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Geo Format Design A

ftp_st *McGraw-Hill CTP Title Program*

ftp_nm Third Edition

Author One ftp_au
The University of Wisconsin

Author Two
Iowa State University ftp_af

Author Three
Harvard University

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Geo Format Design A

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McGraw-Hill CTP Title Program

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Third Edition

ABOUT THE AUTHOR(S) faa_tt

Author One faa_ha

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DEDICATION

fdd_tx *To Judy, my wife and friend, for sharing life's adventures.*

fdd_au Author One
Author University fdd_af

To Daria for the warmth of memories past and the excitement of adventures to come.

Author Two

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Fredric Bassett
Rose State College
David Bastedo
San Bernadino Valley College
Mark G. Birchette
Long Island University
Leann Blem
Virginia Commonwealth University
Ty W. Bryan
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Fredric Bassett
Rose State College

Thank you to all my reviewers for the assistance you provided me throughout the publishing process.

fpr_au **-John Q. Author**
fpr_af *Author University*

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Boxed Readings

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PART THREE

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bch_tt A Reduction in Atmospheric Ozone

bch_st Let the Sunshine In

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Chapter Objectives

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This is an example of a photo caption that would appear in the part openers. *(Photo courtesy of Getty Images).*

Chapter Outline

CHAPTER

16

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The Earth Science Tradition

This is the Subtitle

Chapter Objectives

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bchop_fgct This is an example of a photo caption that would appear in the part openers. *(Photo courtesy of Getty Images).*

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Chapter Outline

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CHAPTER

16

The Earth Science Tradition

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Chapter Objectives

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CHAPTER

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bopcs_tt

Case Study

bopcs_st

Saving an African Eden

This is an A-Head

bopcs_ha

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

bopcs_tx

This is a B-Head

bopcs_hb

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

bopcs_eq $a + b = c$

It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

bopcs_lb

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
- In many cases, these spikes are involved.

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—bopcs_tbnm 85–93°C) in Italy where it infects the hyperthermophilic.

This is a C-Head

bopcs_hc

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

bopcs_tbsh

bopcs_fgnm bopcs_fgtt

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers) that causes a rare demyelinating disease of the central nervous system. (c) Adenovirus, 252 capsomers (X 171,000). (d) Computer-simulated model of adenovirus. *Source: Google Earth*

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1. In many cases, these spikes are involved in virus attachment to the host cell surface. bopcs_ln
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88. In many cases, these spikes are involved in virus attachment to the host cell surface.

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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally*

bopcs_so bopcs_fn

Table 22.22 Climate Regions bopcs_tbtt

Letter	Name	Characteristics bopcs_tbcn
	WET REGIONS bopcs_tbhs	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bopcs_tbtx
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface. bopcs_tbln
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface.

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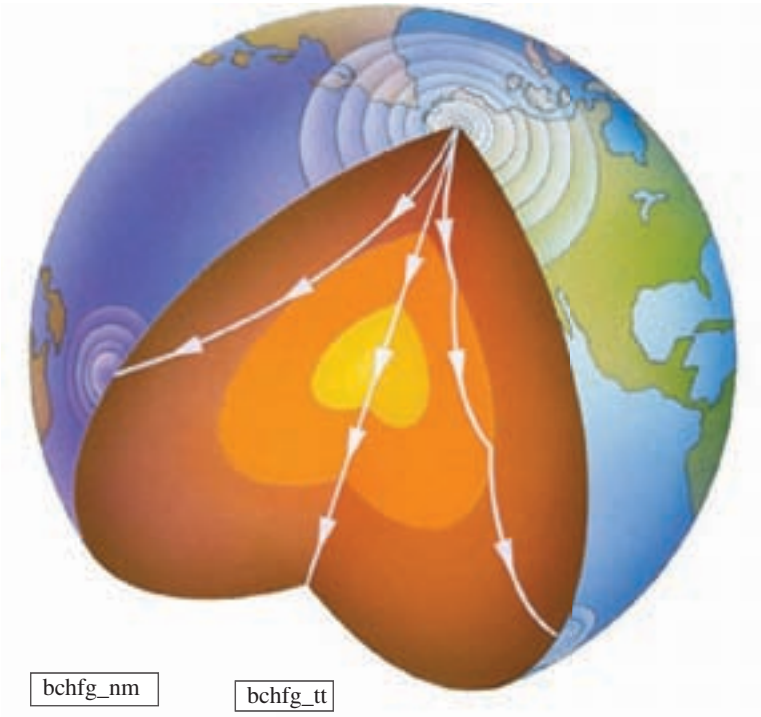

bchfg_nm

bchfg_tt

Figure 5.11 **Examples of Icosahedral Capsids.** (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: TNT*

bch_fgso

bch_fgct

bch_tbnm

Table 22.22 **Climate Regions**

bch_tbtt

Letter	Name	Characteristics
	WET REGIONS	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface.

bch_tbcn

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: Getty Images*

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Table 22.22 Some Noteable Earthquakes Over the Last Milenia

Year	*Location*	*Deaths (estimated)*	*Magnitude*	*Comments*
1556	Shensi, China	830,000	—	Possibly the greatest natural disaster.
1755	Lisbon, Portugal	70,000	—	Tsunami damage extensive.
1811–1812	New Madrid, Missouri	few	7.9	Three major earthquakes.
1886	Charleston, SC	60	—	Greatest historical earthquake in the eastern United States.
1906	San Francisco, CA	1,500	7.8	Fires caused extensive damage.
1556	Shensi, China	830,000	—	Possibly the greatest natural disaster.
1755	Lisbon, Portugal	70,000	—	Tsunami damage extensive.
1886	Charleston, SC	60	—	Greatest historical earthquake in the eastern United States.
1908	Messina, Italy	120,000	—	

bchba_tt

Earth Systems

bchba_st

Global Warming and Glaciers

This is an A-Head

bchba_ha

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genom tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

bchba_tx

bchba_lu

This is a B-Head

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genon assemble into filamentous structures.

bchba_fn

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

bchba_eq $a + b = c$

It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
- In many cases, these spikes are involved.

bchba_lb

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

bchba_hc

This is a C-Head

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

1. In many cases, these spikes are involved in virus attachment to the host cell surface.
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- In many cases, these spikes are involved.
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bchba_so

[1] Ulrich, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. Ubiquitous virus development outside a host. Nature 436:1101–02. *Source: Rand McNally*

bchba_tbnm

Table 22.22 Climate Regions bchba_tbtt

Letter	Name	Characteristics
	WET REGIONS	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface.

bchha_tbcn

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What Do You Think?

It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

bchbb_tx

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It is suspected that the development of tails only at high temgenome tein their classification as “acellular entities” or “forms”—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
- In many cases, these spikes are involved.

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It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

1. In many cases, these spikes are involved in virus attachment to the host cell surface.

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It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: Getty Images*

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Figure 5.11 **Examples of Icosahedral Capsids.** (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: Getty Images*

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: Getty Images*

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24.4 Earth Systems

Global Warming and Glaciers

This is an A-Head

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

This is a B-Head

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

$$a + b = c$$

It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
- In many cases, these spikes are involved.

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

This is a C-Head

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

1. In many cases, these spikes are involved in virus attachment to the host cell surface.
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88. In many cases, these spikes are involved in virus attachment to the host cell surface.

