Preface

Goals of the Fourteenth Edition

Dr. Sylvia Mader's text, *Inquiry into Life,* was originally developed to reach out to science-shy students. The text now represents one of the cornerstones of introductory biology education. *Inquiry into Life* was founded on the belief that teaching science from a human perspective, coupled with human applications, would make the material more relevant to the student. Interestingly, even though it has been thirty-six years since the first edition was published, this style of relevancy-based education remains the focus of the national efforts to increase scientific literacy in the general public.

Humans are a naturally inquisitive species. Like the child on the front cover, we express an interest in the living world from a very young age. We want to know not only why we are different, but how we are the same as the species we share the planet with. Students in the 21st century are being exposed, almost on a daily basis, to exciting new discoveries and insights that, in many cases, were beyond our predictions even a few short years ago. It is our task, as instructors, not only to make these findings available to our students, but to enlighten students as to why these discoveries are important to their lives and society. At the same time, we must provide students with a firm foundation in those core principles on which biology is founded, and in doing so, provide them with the background to keep up with the many discoveries still to come.

In this edition, we focused on the concept of inquiry and our inherent desire to learn. To do this, we integrated a tested, traditional learning system with modern digital and pedagogical approaches designed to stimulate and engage today's student.

The authors of the text identified several goals that guided them through the revision of *Inquiry into Life,* Fourteenth Edition:

1. build upon the strengths of the previous editions of the text,
2. enhance the learning process by integrating more human-related applications,
3. deploy new pedagogical elements, including multimedia assets, to increase student interaction with the text,
4. develop a new series of digital assets designed to engage the modern student and provide assessment of learning outcomes.

Integrating Featured Readings with Quantitative Analysis and Digital Content

To focus on the relevancy of biology to our everyday lives, the authors developed a series of new feature readings for this text. Each of these readings has a human focus, and in many cases represents topics that have recently been in the news. Each feature is supplemented by a series of questions that instructors may use to promote conversations in the classroom, or as the basis for one-minute opinion papers.

In addition, the majority of these features are now linked to a new style of digital questions. These multipart questions, all assignable within Connect, explore the quantitative aspects of the topic at a level which is comfortable for introductory biology students. In these questions, students analyze graphs and inquire into trends in the data.

SCIENCE IN YOUR LIFE ▶ HEALTH

How Safe Is Your Cell Phone?

The frequency of cell phone use in the United States has risen from 130 million users in 2000 to over 288 million users in 2005. The National Cancer Institute has raised concerns about the increased frequency of usage due to the fact that cell phones emit radiofrequency (RF) energy. Radiofrequency energy is a form of nonionizing electromagnetic radiation that is being studied to determine its effects on the human body.

At this point there is no conclusive evidence that the nonionizing radiation emitted by cell phones is associated with cancer risk. The radiation that is emitted by a cell phone comes from its antennas, which in housed within the handset. Due to the new designs of today's cell phones, the handset is often held close to the side of the user's head. This leads to an increased absorption of nonionizing radiation to the side of the head, neck, and face. The level of exposure to RF depends on a variety of variables, such as the frequency and duration of calls as well as the quality of transmission and the size of the handset.

Numerous studies have been conducted to determine the relationship between cell phone use and the risk of developing malignant and benign brain tumors. Researchers reported that, overall, cell phone users did not show an increased risk for two of the most common brain tumors. However, the study group that had the greatest usage of cell phones showed an increased risk of glioma, a malignant type of brain tumor. The research considered this finding inconclusive.

Many of the other studies that have been conducted share a variety of discrepancies between their results. A Danish study showed no increased risk of acoustic neuroma in long-term cell phone users compared to short-term users. A Swedish study examined similar populations and discovered an elevated risk in the long-term users compared to the short-term users. So should the government ban the production and use of cell phones because of the potential for an increased risk of brain cancer? Or should people be allowed to freely use cell phones despite the potential risk?

Questions to Consider

1. At this point, there is no conclusive evidence that the radiation emitted by cell phones is associated with cancer risk. How many studies do you think are necessary to prove cell phones are or are not safe to use?
2. What type of study would you design if you were trying to prove that cell phones are safe to use?
3. Do you think that cell phones can have a negative impact upon the various levels of biological organization? If so, which levels do you think are impacted the most and in what way?

connect: Explore the concepts through a variety of multimedia assets, question types, and data interpretation.
www.mcgrawhillconnect.com

Figure 1A **Are cell phones safe?** Several studies have not indicated any danger from radiation associated with cell phone use.

Media Integration

Students can improve the effectiveness of their learning by integrating the digital assets of today's courses into their study habits. LearnSmart™ and Connect®, McGraw-Hill's flagship digital tools, can increase student preparedness for class as well as increase retention of difficult topics. These assets may easily be uploaded into any course management system to provide your students with useful study tutorials.

As educators, the authors recognize that today's students are digital learners. Therefore, a significant new feature of this edition is the integration of media assets into the chapter content. Virtually every section of the textbook is now linked to MP3 files, animations of biological processes, and National Geographic and ScienCentral videos. In addition, McGraw-Hill's new 3D animations are integrated into the more difficult chapters of the text.

MP3 Files

These three- to five-minute audio files serve as a review of the material in the chapter, and they also assist the student in the pronunciation of scientific terms.

Animations

Drawing on McGraw-Hill's vast library of animations, the authors have selected animations that will enhance the student's understanding of complex biological processes.

3D Animations

For topics such as photosynthesis and cellular respiration, McGraw-Hill has produced a series of dynamic 3D animations that may be used both as presentation tools in the classroom, and as mini-tutorials that can be assigned within Connect or your course management system.

Videos

Two different types of movies are integrated into this edition of the text. The ScienCentral videos are short news clips on recent advances in the sciences. The National Geographic videos provide students with a glimpse of the complexity of life that normally would not be possible in the classroom.

Virtual Labs

These simulated experiments serve as excellent tutorials, allowing students to explore the topics covered in select chapters of the text.

Guided Tutorials

In addition to the assets listed above, the author of the textbook has prepared a series of short (2-3 minute) guided tutorials of some of the more difficult topics in the text. A complete list of these tutorials is provided on the inside back cover of the text.