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Gene Regulatory Networks The Regulatory Genome Plant Gene Regulatory Networks Handbook of Research on Computational Methodologies in Gene Regulatory Networks ⍰ ⍰ ⍰ ⍰ /⍰ ⍰ ⍰ ⍰ ⍰ ⍰ ⍰ ⍰ ⍰ /Regulatory genome Gene Regulatory Networks Analysis of Deterministic Cyclic Gene Regulatory Network Models with Delays Evolution of Gene Regulatory Networks in Plant Development Emerging Research in the Analysis and Modeling of Gene Regulatory Networks Evolutionary Computation in Gene Regulatory Network Research Computational Modeling of Gene Regulatory Networks Reverse Engineering of Regulatory Networks Transcription Factor Regulatory Networks Regulatory Networks in Stem Cells Probabilistic Boolean Networks Genetic Regulatory Networks Plant Development: Role of Gene Regulatory Networks Bacterial Regulatory Networks MicroRNA Regulatory Network: Structure and Function Experimental and Mathematical Analysis of Regulatory Networks in T-helper Lymphocytes Transcription Factor Regulatory Networks Integration and Visualization of Gene Selection and Gene Regulatory Networks for Cancer Genome Networks in Cell Biology Regulatory Networks in Prokaryotes Analysis and Design of Delayed Genetic Regulatory Networks Biomolecular Networks Gene Regulatory Networks Construction Regulatory Networks in Stem Cells Network Inference in Molecular Biology Regulatory Delegation in the European Union Evolution of Gene Regulatory Networks in Plant Development The Complexity of Gene Regulatory Networks in a Photosynthetic Model Organism Computational Genetic Regulatory Networks: Evolvable, Self-organizing Systems Integrating External Biological Knowledge in the Construction of Regulatory Networks from LINCS Data Modeling Transcriptional Regulation Bacterial Regulatory Networks Gene Network Inference Inference of gene-regulatory networks in primary human hepatocytes Ingenious Genes Algorithms For Analysis, Inference, And Control Of Boolean Networks

Gene Regulatory Networks

2020-05-22

GENE REGULATORY NETWORKS VOLUME 139 IN THE CURRENT TOPICS IN DEVELOPMENTAL BIOLOGY SERIES HIGHLIGHTS NEW ADVANCES IN THE FIELD WITH THIS NEW VOLUME PRESENTING INTERESTING CHAPTERS WRITTEN BY AN INTERNATIONAL BOARD OF AUTHORS TOPICS IN THIS RELEASE INCLUDE MOUSE HINDBRAIN GRN XENOPUS ENDODERM GRN ORGANOGENESIS VERTEBRATE LIMB GRN THE NOTOCHORD GENE REGULATORY NETWORK IN CHORDATE EVOLUTION CONSERVATION AND DIVERGENCE FROM CIONA TO VERTEBRATES CIONA EARLY EMBRYO GRNS BOOLEAN LOGIC MODELS MODELING GRN RESPONSE TO MORPHOGEN GRADIENT GRN ARCHITECTURE THEORY OF GRN EVOLUTION EVOLUTION OF FLY SEGMENTATION GRNS GRN EVOLUTION IN ECHINODERMS EVOLUTION OF NETWORK SPECIFICITY AND MORE PROVIDES THE AUTHORITY AND EXPERTISE OF LEADING CONTRIBUTORS FROM AN INTERNATIONAL BOARD OF AUTHORS PRESENTS THE LATEST RELEASE IN THE CURRENT TOPICS IN DEVELOPMENTAL BIOLOGY SERIES INCLUDES THE LATEST INFORMATION ON GENE REGULATORY NETWORKS

The Regulatory Genome

2010-07-19

GENE REGULATORY NETWORKS ARE THE MOST COMPLEX EXTENSIVE CONTROL SYSTEMS FOUND IN NATURE THE INTERACTION BETWEEN BIOLOGY AND EVOLUTION HAS BEEN THE SUBJECT OF GREAT INTEREST IN RECENT YEARS THE AUTHOR ERIC DAVIDSON HAS BEEN INSTRUMENTAL IN ELUCIDATING THIS RELATIONSHIP HE IS A WORLD RENOWNED SCIENTIST AND A MAJOR CONTRIBUTOR TO THE FIELD OF DEVELOPMENTAL BIOLOGY THE REGULATORY GENOME BEAUTIFULLY EXPLAINS THE CONTROL OF ANIMAL DEVELOPMENT IN TERMS OF STRUCTURE FUNCTION RELATIONS OF INHERITED REGULATORY DNA SEQUENCE AND THE EMERGENT PROPERTIES OF THE GENE REGULATORY NETWORKS COMPOSED OF THESE SEQUENCES NEW INSIGHTS INTO THE MECHANISMS OF BODY PLAN EVOLUTION ARE DERIVED FROM CONSIDERATIONS OF THE CONSEQUENCES OF CHANGE IN DEVELOPMENTAL GENE REGULATORY NETWORKS EXAMPLES OF CRUCIAL EVIDENCE UNDERSCORE EACH MAJOR CONCEPT THE CLEAR WRITING STYLE EXPLAINS REGULATORY CAUSALITY WITHOUT REQUIRING A SOPHISTICATED BACKGROUND IN DESCRIPTIVE DEVELOPMENTAL BIOLOGY THIS UNIQUE TEXT SUPERSEDES ANYTHING CURRENTLY AVAILABLE IN THE MARKET THE ONLY BOOK IN THE MARKET THAT IS SOLELY DEVOTED TO THE GENOMIC REGULATORY CODE FOR ANIMAL DEVELOPMENT WRITTEN AT A CONCEPTUAL LEVEL INCLUDING MANY NOVEL SYNTHETIC CONCEPTS THAT ULTIMATELY SIMPLIFY UNDERSTANDING PRESENTS A COMPREHENSIVE TREATMENT OF MOLECULAR CONTROL ELEMENTS THAT DETERMINE THE FUNCTION OF GENES PROVIDES A COMPARATIVE TREATMENT OF DEVELOPMENT BASED ON PRINCIPLES RATHER THAN DESCRIPTION OF DEVELOPMENTAL PROCESSES CONSIDERS THE EVOLUTIONARY PROCESSES IN TERMS OF THE STRUCTURAL PROPERTIES OF GENE REGULATORY NETWORKS INCLUDES 42 FULL COLOR DESCRIPTIVE FIGURES AND DIAGRAMS

Plant Gene Regulatory Networks

2009-10-31

THIS BOOK FOCUSES ON METHODS WIDELY USED IN MODELING GENE NETWORKS INCLUDING STRUCTURE DISCOVERY LEARNING AND OPTIMIZATION PROVIDED BY PUBLISHER