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In many cases, these spikes are involved.
In many cases, these spikes are involved in virus attachment to the host cell surface.
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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally*

bchba_fgnm bchba_fgtt

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers) that causes a rare demyelinating disease of the central nervous system. (c) Adenovirus, 252 capsomers (X 171,000). (d) Computer-simulated model of adenovirus. *Source: Google Earth*

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EXPANDING YOUR KNOWLEDGE

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EXPLORING WEB RESOURCES

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a. erosion **c.** transportation
b. deposition **d.** all of the above

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bce_fgct **Figure 5.11 Examples of Icosahedral Capsids.** Canine parvovirus model, 12 capsomers. *Source: Google Earth*

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b. deposition **d.** all of the above

Climate Regions

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Letter	Name	Characteristics
	WET REGIONS	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F).

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SUGGESTED READINGS

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Author. *"Title of Article." Title of Journal Volume number (Year)*: Page(s). Name of Database. EBSCOhost. Honolulu Community Coll. Lib., HI. Date of Access <http://search.epnet.com/>.

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"*New Arm, Same Spirit*." People 23 Feb. 2004: 58+. MasterFILE Premier. EBSCOhost. Honolulu Community Coll. Lib., HI. 8 May.

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For Additional Help in Studying This Chapter, please visit our vebsite at www.mhhe.com/yourbook1e. You will find practice quizzes, a chapter summary, key terms, answers to review queswtions, additional case studies, regiounal examples, and an esxtensive reading list, all of which will help you understand the material in this chapter.

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APPENDIX 1

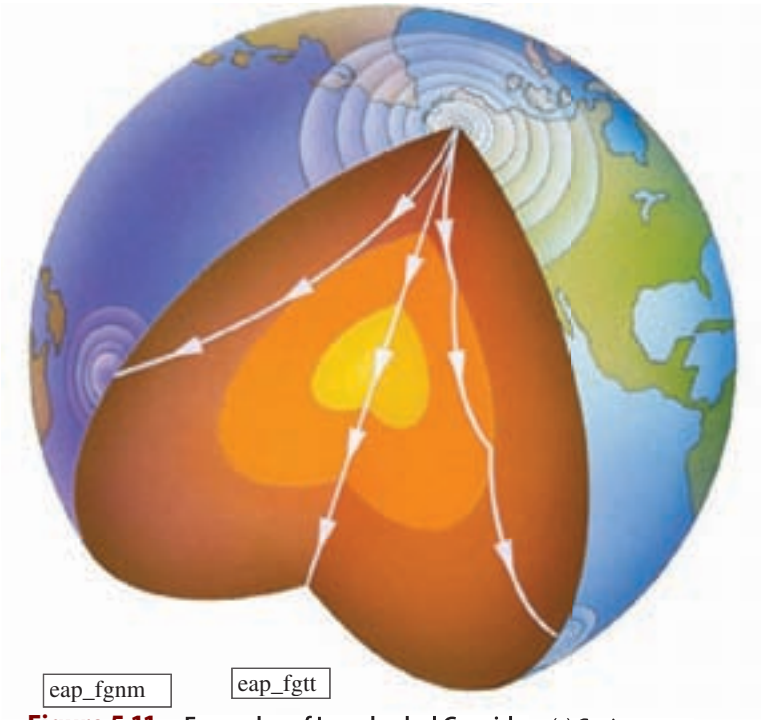

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: TNT* eap_fgso eap_fgct

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Table 22.22 Climate Regions eap_tbtt

Letter	Name	Characteristics
	WET REGIONS	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface.

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GLOSSARY

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AB toxins The structure and activity of many exotoxins based on the AB model. In this model, the B portion of the toxin is responsible for toxin binding to a cell but does not directly harm it. The A portion enters the cell and disrupts its function. (824)

egl_tm

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ABC protein secretion pathway Transport systems that use ATP hydrolysis to drive translocation across the plasma membrane. When used for nutrient uptake, usually called ATP-binding cassette transport systems. (65)

accessory pigments Photosynthetic pigments such as carotenoids and phycobiliproteins that aid chloro- phyll in trapping light energy. (217)

acellular slime mold Chemoorganotrophic protists with a distinctive life cycle that includes thestreaming of protoplasm that moves in an amoeboidfashion. Cells within the multinucleate mass (calleda plasmodium) lack cell walls. Also called Myxogastria, and were formerly considered fungi. (614)

acetyl-CoA pathway A biochemical pathway usedby methanogens to fix CO2. It is also used by acetogens to generate acetic acid. (506)

acetyl-coenzyme A (acetyl-CoA) A combinationof acetic acid and coenzyme A that is energy rich; itis produced by many catabolic pathways and is thesubstrate for the tricarboxylic acid cycle, fatty acidbiosynthesis, and other pathways. (198)

acid fast Refers to bacteria like the mycobacteria thatcannot be easily decolorized with acid alcohol after being stained with dyes such as basic fuchsin. (26, 596)

acid-fast staining Astaining procedure that differentiates between bacteria based on their ability to retain adye when washed with an acid alcohol solution. (26)

acidic dyes Dyes that are anionic or have negatively charged groups such as carboxyls. (26)

acidophile (as_id-o-f¯ l_) A microorganism that hasits growth optimum between about pH 0 and 5.5.(134)

acquired enamel pellicle A membranous layer onthe tooth enamel surface formed by selectively adsorbing glycoproteins (mucins) from saliva. This pellicle confers a net negative charge to the toothsurface. (991)

acquired immune deficiency syndrome (AIDS) An infectious disease syndrome caused by the humanimmunodeficiency virus and is characterized by theloss of a normal immune response, followed by increased susceptibility to opportunistic infections andan increased risk of some cancers. (925)

acquired immune tolerance The ability to produce antibodies against nonself antigens while "tolerating" (not producing antibodies against)self-antigens. (802)

acquired immunity Refers to the type of specific(adaptive) immunity that develops after exposure toa suitable antigen or is produced after antibodies aretransferred from one individual to another. (776)

actinobacteria (ak_tˇ_-no-bak-t_r-e-ah) A group ofgram-positive bacteria containing the actinomycetesand their high G C relatives. (593)

actinomycete (ak_tˇ_-no-mi_s_t) An aerobic, grampositive bacterium that forms branching filaments (hyphae) and asexual spores. (589)

actinorhizae Associations between actinomycetes and plant roots. (704)

B

bacille Calmette-Guerin (BCG) An attenuated form of Mycobacterium tuberculosis used in some countries as a vaccine for tuberculosis. (955)

bacteremia (bak_ter-e_me-ah) The presence of viable bacteria in the blood. (821)

Bacteria (bak-te_re-a) The domain that contains procaryotic cells with primarily diacyl glycerol diesters in their membranes and with bacterial rRNA. (2, 474)

bacterial artificial chromosome (BAC) A cloning vector constructed from the E. coli F-factor plasmid that is used to clone foreign DNA fragments. (370)

bacterial (septic) meningitis *See meningitis. (950)*

bacterial vaginosis (bak-te_re-_l vaj_ˇ_-no_sis) Bacterial vaginosis is a sexually transmitted disease caused by Gardnerella vaginalis, Mobiluncus spp., Mycoplasma hominis, and various anaerobic bacteria. Although a mild disease, it is a risk factor for obstetric infections and pelvic inflammatory disease. (971)

bacteriochlorophyll (bak-te_re-o-klo_ro-fil) A modified chlorophyll that serves as the primary lighttrapping pigment in purple and green photosynthetic bacteria and heliobacteria. (218)

C

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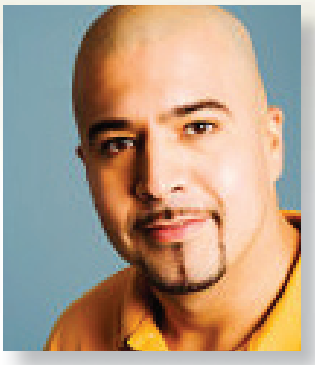

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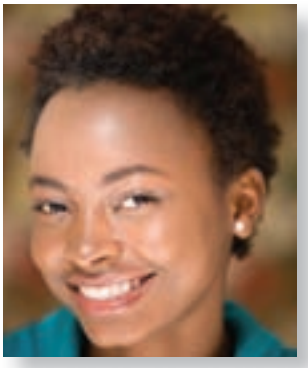

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To Judy, my wife and friend, for sharing life's adventures.

