



# Infectious Diseases

Infectious diseases are passed to the human host by a biological agent such as a bacteria, virus, fungus, or parasite. These are a group of diseases that are “caught” rather than those that develop over a period of time. Infections can vary in degree and severity, with flu and diarrhea being relatively mild and hepatitis and HIV/AIDS being much more severe. Many infectious diseases once thought of as terminal are now easily preventable through vaccines and other preventative measures. Several, such as polio and smallpox, have been eradicated in recent years in many parts of the world.

### AIDS/HIV

Acquired Immune Deficiency Syndrome, more commonly known as AIDS, is a collection of symptoms and infections due to damage to the immune system caused by the human immunodeficiency virus (HIV). HIV is transmitted through the direct contact of a bodily fluid (such as mucus, breast milk or blood) containing the virus. Most often, the transmittal occurs during sexual intercourse, blood transfusion, breastfeeding, or childbirth.

Because HIV causes the immune system to break down, those with the virus have a higher tendency to acquire common everyday illnesses. People in the late stages of the disease often exhibit systemic symptoms of infection such as fever, sweating (particularly at night), swollen glands, chills, weakness, and weight loss. Though antiretroviral treatments exist to slow the mortality and morbidity of the virus, there is no known cure.

Scientists now believe that HIV, which originated in sub-Saharan Africa during the 20<sup>th</sup> century, is now a pandemic, affecting an estimated 38.6 million people worldwide. The World Health Organization (WHO) estimated that as of January 2006, more than 25 million people have been infected since the disease's discovery in 1981, making it one of the most destructive epidemics in history.

	COMPANY	PRODUCT	PHASE
AIDS/HIV	Gilead Sciences, Inc.	GS 9137	II
	Gryphon Therapeutics, Inc.	Nonakine	II
	Novartis AG	Proleukin (aldesleukin) and Rituximab	II
	Gilead Sciences, Inc.	Atripla	M
	Gilead Sciences, Inc.	Emtriva (emtricitabine)	M
	Novartis AG	Macrolin	M
	Gilead Sciences, Inc.	Truvada (emtricitabine and tenofovir disoproxil fumarate)	M
	Gilead Sciences, Inc.	Viread (tenofovir disoproxil fumarate)	M

### Anthrax

Anthrax is an acute infectious disease caused by the bacteria *Bacillus anthracis* and is highly lethal in some forms. It most commonly occurs in wild and domestic animals, but humans can contract the disease through exposure to an infected animal or to a high density of anthrax spores. There are no known cases of infection in humans as a result of direct contact with a diseased person.

Anthrax is able to enter the body through the intestines (ingestion), lungs (inhalation) or the skin (cutaneous), causing ulcers and other symptoms of infection. It can be treated with high doses of antibiotics such as penicillin.

	COMPANY	PRODUCT	PHASE
Anthrax	VaxGen, Inc.	rPA102	II

*Gilead Sciences is a biopharmaceutical company that discovers, develops and commercializes innovative therapeutics in areas of unmet medical need. The company's mission is to advance the care of patients suffering from life-threatening diseases worldwide. Headquartered in Foster City, California, Gilead has more than 2,100 employees, with operations in North America, Europe and Australia. Gilead reported full-year 2005 revenues of \$2.0 billion.*



*Gilead's products include treatments for HIV, chronic hepatitis B, life-threatening fungal infections and influenza. In July 2006, ATRIPLA™ (efavirenz 600 mg/ emtricitabine 200 mg/ tenofovir disoproxil fumarate 300 mg), the first once-daily single tablet regimen for the treatment of HIV, was approved by the U.S. Food and Drug Administration. ATRIPLA is a co-formulation of Truvada® (emtricitabine and tenofovir disoproxil fumarate) and Bristol Myers-Squibb's (BMS) Sustiva® (efavirenz) and was made possible through a unique U.S. joint venture between Gilead and BMS – the first of its kind in HIV.*