Handbook of Research on Computational Methodologies in Gene Regulatory Networks

2006

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2011-09-22

GENE REGULATORY NETWORKS PLAY A VITAL ROLE IN ORGANISMAL DEVELOPMENT AND FUNCTION BY CONTROLLING GENE EXPRESSION WITH THE AVAILABILITY OF COMPLETE GENOME SEQUENCES SEVERAL NOVEL EXPERIMENTAL AND COMPUTATIONAL APPROACHES HAVE RECENTLY BEEN DEVELOPED WHICH PROMISE TO SIGNIFICANTLY ENHANCE OUR ABILITY TO COMPREHENSIVELY CHARACTERIZE THESE REGULATORY NETWORKS BY ENABLING THE IDENTIFICATION OF RESPECTIVELY THEIR GENOMIC OR REGULATORY STATE COMPONENTS OR THE INTERACTIONS BETWEEN THESE TWO IN UNPRECEDENTED DETAIL DIVIDED INTO FIVE CONVENIENT SECTIONS GENE REGULATORY NETWORKS METHODS AND PROTOCOLS DETAILS HOW EACH OF THESE APPROACHES CONTRIBUTES TO A MORE THOROUGH UNDERSTANDING OF THE COMPOSITION AND FUNCTION OF GENE REGULATORY NETWORKS WHILE PROVIDING A COMPREHENSIVE PROTOCOL ON HOW TO IMPLEMENT THEM IN THE LABORATORY WRITTEN IN THE HIGHLY SUCCESSFUL METHODS IN MOLECULAR BIOLOGYTM

SERIES FORMAT CHAPTERS CONTAIN INTRODUCTIONS TO THEIR RESPECTIVE TOPICS LISTS OF THE NECESSARY MATERIALS AND REAGENTS STEP BY STEP READILY REPRODUCIBLE LABORATORY PROTOCOLS AND NOTES ON TROUBLESHOOTING AND AVOIDING KNOWN PITFALLS AUTHORITATIVE AND ACCESSIBLE GENE REGULATORY NETWORKS METHODS AND PROTOCOLS AIMS TO PROVIDE NOVICES AND EXPERIENCED RESEARCHERS ALIKE WITH A COMPREHENSIVE AND TIMELY TOOLKIT TO STUDY GENE REGULATORY NETWORKS FROM THE POINT OF DATA GENERATION TO PROCESSING VISUALIZATION AND MODELING

Gene Regulatory Networks

2015-02-25

THIS BRIEF EXAMINES A DETERMINISTIC ODE BASED MODEL FOR GENE REGULATORY NETWORKS GRN THAT INCORPORATES NONLINEARITIES AND TIME DELAYED FEEDBACK AN INTRODUCTORY CHAPTER PROVIDES SOME INSIGHTS INTO MOLECULAR BIOLOGY AND GRNS THE MATHEMATICAL TOOLS NECESSARY FOR STUDYING THE GRN MODEL ARE THEN REVIEWED IN PARTICULAR HILL FUNCTIONS AND SCHWARZIAN DERIVATIVES ONE CHAPTER IS DEVOTED TO THE ANALYSIS OF GRNS UNDER NEGATIVE FEEDBACK WITH TIME DELAYS AND A SPECIAL CASE OF A HOMOGENOUS GRN IS CONSIDERED ASYMPTOTIC STABILITY ANALYSIS OF GRNS UNDER POSITIVE FEEDBACK IS THEN CONSIDERED IN A SEPARATE CHAPTER IN WHICH CONDITIONS LEADING TO BI STABILITY ARE DERIVED GRADUATE AND ADVANCED UNDERGRADUATE STUDENTS AND RESEARCHERS IN CONTROL ENGINEERING APPLIED MATHEMATICS SYSTEMS BIOLOGY AND SYNTHETIC BIOLOGY WILL FIND THIS BRIEF TO BE A CLEAR AND CONCISE INTRODUCTION TO THE MODELING AND ANALYSIS OF GRNS

Analysis of Deterministic Cyclic Gene Regulatory Network Models with Delays

2018-02-15

DURING THEIR LIFE CYCLE PLANTS UNDERGO A WIDE VARIETY OF MORPHOLOGICAL AND DEVELOPMENTAL CHANGES IMPINGING THESE DEVELOPMENTAL PROCESSES THERE IS A LAYER OF GENE PROTEIN AND METABOLIC NETWORKS THAT ARE RESPONSIBLE FOR THE INITIATION OF THE CORRECT DEVELOPMENTAL TRANSITIONS AT THE RIGHT TIME OF THE YEAR TO ENSURE PLANT LIFE SUCCESS NEW OMIC TECHNOLOGIES ARE ALLOWING THE ACQUISITION OF MASSIVE AMOUNT OF DATA TO DEVELOP HOLISTIC AND INTEGRATIVE ANALYSIS TO UNDERSTAND COMPLEX PROCESSES AMONG THEM MICROARRAY NEXT GENERATION SEQUENCING NGS AND PROTEOMICS ARE PROVIDING ENORMOUS AMOUNT OF DATA FROM DIFFERENT PLANT SPECIES AND DEVELOPMENTAL STAGES THUS ALLOWING THE ANALYSIS OF GENE NETWORKS GLOBALLY BESIDES THE COMPARISON OF MOLECULAR NETWORKS FROM DIFFERENT SPECIES IS PROVIDING INFORMATION ON THEIR EVOLUTIONARY HISTORY SHEDDING LIGHT ON THE ORIGIN OF MANY KEY GENES PROTEINS MOREOVER DEVELOPMENTAL PROCESSES ARE NOT ONLY GENETICALLY PROGRAMED BUT ARE ALSO AFFECTED BY INTERNAL AND EXTERNAL SIGNALS METABOLISM LIGHT HORMONE ACTION TEMPERATURE BIOTIC AND ABIOTIC STRESSES ETC HAVE A DEEP EFFECT ON DEVELOPMENTAL PROGRAMS THE INTERFACE AND INTERPLAY BETWEEN THESE INTERNAL AND EXTERNAL CIRCUITS WITH DEVELOPMENTAL PROGRAMS CAN BE UNRAVELED THROUGH THE INTEGRATION OF SYSTEMATIC EXPERIMENTATION WITH THE COMPUTATIONAL ANALYSIS OF THE GENERATED OMICS DATA MOLECULAR SYSTEMS BIOLOGY THIS RESEARCH TOPIC INTENDS TO DEEPEN IN THE DIFFERENT PLANT DEVELOPMENTAL PATHWAYS AND HOW THE CORRESPONDING GENE NETWORKS EVOLVED FROM A MOLECULAR SYSTEMS BIOLOGY PERSPECTIVE GLOBAL APPROACHES FOR PHOTOPERIOD CIRCADIAN CLOCK AND HORMONE REGULATED PROCESSES PATTERN FORMATION PHASE TRANSITIONS ORGAN DEVELOPMENT ETC WILL PROVIDE NEW INSIGHTS ON HOW PLANT COMPLEXITY WAS BUILT DURING EVOLUTION UNDERSTANDING THE INTERFACE AND INTERPLAY BETWEEN DIFFERENT REGULATORY NETWORKS WILL ALSO PROVIDE FUNDAMENTAL INFORMATION ON PLANT BIOLOGY AND FOCUS ON THOSE TRAITS THAT MAY BE IMPORTANT FOR NEXT GENERATION AGRICULTURE