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—Author One

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Author University

To Daria for the warmth of memories past and the excitement of adventures to come.

—Author Two

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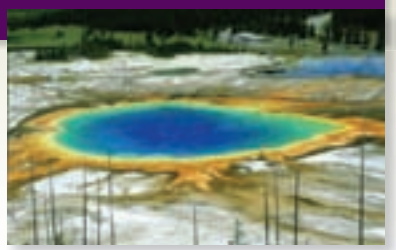

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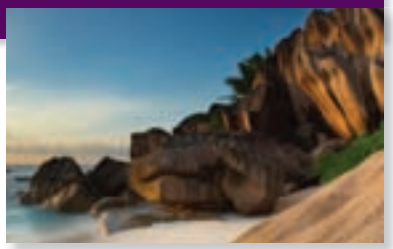

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Sharon R. Barnewall, *Columbus State Community College*
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Fredric Bassett, *Rose State College*

Thank you to all my reviewers for the assistance you provided me throughout the publishing process.

-John Q. Author fpr_au
Author University fpr_af

LIST OF FEATURES ffm_tt

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4. Origin of Chloroplasts and Mitochondria (Chapter 2)
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Boxed Readings

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Herbs to Dye For (Chapter 17)
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Buying Time for the Rain Forest (Chapter 26)

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PART THREE

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(Photo courtesy of Getty Images). bpuop_ctso

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The Earth Science Tradition

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PART OUTLINE

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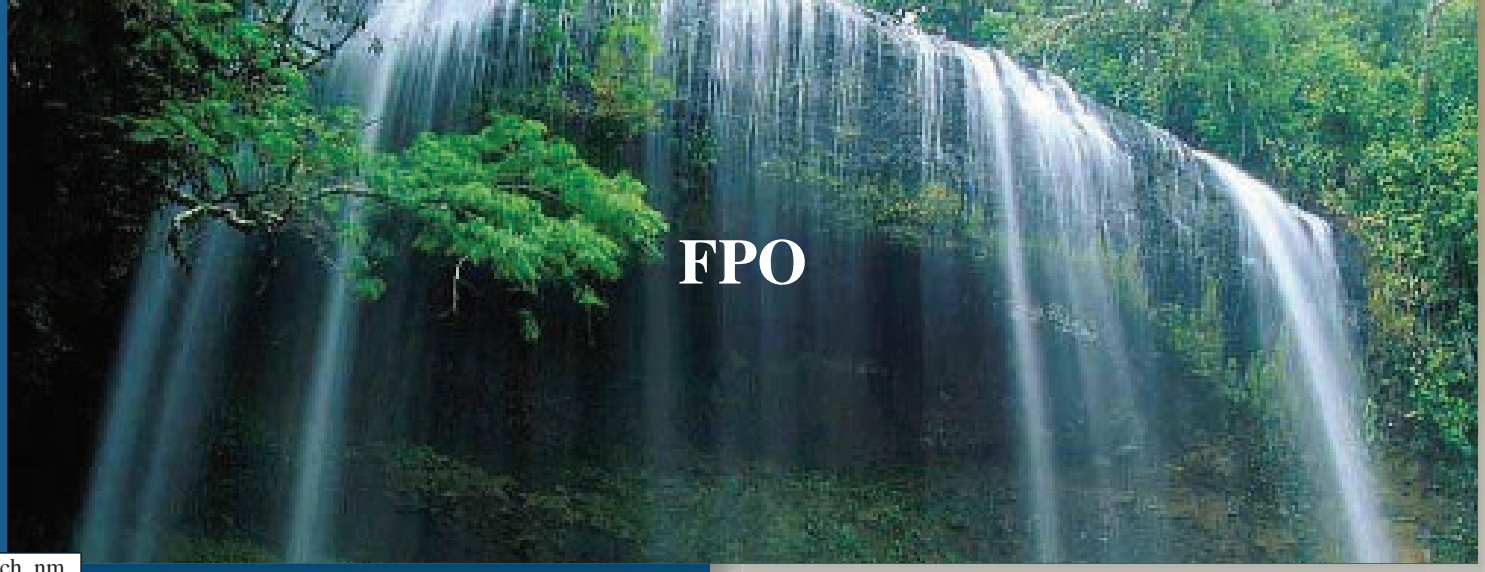

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CHAPTER 5

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The Earth Science Tradition bch_tt

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CHAPTER 35

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A Reduction in Atmospheric Ozone

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Let the Sunshine In

CHAPTER OBJECTIVES bchob_tt

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CHAPTER 16

The Earth Science Tradition

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CHAPTER OBJECTIVES

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CHAPTER 16

The Earth Science Tradition

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CHAPTER OBJECTIVES

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bch_nm_b CHAPTER 16

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The Earth Science Tradition

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CHAPTER OBJECTIVES

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CASE STUDY *Saving an African Eden* bopcs_st

This is an A-Head bopcs_ha

The fact that viruses cannot multiply without first infecting a host cov To find out more about the structure of the tails, the ATV geno bopcs_tx find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

This is a B-Head bopcs_hb

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

bopcs_eq $a + b = c$

It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachme bopcs_lb host cell surface.
- In many cases, these spikes are involved.

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

This is a C-Head bopcs_hc

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

bopcs_fgnm bopcs_fgtt

FIGURE 5.11 **Examples of Icosahedral Capsids.** (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated imag bopcs_fgct poyomavirus (72 capsomers) that causes a rare demyelinating disease of the central nervous system. (c) Adenovirus, 252 capsomers (X 171,000). (d) Computer-simulated model of adenovirus. *Source: Google Earth*

bopcs_fgso

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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally* bopcs_so

bopcs_tbnm

TABLE 20.22 *Climate Regions* bopcs_tbtt

Letter	Name	Characteristics bopcs_tbcn
WET REGIONS bopcs_tbhs		
Region A bopcs_tbsh	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. bopcs_tbtx Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Eart bopcs_tbln surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of the Earth's surface.
DRY REGIONS		
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F).