*Recognizing the global need represented by a growing HIV/AIDS epidemic, in 2003 Gilead established the Gilead Access Program to provide its antiretrovirals Truvada and Viread® (tenofovir disoproxil fumarate) at no-profit pricing to countries in Africa, Latin America, the Caribbean and other parts of the world with limited resources to combat the disease. Since its inception, Gilead has expanded the program to include 97 developing countries.*

*Gilead maintains an active research program dedicated to developing new compounds for the treatment of diseases that represent significant unmet medical needs, including HIV and hepatitis B and C, and cystic fibrosis-related respiratory infections.*

## **Cholera**

Cholera is a waterborne disease caused by the bacterium *Vibrio cholerae*, typically found in contaminated water and shellfish. Cholera is transmitted through the ingestion of contaminated feces that usually occurs when untreated sewage is released into waterways and into the groundwater. Diarrhea results, which makes transmission possible under unsanitary conditions. Symptoms include a general upset of the GI tract, including severe diarrhea. Treatments include rehydration through electrolyte replacement therapy. Antibiotics also have been shown to reduce the duration and severity of the disease. The best way to prevent outbreaks are to monitor sanitation and water quality. The World Health Organization estimates that in 2005, around 140,000 people developed the disease.

COMPANY	PRODUCT	PHASE	
Novartis AG	Cholera-Impfstoff Behring	M	Cholera
Novartis AG	Dukoral	M	

### Cytomegalovirus (CMV) Infection

Cytomegalovirus is part of the herpes virus family. Like other herpes viruses, it lies dormant most of the time, producing few, if any, symptoms. When it does reactivate, it often does so without any symptoms. CMV tends to attack the salivary glands and fetuses. Though it does not present a major threat to the human body, those with compromised immune systems will have a more difficult time fighting the disease, leading to bothersome infections that may linger.

It is important to note that CMV remains the most prevalent cause of congenital viral infection in the United States. Infants who contract the disease from their mother in the womb will have problems with generalized infection of the liver and spleen, and in these cases, the infection is potentially fatal. Approximately 80 percent-90 percent of children will have resulting complications in early childhood including hearing loss and mental retardation.

	COMPANY	PRODUCT	PHASE
Cytomegalovirus Infection	PDL BioPharma, Inc.	Protovir (sevirumab)	II
	Gilead Sciences, Inc.	Vistide (cidofovir injection)	M

### Diphtheria, Tetanus, and Pertussis Vaccines

Diphtheria, tetanus, and pertussis (usually called “whooping cough”) are all dangerous infectious diseases caused by bacteria (different bacteria are responsible for each infection).

The major symptoms of diphtheria include sore throat and swollen glands, as well as the characteristic grayish material that coats the back of the throat and may make breathing difficult. The bacteria produce toxins that damage the heart, brain, and nerves, ultimately leading to death if not treated.

The bacteria responsible for tetanus also produce a toxin that affects the nerves, though with tetanus it is specifically the nerves that control muscle movements that are targeted. This can lead to muscle stiffness and spasms, especially in the face and neck muscles (which will cause “lock jaw,” the condition most people associate with tetanus). Even with treatment, tetanus can be fatal.

Pertussis is better known as whooping cough. This is because the major symptom is violent coughs, followed by a “whoop” sound as the patient struggles to breathe in. The coughing spells can be so powerful that they result in broken ribs, vomiting, and broken blood vessels in the face.

Whooping cough used to be the leading cause of childhood illness in the United States, and diphtheria used to be a leading cause of death in children. Tetanus was also alarmingly prevalent. Thankfully, all three diseases have become quite rare in the United States since immunization became routine.