Evolution of Gene Regulatory Networks in Plant Development

2016-06-06

WHILE TECHNOLOGICAL ADVANCEMENTS HAVE BEEN CRITICAL IN ALLOWING RESEARCHERS TO OBTAIN MORE AND BETTER QUALITY DATA ABOUT CELLULAR PROCESSES AND SIGNALS THE DESIGN AND PRACTICAL APPLICATION OF COMPUTATIONAL MODELS OF GENOMIC REGULATION CONTINUES TO BE A CHALLENGE EMERGING RESEARCH IN THE ANALYSIS AND MODELING OF GENE REGULATORY NETWORKS PRESENTS A COMPILATION OF RECENT AND EMERGING RESEARCH TOPICS ADDRESSING THE DESIGN AND USE OF TECHNOLOGY IN THE STUDY AND SIMULATION OF GENOMIC REGULATION EXPLORING BOTH THEORETICAL AND PRACTICAL TOPICS THIS PUBLICATION IS AN ESSENTIAL REFERENCE SOURCE FOR STUDENTS PROFESSIONALS AND RESEARCHERS WORKING IN THE FIELDS OF GENOMICS MOLECULAR BIOLOGY BIOINFORMATICS AND DRUG DEVELOPMENT

Emerging Research in the Analysis and Modeling of Gene Regulatory

Networks

2016-02-23

INTRODUCING A HANDBOOK FOR GENE REGULATORY NETWORK RESEARCH USING EVOLUTIONARY COMPUTATION WITH APPLICATIONS FOR COMPUTER SCIENTISTS COMPUTATIONAL AND SYSTEM BIOLOGISTS THIS BOOK IS A STEP BY STEP GUIDELINE FOR RESEARCH IN GENE REGULATORY NETWORKS GRN USING EVOLUTIONARY COMPUTATION EC THE BOOK IS ORGANIZED INTO FOUR PARTS THAT DELIVER MATERIALS IN A WAY EQUALLY ATTRACTIVE FOR A READER WITH TRAINING IN COMPUTATION OR BIOLOGY EACH OF THESE SECTIONS AUTHORED BY WELL KNOWN RESEARCHERS AND EXPERIENCED PRACTITIONERS PROVIDES THE RELEVANT MATERIALS FOR THE INTERESTED READERS THE FIRST PART OF THIS BOOK CONTAINS AN INTRODUCTORY BACKGROUND TO THE FIELD THE SECOND PART PRESENTS THE EC APPROACHES FOR ANALYSIS AND RECONSTRUCTION OF GRN FROM GENE EXPRESSION DATA THE THIRD PART OF THIS BOOK COVERS THE CONTEMPORARY ADVANCEMENTS IN THE AUTOMATIC CONSTRUCTION OF GENE REGULATORY AND REACTION NETWORKS AND GIVES DIRECTION AND GUIDELINES FOR FUTURE RESEARCH FINALLY THE LAST PART OF THIS BOOK FOCUSES ON APPLICATIONS OF GRNS WITH EC IN OTHER FIELDS SUCH AS DESIGN ENGINEERING AND ROBOTICS PROVIDES A REFERENCE FOR CURRENT AND FUTURE RESEARCH IN GENE REGULATORY NETWORKS GRN USING EVOLUTIONARY COMPUTATION EC COVERS SUB DOMAINS OF GRN RESEARCH USING EC SUCH AS EXPRESSION PROFILE ANALYSIS REVERSE ENGINEERING GRN EVOLUTION APPLICATIONS CONTAINS USEFUL CONTENTS FOR COURSES IN GENE REGULATORY NETWORKS SYSTEMS BIOLOGY COMPUTATIONAL BIOLOGY AND SYNTHETIC BIOLOGY DELIVERS STATE OF THE ART RESEARCH IN GENETIC ALGORITHMS GENETIC PROGRAMMING AND SWARM INTELLIGENCE EVOLUTIONARY COMPUTATION IN GENE REGULATORY NETWORK RESEARCH IS A REFERENCE FOR RESEARCHERS AND PROFESSIONALS IN COMPUTER SCIENCE SYSTEMS BIOLOGY AND BIOINFORMATICS AS WELL AS UPPER UNDERGRADUATE GRADUATE AND POSTGRADUATE STUDENTS HITOSHI IBA IS A PROFESSOR IN THE DEPARTMENT OF INFORMATION AND COMMUNICATION ENGINEERING GRADUATE SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY AT THE UNIVERSITY OF TOKYO TOYKO JAPAN HE IS AN ASSOCIATE EDITOR OF THE IEEE TRANSACTIONS ON EVOLUTIONARY COMPUTATION AND THE JOURNAL OF GENETIC PROGRAMMING AND EVOLVABLE MACHINES NASIMUL NOMAN IS A LECTURER IN THE SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE AT THE UNIVERSITY OF NEWCASTLE NSW AUSTRALIA FROM 2002 TO 2012 HE WAS A FACULTY MEMBER AT THE UNIVERSITY OF DHAKA BANGLADESH NOMAN IS AN EDITOR OF THE BIOMED RESEARCH INTERNATIONAL JOURNAL HIS RESEARCH INTERESTS INCLUDE COMPUTATIONAL BIOLOGY SYNTHETIC BIOLOGY AND BIOINFORMATICS

Evolutionary Computation in Gene Regulatory Network Research

2008

THIS BOOK SERVES AS AN INTRODUCTION TO THE MYRIAD COMPUTATIONAL APPROACHES TO GENE REGULATORY MODELING AND ANALYSIS AND IS WRITTEN SPECIFICALLY WITH EXPERIMENTAL BIOLOGISTS IN MIND MATHEMATICAL JARGON IS AVOIDED AND EXPLANATIONS ARE GIVEN IN INTUITIVE TERMS IN CASES WHERE EQUATIONS ARE UNAVOIDABLE THEY ARE DERIVED FROM FIRST PRINCIPLES OR AT THE VERY LEAST AN INTUITIVE DESCRIPTION IS PROVIDED EXTENSIVE EXAMPLES AND A LARGE NUMBER OF MODEL DESCRIPTIONS ARE PROVIDED FOR USE IN BOTH CLASSROOM EXERCISES AS WELL AS SELF GUIDED EXPLORATION AND LEARNING AS SUCH THE BOOK IS IDEAL FOR SELF LEARNING AND ALSO AS THE BASIS OF A SEMESTER LONG COURSE FOR UNDERGRADUATE AND GRADUATE STUDENTS IN MOLECULAR BIOLOGY BIOENGINEERING GENOME SCIENCES OR SYSTEMS BIOLOGY