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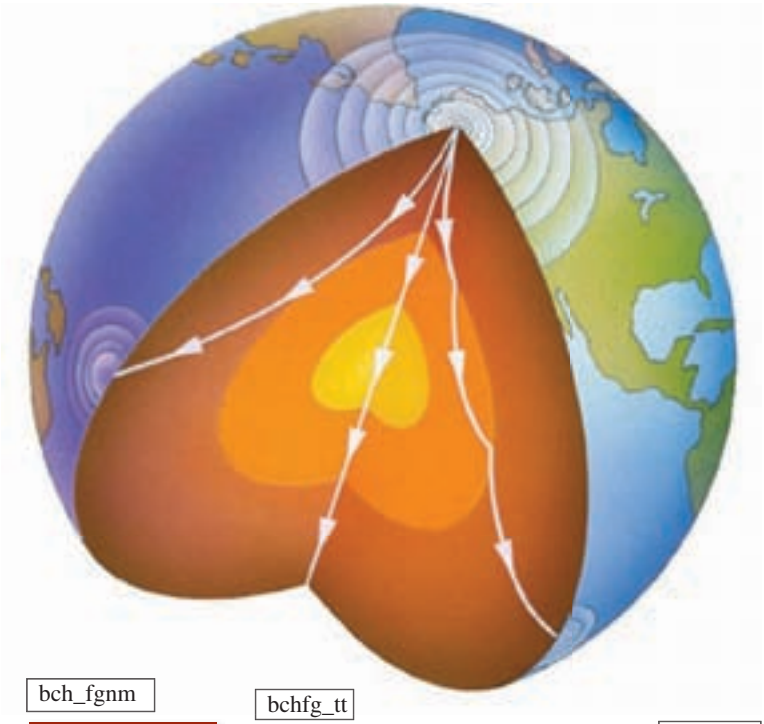

bch_fgnm

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FIGURE 5.11 Examples of Icosahedral Capsids. (a) Canine bch_fgct virus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: TNT* bch_fgso

bch_tbnm **TABLE 20.22** *Climate Regions* bch_tbtt

Letter	Name	Characteristics bch_tbcn
WET REGIONS bch_tbhs		
Region A bch_tbsh	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bch_tbtx
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of the Earth's surface. bch_tbln
DRY REGIONS		
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bch_tblb • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of the Earth's surface.

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FIGURE 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: Getty Images* bce_fgso

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TABLE 20.22 *Some Noteable Earthquakes Over the Last Millenia*

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Year	Location	Deaths *(estimated)*	Magnitude	Comments
1556	Shensi, China	830,000	—	Possibly the greatest natural disaster.
1755	Lisbon, Portugal	70,000	—	Tsunami damage extensive
1811-1812	New Madrid, Missouri	few	7.9	Three major earthquakes.
1886	Charleston, SC	60	—	Greatest historical earthquake in easter United States.
1906	San Francisco, CA	1,500	7.8	Fires caused extensive damage.
1556	Shensi, China	830,000	—	Possibly the greatest natural disaster.
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1886	Charleston, SC	60	—	Greatest historical earthquake in easter United States.
1906	San Francisco, CA	1,500	7.8	Fires caused extensive damage.

bchba_tt

EARTH SYSTEMS

Design-supplied art: **G2.box1**

Global Warming and Glaciers bchba_st

bchba_ha

This is an A-Head

The fact that viruses cannot multiply without first infecting a host cov bchba_tx To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator*.

bchba_hb

This is a B-Head

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It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in ac bchba_eq ings and induces lysis rather than *lysogeny*.

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It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

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- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
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So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

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So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally.* bchba_fn bchba_so

bchba_tbnm

TABLE 20.22 *Climate Regions* bchba_tbtt

Letter	Name	Characteristics bchha_tbcn
WET REGIONS bchba_tbhs		
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bchba_tbtx
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bchba_tbln 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of the Earth's surface.
DRY REGIONS		
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bchba_tblb • Monthly average temperature above 18°C (64°F).

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WHAT DO YOU THINK?

It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny*.

bchbb_tx

$$a + b = c$$

bchbb_eq

It is suspected that the development of tails only at high temgenome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachr to the host cell surface.

bchbb_lb

- In many cases, these spikes are involved.

It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than lysogeny.

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10. In many cases, these spikes are involved in virus attachment to the host cell surface.
88. In many cases, these spikes are involved in virus attachment to the host cell surface.

It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis.

In many cases, these spikes are involved.
In many cases, these spikes are involved in virus attachment to the host cell surface.

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In many cases, these spikes are involved.

Design-supplied art: **G2.box2**

(a)

(b)

(c)

FIGURE 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) C (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. *Source: Getty Images*

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bchba_nm

24.4 EARTH SYSTEMS

Design-supplied art: **G2.box1**

Global Warming and Glaciers

This is an A-Head

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator*.

This is a B-Head

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny*.

$$a + b = c$$

It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
- In many cases, these spikes are involved.

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

This is a C-Head

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

1. In many cases, these spikes are involved in virus attachment to the host cell surface.
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In many cases, these spikes are involved.
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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally.*

bchba_fgnm bchba_fgtt

FIGURE 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of th bchba_fgct poyomavirus (72 capsomers) that causes a rare demyelinating disease of the central nervous system. (c) Adenovirus, 252 capsomers (X 171,000). (d) Computer-simulated model of adenovirus. *Source: Google Earth*

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TESTING YOUR KNOWLEDGE

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EXPANDING YOUR KNOWLEDGE

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EXPLORING WEB RESOURCES

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   a. erosion **c.** transportation
   b. deposition **d.** all of the above

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FIGURE 5.11 Examples of Icosahedral Capsids. Canine parvovirus model, 12 capsomers. *Source: Google Earth* bce_fgso

Climate Regions bce_tbtt

Letter	Name	Characteristics bce_tbcn
WET REGIONS bce_tbhs		
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bce_tbtx
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bce_tbln
DRY REGIONS		
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bce_tblb

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bcer_ln

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SUGGESTED READINGS

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Author. *"Title of Article." Title of Journal Volume number (Year)*: Page(s). Name of Database. EBSCOhost. Honolulu Community Coll. Lib., HI. Date of Access <http://search.epnet.com/>.

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www.adobe.com bce_ur

"*New Arm, Same Spirit*." People 23 Feb. 2004: 58+. MasterFILE Premier. EBSCOhost. Honolulu Community Coll. Lib., HI. 8 May.

For Additional Help in Studying This Chapter:

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Please visit our website at www.mhhe.com/yourbook1e. You will find practice quizzes, a chapter summary, key terms, answers to review queswtions, additional case studies, regiounal examples, and an esxtensive reading list, all of which will help you understand the material in this chapter.