COMPANY	PRODUCT	PHASE	
Novartis AG	Acelluvax	M	Acellular Pertussis
Novartis AG	Quatro-Virelon	M	
Novartis AG	Triacelluvax	M	
Novartis AG	Diphtherie-Adsorbat-Impfstoff Behring	M	Diphtheria
Novartis AG	Dif-Tet-All	M	
Novartis AG	Quatro-Virelon	M	
Novartis AG	Td-pur	M	
Novartis AG	Td-Virulon	M	
Novartis AG	Triacelluvax	M	
Novartis AG	Clostet	M	
Novartis AG	Dif-Tet-All	M	Tetanus
Novartis AG	Quatro-Virelon	M	
Novartis AG	Td-pur	M	
Novartis AG	Td-Virulon	M	
Novartis AG	Tetanol	M	
Novartis AG	Triacelluvax	M	

### Epstein-Barr virus

The Epstein-Barr virus (EBV), also known as the Human Herpes Virus 4 (HHV-4), is a member of the herpes family and one of the most common human viruses. It is most often asymptomatic, but sometimes causes infectious mononucleosis (also known as mono, a glandular fever).

Approximately 1 in 5 people (20 percent) or 54.4 million people in the United States carry the virus in their throats.

COMPANY	PRODUCT	PHASE	
MedImmune	Epstein-Barr Virus Vaccine	II	Epstein-Barr Virus

### Fungal Infections

Sometimes referred to as mycosis, fungal infections occur when fungi are able to pass the immune system barriers of the body and establish infections. This most often happens in individuals whose immune system functions are diminished due to other diseases or treatments. Some infections, however, occur in any individual who comes into contact with the infection-causing agent.

Mycoses are usually classified according to the tissues that were initially colonized. Toenail fungus is an example of a common fungal infection in the nails on the feet.

COMPANY	PRODUCT	PHASE	
Gilead Sciences, Inc.	Ambisome (amphotericin B)	M	Fungal Infections



*Your Liver. Your Life.*

*The American Liver Foundation was incorporated in 1976 with members of the American Association for the Study of Liver Diseases (AASLD) and is the nation's leading organization for liver health promotion and disease prevention. The Northern California Chapter opened in 1997 and serves Northern California and Nevada.*

#### RESEARCH

*Since 1979, the Foundation's grants program has given close to \$18 million in research awards, encouraging young physicians and scientists to build careers in liver disease research and treatment.*

#### EDUCATION

*The Chapter presents a wide range of educational programs for health care providers, patients and the community offering information on the latest treatments and research breakthroughs in liver disease and transplantation.*

#### CHILDREN

*The Chapter presents an annual Children's Liver Disease Conference and offers a quarterly support group for parents of children affected by liver disease. The Chapter's parent-led Children's Liver Council (CLC) is responsible for adopting and localizing the Foundation's national strategic plan for children's liver diseases.*

#### THINK B

*THINK B is a national program designed to raise awareness about hepatitis B in the Asian & Pacific Islander (API) community by providing education, screening and vaccination.*

#### LATINO OUTREACH

*Through a grant from the Chiron Foundation, the Chapter is conducting hepatitis C outreach and education in the Latino communities of Alameda, Marin, San Francisco and San Mateo counties.*

#### ADVOCACY

*As a result of the Foundation's advocacy leadership role, federal funding for liver disease research has increased from \$129 million in 1994 to \$452 million in 2005.*

*To learn more, please visit [www.liverfoundation.org](http://www.liverfoundation.org)*

#### **Hepatitis**

Hepatitis is a gastroenterological disease, characterized by inflammation of the liver. The symptoms and prognosis, as well as treatments, depend on the cause of the infection and the type of the hepatitis.

Hepatitis B is a liver disease caused by viral hepatitis. It is endemic in China and other parts of Asia as well as an epidemic in Africa. Currently, 3 percent of the world is infected with the virus, but it is thought that up to 6 percent have been exposed. Currently, 1.25 million Americans are infected. Symptoms of this form of hepatitis include acute illness due to liver

inflammation, vomiting, and jaundice. It can sometimes lead to death. When hepatitis B becomes chronic in an individual, it usually leads to liver cirrhosis (permanent scarring of the liver) and later to liver cancer due to constant inflammation and other complications. Hepatitis B is considered a sexually transmitted disease; unprotected sex remains one of the most common ways in which it is spread. It is also spread by sharing needles or from mother to child in-utero. Because it is nearly 100 times as infectious as HIV, it is vitally important to protect oneself from infection. There is a vaccine that helps patients to fully recover in most of the cases, however those who are vaccinated still carry the disease and can pass it on to others.