Computational Modeling of Gene Regulatory Networks

2023-11-07

THIS VOLUME DETAILS THE DEVELOPMENT OF UPDATED DRY LAB AND WET LAB BASED METHODS FOR THE RECONSTRUCTION OF GENE REGULATORY NETWORKS GRN CHAPTERS GUIDE READERS THROUGH CULPRIT GENES IN SILICO DRUG DISCOVERY TECHNIQUES GENOME WIDE CHIP X DATA HIGH THROUGHPUT TRANSCRIPTOMIC DATA EXOME SEQUENCING NEXT GENERATION SEQUENCING FUORESCENCE SPECTROSCOPY DATA ANALYSIS IN BIOINFORMATICS COMPUTATIONAL BIOLOGY AND S SYSTEM BASED MODELING OF GRN WRITTEN IN THE HIGHLY SUCCESSFUL METHODS IN MOLECULAR BIOLOGY SERIES FORMAT CHAPTERS INCLUDE INTRODUCTIONS TO THEIR RESPECTIVE TOPICS LISTS OF THE NECESSARY MATERIALS AND REAGENTS STEP BY STEP READILY REPRODUCIBLE LABORATORY PROTOCOLS AND KEY TIPS ON TROUBLESHOOTING AND AVOIDING KNOWN PITFALLS AUTHORITATIVE AND CUTTING EDGE REVERSE ENGINEERING OF REGULATORY NETWORKS AIMS TO BE A USEFUL AND PRACTICAL GUIDE TO NEW RESEARCHERS AND EXPERTS LOOKING TO EXPAND THEIR KNOWLEDGE

Reverse Engineering of Regulatory Networks

2022-10-20

THIS BOOK COVERS VARIOUS STATE OF THE ART TECHNIQUES REGARDING THE ASSOCIATIONS BETWEEN TRANSCRIPTION FACTORS TFS AND GENES WITH A FOCUS ON PROVIDING METHODOLOGICAL AND PRACTICAL REFERENCES FOR RESEARCHERS THE CONTENTS COVER DIVERSE PROTOCOLS AND SUMMARIES OF TFS INCLUDING SCREENING OF TF DNA INTERACTIONS DETECTION OF OPEN CHROMATIN REGIONS IDENTIFICATION OF EPIGENETIC REGULATIONS ENGINEERING TFS WITH GENOME

EDITING TOOLS DETECTION OF TRANSCRIPTIONAL ACTIVITIES COMPUTATIONAL ANALYSIS OF TF NETWORKS FUNCTIONS AND DRUGGABILITIES OF TFS IN BIOMEDICAL RESEARCH AND MUCH MORE WRITTEN FOR THE HIGHLY SUCCESSFUL METHODS IN MOLECULAR BIOLOGY SERIES CHAPTERS FEATURE THE KIND OF DETAILED IMPLEMENTATION ADVICE FROM THE EXPERTS TO ENSURE SUCCESSFUL RESEARCH RESULTS AUTHORITATIVE AND CUTTING EDGE TRANSCRIPTION FACTOR REGULATORY NETWORKS AIMS TO BENEFIT READERS WHO ARE INTERESTED IN USING STATE OF THE ART TECHNIQUES TO STUDY TFS AND THEIR MYRIAD EFFECTS IN CELLULAR LIFE

Transcription Factor Regulatory Networks

2009-03-04

STEM CELLS APPEAR TO BE FUNDAMENTAL CELLULAR UNITS ASSOCIATED WITH THE ORIGIN OF MULTICELLULAR ORGANISMS AND HAVE EVOLVED TO FUNCTION IN SAFEGUARDING THE CELLULAR HOMEOSTASIS IN ORGAN T SUES THE CHARACTERISTICS OF STEM CELLS THAT DISTINGUISH THEM FROM OTHER CELLS HAVE BEEN THE FASCINATING SUBJECTS OF STEM CELL RESEARCH THE IMPORTANT PROPERTIES OF STEM CELLS SUCH AS MA TENANCE OF QUIESCENCE SELF RENEWAL CAPACITY AND DIFFERENTIATION POTENTIAL HAVE PROPELLED THIS EXCITING ELD AND PRESENTLY FORM A COMMON THEME OF RESEARCH IN DEVELOPMENTAL BIOLOGY AND MEDICINE THE DERIVATION OF PLURIPOTENT EMBRYONIC STEM CELLS THE PROSPECTIVE IDENTI CATION OF MULTIPOTENT ADULT STEM CELLS AND MORE RECENTLY THE INDUCED PLURIPOTENT STEM CELLS POPULARLY CALLED IPS ARE IMPORTANT MILESTONES IN THE ARENA OF STEM CELL BIOLOGY COMPLEX NETWORKS OF TRANSCRIPTION FACTORS DIFFERENT SIGNALING MOLECULES AND THE INTERACTION OF GENETIC AND EPI NETIC EVENTS CONSTANTLY MODULATE STEM CELL BEHAVIOR TO EVOKE PROGRAMMING AND REPROGRAMMING PROCESSES IN NORMAL TISSUE HOMEOSTASIS DURING DEVELOPMENT IN ANY GIVEN CELLULAR SCENARIO THE REGULATORY NETWORKS CAN POSE CONSIDERABLE COMPLEXITY AND YET EXERT AN ORDERLY CONTROL OF STEM CELL DIFFERENTIATION DURING NORMAL DEVELOPMENT AN ABERRATION IN THESE NELY TUNED PROCESSES DURING DEVELOPMENT USUALLY RESULTS IN A SPECTRUM OF DISEASES SUCH AS CANCERS AND NEUROLOGICAL DISORDERS THISUNDERSCORESTHEIMMINENTNEEDFORAMORECOMPLETEUNDERSTANDINGOFMOLECULAR MECHANISMS UNDERLYING THE REGULATORY CIRCUITRIES REQUIRED FOR STEM CELL MAINTENANCE OVERTHEPAST$3\ 5$YEARS ADIVERSEGROUPOFBENCHANDPHYSICIANSCIENTISTSHAVEPROSPECTIVELY ENHANCED OUR KNOWLEDGE OF STEM CELL BIOLOGY THESE STUDIES ARE UNVEILING MANY UNRECOGNIZED OR PREVIOUSLY UNKNOWN FUNDAMENTALS OF DEVELOPMENTAL BIOLOGY

