evaluates all minority health and health disparities research and activities of the NIH; conducts and supports research on minority health and health disparities; promotes and supports the training of a diverse research workforce; translates and disseminates research information; and fosters collaborations and partnerships. The NIMHD supports a broad range of biomedical, behavioral, and social science research and training to reduce the incidence of HIV, prevent and treat HIV and its comorbidities, and to eliminate HIV/AIDS health disparities among racial/ethnic minorities, the socioeconomically disadvantaged, and those living in rural areas. The NIMHD is particularly interested in promoting and supporting community-based participatory research (CBPR) and collaboration to eliminate HIV/AIDS health disparities.

Information about the NIMHD is available at http://www.nimhd.nih.gov.

National Institute of Neurological Disorders and Stroke (NINDS)

The NINDS supports basic, translational, and clinical research on the effects of HIV infection and comorbidities on CNS. NINDS-supported research includes, but is limited to:

- Basic mechanisms of HIV-neuropathogenesis
- Novel approaches to detect and eradicate HIV from the brain
- Infectious comorbidities such as progressive multifocal leukoencephalopathy (PML), cryptococcal meningitis, and neurosyphilis on HIV-associated CNS diseases
- Strategies to prevent and treat neurologic complications due to HIV infection and long-term ART
- Effects of ART on the nervous system
- HIV-associated peripheral neuropathy
- Elucidation of novel mechanisms of pathogenesis that are driving neurocognitive decline at the intersection of HIV-associated neurodegenerative processes

Information about the NINDS is available at http://www.ninds.nih.gov.

National Institute of Nursing Research

(NINR)

The NINR sponsors domestic and international HIV/AIDS research focused on health promotion, disease prevention, and symptom management, including approaches to reduce HIV risk, develop and implement culturally appropriate HIV prevention education for adolescents, and overcome barriers to prevention in the United States and developing countries. The NINR is focused on research to promote health and quality of life and prevention strategies across the course of HIV/AIDS disease, particularly in areas of symptom mechanism(s), biobehavioral interventions, prevalence disparity, age-related decision-making, and palliative and end-of-life care. These include:

- Studies to manage the physical and psychosocial symptoms associated with HIV infection, its complications, and its treatment, such as frailty, fatigue, wasting, sleep disturbances, pain, cognitive impairment, neuropathies, anxiety, and depression
- Symptom management in comorbid non-AIDS-related conditions in older adults with HIV/AIDS
- Age-appropriate behavioral interventions to increase treatment adherence and prevention strategies
- Underlying factors associated with differential responses to clinical conditions and HIV treatment regimens
- Psychoneurological or biobehavioral interventions to maintain or improve immune competence in HIV-infected persons.

Information about the NINR is available at http://www.ninr.nih.gov.

National Library of Medicine

(NLM)

The NLM works to translate biomedical research into practice. The NLM's electronic information services deliver trillions of bytes of data to millions of users, including scientists, health professionals, and the public in the United States and around the globe every day. Among the NLM's information resources are:

- **AIDSinfo** (http://aidsinfo.nih.gov) is a website that offers access to the latest, federally approved HIV/AIDS medical practice guidelines; HIV treatment and prevention clinical trials; and other research information for health care providers, researchers, people affected by HIV/AIDS, and the general public. InfoSIDA (http://infosida.nih.gov) is the Spanish-language site of AIDSInfo.
- The **NLM HIV/AIDS Information** page (http://sis.nlm.nih.gov/hiv/index.php) provides the latest information on HIV research, treatment, and clinical trials, along with information on HIV diagnosis and testing; prevention; related medical conditions; statistics; and many other HIV-related topics.
- The NLM's **MEDLINE®/PubMed®** (http://www.ncbi.nlm.nih.gov/pubmed) is a publicly available database of more than 18 million journal citations from 1948 to the present, which also includes an AIDS-specific subset.
- The NLM's **PubMed Central®** (http://pubmed.gov) is a Web-based repository of biomedical journal literature providing free, unrestricted access to more than 1.5 million full-text articles.
- **MedlinePlus®** (http://www.nlm.nih.gov/medlineplus) and Medline Plus *en espanol* (http://www.nlm.nih.gov/medlineplus/spanish), the NLM's main portals for consumer health information, provide comprehensive, up-to-date, easy-to-read information on nearly 800 health topics in English and Spanish. MedlinePlus includes a series of HIV/AIDS-specific pages in both English and Spanish.
- ClinicalTrials.gov (http://www.clinicaltrials.gov) provides the public with comprehensive information about all types of clinical research studies.

Center for Scientific Review

(CSR)

The CSR ensures that NIH grant applications receive fair, independent, expert, and timely reviews. The CSR organizes peer-review groups composed of experienced and respected researchers from across the country and abroad who evaluate the majority of NIH grant applications for their scientific merit. These reviews allow the NIH to fund the most scientifically promising research.

All AIDS-related unsolicited grant applications are reviewed by a study section or special emphasis panel within the AIDS and AIDS Related Research (AARR) integrated review group on an expedited cycle mandated by Congress. AARR reviews grant applications in the areas of basic, translational, clinical, and behavioral aspects of HIV/AIDS research. This includes studies on:

- Molecular biology and virology of HIV and related retroviruses
- Immunology and pathogenesis of HIV and related retroviruses
- Epidemiology and clinical studies of HIV and associated diseases
- AIDS-associated opportunistic infections and cancers

- Discovery, design, and evaluation of therapeutics
- Development of vaccines
- Effects of HIV/AIDS on the nervous system and HIV-associated neurocognitive disorders
- Behavioral and social science approaches to preventing HIV/AIDS
- Behavioral and social consequences of HIV infection and AIDS

Information about the CSR is available at http://www.csr.nih.gov.

NIH Fogarty International Center (FIC)

The FIC is the NIH's focal point for international cooperation in biomedical research, facilitating the global exchange of ideas and collaborative research. The FIC builds partnerships between health research institutions in the United States and in low- and middle-income countries to support and facilitate basic, clinical, and applied research and research training for investigators interested in addressing the global HIV pandemic.

With co-funding from other NIH ICs and Offices, the FIC has provided 25 years of support to HIV-related research and to the development of multidisciplinary biomedical, behavioral, and social science research capacity for the prevention, care, and treatment of HIV/AIDS and HIV-related conditions for adults and children in low- and middle-income countries.

The FIC HIV Research Training program strengthens the capacity of researchers and institutions in low- and middle-income countries to conduct HIV-related research in their countries and to compete independently for research funding.

Information about the FIC is available at http://www.fic.nih.gov.

To learn more about the Fogarty HIV Research Training program, go to http://www.fic.nih.gov/Programs/Pages/hiv-aids-research-training.aspx.

NIH Office of Research Infrastructure Programs (ORIP)

ORIP, a component of DPCPSI in the NIH OD, supports research infrastructure and research-related resources programs. ORIP's infrastructure programs are designed to ensure that the NIH effectively addresses and coordinates important areas of emerging scientific opportunities.

The seven National Primate Research Centers and other ORIP-funded primate resources provide comprehensive support for investigators engaged in HIV/AIDS research using nonhuman primates, including studies of mechanisms of pathogenesis and development of vaccines and microbicides. ORIP also funds cooperative agreements to support a consortium of specific pathogen-free macaque breeding colonies that provide animals to investigators who are studying many aspects of HIV/AIDS.

Information about ORIP is available at http://dpcpsi.nih.gov/orip/index