Hepatitis C is one of the deadliest strains of hepatitis and it affects approximately 3.9 million Americans. It is only transmitted through the blood and is commonly contracted through the sharing of needles. Like hepatitis B, it causes liver cirrhosis and cancer. Due to its prevalence, it is thought that hepatitis C will someday surpass AIDS as a cause of death. There is no vaccine as of yet, but there are treatments that prevent the virus from multiplying within the body.

Hepatitis E is characterized by symptoms similar to those of the other hepatitis strains, though it often presents itself quickly and severely, particularly in pregnant women. This form seems to be more prevalent on the Indian subcontinent.

COMPANY	PRODUCT	PHASE	
<b>Dynavax Technologies Corp.</b>	Supervax	II	<b>Hepatitis B</b>
<b>Novartis AG</b>	VaxImmune vaccine adjuvant	II	
<b>Gilead Sciences, Inc.</b>	Emtriva (emtricitabine (FTC))	III	
<b>Dynavax Technologies Corp.</b>	Hepelisav	III	
<b>Gilead Sciences, Inc.</b>	Tenofovir Disoproxil Fumarate	III	
<b>Novartis AG</b>	Gen H-B-Vax K or D	M	
<b>Gilead Sciences, Inc.</b>	Hepsera (adefovir dipivoxil)	M	
<b>Novartis AG</b>	Recombivax HB	M	
<b>SciClone Pharmaceuticals, Inc.</b>	Zadaxin (thymalfasin)	M	
<b>Intarcia Therapeutics, Inc.</b>	Omega interferon	II	<b>Hepatitis C</b>
<b>SciClone Pharmaceuticals, Inc.</b>	Zadaxin (thymalfasin)	III	
<b>Nektar Therapeutics</b>	Peg-Intron (peginterferon alfa-2b)	M	
<b>Nektar Therapeutics</b>	Pegasys (peg-interferon alfa-2a)	M	
<b>Genelabs Technologies, Inc.</b>	HEV Vaccine	II	<b>Hepatitis E</b>

### Infection

An infection occurs when a foreign species colonizes itself in a host organism. The invader (or pathogen) uses the host's body to multiply, which may interfere with the normal body function of the host. These pathogens can be bacteria, parasites, fungi, viruses, prions, or viroids. An infection can lead to chronic wounds, gangrene and even death. After the host body's immune system determines that there has been an infection, an immune response kicks in and inflammation and superficial redness generally ensue. In some cases a parasitic relationship

develops between the host and the parasite where the parasite benefits to the detriment of the host. There are cures for many infectious diseases; still many preventable infections cause death in developed and developing countries alike.

	COMPANY	PRODUCT	PHASE
Skin and Soft Tissue Infections	Cerexa, Inc.	Ceftaroline acetate / PPI-0903	II
Bacterial Infections	Planet Biotechnology, Inc.	CaroRx	II
Infection	EVIT Labs, Inc.	NVC-101	II
	NovaCal Pharmaceuticals, Inc.	NVC-101	II
Intra Abdominal Infection	Johnson & Johnson	Doripenem for Injection	III
Skin and Soft Tissue Infections	Theravance, Inc.	Telavancin / TD-6424	III
Infection	Novartis AG	Quinvaxem Vaccine	A
Skin and Soft Tissue Infections	Novartis AG	Cubicin/Cidecin (daptomycin)	M
	Impax Laboratories, Inc.	Demeclocycline Hydrochloride	M
	Novartis AG	DTP Vaccine	M
	Impax Laboratories, Inc.	Minocycline Hydrochloride	M
Throat Infection	Parnell Pharmaceuticals, Inc.	Oragesic	M