Regulatory Networks in Stem Cells

2010-01-01

THIS IS THE FIRST COMPREHENSIVE TREATMENT OF PROBABILISTIC BOOLEAN NETWORKS PBNS AN IMPORTANT MODEL CLASS FOR STUDYING GENETIC REGULATORY NETWORKS THIS BOOK COVERS BASIC MODEL PROPERTIES INCLUDING THE RELATIONSHIPS BETWEEN NETWORK STRUCTURE AND DYNAMICS STEADY STATE ANALYSIS AND RELATIONSHIPS TO OTHER MODEL CLASSES RESEARCHERS IN MATHEMATICS COMPUTER SCIENCE AND ENGINEERING ARE EXPOSED TO IMPORTANT APPLICATIONS IN SYSTEMS BIOLOGY AND PRESENTED WITH AMPLE OPPORTUNITIES FOR DEVELOPING NEW APPROACHES AND METHODS THE BOOK IS ALSO APPROPRIATE FOR ADVANCED UNDERGRADUATES GRADUATE STUDENTS AND SCIENTISTS WORKING IN THE FIELDS OF COMPUTATIONAL BIOLOGY GENOMIC SIGNAL PROCESSING CONTROL AND SYSTEMS THEORY AND COMPUTER SCIENCE

Probabilistic Boolean Networks

2007-05-01

GENE REGULATORY NETWORKS ARE COMPOSED OF MOLECULAR REGULATORS SUCH AS TRANSCRIPTION FACTORS WHICH BIND SHORT NON CODING DNA SEQUENCES THESE SEQUENCES ARE ALSO CALLED CIS REGULATORY ELEMENTS AND ARE LOCATED IN THE PROMOTER REGION OF A GENE TRANSCRIPTION REGULATORS FORM AN INTERCONNECTED REGULATORY NETWORK WHICH INTEGRATES ENDOGENOUS AND ENVIRONMENTAL SIGNALS INTO CHANGES IN GENE EXPRESSION GENE REGULATORY NETWORKS PROVIDE AN INSIGHT ABOUT ORGANIZATION OF PLANT CELLS AND THEIR FUNCTIONS THEY CONSIST OF THOUSANDS OF CONNECTIONS BETWEEN THE TARGET GENES AND TRANSCRIPTION FACTORS TOGETHER THEY REGULATE MANY CELLULAR FUNCTIONS THEY ALSO HELP IN UNDERSTANDING THE REGULATION OF GENES UNDER VARIOUS CONDITIONS THE BOOK STUDIES ANALYSES AND UPHOLDS THE PILLARS OF GENE REGULATORY NETWORKS AND ITS UTMOST SIGNIFICANCE IN MODERN TIMES FROM THEORIES TO RESEARCH TO PRACTICAL APPLICATIONS CASE STUDIES RELATED TO ALL CONTEMPORARY TOPICS OF RELEVANCE TO THIS FIELD HAVE BEEN INCLUDED HEREIN AS THIS FIELD IS EMERGING AT A RAPID PACE THE CONTENTS OF THIS BOOK WILL HELP THE READERS UNDERSTAND THE MODERN CONCEPTS AND APPLICATIONS OF THE SUBJECT

Genetic Regulatory Networks

2021-11-16

REGULATORY NETWORKS ENABLE BACTERIA TO ADAPT TO ALMOST EVERY ENVIRONMENTAL NICHE ON EARTH REGULATION IS ACHIEVED BY A NETWORK OF INTERACTIONS AMONG DIVERSE TYPES OF MOLECULES INCLUDING DNA RNA PROTEINS AND METABOLITES THE PRIMARY ROLE OF REGULATORY NETWORKS IN BACTERIA IS TO CONTROL THE RESPONSE TO ENVIRONMENTAL CHANGES SUCH AS NUTRITIONAL STATUS AND ENVIRONMENTAL STRESS A COMPLEX ORGANIZATION OF NETWORKS ALLOWS THE ORGANISM TO COORDINATE AND INTEGRATE MULTIPLE ENVIRONMENTAL SIGNALS RENOWNED AUTHORS UNDER THE EXPERT GUIDANCE OF THE EDITOR ALAIN A M FILLOUX HAVE CONTRIBUTED AUTHORITATIVE UP TO DATE REVIEWS OF THE CURRENT RESEARCH AND THEORIES ON REGULATORY NETWORKS IN BACTERIA THE VOLUME CONTAINS CRITICAL REVIEWS WRITTEN BY THE LEADING RESEARCH SCIENTISTS IN THIS TOPICAL FIELD THE AUTHORS FULLY EXPLORE VARIOUS REGULATORY NETWORKS DISCUSS VARIATIONS OF COMMON THEMES AND PROVIDE FRESH INSIGHTS INTO BACTERIAL REGULATORY MECHANISMS TOPICS INCLUDE THE SIGMA NETWORK IN ESCHERICHIA COLI CONTROL OF BACTERIAL VIRULENCE ECF SIGMA FACTORS QUORUM SENSING CYCLIC DI GMP RNA MEDIATED REGULATION THE H NS REGULATOR TWO COMPONENT REGULATORY SYSTEMS BACTERIAL CHEMOTAXIS REGULATION OF IRON HOMEOSTASIS ANAEROBIC REGULATORY NETWORKS BACTERIAL BISTABLE REGULATORY NETWORKS AND EVOLUTION OF TRANSCRIPTION FACTORS AND REGULATORY NETWORKS THIS BOOK IS ESSENTIAL READING FOR EVERYONE INTERESTED IN GENE EXPRESSION AND REGULATION IN BACTERIA AND IS A RECOMMENDED TEXT FOR ALL MICROBIOLOGY LIBRARIES

Plant Development: Role of Gene Regulatory Networks

2012

THIS BOOK DISCUSSES TOPICS RELATED TO THE TOPOLOGICAL STRUCTURE AND BIOLOGICAL FUNCTION OF GENE NETWORKS REGULATED BY MICRORNAS IT FOCUSES ON ANALYZING THE RELATION BETWEEN TOPOLOGICAL STRUCTURE AND BIOLOGICAL FUNCTION APPLYING THESE THEORETICAL RESULTS TO GENE NETWORKS INVOLVING MICRORNA ILLUSTRATING THEIR BIOLOGICAL MECHANISMS AND IDENTIFYING THE ROLES OF MICRORNA IN CONTROLLING VARIOUS PHENOMENA EMERGING FROM THE NETWORKS IN ADDITION THE BOOK EXPLAINS HOW TO CONTROL THE COMPLEX BIOLOGICAL PHENOMENA USING MATHEMATICAL TOOLS AND OFFERS A NEW PERSPECTIVE ON STUDYING MICRORNA IT IS A USEFUL RESOURCE FOR GRADUATE STUDENTS AND RESEARCHERS WHO ARE WORKING ON OR INTERESTED IN MICRORNAS AND GENE NETWORK