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APPENDIX 1

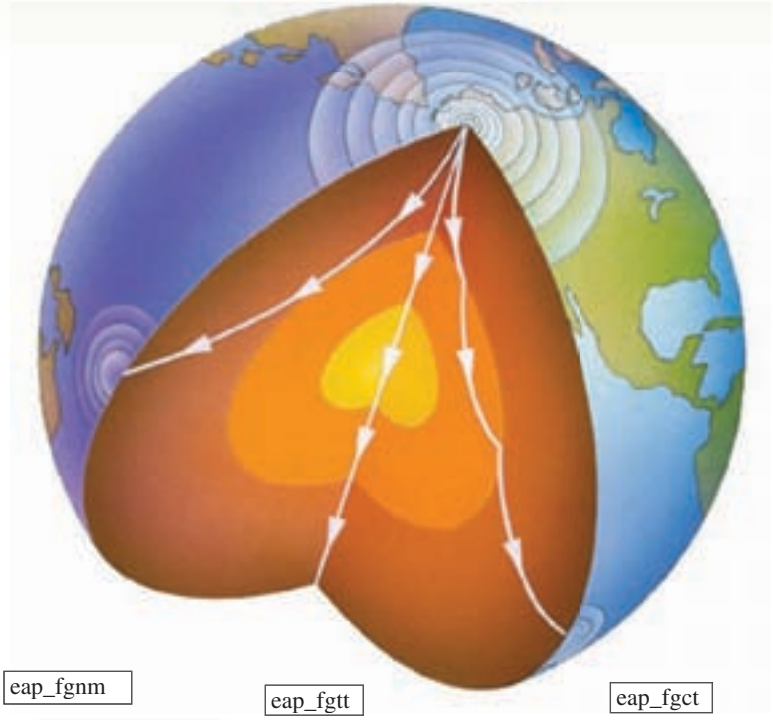

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FIGURE 5.11 **Examples of Icosahedral Capsids.** (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: TNT* eap_fgso

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TABLE 20.22 *Climate Regions* eap_tbtt

Letter	Name	Characteristics
WET REGIONS		
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature ab eap_tbtx 18°C (64°F). All or most months may have average precipitation above x.
eap_tbsh ***Region B***	Subtropical	1. Wet, hot equatorial regions that cover about a third of the E eap_tbln surface. Monthly average temperature above 18°C (64°F).
DRY REGIONS		
Region C	Tundra	• Wet, hot equatorial regions tha eap_tblb cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F).

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GLOSSARY

A

AB toxins The structure and activity of many exotoxins based on the AB model. In this model, the B portion of the toxin is responsible for toxin binding to a cell but does not directly harm it. The A portion enters the cell and disrupts its function. (824)

ABC protein secretion pathway Transport systems that use ATP hydrolysis to drive translocation across the plasma membrane. When used for nutrient uptake, usually called ATP-binding cassette transport systems. (65)

accessory pigments Photosynthetic pigments such as carotenoids and phycobiliproteins that aid chloro- phyll in trapping light energy. (217)

acellular slime mold Chemoorganotrophic protists with a distinctive life cycle that includes thestreaming of protoplasm that moves in an amoeboidfashion. Cells within the multinucleate mass (calleda plasmodium) lack cell walls. Also called Myxogastria, and were formerly considered fungi. (614)

acetyl-CoA pathway A biochemical pathway usedby methanogens to fix CO2. It is also used by acetogens to generate acetic acid. (506)

acetyl-coenzyme A (acetyl-CoA) A combinationof acetic acid and coenzyme A that is energy rich; itis produced by many catabolic pathways and is thesubstrate for the tricarboxylic acid cycle, fatty acidbiosynthesis, and other pathways. (198)

acid fast Refers to bacteria like the mycobacteria thatcannot be easily decolorized with acid alcohol after being stained with dyes such as basic fuchsin. (26, 596)

acid-fast staining Astaining procedure that differentiates between bacteria based on their ability to retain adye when washed with an acid alcohol solution. (26)

acidic dyes Dyes that are anionic or have negatively charged groups such as carboxyls. (26)

acidophile (as_id-o-f¯ l_) A microorganism that hasits growth optimum between about pH 0 and 5.5.(134)

acquired enamel pellicle A membranous layer onthe tooth enamel surface formed by selectively adsorbing glycoproteins (mucins) from saliva. (991)

acquired immune deficiency syndrome (AIDS) An infectious disease syndrome caused by the humanimmunodeficiency virus and is characterized by theloss of a normal immune response, followed by increased susceptibility to opportunistic infections andan increased risk of some cancers. (925)

acquired immune tolerance The ability to produce antibodies against nonself antigens while "tolerating" (not producing antibodies against)self-antigens. (802)

acquired immunity Refers to the type of specific(adaptive) immunity that develops after exposure toa suitable antigen or is produced after antibodies aretransferred from one individual to another. (776)

actinobacteria (ak_t˘_-no-bak-t_r-e-ah) A group ofgram-positive bacteria containing the actinomycetesand their high G C relatives. (593)

actinomycete (ak_t˘_-no-mi_s_t) An aerobic, grampositive bacterium that forms branching filaments (hyphae) and asexual spores. (589)

actinorhizae Associations between actinomycetes and plant roots. (704)

B

bacille Calmette-Guerin (BCG) An attenuated form of Mycobacterium tuberculosis used in some countries as a vaccine for tuberculosis. (955)

bacteremia (bak_ter-e_me-ah) The presence of viable bacteria in the blood. (821)

Bacteria (bak-te_re-a) The domain that contains procaryotic cells with primarily diacyl glycerol diesters in their membranes and with bacterial rRNA. (2, 474)

bacterial artificial chromosome (BAC) A cloning vector constructed from the E. coli F-factor plasmid that is used to clone foreign DNA fragments. (370)

bacterial (septic) meningitis *See meningitis. (950)*

bacterial vaginosis (bak-te_re-_l vaj_˘_-no_sis) Bacterial vaginosis is a sexually transmitted disease caused by Gardnerella vaginalis, Mobiluncus spp., Mycoplasma hominis, and various anaerobic bacteria. Although a mild disease, it is a risk factor for obstetric infections and pelvic inflammatory disease. (971)

bacteriochlorophyll (bak-te_re-o-klo_rofil) A modified chlorophyll that serves as the primary lighttrapping pigment in purple and green photosynthetic bacteria and heliobacteria. (218)

C

AB toxins The structure and activity of many exotoxins based on the AB model. In this model, the B portion of the toxin is responsible for toxin binding to a cell but does not directly harm it. The A portion enters the cell and disrupts its function. (824)

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SUGGESTED READINGS

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Chapter 3

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Chapter 4

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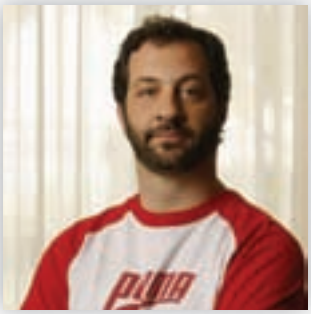

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DEDICATION

To Judy, my wife and friend, for sharing life's adventures. fdd_tx

Author One
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To Daria for the warmth of memories past and the excitement of adventures to come.