MedImmune

*Scientists at MedImmune, Inc.'s Mountain View and Santa Clara research and development facilities are supporting the federal government's efforts to protect Americans against both seasonal and potential pandemic influenza.*

*In May 2006, MedImmune was awarded a \$170 million, five-year contract from the U.S. Department of Health and Human Services (HHS) to develop cell culture-based seasonal and pandemic vaccines using its proprietary live, attenuated, needle-free influenza vaccine technology. (The cell culture research project has been funded in whole or in part with Federal funds from the Office of Public Health Emergency Preparedness, Office of Research and Development Coordination, under Contract No. HHS0100200600010C.) Additionally, in June 2006, the National Institutes of Health (NIH) began enrolling participants in a Phase 1 study of an intranasal H5N1 influenza vaccine candidate produced by reverse genetics (or "plasmid rescue"), a proprietary technology that enhances the safety, reliability and efficiency with which new vaccine virus strains can be constructed. Investigators are hopeful that this candidate would be as effective against potential pandemic A/H5N1 strains as its seasonal counterparts are against antigenically matched and mismatched strains of influenza. For producing pandemic influenza vaccine seeds, reverse genetics has the benefit of removing potentially pathogenic portions of the virus, thereby creating a safer production process and vaccine.*

*MedImmune's marketed influenza vaccine, FluMist® (Influenza Virus Vaccine Live, Intranasal) is currently made using chicken eggs, as are all other U.S.-approved influenza vaccines. The company currently can scale up production*

capacity of a monovalent pandemic vaccine using egg-based production methods. MedImmune believes that by applying cell culture-based manufacturing methods, it could further reduce production times and substantially increase its U.S.-based manufacturing capacity in preparation for a pandemic.

*These governmental milestones and partnerships bolster MedImmune's commitment to preparing the U.S. to be protected against influenza illness annually and in the event of a pandemic. MedImmune has offered to license the key intellectual property for reverse genetics technology to governmental organizations and companies to develop pandemic and seasonal influenza vaccines.*

### Influenza (Flu)

Influenza, more commonly known as “the flu,” is a viral infection of the respiratory system (nose, throat, and lungs). Because it is such a commonly occurring condition, people do not usually realize just how dangerous it can really be. Each year, 5 percent-20 percent of the American population will get some strain of the flu, 200,000 will be admitted to the hospital, and about 36,000 people will actually die from it. Individuals who are young and healthy are usually sick for about a week on average, experiencing a high fever, chills, sore throat, cough, runny nose, and body aches. Those persons whose immune systems are in some way compromised, such as the elderly or those with other chronic illnesses, often have a much harder time recovering from the flu. It is not uncommon for pneumonia (an infection of the lungs) to develop. The flu is highly contagious and precautions such as vaccination and regular personal hygiene should be taken seriously during flu season to prevent transmittal of the flu.

COMPANY	PRODUCT	PHASE	Influenza
Novartis AG	Flu Cell Culture Vaccine	II	
Novartis AG	Influenza cell culture vaccine	II	
Novartis AG	Flu Cell Culture Vaccine	III	
MedImmune	CAIV-T	PA	
MedImmune	FluMist® (Influenza Virus Vaccine Live, Intranasal)	A	
Gilead Sciences, Inc.	Tamiflu (oseltamivir phosphate)	A	
Novartis AG	Agrippal-S1	M	
Novartis AG	Begrivac	M	
Novartis AG	Fluad	M	
Novartis AG	Fluvirin/flu vaccine	M	
Novartis AG	PedvaxHIB Liquid	M	
Impax Laboratories, Inc.	Rimantadine Hydrochloride	M	
Gilead Sciences, Inc.	Tamiflu (oseltamivir phosphate)	M	
Novartis AG	Vaxem-Hib	M	
SciClone Pharmaceuticals, Inc.	Zadaxin (thymalfasin)	M	

### Malaria

Malaria is an infectious disease widespread in tropical and subtropical regions. It is caused by a single cell parasite called Plasmodium that is transmitted primarily by the bite of female mosquitoes. Plasmodium invades and destroys the red blood cells of its host, starting in the liver. The blood cells are invaded and destroyed in cycles, such that every three to four days the infected person will experience chills, fever, nausea, vomiting, and sweating.

