

READ FREE DIFFUSION OSMOSIS AND ACTIVE TRANSPORT WORKSHEET ANSWERS (DOWNLOAD ONLY)

ONE PROPERTY COMMON TO ALL CELLS IS TRANSPORT MOLECULES AND IONS MUST ENTER AND LEAVE CELLS BY CROSSING MEMBRANES IN A CONTROLLED MANNER THE PROCESS MAY TAKE ANY OF SEVERAL FORMS SIMPLE DIFFUSION CARRIER MEDIATED DIFFUSION ACTIVE TRANSPORT OR GROUP TRANSLOCATION THERE IS MORE THAN ONE WAY TO MEASURE EACH TRANSPORT KINETICS WITH PARTICULAR REFERENCE TO THE RED BLOOD CELL WERE DISCUSSED IN A PREVIOUS VOLUME THREE CHAPTERS DEAL WITH THE GENERAL SUBJECT OF TRANSPORT IN THIS VOLUME MALONEY KASHKET AND WILSON SUMMARIZE THE APPROPRIATE METHODOLOGY FOR STUDYING METABOLITE AND ION TRANSPORT IN BACTERIA AND KIMMICH DESCRIBES THE RELEVANT METHODOLOGY FOR THE ISOLATED INTESTINAL EPITHELIAL CELL THE METHODS DESCRIBED IN THESE TWO CHAPTERS HAVE GENERAL APPLICATION TO TRANSPORT STUDIES IN SINGLE CELLS FROM ANY SOURCE THE APPROACH DESCRIBED IN THESE TWO COMPLEMENTARY ARTICLES IS EXTENDED IN THE CHAPTER BY HOCHSTADT AND HER COLLABORATORS ON THE USE OF ISOLATED MEMBRANES FROM BACTERIAL AND MAMMALIAN CELLS FOR THE STUDY OF TRANSPORT PHENOMENA IF ONE CAN PREPARE A SUITABLE PLASMA MEMBRANE FRACTION SEALED IMPERMEABLE VESICLES WITH THE NECESSARY TRANSPORT COMPONENTS INTACT IT BECOMES POSSIBLE TO SEPARATE THE EVENTS OF TRANSPORT FROM ANY SUBSEQUENT METABOLISM THAT MAY OCCUR IN THE CELL ISOLATED MEMBRANE VESICLES ARE RELATIVELY EASY TO OBTAIN FROM BACTERIA AND THEY ARE COMPARATIVELY WELL STUDIED WORK WITH SIMILAR PREPARATIONS FROM CULTURED MAMMALIAN CELLS IS JUST BEGINNING BUT HAS MUCH PROMISE INTRACELLULAR TRANSPORT IS A COLLECTION OF PAPERS THAT EXAMINES THE PROCESSES OF AND THE MECHANISMS UNDERLYING INTRACELLULAR TRANSPORT ONE PAPER DESCRIBES THAT ALL ACTIVE TRANSPORT PROCESSES IN THE AMOEBA ARE INTRACELLULAR AND DEPEND ON DYNAMIC TRANSFORMATIONS OF MEMBRANE INTO CYTOPLASM AND OF CYTOPLASM INTO MEMBRANE ANOTHER PAPER DISCUSSES THE KINETICS OF MEMBRANE TRANSPORT OF WHICH THE PHENOMENA OF COUNTERFLOW CAN BECOME A MOBILE CARRIER SYSTEM THE PAPER NOTES THAT THE SPECIFIC TRANSPORT PROPERTIES OF MEMBRANES ARE CONFERRED BY THE PROTEINS OF THE SURFACES THAT ARE GROUPED AS MACROMOLECULAR COMPLEXES PROBABLY SIMILAR TO THOSE OF ENZYMES ONE PAPER DESCRIBES THE CONCEPT OF PARAMETRIC PUMPING AN OSCILLATION DRIVEN SEPARATION PROCESS AS A POSSIBLE MODEL FOR ACTIVE TRANSPORT IN BIOLOGICAL CELLS ANOTHER PAPER COMPARES THE FINE SCALE DIFFUSION EFFECTS THAT HAPPEN IN A MIXTURE WITHOUT LARGE SCALE CONCENTRATION GRADIENTS AND WHERE THE EFFECT ARE ON A LARGE SCALE THE HOMOGENOUS KINETIC LAW CAN BE USED IN THE LARGE SCALE SITUATION THE LAW ALREADY CAN ACCOUNT FOR ANY OF THE FINE SCALE DIFFUSION EFFECTS THE PAPER NOTES THAT WITHOUT LARGE SCALE CONCENTRATION GRADIENTS THE TRANSPORT EVENT IS FROM A LOCAL REGION TO A NEARBY REACTION SITE ONLY WHERE THE EFFECTS ARE ON A LARGE SCALE THE DIFFUSION RESULTS IN A GROSS TRANSPORT OF OVER DISTANCES LARGER THAN MOLECULAR DIMENSIONS THIS COLLECTION CAN PROVE USEFUL FOR MATHEMATICIANS CELLULAR BIOLOGISTS PHYSICAL CHEMISTS PHYSIOLOGISTS ELECTRON MICROSCOPICISTS GENETICISTS AND ENGINEERS TRANSPORT AND DIFFUSION ACROSS CELL MEMBRANES IS A COMPREHENSIVE TREATMENT OF THE TRANSPORT AND DIFFUSION OF MOLECULES AND IONS ACROSS CELL MEMBRANES THIS BOOK SHOWS THAT THE SAME KINETIC EQUATIONS WITH APPROPRIATE MODIFICATION CAN DESCRIBE ALL THE SPECIALIZED MEMBRANE TRANSPORT SYSTEMS THE PORES THE CARRIERS AND THE TWO CLASSES OF PUMPS THE KINETIC FORMALISM IS DEVELOPED STEP BY STEP AND THE FEATURES THAT MAKE A SYSTEM EFFECTIVE IN CARRYING OUT ITS BIOLOGICAL ROLE ARE HIGHLIGHTED THIS BOOK IS ORGANIZED INTO SIX CHAPTERS AND BEGINS WITH AN INTRODUCTION TO THE STRUCTURE AND DYNAMICS OF CELL MEMBRANES FOLLOWED BY A DISCUSSION ON HOW THE MEMBRANE ACTS AS A BARRIER TO THE TRANSMEMBRANE DIFFUSION OF MOLECULES AND IONS THE FOLLOWING CHAPTERS FOCUS ON THE ROLE OF THE MEMBRANE S PROTEIN COMPONENTS IN FACILITATING TRANSMEMBRANE DIFFUSION OF SPECIFIC MOLECULES AND IONS MEASUREMENTS OF DIFFUSION THROUGH PORES AND THE KINETICS OF DIFFUSION AND THE STRUCTURE OF SUCH PORES AND THEIR BIOLOGICAL REGULATION THIS BOOK METHODICALLY INTRODUCES THE READER TO THE CARRIERS OF CELL MEMBRANES THE KINETICS OF FACILITATED DIFFUSION AND COTRANSPORT SYSTEMS THE PRIMARY ACTIVE TRANSPORT SYSTEMS ARE CONSIDERED EMPHASIZING THE PUMPING OF AN ION SODIUM POTASSIUM CALCIUM OR PROTON AGAINST ITS ELECTROCHEMICAL GRADIENT DURING THE COUPLED PROGRESS OF A CHEMICAL REACTION WHILE A CONFORMATIONAL CHANGE OF THE PUMP ENZYME TAKES PLACE THIS BOOK IS OF INTEREST TO ADVANCED UNDERGRADUATE STUDENTS AS WELL AS TO GRADUATE STUDENTS AND RESEARCHERS IN