Bacterial Regulatory Networks

2018-11-02

IN THIS BOOK AN INTERDISCIPLINARY APPROACH COMBINING DYNAMIC QUANTITATIVE MEASUREMENTS WITH MATHEMATICAL MODELLING IS USED TO SOLVE TWO DIFFERENT PROBLEMS IN MOLECULAR IMMUNOLOGY IN THE FIRST PART STRUCTURE AND FUNCTION OF THE GENE REGULATORY NETWORK THAT CONTROLS DIFFERENTIATION OF TYPE I T HELPER TH1 CELLS IS INVESTIGATED BY DETERMINING THE NETWORK STRUCTURE THROUGH AN ITERATIVE PROCESS OF MODELLING AND EXPERIMENTS THE AUTHOR SHOWS THAT TH1 DIFFERENTIATION PROCEEDS IN TWO STEPS IN THE EARLY EFFECTOR PHASE THE TH1 MASTER TRANSCRIPTION FACTOR T BET IS CONTROLLED BY AN INTERFERON DEPENDENT POSITIVE FEEDBACK LOOP WHILE IN THE LATER PHASE A SECOND IL 12 DEPENDENT FEEDBACK MAINTAINS T BET EXPRESSION THE ANTIGEN SIGNAL ACTS AS A SWITCH BETWEEN THE TWO PATHWAYS MOREOVER IT IS SHOWN THAT ONLY T BET EXPRESSION IN THE LATE PHASE IS PREDICTIVE OF THE SUCCESS OF THE DIFFERENTIATION PROCESS SINCE T BET EXPRESSION IN THE LATE PHASE REQUIRES IL 12 STIMULATION THIS WORK UNCOVERS THE MOLECULAR MECHANISMS BEHIND THE UNIQUE ROLE OF IL 12 IN TH1 DIFFERENTIATION IN THE SECOND PART REGULATION OF THE TRANSCRIPTION FACTOR NFAT THAT MEDIATES ANTIGENIC STIMULATION IN T CELLS IS INVESTIGATED NFAT IS ACTIVATED BY NUCLEAR IMPORT UPON DEPHOSPHORYLATION OF MULTIPLE RESIDUES BASED ON SIMULTANEOUS MEASUREMENTS OF NFAT SUBCELLULAR LOCALIZATION AND PHOSPHORYLATION A QUANTITATIVE MATHEMATICAL MODEL OF THE NFAT REGULATORY NETWORK IS DEVELOPED AND THE UNDERLYING DESIGN PRINCIPLES ARE ANALYZED IN SUMMARY THE STUDY EXEMPLIFIES THE NECESSITY OF A DYNAMIC ANALYSIS AT THE SYSTEMS LEVEL TO UNDERSTAND COMPLEX BIOLOGICAL PROCESSES

MicroRNA Regulatory Network: Structure and Function

2010

TRANSCRIPTION FACTOR REGULATORY METHODS DETAILS VARIOUS TECHNIQUES RANGING FROM CUTTING EDGE TO GENERAL TECHNIQUES USE TO STUDY TRANSCRIPTION FACTOR REGULATORY NETWORKS WRITTEN IN THE HIGHLY SUCCESSFUL METHODS IN MOLECULAR BIOLOGY SERIES FORMAT CHAPTERS INCLUDE INTRODUCTIONS TO THEIR RESPECTIVE TOPICS LISTS OF THE NECESSARY MATERIALS AND REAGENTS STEP BY STEP READILY REPRODUCIBLE LABORATORY PROTOCOLS AND KEY TIPS ON TROUBLESHOOTING AND AVOIDING KNOWN PITFALLS AUTHORITATIVE AND PRACTICAL TRANSCRIPTION FACTOR REGULATORY METHODS AIDS SCIENTISTS IN THE FURTHER STUDY INTO POST GENOMIC OR THE PERSONAL GENOMIC ERA

Experimental and Mathematical Analysis of Regulatory Networks in T-helper Lymphocytes

2014-06-14

INTEGRATION AND VISUALIZATION OF GENE SELECTION AND GENE REGULATORY NETWORKS FOR CANCER GENOME HELPS READERS IDENTIFY AND SELECT THE SPECIFIC GENES CAUSING ONCOGENES THE BOOK ALSO ADDRESSES THE VALIDATION OF THE SELECTED GENES USING VARIOUS CLASSIFICATION TECHNIQUES AND PERFORMANCE METRICS MAKING IT A VALUABLE SOURCE FOR CANCER RESEARCHERS BIOINFORMATICIANS AND RESEARCHERS FROM DIVERSE FIELDS INTERESTED IN APPLYING SYSTEMS BIOLOGY APPROACHES TO THEIR STUDIES PROVIDES WELL DESCRIBED TECHNIQUES FOR THE PURPOSE OF GENE SELECTION FEATURE SELECTION FOR THE GENERATION OF GENE SUBSETS PRESENTS AND ANALYZES THREE DIFFERENT TYPES OF GENE SELECTION ALGORITHMS SUPPORT VECTOR MACHINE BAYESIAN T TEST RECURSIVE FEATURE ELIMINATION SVM BT RFE CANONICAL CORRELATION ANALYSIS TRACE RATIO CCA TR AND SIGNAL TO NOISE RATIO TRACE RATIO SNRTR CONSOLIDATES FUNDAMENTAL KNOWLEDGE ON GENE DATASETS AND CURRENT TECHNIQUES ON GENE REGULATORY NETWORKS INTO A SINGLE RESOURCE

Transcription Factor Regulatory Networks

2018-05-09

KEY INTRODUCTORY TEXT FOR GRADUATE STUDENTS AND RESEARCHERS IN PHYSICS BIOLOGY AND BIOCHEMISTRY

Integration and Visualization of Gene Selection and Gene Regulatory Networks for Cancer Genome

2010-05-13

THE AUTHORS EXPLORE REGULATORY NETWORKS IN A WIDE RANGE OF PROKARYOTES INCLUDING ORGANISMS THAT HAVE ONLY RECENTLY BEEN INVESTIGATED AT THE MOLECULAR LEVEL