This disease has been mostly eradicated from the Western world, but it continues to be a huge problem in many developing countries near the equator, especially Africa and South America. Each year, it is estimated that 350 million - 500 million people become infected, with a resulting 1.3 million - 3.0 million deaths annually. This is at least one death every 30 seconds, most of whom are children under the age of 5. To control the disease, mosquito eradication techniques as well as mosquito nets are employed to prevent mosquito bites. Those who become infected, however, require medication to treat the infection. Malaria remains a significant threat to health that needs to be addressed and contained.

	COMPANY	PRODUCT	PHASE
Malaria	Impax Laboratories, Inc.	Chloroquine Phosphate Tablets	M

### Measles

Measles are a disease caused by the Morbillivirus virus. It is spread through contact with the fluids of an infected person's nose and mouth, or by directly breathing air from an infected person. Measles is highly contagious, and 90% of those exposed (without immunity) will catch the disease. The incubation period usually lasts for 10 to 12 days and once the rash appears, infected people are contagious for the first 3-5 days. Symptoms include a fever that lasts for at least three days and the three C's—cough, coryza (runny nose) and conjunctivitis (red eyes). An itchy rash appears that covers the body with dark brown to red spots.

Treatment includes preventative vaccination; those not vaccinated usually recover with rest and supportive treatment.

	COMPANY	PRODUCT	PHASE
Measles	Novartis AG	Masern-Virus-Impfstoff	M
	Novartis AG	M-Mvax	M
	Novartis AG	M-M-Rvax	M
	Novartis AG	Morbilvax	M
	Novartis AG	Morubel	M

### Meningococcal Infections (Meningitis)

Meningitis is caused by the presence of Neisseria meningitides (meningococcus), the bacteria that causes inflammation of the membranes (meninges) covering the brain. This is usually due to bacterial infections in the body that have spread into the blood and cerebrospinal fluid. Meningitis can affect any age group, though the causes may be different. Typical signs and symptoms include fever, headache, stiff neck, light sensitivity and vomiting. The most common cause of meningitis is a virus and the disease usually can be treated within a few days. Bacterial meningitis, however, can become very serious if not immediately treated. In the United States, approximately 2.5 out of every 100,000 persons becomes infected with bacterial meningitis each year.

COMPANY	PRODUCT	PHASE	
Novartis AG	MenACWY vaccine	II	Meningitis
SuperGen Inc	Partaject Busulfan	II	
Novartis AG	Meningococcus C vaccine	III	
XOMA Ltd	Neuprex (opebecan)	III	Meningococcal Infections
Gilead Sciences, Inc.	Ambisome (amphotericin B)	M	Meningitis
Novartis AG	DepoCyt (cytarabine)	M	
Novartis AG	Menjugate	M	
Novartis AG	Menpovax A and C	M	

### Mumps

Mumps is a viral disease in humans, which, prior to vaccination, was a major childhood disease. In the third world, where vaccines are not widely available, mumps is still a significant threat to health. Symptoms include painful swelling of salivary glands and a high fever. Testicular swelling and rash may also accompany the diseases. In adults, complications often arise, leading to infertility or sub fertility. Apart from painkillers, there is no specific treatment for the disease. A vaccine is available.