BIOCHEMISTRY PHYSIOLOGY PHARMACOLOGY AND BIOPHYSICS WITH CONTRIBUTIONS BY NUMEROUS EXPERTS THIS BOOK DEALS WITH ENERGETICS OF TRANSPORT PROCESSES LARGELY EXPRESSED IN TERMS OF THE THERMODYNAMICS OF IRREVERSIBLE PROCESSES SINCE AT THE PRESENT TIME TOO LITTLE IS KNOWN ABOUT THE MOLECULAR MECHANISM OF TRANSPORT THE PRESENT TREATMENT IS BASED LARGELY ON HYPOTHETICAL MODELS CARE HAS BEEN TAKEN HOWEVER TO DEFINE THE CRUCIAL FEATURES OF THESE MODELS AS GENERALLY AS POSSIBLE SO THAT THE EQUATIONS DO NOT DEPEND TOO MUCH ON HYPOTHETICAL DETAILS ACCORDINGLY MOST EQUATIONS THOUGH DEVELOPED ON THE BASIS OF A MOBILE CARRIER FERRYBOAT MODEL SHOULD APPLY EQUALLY TO A CONFORMATIONAL MODEL WITH AN APPROPRIATE REINTERPRETATION OF THE SYMBOLS TO BETTER ELUCIDATE THE ESSENTIALS THE MODELS ARE GREATLY SIMPLIFIED BY SPECIAL ASSUMPTIONS MAXIMALLY ONLY TWO FLOWS ARE ASSUMED TO BE PRESENT IN EACH MODEL AT ONE TIME E G TWO SOLUTE FLOWS THE FLOW OF SOLVENT AND OF ONE SOLUTE THE FLOW OF SOLVENT AND OF HEAT THE SIMPLIFYING ASSUMPTIONS MAY OFTEN BE UNREAL HENCE THE EQUATIONS SHOULD NOT BE APPLIED UNCRITICALLY TO ACTUAL MECHANISMS THEY MAY AT BEST SERVE AS A BASIS ON WHICH THE MORE APPROPRIATE EQUATIONS MAY BE DEVELOPED THE BOOK IS NOT DESIGNED TO GIVE A COMPLETE KINETIC ANALYSIS OF THE TRANSPORT PROCESSES DESCRIBED THE KINETIC EQUATIONS ARE KEPT TO THE MINIMUM REQUIRED TO DESCRIBE THE MODEL CONCERNED AND TO RELATE IT TO THE CORRESPONDING THERMODYNAMIC EQUATIONS THE INTENTION IS TO STRESS THE CLOSE RELATIONSHIP BETWEEN BIOSMOTIC TRANSPORT AND BIOCHEMICAL PROCESSES IN METABOLISM THIS BOOK DESCRIBES A HALF CENTURY OF RESEARCH ON CELLULAR MEMBRANE TRANSPORT AND ON METABOLIC ENERGY CAPTURE AND UTILIZATION DURING THIS TIME WHICH BEGINS IN THE LATE 1930S THE EFFORT AND IMAGINATION OF VARIOUS SCIENTISTS OVERTHREW REIGNING FORMULATIONS CREATED NOVEL EXPLANATORY MODELS AND UNIFIED PREVIOUSLY DISTINCT EXPERIMENTAL FIELDS MY PRIMARY GOAL IS TO DISPLAY THE COURSE OF THAT RESEARCH SHOWING HOW NEW EXPERIMENTS DEFINED NOVEL ENTITIES AND PROCESSES AND HOW AN ENCOMPASSING FIELD BIOENERGETICS THEN EMERGED A SECONDARY GOAL IS TO PRESENT EXAMPLES OF MAINSTREAM BIOLOGICAL RESEARCH THAT ILLUSTRATE HOW EXPERIMENTAL RESULTS SEEN AS REFUTATIONS CONFIRMATIONS AND ELABORATIONS CAN SWAY OPINION TOWARD A SOLID CONSENSUS THIS INTERPRETATION DIFFERS FROM THE CURRENTLY FASHIONABLE VIEW OF SOME COMMENTATORS THAT STRESSES INSTEAD THE CENTRAL ROLES OF POWER PRESTIGE GENDER CLASS AND ETHNICITY IN ANY CASE THE SCIENTIFIC PRACTICES EXHIBITED HERE DESERVE PROPER PHILOSOPHICAL SCRUTINY ALTHOUGH CONSTRAINTS OF SPACE HAVE SQUEEZED ANY ANALYSIS FROM THIS DRAFT BRIEF MENTION OF SALIENT ISSUES DOES APPEAR IN RELEVANT CHAPTERS AND IN THE FINAL CONCLUSIONS ODDLY HISTORIANS AND PHILOSOPHERS SEEM RELUCTANT TO DEAL WITH THIS SCIENCE THOSE WHO DO CONSIDER BIOLOGICAL TOPICS TEND TO FOCUS ON THE THEORY OF EVOLUTION EVEN THOUGH THE BULK OF BIOLOGICAL RESEARCH IN THIS CENTURY IN TERMS OF PAPERS PUBLISHED AND TECHNOLOGY INFLUENCED HAS DEALT NOT WITH EVOLUTION PER SE BUT WITH WHAT MAY BE TERMED PHYSIOLOGY AND BIOCHEMISTRY AND THESE ENDEAVORS WHICH ARE THE AIMS EFFORTS AND ACCOMPLISHMENTS OF THE VAST MAJORITY OF BIOLOGISTS HAVE BEEN LARGELY IGNORED THIS BOOK FOCUSES ON ACTIVE TRANSPORT AS A WAY TO INCREASE PHYSICAL ACTIVITY LEVELS ACTIVE COMMUTING AND ACTIVE TRANSPORTATION ON FOOT OR BY BICYCLE CREATE OPPORTUNITIES FOR PHYSICAL ACTIVITY PROVIDE TRANSPORTATION OPTIONS FOR THOSE WITHOUT A CAR ENCOURAGE SOCIAL COHESION AND REDUCE CONTRIBUTIONS TO AIR POLLUTION THIS IS A FASCINATING COLLECTION OF PERSONAL ACCOUNTS WHICH IS A MUST READ FOR ANYONE INTERESTED IN MEMBRANE TRANSPORT OR THE HISTORY OF THE DEVELOPMENT OF THE CURRENT PICTURE OF MEMBRANE TRANSPORT PHYSIOLOGY THIS DELIGHTFUL BOOK COULD SERVE VARIOUSLY AS A HISTORY FOR INVESTIGATORS AND HISTORIANS OR AS A TEXTBOOK FOR ADVANCED STUDENTS NO BIOLOGY OR MEDICAL LIBRARY SHOULD BE WITHOUT IT ION TRANSPORT IN PROKARYOTES PROVIDES AN ADVANCE TREATISE ON ION TRANSPORT AND PROKARYOTIC ORGANISMS THIS BOOK IS DIVIDED INTO THREE MAIN TOPICS CATION TRANSPORT SYSTEMS ANION TRANSPORT SYSTEMS AND PLASMID ENCODED TRANSPORT SYSTEMS THIS COMPILATION SPECIFICALLY DISCUSSES THE PROTON TRANSPORT AND PROTON MOTIVE FORCE IN PROKARYOTIC CELLS POTASSIUM TRANSPORT IN BACTERIA AND BIOENERGETIC FUNCTIONS OF SODIUM IONS THE CALCIUM TRANSPORT IN PROKARYOTES PHOSPHATE TRANSPORT IN PROKARYOTES AND TRANSPORT OF ORGANIC ACIDS IN PROKARYOTES ARE ALSO ELABORATED THIS TEXT LIKEWISE COVERS THE CHLORIDE NITRATE AND SULFATE TRANSPORT IN BACTERIA AND BACTERIAL MAGNESIUM MANGANESE AND ZINC TRANSPORT THIS PUBLICATION IS RECOMMENDED FOR BIOLOGISTS