Networks in Cell Biology

2003

THIS BOOK OFFERS AN ESSENTIAL INTRODUCTION TO THE LATEST ADVANCES IN DELAYED GENETIC REGULATORY NETWORKS GRNS AND PRESENTS CUTTING EDGE WORK ON THE ANALYSIS AND DESIGN OF DELAYED GRNS IN WHICH THE SYSTEM PARAMETERS ARE SUBJECT TO UNCERTAIN STOCHASTIC AND OR PARAMETER VARYING CHANGES SPECIFICALLY THE TYPES EXAMINED INCLUDE DELAYED SWITCHING GRNS DELAYED STOCHASTIC GRNS DELAYED REACTION DIFFUSION GRNS DELAYED DISCRETE TIME GRNS ETC IN ADDITION THE SOLVABILITY OF STABILITY ANALYSIS CONTROL AND ESTIMATION PROBLEMS INVOLVING DELAYED GRNS ARE ADDRESSED IN TERMS OF LINEAR MATRIX INEQUALITY OR M MATRIX TESTS THE BOOK OFFERS A COMPREHENSIVE REFERENCE GUIDE FOR RESEARCHERS AND PRACTITIONERS WORKING IN SYSTEM SCIENCES AND APPLIED MATHEMATICS AND A VALUABLE SOURCE OF INFORMATION FOR SENIOR UNDERGRADUATES AND GRADUATES IN THESE AREAS FURTHER IT ADDRESSES A GAP IN THE LITERATURE BY PROVIDING A UNIFIED AND CONCISE FRAMEWORK FOR THE ANALYSIS AND DESIGN OF DELAYED GRNS

Regulatory Networks in Prokaryotes

2019-04-11

ALTERNATIVE TECHNIQUES AND TOOLS FOR ANALYZING BIOMOLECULAR NETWORKS WITH THE RECENT RAPID ADVANCES IN MOLECULAR BIOLOGY HIGH THROUGHPUT EXPERIMENTAL METHODS HAVE RESULTED IN ENORMOUS AMOUNTS OF DATA THAT CAN BE USED TO STUDY BIOMOLECULAR NETWORKS IN LIVING ORGANISMS WITH THIS DEVELOPMENT HAS COME RECOGNITION OF THE FACT THAT A COMPLICATED LIVING ORGANISM CANNOT BE FULLY UNDERSTOOD BY MERELY ANALYZING INDIVIDUAL COMPONENTS RATHER IT IS THE INTERACTIONS OF COMPONENTS OR BIOMOLECULAR NETWORKS THAT ARE ULTIMATELY RESPONSIBLE FOR AN ORGANISM S FORM AND FUNCTION THIS BOOK ADDRESSES THE IMPORTANT NEED FOR A NEW SET OF COMPUTATIONAL TOOLS TO REVEAL ESSENTIAL BIOLOGICAL MECHANISMS FROM A SYSTEMS BIOLOGY APPROACH READERS WILL GET COMPREHENSIVE COVERAGE OF ANALYZING BIOMOLECULAR NETWORKS IN CELLULAR SYSTEMS BASED ON AVAILABLE EXPERIMENTAL DATA WITH AN EMPHASIS ON THE ASPECTS OF NETWORK SYSTEM INTEGRATION AND ENGINEERING EACH TOPIC IS TREATED IN DEPTH WITH SPECIFIC BIOLOGICAL PROBLEMS AND NOVEL COMPUTATIONAL METHODS GENE NETWORKS TRANSCRIPTIONAL REGULATION RECONSTRUCTION OF GENE REGULATORY NETWORKS AND INFERENCE OF TRANSCRIPTIONAL REGULATORY NETWORKS PROTEIN INTERACTION NETWORKS PREDICTION OF PROTEIN PROTEIN INTERACTIONS TOPOLOGICAL STRUCTURE OF BIOMOLECULAR NETWORKS ALIGNMENT OF BIOMOLECULAR NETWORKS AND NETWORK BASED PREDICTION OF PROTEIN FUNCTION METABOLIC NETWORKS AND

SIGNALING NETWORKS ANALYSIS RECONSTRUCTION AND APPLICATIONS OF METABOLIC NETWORKS MODELING AND INFERENCE OF SIGNALING NETWORKS AND OTHER TOPICS AND NEW TRENDS IN ADDITION TO THEORETICAL RESULTS AND METHODS MANY COMPUTATIONAL SOFTWARE TOOLS ARE REFERENCED AND AVAILABLE FROM THE AUTHORS SITES BIOMOLECULAR NETWORKS IS AN INDISPENSABLE REFERENCE FOR RESEARCHERS AND GRADUATE STUDENTS IN BIOINFORMATICS COMPUTATIONAL BIOLOGY SYSTEMS BIOLOGY COMPUTER SCIENCE AND APPLIED MATHEMATICS

Analysis and Design of Delayed Genetic Regulatory Networks

2009-06-29

HOWEVER THE FAST AND DEVELOPMENT IN DNA SEQUENCING AND HIGH THROUGHPUT TECHNOLOGY MOST OF THE SIMPLE BIOLOGICAL PROCESS EVEN IN PROKARYOTIC CELLS ARE NOT FULLY UNDERSTOOD THIS IS BECAUSE GENES AS WELL AS THEIR PRODUCTS PROTEINS DO NOT WORK INDEPENDENTLY THEY INTERACT WITH EACH OTHER AND FORM A COMPLICATED NETWORK WHICH IS CALLED THE GENE REGULATORY NETWORKS GRN GRN HELP US TO UNDERSTAND THE DISEASE ONTOLOGY AND TO REDUCE THE COST OF DRUG DEVELOPMENT RECENTLY RESEARCHERS FROM CALTECH ARE ABLE TO ANSWER SOME OF THE DIFFICULT AND AMBIGUOUS BIOLOGICAL QUESTIONS BY UNLOCKING THE SECRETS OF THE GENE REGULATORY NETWORKS DURING THE LAST DECADE MANY GRN CONSTRUCTION ALGORITHMS HAVE BEEN DEVELOPED IN THIS BOOK WE SIMPLIFIED GRN CONSTRUCTION STEPS ENUMERATE SOME OF IMPORTANT AVAILABLE TOOLS AND DISCUSES GRN CHALLENGES AND FUTURE PERSPECTIVE