COMPANY	PRODUCT	PHASE	
Novartis AG	M-Mvax	M	Mumps
Novartis AG	M-M-Rvax	M	
Novartis AG	Mumpsvox	M	
Novartis AG	Vaxipar	M	

### Pneumonia

Pneumonia is an illness of the lungs and respiratory system in which the alveoli (microscopic air filled sacs responsible for absorbing oxygen) become inflamed and filled with fluid. Pneumonia can result from several different causes, including infection with bacteria, viruses, fungi, or parasites. Chemical or physical injuries to the lungs and medical illnesses such as lung cancer or alcohol abuse can also contribute to pneumonia. Commonly recognized symptoms include cough, chest pain, fever and difficulty breathing. It is often diagnosed through the use of X-rays and examination of the sputum (mucus and saliva coughed up from the lungs). Bacterial pneumonias are treated with antibiotics; other forms require different treatments. Pneumonia is a common illness that can strike at any age. Unfortunately, in the case of the chronically ill and elderly population, it often results in death. Vaccines as prevention combined with other treatments are available therapeutic options.

	COMPANY	PRODUCT	PHASE
Pneumonia	Nektar Therapeutics	Inhaled ICU Antibiotic	II
	Johnson & Johnson	Doripenem	III
	Theravance, Inc.	Telavancin / TD-6424	III
	Novartis AG	Tifacogin	III
	Novartis AG	Pneumopur	M

### Polio

Polio is a viral paralytic disease caused by a virus invading the intestinal wall, blood stream, and into the central nervous system. The virus causes muscle weakness and often paralysis. Efforts by the World Health Organization and the The Rotary Foundation have reduced the number of annual diagnosed cases from the hundreds of thousand to around a thousand. Polio enters the body through the mouth, usually in contaminated water or food. It is extremely infectious and paralysis can begin in only a few hours. The incubation period is three to five days, and no symptoms are present during this time. It is during this period that it is most often transmitted in waste material. Symptoms include fatigue, vomiting, headache, and pain in the neck and extremities. Around 1% of unimmunized people develop paralytic complication. Thanks to a vaccine, polio has been nearly eradicated.

	COMPANY	PRODUCT	PHASE
Polio	Novartis AG	IPV-Virelon	M
	Novartis AG	Polio Vaccine	M
	Novartis AG	Polioral	M
	Novartis AG	Quatro-Virelon	M
	Novartis AG	Td-Virelon	M

### Rabies Vaccine

Rabies is a disease caused by a virus, usually transmitted by the bite of an infected animal. While it used to be more common to find rabid domestic animals (such as dogs and cats), the majority of rabid animals are now wildlife (such as skunks, raccoons, bats, and foxes). Thanks to new vaccines (both preventative and post-exposure), human death from rabies in the United States has been nearly abolished.

	COMPANY	PRODUCT	PHASE
Rabies	Novartis AG	Rabavert	M
	Novartis AG	Rabipur/Rabivac	M

### Rubella

Rubella is a disease caused by the Rubella virus. It is mild and often goes unnoticed. The virus enters the body through the nose or throat and the disease can last from 1 to 5 days, after a 2 to 3 week incubation period. Children recover more quickly than adults, but if it is passed to an unborn fetus, the child will develop congenital rubella syndrome. Symptoms include: rash on the stomach, low fever, swollen glands, joint pain, headache, conjunctivitis, and rash. The body is generally able to heal itself with proper rest and care.

COMPANY	PRODUCT	PHASE	
Novartis AG	Gunevax	M	Rubella
Novartis AG	M-M-Rvax	M	
Novartis AG	Morubel	M	
Novartis AG	Rubellovac	M	

### Smallpox

Smallpox was a uniquely human viral disease caused by two viruses called Variola major and Variola minor. V. major is the more deadly form of the two, with a typical mortality of 20 percent-40 percent of those infected. The other strain, V. minor, typically only kills 1 percent of its victims. Symptoms of the disease are corneal ulcerations and an eruption of pimples, first in the mouth, then the arms and hands, and later the rest of the body. These pimples gradually become pustules. In the severe form, pimples do not form but internal bleeding occurs directly under the skin and in the organs. Nearly 96 percent of people with this form will die due to blood and fluid loss.

