

LABORATORY TECHNIQUES IN BASIC BIOLOGICAL SCIENCES

Assoc. Prof. Dr. Sahra KIRMUSAOĞLU

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“Dünyada her şey için, medeniyet için, hayat için başarı için en gerçek yol gösterici ilimdir, fendir. İlim ve fennin dışında yol gösterici aramak gaflettir, cahilliktir, doğru yoldan sapmaktır. Yalnız ilmin ve fennin, yaşadığımız her dakikadaki safhalarının gelişimini anlamak ve ilerlemeleri zamanında takip etmek şarttır.”

Mustafa Kemal ATATÜRK, 1924

“Gelişmiş uygarlaşmış bir ulus olarak uygarlık alanının üzerinde yaşayacağız: bu yaşam ancak bilim ve fenle olur. Bilim ve fen nerede ise oradan alacağız ve ulusun her bireyinin kafasına koyacağız. Bilim ve fen için bağ ve koşul yoktur.”

Mustafa Kemal ATATÜRK, 1922

Ulu Önder Mustafa Kemal ATATÜRK’ ü anmak ve O’na olan minnettarlığımı ifade etmekten onur duyarım...

Saygı.. Minnet.. ve Özlemle...

“For everything in the world, for civilization, for life, for success, the most genuine guide is science and knowledge. Searching for a guide other than science and knowledge is unawareness, ignorance, and straying from the right way. It is essential to understand the development of every minute we live through science and knowledge and to keep up with their progress in a timely manner.”

Mustafa Kemal ATATÜRK, 1924

“As an developed and civilized nation, we will live above the level of civilization: this life can only be achieved through science and knowledge. Wherever science and knowledge exist, we will take them and instill them in the minds of every individual of the nation. There are no boundaries or conditions for science and knowledge.”

Mustafa Kemal ATATÜRK, 1922

I honour to commemorate and express my gratitude to Great Leader Mustafa Kemal ATATÜRK...

With Respect... Gratefulness... and Full of Longing...

Çocukluğumdan beri birlikte büyüdük, her şeyi birlikte öğrendik ve tüm zorluklara rağmen tüm engelleri birlikte aştık... ve şimdi birlikte yaşıyoruz... Sadece eğitimim ve akademik hayatım boyunca değil, tüm hayatım boyunca, hayatın her alanında, her zor durumda, ne zaman kendimi çaresiz hissetsem, sen her zaman yanımda oldun, beni destekledin, her zaman benim için oradaydın. Akademik hedeflerime ulaşmak için akademik yolculuğumun tüm aşamalarında ve gerekliliklerinde beni her zaman takip ettin ve cesaretlendirdin.

Sevgili ve Kıymetli Annem, Sen ve Senin desteğin olmasaydı, bu başarıya ulaşamazdım.

Sevgili ve Çok Değerli Anneme...

Since my childhood, we grew up together, learned everything together, and despite all the difficulties, we overcame all challenges together... and now we have been aging together... Not only throughout my entire education and academic life, but also throughout my whole life, in every aspect of life, during every difficult conditions, whenever I felt overwhelmed, you were always by my side, supporting me, always there for me. You always followed and encouraged me in all the requirements and stages of my academic journey to achieve my academic goals.

My Dear and Precious Mom, without you and your support, I would not have achieved this level of success.

To My Dear and So Precious Mother...

Preface

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Basic biological sciences include disciplines such as, biochemistry, microbiology, physiology, histology, haematology, molecular biology, ecology, botany, zoology, and genetics, and study cells, living organisms, and cellular structures. Many methods used in basic biological sciences are also widely used in various sub-disciplines of biology, clinical diagnostic laboratories, research laboratories, medicine and hospitals.

The foundation of this book is based on the contributions of my highly esteemed Professors, both at the faculty and at the Medical Microbiology Laboratory of Abant İzzet Baysal University Research and Application Hospital, who have guided me in academia, my 10 years of undergraduate and graduate education, and my 21 years of academic professional experience. The lack of sufficient resources including laboratory application methods used in basic biological sciences and a serious need for basic scientists and students encouraged me to write this book. In this study, the course contents of basic biological sciences-related courses taught in departments such as medicine, biology, molecular biology and genetics, biotechnology, veterinary medicine, nutrition and dietetics, pharmacy, dentistry, physical therapy, and medical laboratory technology. The aim is to help researchers understand the subject and lay the foundation for the subfields of biology by combining basic knowledge on related topics with laboratory applications.

Basic Biological Techniques is a book that enables and guides the application of theoretical knowledge of basic biological sciences in a laboratory environment, helping researchers to observe biological diversity, identify cells and their structures, and observe the effects of environmental factors on cells. Basic Biological Techniques provides a fundamental resource for understanding basic information and connecting new discoveries and developments in the subfields of basic sciences through laboratory applications. Basic Biological Techniques serves as a fundamental resource for understanding both basic knowledge and new discoveries and developments in the subfields of basic sciences through laboratory applications, enabling connections to be made.

I hope it will be useful for all Academicians, Scientists, Researchers and Students..

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The Faculty of Medicine

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January 2026, ISTANBUL.

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