SPECIALISTS AND STUDENTS INTERESTED IN THE BACTERIAL ION TRANSPORT SYSTEM BIOLOGICAL MEMBRANES AND TRANSPORT BIOLOGICAL MEMBRANES AND TRANSPORT AN INTRODUCTION TO THE PRINCIPLES OF MEMBRANE TRANSPORT HOW MOLECULES AND IONS MOVE ACROSS THE CELL MEMBRANE BY SIMPLE DIFFUSION AND BY MAKING USE OF SPECIALIZED MEMBRANE COMPONENTS CHANNELS CARRIERS AND PUMPS THE TEXT EMPHASIZES THE QUANTITATIVE ASPECTS OF SUCH MOVEMENT AND ITS INTERPRETATION IN TERMS OF TRANSPORT KINETICS MOLECULAR STUDIES OF CHANNELS CARRIERS AND PUMPS ARE DESCRIBED IN DETAIL AS WELL AS STRUCTURAL PRINCIPLES AND THE FUNDAMENTAL SIMILARITIES BETWEEN THE VARIOUS TRANSPORTERS AND THEIR EVOLUTIONARY INTERRELATIONSHIPS THE REGULATION OF TRANSPORTERS AND THEIR ROLE IN HEALTH AND DISEASE ARE ALSO CONSIDERED PROVIDES AN INTRODUCTION TO THE PROPERTIES OF TRANSPORT PROTEINS CHANNELS CARRIERS AND PUMPS PRESENTS UP TO DATE INFORMATION ON THE STRUCTURE OF TRANSPORT PROTEINS AND ON THEIR FUNCTION AND REGULATION INCLUDES INTRODUCTIONS TO TRANSPORT KINETICS AND TO THE CLONING OF GENES THAT CODE TRANSPORT PROTEINS FURNISHES A LINK BETWEEN THE EXPERIMENTAL BASIS OF THE SUBJECT AND THEORETICAL MODEL BUILDING THE OSMOSIS STUDENT LEARNING GUIDE INCLUDES SELF DIRECTED READINGS EASY TO FOLLOW ILLUSTRATED EXPLANATIONS GUIDING QUESTIONS INQUIRY BASED ACTIVITIES A LAB INVESTIGATION KEY VOCABULARY REVIEW AND ASSESSMENT REVIEW QUESTIONS ALONG WITH A POST TEST IT COVERS THE FOLLOWING STANDARDS ALIGNED CONCEPTS CELLS THE BASIC UNITS OF LIFE CELL MEMBRANE AND CELL TRANSPORT DIFFUSION DIFFUSION IN THE LUNGS OSMOSIS THE DIFFUSION OF WATER PASSIVE TRANSPORT ACTIVE TRANSPORT OSMOSIS IN PLANT CELLS AND OSMOSIS IN ANIMAL CELLS ALIGNED TO NEXT GENERATION SCIENCE STANDARDS NGSS AND OTHER STATE STANDARDS CHLORIDE TRANSPORT IN BIOLOGICAL MEMBRANES IS A COLLECTION OF PAPERS THAT PRESENT ADVANCES AND THE STATE OF KNOWLEDGE IN THE TRANSPORT OF CHLORIDE AND OTHER ANIONS ACROSS BIOLOGICAL MEMBRANES THE BOOK INCLUDES PAPERS THAT DISCUSS TOPICS SUCH AS THE ANION TRANSPORT PROTEIN FUNCTIONAL SITES OF THE RED CELL ANION EXCHANGE PROTEIN AND ANION AND PROTON TRANSPORT THROUGH LIPID BILAYERS ALSO COVERED IN THE BOOK ARE CHLORIDE TRANSPORT IN CERTAIN AREAS SUCH AS THE RENAL TUBULE THE GASTRIC MUCOSA AND THE CORNEA THE ROLE OF SODIUM IN ANION TRANSPORT CHLORIDE REABSORPTION AND THE HORMONAL CONTROL OF CHLORIDE SECRETION THE TEXT IS RECOMMENDED FOR BIOLOGISTS BIOCHEMISTS AND PRACTITIONERS IN HEALTH SCIENCE ESPECIALLY THOSE WHO WOULD LIKE TO KNOW MORE ABOUT THE PROCESSES INVOLVED IN CHLORIDE TRANSPORT THE STUDY OF SOLUTE TRANSPORT IN PLANTS DATES BACK TO THE BEGINNINGS OF EXPERIMENTAL PLANT PHYSIOLOGY BUT HAS ITS ORIGINS IN THE MUCH EARLIER INTERESTS OF HUMANKIND IN AGRICULTURE GIVEN THIS LINEAGE IT IS NOT SURPRISING THAT THERE HAVE BEEN MANY BOOKS ON THE TRANSPORT OF SOLUTES IN PLANTS TEXTS ON THE CLOSELY RELATED SUBJECT OF MINERAL NUTRITION ALSO COMMONLY ADDRESS THE TOPIC OF ION TRANSPORT WHY ANOTHER BOOK WELL PHYSIOLOGISTS CONTINUE TO MAKE NEW DISCOVERIES PARTICULARLY PERTINENT IS THE CHARACTERISATION OF ENZYMES THAT ARE ABLE TO TRANSPORT PROTONS ACROSS MEMBRANES DURING THE HYDROLYSIS OF ENERGY RICH BONDS THESE ENZYMES WHICH INCLUDE THE H⁺ ATPASES ARE NOW KNOWN TO BE CRUCIAL FOR SOLUTE TRANSPORT IN PLANTS AND WE HAVE GIVEN THEM DUE EMPHASIS FROM AN ACADEMIC POINT OF VIEW THE TRANSPORT SYSTEMS IN PLANTS ARE NOW APPRECIATED AS WORTHY OF STUDY IN THEIR OWN RIGHT NOT JUST AS AN EXTENSION OF THOSE SYSTEMS ALREADY MUCH MORE WIDELY INVESTIGATED IN ANIMALS FROM A WIDER PERSPECTIVE UNDERSTANDING SOLUTE TRANSPORT IN PLANTS IS FUNDAMENTAL TO UNDERSTANDING PLANTS AND THE EXTENT TO WHICH THEY CAN BE MANIPULATED FOR AGRICULTURAL PURPOSES AS PHYSIOLOGISTS INTERESTED IN THE MECHANISMS OF TRANSPORT WE FIRST SET OUT IN THIS BOOK TO EXAMINE THE SOLUTES IN PLANTS AND WHERE ARE THEY LOCATED OUR NEXT CONSIDERATION WAS TO PROVIDE THE TOOLS BY WHICH SOLUTE MOVEMENT CAN BE UNDERSTOOD A VITAL PART OF THIS WAS TO DESCRIBE MEMBRANES AND THOSE ENZYMES CATALYSING TRANSPORT EVERY SECOND THROUGHOUT LIFE BILLIONS OF SODIUM POTASSIUM PUMPS ENABLE THE HUMAN MUSCLE CELLS TO FUNCTION THE PUMP IS AN ENZYME FOUND IN THE PLASMA MEMBRANE OF ALL ANIMAL CELLS AND IS AN IMPORTANT EXAMPLE OF ACTIVE TRANSPORT THE NA⁺ K⁺ PUMPS KEEP US GOING BY PUMPING SODIUM OUT OF CELLS WHILE PUMPING POTASSIUM INTO CELLS AND WITHOUT THEM WE WOULD NOT SURVIVE ADDRESSED TO SCIENTISTS IN THE FIELD OF BIOMEDICINE THE AUTHOR PRESENTS A THOROUGH OVERVIEW OF HIS SCIENTIFIC RESULTS OVER MORE THAN 40 YEARS THE BOOK IS RICHLY ILLUSTRATED AND SEEKS TO EXPLAIN HOW A SINGLE MOLECULE CREATES THE REQUIRED CONDITIONS FOR OUR MUSCLES TO WORK METABOLIC PATHWAYS THIRD EDITION METABOLIC TRANSPORT VOLUME VI INVESTIGATES MEMBRANE TRANSPORT AND ITS ROLE IN CELL PHYSIOLOGY THE BOOK DESCRIBES THE TRANSPORT OF SOLUTES ACROSS MEMBRANES AND OF CARBOHYDRATES IN BACTERIAL CELLS AS WELL AS OTHER PROCESSES SUCH AS CELLULAR TRANSPORT OF WATER AMINO ACID TRANSPORT IN MICROORGANISMS PROTON TRANSPORT AND CALCIUM TRANSPORT BY THE SARCOPLASMIC RETICULUM ORGANIZED INTO 16 CHAPTERS THIS VOLUME BEGINS WITH AN OVERVIEW OF THE KINETICS OF TRANSPORT EMPHASIZING THE MONOVALENT CARRIER MECHANISM OF FACILITATED DIFFUSION AND ACTIVE TRANSPORT INVOLVING MONOVALENT CARRIERS THE BOOK THEN INTRODUCES THE READER TO THE TRANSPORT OF VARIOUS LIGANDS BY ANIMAL CELLS OR MICROORGANISMS TRANSPORT BY INTRACELLULAR ORGANELLES AND THE ROLE OF SODIUM PUMP IN ANIMAL TISSUES IN THE REGULATION OF CELLULAR METABOLISM AND FUNCTION THE BOOK ALSO EXAMINES THE TRANSPORT OF BIOGENIC AMINES AND SOME MECHANISMS INVOLVED IN THE CONTROL OF TRANSPORT A FEW EXAMPLES OF THE ROLE OF TRANSPORT IN SUBSERVING OTHER CELLULAR PROCESSES ARE PRESENTED THIS BOOK IS A VALUABLE SOURCE OF INFORMATION FOR WORKERS IN THE TRANSPORT FIELD ALONG WITH BIOLOGISTS WHOSE RESEARCH INTERESTS OVERLAP WITH THE TRANSPORT FIELD FIRST PUBLISHED IN 1982 THE BOOK ATTEMPTS TO EXPLAIN TRANSPORT PROCESSES FOR RADIOLABELLED TRACERS AN HISTORICAL APPROACH TO ION TRANSPORT IN SKELETAL MUSCLE USING FROG MUSCLE AS A MODEL DISCUSSES ALL MAJOR COMPONENTS OF IONIC FLUX BELIEVED TO BE OCCURRING IN SKELETAL MUSCLE FIBERS PRESENTS BASIC PRINCIPLES EARLY RESEARCH AND TRACES THE TRANSPORT STUDIES THAT HAVE PLACED SKELETAL MUSCLE IN THE SAME FRAMEWORK AS RED BLOOD CELLS AND GIANT AXONS