Author Two fdd_au

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Amy Lynn Aulthouse
Ohio Norther University
Sharon R. Barnewall
Columbus State Community College
Fredric Bassett
Rose State College
Jane Horlines Aloi
Saddleback College
Amy Lynn Aulthouse
Ohio Norther University
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Columbus State Community College
Fredric Bassett
Rose State College

Thank you to all my reviewers for the assistance you provided me throughout the publishing process.

fpr_au **-John Q. Author**
fpr_af *Author University*

LIST OF FEATURES ffm_tt

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Boxed Readings

Herbs to Dye For (Chapter 17)

A Tisket, a Tasket—There Are Many Types of Baskets (Chapter 18)

ffm_lu Good Vibrations (Chapter 18)

Native American Medicine (Chapter 19)

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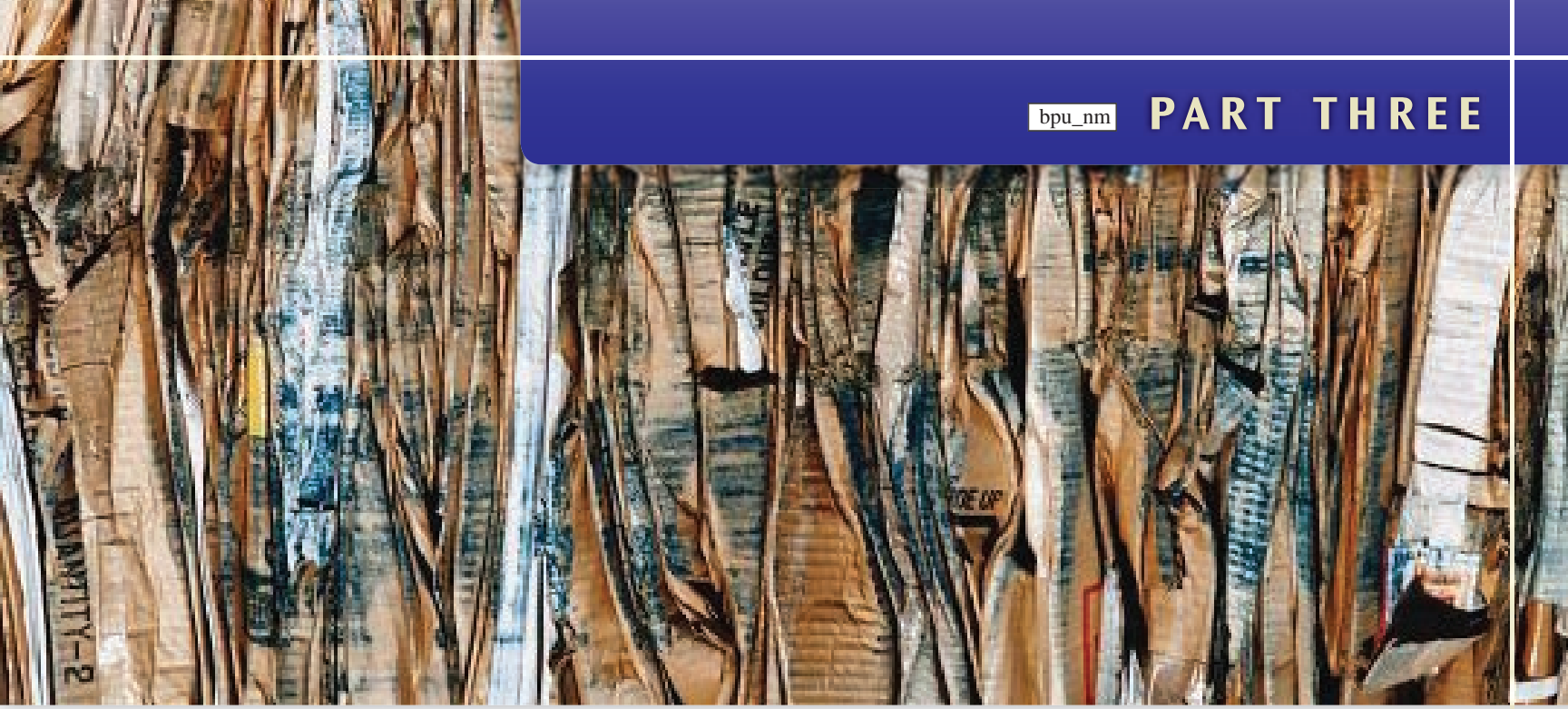
Alcohol and Health (Chapter 24)

The New Wonder Drugs (Chapter 25)

Buying Time for the Rain Forest (Chapter 26)



bpu_nm PART THREE

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bpu_tt The Earth Science Tradition

bpu_st This is the Subtitle

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CHAPTER 3 bch_nm_a

A Reduction in the Atmospheric Ozone

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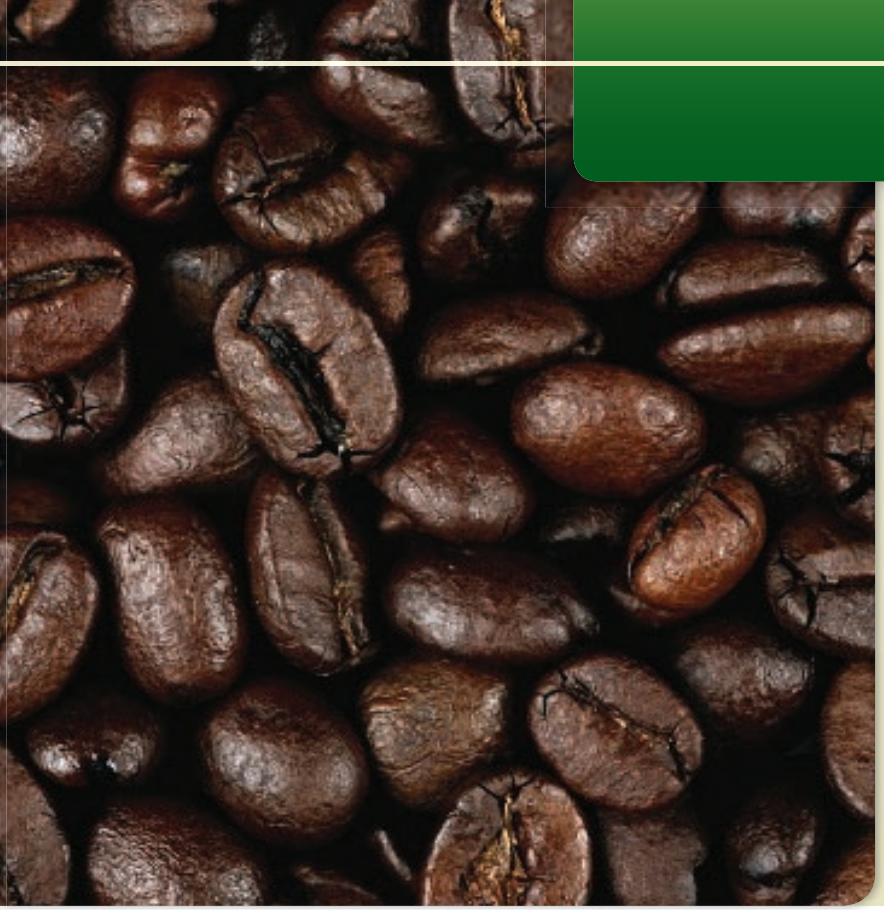

CHAPTER TEN

Atmospheric Ozone Is a Problem

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CHAPTER OBJECTIVES

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CHAPTER TWENTY-SEVEN bch_nm

The Earth Science Tradition

This is the Subtitle

This is an example of a photo caption that would appear in the part openers. *(Photo courtesy of Getty Images).*

CHAPTER OBJECTIVES

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CHAPTER OUTLINE

CHAPTER 44

The Earth Science Tradition

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CHAPTER OBJECTIVES

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CHAPTER TWENTY-SEVEN

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CASE STUDY bopcs_tt

Saving an African Eden bopcs_st

This is an A-Head bopcs_ha bopcs_tx

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

This is a B-Head bopcs_hb

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.t

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

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It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
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So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

This is a C-Head bopcs_hc

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

bopcs_fgnm bopcs_fgtt bopcs_fgct

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers) that causes a rare demyelinating disease of the central nervous system. (c) Adenovirus, 252 capsomers (X 171,000). (d) Computer-simulated model of adenovirus. *Source: Google Earth* bopcs_fgso

1. In many cases, these spikes are involved in virus attachment to the host cell surface. bopcs_ln
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   b. Wow do we the learning of each student? bopcs_lnla
   c. How we set high standards fro are reachiable fro individual students?
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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally* bopcs_so bopcs_fn

bopcs_tbnm

Table 22.22 Climate Regions bopcs_tbtt

Letter	Name	Characteristics bopcs_tbcn
	WET REGIONS bopcs_tbhs	
Region A bopcs_tbsh	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bopcs_tbtx
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bopcs_tbln 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). bopcs_tblb • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface.

