Building Working Cells and Tissues (BWCT) – FOM1
FM-102 85 course hours
Updated March 2021

BWCT is an integrated course taught in early fall of FOM1 that applies key principles of biochemistry, histology and physiology to promote an understanding of how cells and tissues are built, how they function and how malfunction can lead to disease. This basic knowledge provides the foundation for understanding organ structure, physiology and disease states that are covered in subsequent courses, during clinical rotations and in clinical practice. Basic science concepts are reinforced throughout the course with problem solving and clinical case discussions with whole-class and small-group formats utilizing various teaching methods. Substantial connections exist between BWCT and the concurrent Principles of Human Genetics course, as many metabolic diseases have a genetic origin. In addition, some of the clinical discussions are carried out jointly between BWCT and DCS (Doctoring and Clinical Skills). The course includes large and small group sessions, integrated case discussion and virtual microscopy labs.

After the completion of the BWCT course, the MS1 will be able to:

- Demonstrate an understanding of basic aspects of structure and function of nucleic acids and proteins using knowledge obtained from class lectures, lecture notes and a textbook, by obtaining a passing grade on the first Building Working Cells and Tissues (BWCT) exam (Physician as a Scientist)
- Demonstrate an understanding using knowledge obtained from class lectures, lecture notes and the textbook, of the enzyme function, regulation, and kinetics by obtaining a passing grade on the BWCT exam (Physician as a Scientist)
- Gain an understanding from lectures, lecture notes and the textbook of the components and function of cell membranes, including membrane proteins that are often drug targets. Students will demonstrate this understanding by obtaining a passing grade on the BWCT exams (Physician as a Scientist)
- Demonstrate an understanding of basic aerobic metabolism, including glucose and amino acid metabolic pathways using knowledge obtained from class lectures, lecture notes and the textbook, by obtaining a passing grade on the first BWCT exam (Physician as a Scientist)
- Demonstrate an understanding of nucleotide metabolism, including the action of therapeutic inhibitors, using knowledge obtained from class lectures, lecture notes and the textbook, by obtaining a passing grade on the first BWCT exam (Physician as a Scientist)
- Demonstrate an ability to interpret scientific literature through small discussion groups on specific articles and problem based cases (Physician as a Clinical Problem Solver and Communicator)
- Integrate the basic knowledge of metabolism of sugars, proteins and lipids in order to understand metabolic disease processes. The students will demonstrate a knowledge of biochemical contributions to type I diabetes, type II diabetes, amino acid disorders, glycogen storage diseases, and atherosclerosis by obtaining a passing grade on the comprehensive final exam (Physician as a Clinical Problem Solver and Scientist)
- Demonstrate the ability to make accurate histological observations of basic cell and tissue by using virtual microscopy or electron micrographs
- Compare and contrast well-understood relationships between structure and function at the cell and tissue levels (Physician as a Scientist)
- Identify major cellular components, and describe their molecular structure, functions, and interrelationships (Physician as a Scientist)

- Describe examples that demonstrate how the internal organization and functioning of cells influences, and is influenced by, the extracellular environment (Physician as a Scientist)
- Describe important features of cellular differentiation and its role in establishing and maintaining the major tissue types, including epithelial, connective, muscle, and nerve tissue; this includes how cells are born, live, and die (Physician as a Scientist)
- Relate morphological features to findings revealed by history, physical examination, and laboratory investigations, and predict how changes at the cell and tissue level might alter the findings that are acquired through clinical examples incorporated in lectures, sessions with clinical correlations, and the Integrated Clinical Exercises (Physician as a Scientist and Clinical Problem Solver)
- Demonstrate an understanding of basic concepts of physics and chemistry as they apply to living systems (Physician as a Scientist)
- Demonstrate an understanding of the underlying cellular and molecular mechanisms that provide the basis for cell function, including resting potential, action potential, and inter-cellular communication and also understand basic aspects of muscle function (Physician as a Scientist)
- Achieve an understanding of basic control mechanisms that allow integrated responses to novel situations (Physician as a Scientist)

Student competency is assessed primarily through quizzes, exams and participation in case discussions.

Course co-leaders
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