TRANSPORT

2013-03-09

ONE PROPERTY COMMON TO ALL CELLS IS TRANSPORT MOLECULES AND IONS MUST ENTER AND LEAVE CELLS BY CROSSING MEMBRANES IN A CONTROLLED MANNER THE PROCESS MAY TAKE ANY OF SEVERAL FORMS SIMPLE DIFFUSION CARRIER MEDIATED DIFFUSION ACTIVE TRANSPORT OR GROUP TRANSLOCATION THERE IS MORE THAN ONE WAY TO MEASURE EACH TRANSPORT KINETICS WITH PARTICULAR REFERENCE TO THE RED BLOOD CELL WERE DISCUSSED IN A PREVIOUS VOLUME THREE CHAPTERS DEAL WITH THE GENERAL SUBJECT OF TRANSPORT IN THIS VOLUME MALONEY KASHKET AND WILSON SUMMARIZE THE APPROPRIATE METHODOLOGY FOR STUDYING METABOLITE AND ION TRANSPORT IN BACTERIA AND KIMMICH DESCRIBES THE RELEVANT METHODOLOGY FOR THE ISOLATED INTESTINAL EPITHELIAL CELL THE METHODS DESCRIBED IN THESE TWO CHAPTERS HAVE GENERAL APPLICATION TO TRANSPORT STUDIES IN SINGLE CELLS FROM ANY SOURCE THE APPROACH DESCRIBED IN THESE TWO COMPLEMENTARY ARTICLES IS EXTENDED IN THE CHAPTER BY HOCHSTADT AND HER COLLABORATORS ON THE USE OF ISOLATED MEMBRANES FROM BACTERIAL AND MAMMALIAN CELLS FOR THE STUDY OF TRANSPORT PHENOMENA IF ONE CAN PREPARE A SUITABLE PLASMA MEMBRANE FRACTION SEALED IMPERMEABLE VESICLES WITH THE NECESSARY TRANSPORT COMPONENTS INTACT IT BECOMES POSSIBLE TO SEPARATE THE EVENTS OF TRANSPORT FROM ANY SUBSEQUENT METABOLISM THAT MAY OCCUR IN THE CELL ISOLATED MEMBRANE VESICLES ARE RELATIVELY EASY TO OBTAIN FROM BACTERIA AND THEY ARE COMPARATIVELY WELL STUDIED WORK WITH SIMILAR PREPARATIONS FROM CULTURED MAMMALIAN CELLS IS JUST BEGINNING BUT HAS MUCH PROMISE