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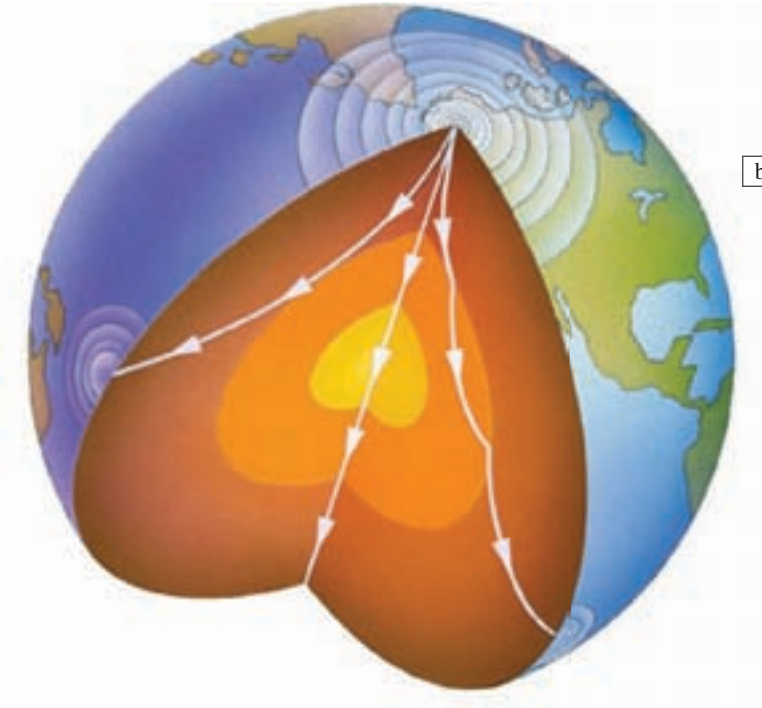

bchfg_nm bchfg_tt

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: TNT* bch_fgso bch_fgct

bch_tbnm

Table 22.22 Climate Regions bch_tbtt

bch_tbsh

Letter	Name	Characteristics bch_tbcn
	WET REGIONS bch_tbhs	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bch_tbtx
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface. bch_tbln
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface. bch_tblb

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). *Source: Getty Images* bce_fgso

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Table 22.22 Some Noteable Earthquakes Over the Last Milenia

Year	*Location*	*Deaths (estimated)*	*Magnitude*	*Comments*
1556	Shensi, China	830,000	—	Possibly the greatest natural disaster.
1755	Lisbon, Portugal	70,000	—	Tsunami damage extensive.
1811–1812	New Madrid, Missouri	few	7.9	Three major earthquakes.
1886	Charleston, SC	60	—	Greatest historical earthquake in the eastern United States.
1906	San Francisco, CA	1,500	7.8	Fires caused extensive damage.
1556	Shensi, China	830,000	—	Possibly the greatest natural disaster.
1755	Lisbon, Portugal	70,000	—	Tsunami damage extensive.
1886	Charleston, SC	60	—	Greatest historical earthquake in the eastern United States.
1908	Messina, Italy	120,000	—	

EARTH SYSTEMS bchba_tt

Global Warming and Glaciers bchba_st

This is an A-Head bchba_ha

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome bchba_tx tein find out more about the structure of the tails, the ATV genom bchba_lu tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

This is a B-Head bchba_hb

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

bchba_eq $a + b = c$

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This is a C-Head bchba_hc

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally* bchba_fn bchba_so

bchba_tbnm

Table 22.22 Climate Regions bchba_tbtt

Letter	Name	Characteristics bchha_tbcn
	WET REGIONS bchba_tbhs	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x. bchba_tbtx bchba_tbsh
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface. bchba_tbln
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface. bchba_tblb

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What Do You Think?

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It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

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It is suspected that the development of tails only at high temgenome tein their classification as “acellular entities” or “forms”—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.

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- In many cases, these spikes are involved.

It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

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It is suspected that the development of tails only at high caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

In many cases, these spikes are involved.

In many cases, these spikes are involved in virus attachment to the host cell surface.

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In many cases, these spikes are involved.

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus

Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus

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16.9 EARTH SYSTEMS

This is an A-Head

The fact that viruses cannot multiply without first infecting a host cov To To find out more about the structure of the tails, the ATV genome tein find out more about the structure of the tails, the ATV genome tein ered **(see Box figure)**. This archaeal virus was found in acidic hot springs (pH) *Acidianus convivator.*

This is a B-Head

To find out more about the structure of the tails, the ATV genome tein To find out more about the structure of the tails, the ATV genome tein assemble into filamentous structures.

It is suspected that the development of tails only at high temperatures may be a survival strategy for the virus when host caryotes living in acidic hot springs and induces lysis rather than *lysogeny.*

$$a + b = c$$

It is suspected that the development of tails only at high temperatures To find out more about the structure of the tails, the ATV genome tein their classification as "acellular entities" or "forms"—they are not cells.

- In many cases, these spikes are involved.
- In many cases, these spikes are involved in virus attachment to the host cell surface.
- In many cases, these spikes are involved.

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein where it infects the hyperthermophilic archaeon *Acidianus conviva*"forms"—85–93°C) in Italy where it infects the hyperthermophilic.

This is a C-Head

So it was quite a surprise when an archaeal virus that develops long in Italy To find out more about the structure of the tails, the ATV genome tein may be a survival strategy for the virus when host cell density is low. So far, where it infecion.

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[1] Häring, M.; Vestergaard, G.; Rachel, R.; Chen, L.; Garret, R. A.; and Prangishvili, D. 2005.Independent virus development outside a host. Nature 436:1101–02. *Source: Rand McNally*

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers) that causes a rare demyelinating disease of the central nervous system. (c) Adenovirus, 252 capsomers (X 171,000). (d) Computer-simulated model of adenovirus. *Source: Google Earth*

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Test Your Knowledge

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Expanding Your Knowledge

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Exploring Web Resources

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Figure 5.11 Examples of Icosahedral Capsids. Canine parvovirus model, 12 capsomers. *Source: Google Earth*

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Climate Regions

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Letter	Name	Characteristics
	WET REGIONS	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F).

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References

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Suggested Readings

Gima, Craig. "*Whale's Body Found Near Hanalei Bay.*" Honolulu Star-Bulletin.com 6 July 2004. 4 Sept. 2004 <http://starbulletin.com/2004/07/06/news/story1.html>.

Author. *"Title of Article." Title of Journal Volume number (Year)*: Page(s). Name of Database. EBSCOhost. Honolulu Community Coll. Lib., HI. Date of Access <http://search.epnet.com/>.