Historically, this disease has been one of the major causes of death throughout the world. Due to the development of vaccines against smallpox, the disease was declared by the WHO in 1979 to be eradicated. Due to recent concerns about its potential for use in bioterrorism, however, there has been a new movement towards more vaccine development against smallpox.

COMPANY	PRODUCT	PHASE	
VaxGen, Inc.	LC16m8	II	Smallpox

### Tuberculosis

Tuberculosis (TB) is a deadly infectious disease caused by the bacterium *Mycobacterium tuberculosis*, most commonly found in the lungs. It can also reside in the central nervous system, lymphatic system, circulatory system, genitourinary system, bones and joints. According to the World Health Organization, over one-third of the world's population now has TB in their bodies and new infections occur at a rate of one per second. One in 10 of those infected will develop active TB, which will be fatal in over 50 percent of the cases if untreated. In 2004, the WHO estimated that 14.6 million people had active TB, with 8.9 million new cases and 1.7 million deaths, mainly in developing countries where treatment is less readily available. Those with HIV/AIDS and suppressed immune systems are more prone to developing active TB. Due to the recent increase in HIV/AIDS, together with the neglect of TB programs, there has been a resurgence of TB and several drug-resistant strains are emerging. The WHO, through its Global Plan to Stop Tuberculosis, aims to save 14 million lives between 2006 and 2015.

COMPANY	PRODUCT	PHASE	
SciClone Pharmaceuticals, Inc.	SCV-07	II	Tuberculosis

### Typhoid Fever

Typhoid fever is an illness caused by the bacterium *Salmonella Typhi* and is transmitted by the ingestion of food or water contaminated with the feces of an infected person. After a 10 to 20 day incubation period, symptoms include high fever, chills, sweats, coughing, skin problems, diarrhea, headaches, muscle pain, lack of appetite, rash, and delusions. Typhoid fever can result in death in 10% to 30% of cases if left untreated. Treatment generally includes antibiotics and reduces fatality to approximately 1%. Vaccines, though not 100% effective, are available, and are recommended to travelers going to Asia, Africa, and Latin America.

	COMPANY	PRODUCT	PHASE
Typhoid	Novartis AG	Typhoral L	M

### Urinary Tract Infections

A urinary tract infection (UTI) is an infection somewhere along the urinary tract, anywhere from the kidneys to the urethra. Common symptoms include a burning sensation upon urination, frequent urination, bloody or foul-smelling urine, high temperature, nausea and vomiting. UTIs are generally caused by either *E. coli* or *Staphylococcus* bacteria and can be prevented by having adequate fluid intake, not resisting the urge to urinate, and practicing good hygiene, especially after sexual intercourse.

	COMPANY	PRODUCT	PHASE
Urinary Tract Infections	Osel, Inc.	Lactin-V	II
	Johnson & Johnson	Doripenem for Injection	III
	Impax Laboratories, Inc.	Flavoxate Hydrochloride Tablets	M
	DepoMed, Inc.	Proquin XR (ciprofloxacin hydrochloride)	M

### Yellow Fever

Yellow fever is an acute viral disease named after the jaundice that develops in some patients. In many African and South American countries, it is an important cause of hemorrhagic illness. As of 2001, the World Health Organization (WHO) estimates that yellow fever causes 200,000 illnesses and 30,000 deaths every year in unvaccinated populations. Symptoms include fever, muscle ache, flushed face, reddening of the eyes, hemorrhaging of the gastrointestinal tract, and jaundice. If the disease progresses, delirium, seizures, dehydration, and hypertension can ensue. Yellow fever is transmitted via the female *Aedes aegypti* mosquito after it transfers blood from an infected person to another. It is important that people get vaccinated. If the disease does take hold, however, fluid replacement, dialysis, and plenty of sleep are crucial to recovery.

	COMPANY	PRODUCT	PHASE
Yellow Fever	Novartis AG	Arilvax	M