PROTONS, ELECTRONS, PHOSPHORYLATION AND ACTIVE TRANSPORT

1970

INTRACELLULAR TRANSPORT IS A COLLECTION OF PAPERS THAT EXAMINES THE PROCESSES OF AND THE MECHANISMS UNDERLYING INTRACELLULAR TRANSPORT ONE PAPER DESCRIBES THAT ALL ACTIVE TRANSPORT PROCESSES IN THE AMOEBA ARE INTRACELLULAR AND DEPEND ON DYNAMIC TRANSFORMATIONS OF MEMBRANE INTO CYTOPLASM AND OF CYTOPLASM INTO MEMBRANE ANOTHER PAPER DISCUSSES THE KINETICS OF MEMBRANE TRANSPORT OF WHICH THE PHENOMENA OF COUNTERFLOW CAN BECOME A MOBILE CARRIER SYSTEM THE PAPER NOTES THAT THE SPECIFIC TRANSPORT PROPERTIES OF MEMBRANES ARE CONFERRED BY THE PROTEINS OF THE SURFACES THAT ARE GROUPED AS MACROMOLECULAR COMPLEXES PROBABLY SIMILAR TO THOSE OF ENZYMES ONE PAPER DESCRIBES THE CONCEPT OF PARAMETRIC PUMPING AN OSCILLATION DRIVEN SEPARATION PROCESS AS A POSSIBLE MODEL FOR ACTIVE TRANSPORT IN BIOLOGICAL CELLS ANOTHER PAPER COMPARES THE FINE SCALE DIFFUSION EFFECTS THAT HAPPEN IN A MIXTURE WITHOUT LARGE SCALE CONCENTRATION GRADIENTS AND WHERE THE EFFECTS ARE ON A LARGE SCALE THE HOMOGENOUS KINETIC LAW CAN BE USED IN THE LARGE SCALE SITUATION THE LAW ALREADY CAN ACCOUNT FOR ANY OF THE FINE SCALE DIFFUSION EFFECTS THE PAPER NOTES THAT WITHOUT LARGE SCALE CONCENTRATION GRADIENTS THE TRANSPORT EVENT IS FROM A LOCAL REGION TO A NEARBY REACTION SITE ONLY WHERE THE EFFECTS ARE ON A LARGE SCALE THE DIFFUSION RESULTS IN A GROSS TRANSPORT OF OVER DISTANCES LARGER THAN MOLECULAR DIMENSIONS THIS COLLECTION CAN PROVE USEFUL FOR MATHEMATICIANS CELLULAR BIOLOGISTS PHYSICAL CHEMISTS PHYSIOLOGISTS ELECTRON MICROSCOPICISTS GENETICISTS AND ENGINEERS

PROTONS, ELECTRONS, PHOSPHORYLATION AND ACTIVE TRANSPORT

2012-12-06

TRANSPORT AND DIFFUSION ACROSS CELL MEMBRANES IS A COMPREHENSIVE TREATMENT OF THE TRANSPORT AND DIFFUSION OF MOLECULES AND IONS ACROSS CELL MEMBRANES THIS BOOK SHOWS THAT THE SAME KINETIC EQUATIONS WITH APPROPRIATE MODIFICATION CAN DESCRIBE ALL THE SPECIALIZED MEMBRANE TRANSPORT SYSTEMS THE PORES THE CARRIERS AND THE TWO CLASSES OF PUMPS THE KINETIC FORMALISM IS DEVELOPED STEP BY STEP AND THE FEATURES THAT MAKE A SYSTEM EFFECTIVE IN CARRYING OUT ITS BIOLOGICAL ROLE ARE HIGHLIGHTED THIS BOOK IS ORGANIZED INTO SIX CHAPTERS AND BEGINS WITH AN INTRODUCTION TO THE STRUCTURE AND DYNAMICS OF CELL MEMBRANES FOLLOWED BY A DISCUSSION ON HOW THE MEMBRANE ACTS AS A BARRIER TO THE TRANSMEMBRANE DIFFUSION OF MOLECULES AND IONS THE FOLLOWING CHAPTERS FOCUS ON THE ROLE OF THE MEMBRANE S PROTEIN COMPONENTS IN FACILITATING TRANSMEMBRANE DIFFUSION OF SPECIFIC MOLECULES AND IONS MEASUREMENTS OF DIFFUSION THROUGH PORES AND THE KINETICS OF DIFFUSION AND THE STRUCTURE OF SUCH PORES AND THEIR BIOLOGICAL REGULATION THIS BOOK METHODICALLY INTRODUCES THE READER TO THE CARRIERS OF CELL MEMBRANES THE KINETICS OF FACILITATED DIFFUSION AND COTRANSPORT SYSTEMS THE PRIMARY ACTIVE TRANSPORT SYSTEMS ARE CONSIDERED EMPHASIZING THE PUMPING OF AN ION SODIUM POTASSIUM CALCIUM OR PROTON AGAINST ITS ELECTROCHEMICAL GRADIENT DURING THE COUPLED PROGRESS OF A CHEMICAL REACTION WHILE A CONFORMATIONAL CHANGE OF THE PUMP ENZYME TAKES PLACE THIS BOOK IS OF INTEREST TO ADVANCED UNDERGRADUATE STUDENTS AS WELL AS TO GRADUATE STUDENTS AND RESEARCHERS IN BIOCHEMISTRY PHYSIOLOGY PHARMACOLOGY AND BIOPHYSICS