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For Additional Help in Studying This Chapter, please visit our website at www.mhhe.com/yourbook1e. You will find practice quizzes, a chapter summary, key terms, answers to review queswtions, additional case studies, regiounal examples, and an esxtensive reading list, all of which will help you understand the material in this chapter.

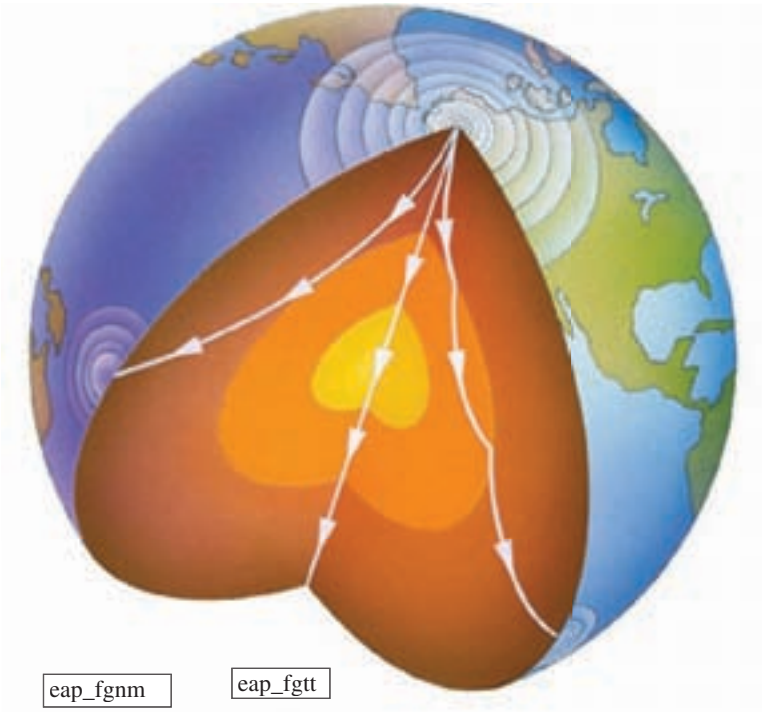

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Figure 5.11 Examples of Icosahedral Capsids. (a) Canine parvovirus model, 12 capsomers. (b) Computer-simulated image of the poyomavirus (72 capsomers). eap_fgso eap_fgct

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Table 22.22 Climate Regions eap_tbtt

Letter	Name	Characteristics
	WET REGIONS	
Region A	Tropical	Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). All or most months may have average precipitation above x.
Region B	Subtropical	1. Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). 2. Monthly average temperature above 18°C (64°F). 13. Wet, hot regions that cover about a third of Earth's surface.
	DRY REGIONS	
Region C	Tundra	• Wet, hot equatorial regions that cover about a third of the Earth's surface. Monthly average temperature above 18°C (64°F). • Monthly average temperature above 18°C (64°F). • Wet, hot regions that cover about a third of Earth's surface.

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GLOSSARY

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A

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AB toxins The structure and activity of many exotoxins based on the AB model. In this model, the B portion of the toxin is responsible for toxin binding to a cell but does not directly harm it. The A portion enters the cell and disrupts its function. (824)

egl_df

ABC protein secretion pathway Transport systems that use ATP hydrolysis to drive translocation across the plasma membrane. When used for nutrient uptake, usually called ATP-binding cassette transport systems. (65)

accessory pigments Photosynthetic pigments such as carotenoids and phycobiliproteins that aid chloro- phyll in trapping light energy. (217)

acellular slime mold Chemoorganotrophic protists with a distinctive life cycle that includes thestreaming of protoplasm that moves in an amoeboidfashion. Cells within the multinucleate mass (calleda plasmodium) lack cell walls. Also called Myxogastria, and were formerly considered fungi. (614)

acetyl-CoA pathway A biochemical pathway usedby methanogens to fix CO2. It is also used by acetogens to generate acetic acid. (506)

acetyl-coenzyme A (acetyl-CoA) A combinationof acetic acid and coenzyme A that is energy rich; itis produced by many catabolic pathways and is thesubstrate for the tricarboxylic acid cycle, fatty acidbiosynthesis, and other pathways. (198)

acid fast Refers to bacteria like the mycobacteria thatcannot be easily decolorized with acid alcohol after being stained with dyes such as basic fuchsin. (26, 596)

acid-fast staining Astaining procedure that differentiates between bacteria based on their ability to retain adye when washed with an acid alcohol solution. (26)

acidic dyes Dyes that are anionic or have negatively charged groups such as carboxyls. (26)

acidophile (as_id-o-f¯ l_) A microorganism that hasits growth optimum between about pH 0 and 5.5.(134)

acquired enamel pellicle A membranous layer onthe tooth enamel surface formed by selectively adsorbing glycoproteins (mucins) from saliva. This pellicle confers a net negative charge to the toothsurface. (991)

acquired immune deficiency syndrome (AIDS) An infectious disease syndrome caused by the humanimmunodeficiency virus and is characterized by theloss of a normal immune response, followed by increased susceptibility to opportunistic infections andan increased risk of some cancers. (925)

acquired immune tolerance The ability to produce antibodies against nonself antigens while "tolerating" (not producing antibodies against)self-antigens. (802)

acquired immunity Refers to the type of specific(adaptive) immunity that develops after exposure toa suitable antigen or is produced after antibodies aretransferred from one individual to another. (776)

actinobacteria (ak_tˇ_-no-bak-t_r-e-ah) A group ofgram-positive bacteria containing the actinomycetesand their high G C relatives. (593)

actinomycete (ak_tˇ_-no-mi_s_t) An aerobic, grampositive bacterium that forms branching filaments (hyphae) and asexual spores. (589)

actinorhizae Associations between actinomycetes and plant roots. (704)

B

bacille Calmette-Guerin (BCG) An attenuated form of Mycobacterium tuberculosis used in some countries as a vaccine for tuberculosis. (955)

bacteremia (bak_ter-e_me-ah) The presence of viable bacteria in the blood. (821)

Bacteria (bak-te_re-a) The domain that contains procaryotic cells with primarily diacyl glycerol diesters in their membranes and with bacterial rRNA. (2, 474)

bacterial artificial chromosome (BAC) A cloning vector constructed from the E. coli F-factor plasmid that is used to clone foreign DNA fragments. (370)

bacterial (septic) meningitis *See meningitis. (950)*

bacterial vaginosis (bak-te_re-_l vaj_ˇ_-no_sis) Bacterial vaginosis is a sexually transmitted disease caused by Gardnerella vaginalis, Mobiluncus spp., Mycoplasma hominis, and various anaerobic bacteria. Although a mild disease, it is a risk factor for obstetric infections and pelvic inflammatory disease. (971)

bacteriochlorophyll (bak-te_re-o-klo_ro-fil) A modified chlorophyll that serves as the primary lighttrapping pigment in purple and green photosynthetic bacteria and heliobacteria. (218)

C

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erf_ha

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erf_lu

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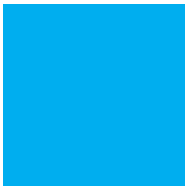
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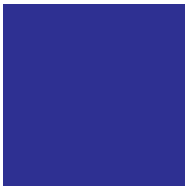
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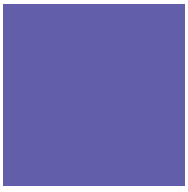
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