

Infectious Diseases Pathology Branch (IDPB)

UNEXPLAINED INFECTIOUS DEATH?

IDPB conducts investigations and studies of infectious diseases of unknown cause or origin to help identify previously unrecognized or new infectious agents.

WHAT WE DO

Diagnosics

IDPB has diagnostic assays for more than 150 etiologic agents, including viral, bacterial, parasitic, and fungal organisms, and provides tissue-based diagnoses to medical examiners, community-based pathologists, and public health departments utilizing:

Immunohistochemistry (IHC) **Molecular evaluation**
Ultrastructural study **Microbiological methods**

Pathogenesis

IDPB employs pathology, the study of the cause of progression of infectious diseases in the human host. IDPB employs modern molecular technologies and electron microscopy that can collect information at a cellular level. IDPB used this approach in the recognition of Lyme carditis as a cause of sudden cardiac deaths (See story below).

In an ongoing study of Nodding Disease, IDPB examines the nature of unusual deposits in the brains of children who died of Nodding Disease. IDPB is also involved in the study of the pathology of the current outbreak of cases of fatal chikungunya.

Expert Consultation

Each year, laboratory specimens from all over the world are sent to IDPB, often in cases where the cause of illness is unknown. IDPB's expert pathologists and scientists routinely provide consultation and perform a range of laboratory tests. Testing by IDPB has resulted in the identification of novel disease agents of public health importance.



Notable Contributions to Public Health

IDPB scientists have played a critical role in the identification, diagnosis, and description of many diseases, including:

- Fungal meningitis** (U.S.)
- Transplant-associated infections** (U.S.)
- Pandemic H1N1 influenza**
- Severe acute respiratory syndrome** (worldwide)
- Monkeypox** (U.S.)
- Bioterrorism-related anthrax** (U.S.)
- Hantavirus** (U.S.)
- Enterovirus 71** (Taiwan)
- West Nile virus** (U.S.)
- Leptospirosis** (U.S.)
- Nipah virus** (Malaysia & Singapore)

Visit IDPB Online at <http://www.cdc.gov/ncezid/dhcpp/idpb/>

National Center for Emerging and Zoonotic Infectious Diseases
Division of High-Consequence Pathogens and Pathology

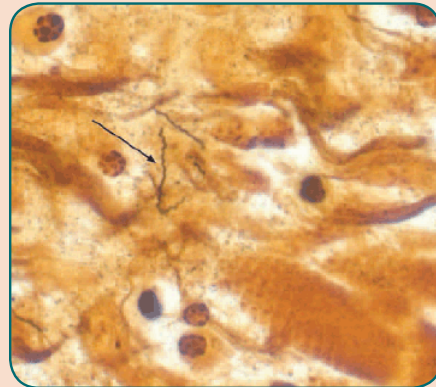


IDPB in Action

Sudden cardiac deaths associated with Lyme carditis (2012-2013)

Towards the end of 2012, CDC began collaborating with medical examiners, health departments, and tissue banks on the investigation of three sudden cardiac deaths associated with lyme carditis and subsequent transplantation of tissues from two of the decedents.

IDPB played a vital role in the investigation by examining cardiac tissue to confirm the presence of *B. burgdorferi* and transplantable tissues were destroyed after the diagnosis of lyme disease was established. CDC continues to work with state and local health departments, medical examiners and coroners to prospectively investigate new cases.



Spirochetes in myocardium
Warthin-Starry stain of cardiac tissue at 158X magnification demonstrating Borrelia burgdorferi spirochetes (arrow) in one of three patients whose death was associated with Lyme carditis
— United States, 2013

Recent Publications

Exserohilum infections associated with contaminated steroid injections: a clinicopathologic review of 40 cases.

Ritter JM1, Muehlenbachs A, Blau DM, Paddock CD, Shieh WJ, Drew CP, Batten BC, Bartlett JH, Metcalfe MG, Pham CD, Lockhart SR, Patel M, Liu L, Jones TL, Greer PW, Montague JL, White E, Rollin DC, Seales C, Stewart D, Deming MV, Brandt ME, Zaki SR; Exserohilum Infections Working Group
Am J Pathol. 2013 Sep;183(3):881-92. doi: 10.1016/j.ajpath.2013.05.007. Epub 2013 Jun 26.

Heartland virus-associated death in Tennessee.

Muehlenbachs A1, Fata CR2, Lambert AJ3, Paddock CD1, Velez JO3, Blau DM1, Staples JE3, Karlekar MB4, Bhatnagar J1, Nasci RS3, Zaki SR
Clin Infect Dis. 2014 Sep 15;59(6):845-50. doi: 10.1093/cid/ciu434. Epub 2014 Jun 9.

Detection of Rickettsia rickettsii, Rickettsia parkeri, and Rickettsia akari in skin biopsy specimens using a multiplex real-time polymerase chain reaction assay.

Denison AM1, Amin BD2, Nicholson WL3, Paddock CD1.
Clin Infect Dis. 2014 Sep 1;59(5):635-42. doi: 10.1093/cid/ciu358. Epub 2014 May 14

Tissue tropism, pathology and pathogenesis of enterovirus infection.

Muehlenbachs A1, Bhatnagar J, Zaki SR.
J Pathol. 2015 Jan;235(2):217-28. doi: 10.1002/path.4438

Tissue and cellular tropism, pathology and pathogenesis of Ebola and Marburg viruses.

Martines RB1, Ng DL, Greer PW, Rollin PE, Zaki SR
J Pathol. 2015 Jan;235(2):153-74. doi: 10.1002/path.4456