ACTIVE TRANSPORT THROUGH ANIMAL CELL MEMBRANES

1968-10-02

WITH CONTRIBUTIONS BY NUMEROUS EXPERTS

PROTONS, ELECTRONS, PHOSPHORYLATION AND ACTIVE TRANSPORT

2014-05-12

THIS BOOK DEALS WITH ENERGETICS OF TRANSPORT PROCESSES LARGELY EXPRESSED IN TERMS OF THE THERMODYNAMICS OF IRREVERSIBLE PROCESSES SINCE AT THE PRESENT TIME TOO LITTLE IS KNOWN ABOUT THE MOLECULAR MECHANISM OF TRANSPORT THE PRESENT TREATMENT IS BASED LARGELY ON HYPOTHETICAL MODELS CARE HAS BEEN TAKEN HOWEVER TO DEFINE THE CRUCIAL FEATURES OF THESE MODELS AS GENERALLY AS POSSIBLE SO THAT THE EQUATIONS DO NOT DEPEND TOO MUCH ON HYPOTHETICAL DETAILS ACCORDINGLY MOST EQUATIONS THOUGH DEVELOPED ON THE BASIS OF A MOBILE CARRIER FERRYBOAT MODEL SHOULD APPLY EQUALLY TO A CONFORMATIONAL MODEL WITH AN APPROPRIATE REINTERPRETATION OF THE SYMBOLS TO BETTER ELUCIDATE THE ESSENTIALS THE MODELS ARE GREATLY SIMPLIFIED BY SPECIAL ASSUMPTIONS MAXIMALLY ONLY TWO FLOWS ARE ASSUMED TO BE PRESENT IN EACH MODEL AT ONE TIME E G TWO SOLUTE FLOWS THE FLOW OF SOLVENT AND OF ONE SOLUTE THE FLOW OF SOLVENT AND OF HEAT THE SIMPLIFYING ASSUMPTIONS MAY OFTEN BE UNREAL HENCE THE EQUATIONS SHOULD NOT BE APPLIED UNCRITICALLY TO ACTUAL MECHANISMS THEY MAY AT BEST SERVE AS A BASIS ON WHICH THE MORE APPROPRIATE EQUATIONS MAY BE DEVELOPED THE BOOK IS NOT DESIGNED TO GIVE A COMPLETE KINETIC ANALYSIS OF THE TRANSPORT PROCESSES DESCRIBED THE KINETIC EQUATIONS ARE KEPT TO THE MINIMUM REQUIRED TO DESCRIBE THE MODEL CONCERNED AND TO RELATE IT TO THE CORRESPONDING THERMODYNAMIC EQUATIONS THE INTENTION IS TO STRESS THE CLOSE RELATIONSHIP BETWEEN BIOSMOTIC TRANSPORT AND BIOCHEMICAL PROCESSES IN METABOLISM

INTRACELLULAR TRANSPORT

2012-12-02

THIS BOOK DESCRIBES A HALF CENTURY OF RESEARCH ON CELLULAR MEMBRANE TRANSPORT AND ON METABOLIC ENERGY CAPTURE AND UTILIZATION DURING THIS TIME WHICH BEGINS IN THE LATE 1930S THE EFFORT AND IMAGINATION OF VARIOUS SCIENTISTS OVERTHREW REIGNING FORMULATIONS CREATED NOVEL EXPLANATORY MODELS AND UNIFIED PREVIOUSLY DISTINCT EXPERIMENTAL FIELDS MY PRIMARY GOAL IS TO DISPLAY THE COURSE OF THAT RESEARCH SHOWING HOW NEW EXPERIMENTS DEFINED NOVEL ENTITIES AND PROCESSES AND HOW AN ENCOMPASSING FIELD BIOENERGETICS THEN EMERGED A SECONDARY GOAL IS TO PRESENT EXAMPLES OF MAINSTREAM BIOLOGICAL RESEARCH THAT ILLUSTRATE HOW EXPERIMENTAL RESULTS SEEN AS REFUTATIONS CONFIRMATIONS AND ELABORATIONS CAN SWAY OPINION TOWARD A SOLID CONSENSUS THIS INTERPRETATION DIFFERS FROM THE CURRENTLY FASHIONABLE VIEW OF SOME COMMENTATORS THAT STRESSES INSTEAD THE CENTRAL ROLES OF POWER PRESTIGE GENDER CLASS AND ETHNICITY IN ANY CASE THE SCIENTIFIC PRACTICES EXHIBITED HERE DESERVE PROPER PHILOSOPHICAL SCRUTINY ALTHOUGH CONSTRAINTS OF SPACE HAVE SQUEEZED ANY ANALYSIS FROM THIS DRAFT BRIEF MENTION OF SALIENT ISSUES DOES APPEAR IN RELEVANT CHAPTERS AND IN THE FINAL CONCLUSIONS ODDLY HISTORIANS AND PHILOSOPHERS SEEM RELUCTANT TO DEAL WITH THIS SCIENCE THOSE WHO DO CONSIDER BIOLOGICAL TOPICS TEND TO FOCUS ON THE THEORY OF EVOLUTION EVEN THOUGH THE BULK OF BIOLOGICAL RESEARCH IN THIS CENTURY IN TERMS OF PAPERS PUBLISHED AND TECHNOLOGY INFLUENCED HAS DEALT NOT WITH EVOLUTION PER SE BUT WITH WHAT MAY BE TERMED PHYSIOLOGY AND BIOCHEMISTRY AND THESE ENDEAVORS WHICH ARE THE AIMS EFFORTS AND ACCOMPLISHMENTS OF THE VAST MAJORITY OF BIOLOGISTS HAVE BEEN LARGELY IGNORED

TRANSPORT AND DIFFUSION ACROSS CELL MEMBRANES

2013-03-08

THIS BOOK FOCUSES ON ACTIVE TRANSPORT AS A WAY TO INCREASE PHYSICAL ACTIVITY LEVELS ACTIVE COMMUTING AND ACTIVE TRANSPORTATION ON FOOT OR BY BICYCLE CREATE OPPORTUNITIES FOR PHYSICAL ACTIVITY PROVIDE TRANSPORTATION OPTIONS FOR THOSE WITHOUT A CAR ENCOURAGE SOCIAL COHESION AND REDUCE CONTRIBUTIONS TO AIR POLLUTION

TRANSPORT ORGANS

2012-12-06

THIS IS A FASCINATING COLLECTION OF PERSONAL ACCOUNTS WHICH IS A MUST READ FOR ANYONE INTERESTED IN MEMBRANE TRANSPORT OR THE HISTORY OF THE DEVELOPMENT OF THE CURRENT PICTURE OF MEMBRANE TRANSPORT PHYSIOLOGY THIS DELIGHTFUL BOOK COULD SERVE VARIOUSLY AS A HISTORY FOR INVESTIGATORS AND HISTORIANS OR AS A TEXTBOOK FOR ADVANCED STUDENTS NO BIOLOGY OR MEDICAL LIBRARY SHOULD BE WITHOUT IT

MECHANICS AND ENERGETICS OF BIOLOGICAL TRANSPORT

1954

ION TRANSPORT IN PROKARYOTES PROVIDES AN ADVANCE TREATISE ON ION TRANSPORT AND PROKARYOTIC ORGANISMS THIS BOOK IS DIVIDED INTO THREE MAIN TOPICS CATION TRANSPORT SYSTEMS ANION TRANSPORT SYSTEMS AND PLASMID ENCODED TRANSPORT SYSTEMS THIS COMPILATION SPECIFICALLY DISCUSSES THE PROTON TRANSPORT AND PROTON MOTIVE FORCE IN PROKARYOTIC CELLS POTASSIUM TRANSPORT IN BACTERIA AND BIOENERGETIC FUNCTIONS OF SODIUM IONS THE CALCIUM TRANSPORT IN PROKARYOTES PHOSPHATE TRANSPORT IN PROKARYOTES AND TRANSPORT OF ORGANIC ACIDS IN PROKARYOTES ARE ALSO ELABORATED THIS TEXT LIKEWISE COVERS THE CHLORIDE NITRATE AND SULFATE TRANSPORT IN BACTERIA AND BACTERIAL MAGNESIUM MANGANESE AND ZINC TRANSPORT THIS PUBLICATION IS RECOMMENDED FOR BIOLOGISTS SPECIALISTS AND STUDENTS INTERESTED IN THE BACTERIAL ION TRANSPORT SYSTEM

ACTIVE TRANSPORT AND SECRETION

2009

BIOLOGICAL MEMBRANES AND TRANSPORT BIOLOGICAL MEMBRANES AND TRANSPORT

VALUING THE HEALTH BENEFITS OF ACTIVE TRANSPORT MODES

2013-05-27

AN INTRODUCTION TO THE PRINCIPLES OF MEMBRANE TRANSPORT HOW MOLECULES AND IONS MOVE ACROSS THE CELL MEMBRANE BY SIMPLE DIFFUSION AND BY MAKING USE OF SPECIALIZED MEMBRANE COMPONENTS CHANNELS CARRIERS AND PUMPS THE TEXT EMPHASIZES THE QUANTITATIVE ASPECTS OF SUCH MOVEMENT AND ITS INTERPRETATION IN TERMS OF TRANSPORT KINETICS MOLECULAR STUDIES OF CHANNELS CARRIERS AND PUMPS ARE DESCRIBED IN DETAIL AS WELL AS STRUCTURAL PRINCIPLES AND THE FUNDAMENTAL SIMILARITIES BETWEEN THE VARIOUS TRANSPORTERS AND THEIR EVOLUTIONARY INTERRELATIONSHIPS THE REGULATION OF TRANSPORTERS AND THEIR ROLE IN HEALTH AND DISEASE ARE ALSO CONSIDERED PROVIDES AN INTRODUCTION TO THE PROPERTIES OF TRANSPORT PROTEINS CHANNELS CARRIERS AND PUMPS PRESENTS UP TO DATE INFORMATION ON THE STRUCTURE OF TRANSPORT PROTEINS AND ON THEIR FUNCTION AND REGULATION INCLUDES INTRODUCTIONS TO TRANSPORT KINETICS AND TO THE CLONING OF GENES THAT CODE TRANSPORT PROTEINS FURNISHES A LINK BETWEEN THE EXPERIMENTAL BASIS OF THE SUBJECT AND THEORETICAL MODEL BUILDING

MOVING QUESTIONS

2022-12-21

THE OSMOSIS STUDENT LEARNING GUIDE INCLUDES SELF DIRECTED READINGS EASY TO FOLLOW ILLUSTRATED EXPLANATIONS GUIDING QUESTIONS INQUIRY BASED ACTIVITIES A LAB INVESTIGATION KEY VOCABULARY REVIEW AND ASSESSMENT REVIEW QUESTIONS ALONG WITH A POST TEST IT COVERS THE FOLLOWING STANDARDS ALIGNED CONCEPTS CELLS THE BASIC UNITS OF LIFE CELL MEMBRANE AND CELL TRANSPORT DIFFUSION DIFFUSION IN THE LUNGS OSMOSIS THE DIFFUSION OF WATER PASSIVE TRANSPORT ACTIVE TRANSPORT OSMOSIS IN PLANT CELLS AND OSMOSIS IN ANIMAL CELLS ALIGNED TO NEXT GENERATION SCIENCE STANDARDS NGSS AND OTHER STATE STANDARDS

ACTIVE COMMUTING AND ACTIVE TRANSPORTATION

2013-05-27

CHLORIDE TRANSPORT IN BIOLOGICAL MEMBRANES IS A COLLECTION OF PAPERS THAT PRESENT ADVANCES AND THE STATE OF KNOWLEDGE IN THE TRANSPORT OF CHLORIDE AND OTHER ANIONS ACROSS BIOLOGICAL MEMBRANES THE BOOK INCLUDES PAPERS THAT DISCUSS TOPICS SUCH AS THE ANION TRANSPORT PROTEIN FUNCTIONAL SITES OF THE RED CELL ANION EXCHANGE PROTEIN AND ANION AND PROTON TRANSPORT THROUGH LIPID BILAYERS ALSO COVERED IN THE BOOK ARE CHLORIDE TRANSPORT IN CERTAIN AREAS SUCH AS THE RENAL TUBULE THE GASTRIC MUCOSA AND THE CORNEA THE ROLE OF SODIUM IN ANION TRANSPORT CHLORIDE REABSORPTION AND THE HORMONAL CONTROL OF CHLORIDE SECRETION THE TEXT IS RECOMMENDED FOR BIOLOGISTS BIOCHEMISTS AND PRACTITIONERS IN HEALTH SCIENCE ESPECIALLY THOSE WHO WOULD LIKE TO KNOW MORE ABOUT THE PROCESSES INVOLVED IN CHLORIDE TRANSPORT

MEMBRANE TRANSPORT

1986

THE STUDY OF SOLUTE TRANSPORT IN PLANTS DATES BACK TO THE BEGINNINGS OF EXPERIMENTAL PLANT PHYSIOLOGY BUT HAS ITS ORIGINS IN THE MUCH EARLIER INTERESTS OF HUMANKIND IN AGRICULTURE GIVEN THIS LINEAGE IT IS NOT SURPRISING THAT THERE HAVE BEEN MANY BOOKS ON THE TRANSPORT OF SOLUTES IN PLANTS TEXTS ON THE CLOSELY RELATED SUBJECT OF MINERAL NUTRITION ALSO COMMONLY ADDRESS THE TOPIC OF ION TRANSPORT WHY ANOTHER BOOK WELL PHYSIOLOGISTS CONTINUE TO MAKE NEW DISCOVERIES PARTICULARLY PERTINENT IS THE CHARACTERISATION OF ENZYMES THAT ARE ABLE TO TRANSPORT PROTONS ACROSS MEMBRANES DURING THE HYDROLYSIS OF ENERGY RICH BONDS THESE ENZYMES WHICH INCLUDE THE H⁺ ATPASES ARE NOW KNOWN TO BE CRUCIAL FOR SOLUTE TRANSPORT IN PLANTS AND WE HAVE GIVEN THEM DUE EMPHASIS FROM AN ACADEMIC POINT OF VIEW THE TRANSPORT SYSTEMS IN PLANTS ARE NOW APPRECIATED AS WORTHY OF STUDY IN THEIR OWN RIGHT NOT JUST AS AN EXTENSION OF THOSE SYSTEMS ALREADY MUCH MORE WIDELY INVESTIGATED IN ANIMALS FROM A WIDER PERSPECTIVE UNDERSTANDING SOLUTE TRANSPORT IN PLANTS IS FUNDAMENTAL TO UNDERSTANDING PLANTS AND THE EXTENT TO WHICH THEY CAN BE MANIPULATED FOR AGRICULTURAL PURPOSES AS PHYSIOLOGISTS INTERESTED IN THE MECHANISMS OF TRANSPORT WE FIRST SET OUT IN THIS BOOK TO EXAMINE THE SOLUTES IN PLANTS AND WHERE ARE THEY LOCATED OUR NEXT CONSIDERATION WAS TO PROVIDE THE TOOLS BY WHICH SOLUTE MOVEMENT CAN BE UNDERSTOOD A VITAL PART OF THIS WAS TO DESCRIBE MEMBRANES AND THOSE ENZYMES CATALYSING TRANSPORT

PRINCIPLES AND MODELS OF BIOLOGICAL TRANSPORT

2014-06-28

EVERY SECOND THROUGHOUT LIFE BILLIONS OF SODIUM POTASSIUM PUMPS ENABLE THE HUMAN MUSCLE CELLS TO FUNCTION THE PUMP IS AN ENZYME FOUND IN THE PLASMA MEMBRANE OF ALL ANIMAL CELLS AND IS AN IMPORTANT EXAMPLE OF ACTIVE TRANSPORT THE NA⁺ K⁺ PUMPS KEEP US GOING BY PUMPING SODIUM OUT OF CELLS WHILE PUMPING POTASSIUM INTO CELLS AND WITHOUT THEM WE WOULD NOT SURVIVE ADDRESSED TO SCIENTISTS IN THE FIELD OF BIOMEDICINE THE AUTHOR PRESENTS A THOROUGH OVERVIEW OF HIS SCIENTIFIC RESULTS OVER MORE THAN 40 YEARS THE BOOK IS RICHLY ILLUSTRATED AND SEEKS TO EXPLAIN HOW A SINGLE MOLECULE CREATES THE REQUIRED CONDITIONS FOR OUR MUSCLES TO WORK

ION TRANSPORT IN PROKARYOTES

1970

METABOLIC PATHWAYS THIRD EDITION METABOLIC TRANSPORT VOLUME VI INVESTIGATES MEMBRANE TRANSPORT AND ITS ROLE IN CELL PHYSIOLOGY THE BOOK DESCRIBES THE TRANSPORT OF SOLUTES ACROSS MEMBRANES AND OF CARBOHYDRATES IN BACTERIAL CELLS AS WELL AS OTHER PROCESSES SUCH AS CELLULAR TRANSPORT OF WATER AMINO ACID TRANSPORT IN MICROORGANISMS PROTON TRANSPORT AND CALCIUM TRANSPORT BY THE SARCOPLASMIC RETICULUM ORGANIZED INTO 16 CHAPTERS THIS VOLUME BEGINS WITH AN OVERVIEW OF THE KINETICS OF TRANSPORT EMPHASIZING THE MONOVALENT CARRIER MECHANISM OF FACILITATED DIFFUSION AND ACTIVE TRANSPORT INVOLVING MONOVALENT CARRIERS THE BOOK THEN INTRODUCES THE READER TO THE TRANSPORT OF VARIOUS LIGANDS BY ANIMAL CELLS OR MICROORGANISMS TRANSPORT BY INTRACELLULAR ORGANELLES AND THE ROLE OF SODIUM PUMP IN ANIMAL TISSUES IN THE REGULATION OF CELLULAR METABOLISM AND FUNCTION THE BOOK ALSO EXAMINES THE TRANSPORT OF BIOGENIC AMINES AND SOME MECHANISMS INVOLVED IN THE CONTROL OF TRANSPORT A FEW EXAMPLES OF THE ROLE OF TRANSPORT IN SUBSERVING OTHER CELLULAR PROCESSES ARE PRESENTED THIS BOOK IS A VALUABLE SOURCE OF INFORMATION FOR WORKERS IN THE TRANSPORT FIELD ALONG WITH BIOLOGISTS WHOSE RESEARCH INTERESTS OVERLAP WITH THE TRANSPORT FIELD

MEMBRANES AND ION TRANSPORT

2009-01-01

FIRST PUBLISHED IN 1982 THE BOOK ATTEMPTS TO EXPLAIN TRANSPORT PROCESSES FOR RADIOLABELLED TRACERS

VALUING THE HEALTH BENEFITS OF ACTIVE TRANSPORT MODES

2014-11-07

AN HISTORICAL APPROACH TO ION TRANSPORT IN SKELETAL MUSCLE USING FROG MUSCLE AS A MODEL DISCUSSES ALL MAJOR COMPONENTS OF IONIC FLUX BELIEVED TO BE OCCURRING IN SKELETAL MUSCLE FIBERS PRESENTS BASIC PRINCIPLES EARLY RESEARCH AND TRACES THE TRANSPORT STUDIES THAT HAVE PLACED SKELETAL MUSCLE IN THE SAME FRAMEWORK AS RED BLOOD CELLS AND GIANT AXONS

BIOLOGICAL MEMBRANES AND TRANSPORT

2014-12-09

CHANNELS, CARRIERS, AND PUMPS

2014-03-01

OSMOSIS AND DIFFUSION SCIENCE LEARNING GUIDE

2009

ACTIVE TRANSPORT IN PLANTS

2012-12-02

CHLORIDE TRANSPORT IN BIOLOGICAL MEMBRANES

1972

ACTIVE TRANSPORT

2012-12-06

SOLUTE TRANSPORT IN PLANTS

1955

ACTIVE TRANSPORT THROUGH ANIMAL CELL MEMBRANES

1977

CELL MEMBRANES AND ION TRANSPORT

2016

THE Na^+ , K^+ PUMPS KEEP US GOING

1985

TRANSPORT PROCESSES, IONO- AND OSMOREGULATION

1967

THE MOVEMENT OF MOLECULES ACROSS CELL MEMBRANES

1971

ION TRANSPORT AND MEMBRANES

2012-12-02

METABOLIC TRANSPORT

1999

ACTIVE TRANSPORT

2020-04-28

BIOLOGICAL TRANSPORT OF RADIOTRACERS

2012-12-06

NA-LINKED TRANSPORT OF ORGANIC SOLUTES

1982-07-16

TRANSPORT IN SKELETAL MUSCLE

1982-10-31

TRANSPORT AND BIOENERGETICS IN BIOMEMBRANES

1984

CHLORIDE TRANSPORT COUPLING IN BIOLOGICAL MEMBRANES AND EPITHELIA

2017

BARRIERS TO ACTIVE TRANSPORT IN PALMERSTON NORTH

1994

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