Biomolecular Networks

2010

STEM CELLS APPEAR TO BE FUNDAMENTAL CELLULAR UNITS ASSOCIATED WITH THE ORIGIN OF MULTICELLULAR ORGANISMS AND HAVE EVOLVED TO FUNCTION IN SAFEGUARDING THE CELLULAR HOMEOSTASIS IN ORGAN T SUES THE CHARACTERISTICS OF STEM CELLS THAT DISTINGUISH THEM FROM OTHER CELLS HAVE BEEN THE FASCINATING SUBJECTS OF STEM CELL RESEARCH THE IMPORTANT PROPERTIES OF STEM CELLS SUCH AS MA TENANCE OF QUIESCENCE SELF RENEWAL CAPACITY AND DIFFERENTIATION POTENTIAL HAVE PROPELLED THIS EXCITING ELD AND PRESENTLY FORM A COMMON THEME OF RESEARCH IN DEVELOPMENTAL BIOLOGY AND MEDICINE THE DERIVATION OF PLURIPOTENT EMBRYONIC STEM CELLS THE PROSPECTIVE IDENTI CATION OF MULTIPOTENT ADULT STEM CELLS AND MORE RECENTLY THE INDUCED PLURIPOTENT STEM CELLS POPULARLY CALLED IPS ARE IMPORTANT MILESTONES IN THE ARENA OF STEM CELL BIOLOGY COMPLEX NETWORKS OF TRANSCRIPTION FACTORS DIFFERENT SIGNALING MOLECULES AND THE INTERACTION OF GENETIC AND EPI NETIC EVENTS CONSTANTLY MODULATE STEM CELL BEHAVIOR TO EVOKE PROGRAMMING AND REPROGRAMMING PROCESSES IN NORMAL TISSUE HOMEOSTASIS DURING DEVELOPMENT IN ANY GIVEN CELLULAR SCENARIO THE REGULATORY NETWORKS CAN POSE CONSIDERABLE COMPLEXITY AND YET EXERT AN ORDERLY CONTROL OF STEM CELL DIFFERENTIATION DURING NORMAL DEVELOPMENT AN ABERRATION IN THESE NELY TUNED PROCESSES DURING DEVELOPMENT USUALLY RESULTS IN A SPECTRUM OF DISEASES SUCH AS CANCERS AND NEUROLOGICAL DISORDERS THISUNDERSCORESTHEIMMINENTNEEDFORAMORECOMPLETEUNDERSTANDINGOFMOLECULAR MECHANISMS UNDERLYING THE REGULATORY CIRCUITRIES REQUIRED FOR STEM CELL MAINTENANCE OVERTHEPAST3 5YEARS ADIVERSEGROUPOFBENCHANDPHYSICIANSCIENTISTSHAVEPROSPECTIVELY ENHANCED OUR KNOWLEDGE OF STEM CELL BIOLOGY THESE STUDIES ARE UNVEILING MANY UNRECOGNIZED OR PREVIOUSLY UNKNOWN FUNDAMENTALS OF DEVELOPMENTAL BIOLOGY

Gene Regulatory Networks Construction

2009-03-19

INFERRING GENE REGULATORY NETWORKS IS A DIFFICULT PROBLEM TO SOLVE DUE TO THE RELATIVE SCARCITY OF DATA COMPARED TO THE POTENTIAL SIZE OF THE NETWORKS WHILE RESEARCHERS HAVE DEVELOPED TECHNIQUES TO FIND SOME OF THE UNDERLYING NETWORK STRUCTURE THERE IS STILL NO ONE SIZE FITS ALL ALGORITHM FOR EVERY DATA SET NETWORK INFERENCE IN MOLECULAR BIOLOGY EXAMINES THE CURRENT TECHNIQUES USED BY RESEARCHERS AND PROVIDES KEY INSIGHTS INTO WHICH ALGORITHMS BEST FIT A COLLECTION OF DATA THROUGH A SERIES OF IN DEPTH EXAMPLES THE BOOK ALSO OUTLINES HOW TO MIX AND MATCH ALGORITHMS IN ORDER TO CREATE ONE TAILORED TO A SPECIFIC DATA SITUATION NETWORK INFERENCE IN MOLECULAR BIOLOGY IS INTENDED FOR ADVANCED LEVEL STUDENTS AND RESEARCHERS AS A REFERENCE GUIDE PRACTITIONERS AND PROFESSIONALS WORKING IN A RELATED FIELD WILL ALSO FIND THIS BOOK VALUABLE

Regulatory Networks in Stem Cells

2012-05-24

THIS BOOK ADDRESSES THE REGULATORY CAPACITY OF THE EU AS IT RESPONDS TO THE HUGE CHALLENGE OF REALIZING THE SINGLE MARKET IT EXPLORES ITS WEAKNESSES THE EU REGULATORY NETWORKS EXPERT COMMITTEES AND EU AGENCIES FORMED IN RESPONSE AND THE EXCEPTIONALLY LARGE AND COMPLEX TRANSNATIONAL REGULATORY SYSTEM WHICH HAS

RESULTED IT DEFINES THE EU REGULATORY SPACE AS A MULTI FACETED PHENOMENON OF INSTITUTIONAL EXPANSION WHOSE SHAPE VARIES ACROSS SECTORS AND CHANGES OVER TIME EMPIRICALLY BASED ON THE EXPLORATION OF HOW REGULATORY DELEGATION HAS EMERGED AND EVOLVED IN THREE KEY EU POLICIES FOOD SAFETY ELECTRICITY AND TELECOMMUNICATIONS THE BOOK DISENTANGLES AND LINKS TOGETHER THE FUNCTIONAL INSTITUTIONAL AND POWER DISTRIBUTIONAL FACTORS AND THEIR INTERPLAY OVER TIME INTO A UNIFIED EXPLANATION OF THE MANY FACES OF THE EU REGULATORY SPACE

Network Inference in Molecular Biology

2016-09-08

DURING THEIR LIFE CYCLE PLANTS UNDERGO A WIDE VARIETY OF MORPHOLOGICAL AND DEVELOPMENTAL CHANGES IMPINGING THESE DEVELOPMENTAL PROCESSES THERE IS A LAYER OF GENE PROTEIN AND METABOLIC NETWORKS THAT ARE RESPONSIBLE FOR THE INITIATION OF THE CORRECT DEVELOPMENTAL TRANSITIONS AT THE RIGHT TIME OF THE YEAR TO ENSURE PLANT LIFE SUCCESS NEW OMIC TECHNOLOGIES ARE ALLOWING THE ACQUISITION OF MASSIVE AMOUNT OF DATA TO DEVELOP HOLISTIC AND INTEGRATIVE ANALYSIS TO UNDERSTAND COMPLEX PROCESSES AMONG THEM MICROARRAY NEXT GENERATION SEQUENCING NGS AND PROTEOMICS ARE PROVIDING ENORMOUS AMOUNT OF DATA FROM DIFFERENT PLANT SPECIES AND DEVELOPMENTAL STAGES THUS ALLOWING THE ANALYSIS OF GENE NETWORKS GLOBALLY BESIDES THE COMPARISON OF MOLECULAR NETWORKS FROM DIFFERENT SPECIES IS PROVIDING INFORMATION ON THEIR EVOLUTIONARY HISTORY SHEDDING LIGHT ON THE ORIGIN OF MANY KEY GENES PROTEINS MOREOVER DEVELOPMENTAL PROCESSES ARE NOT ONLY GENETICALLY PROGRAMED BUT ARE ALSO AFFECTED BY INTERNAL AND EXTERNAL SIGNALS METABOLISM LIGHT HORMONE ACTION TEMPERATURE BIOTIC AND ABIOTIC STRESSES ETC HAVE A DEEP EFFECT ON DEVELOPMENTAL PROGRAMS THE INTERFACE AND INTERPLAY BETWEEN THESE INTERNAL AND EXTERNAL CIRCUITS WITH DEVELOPMENTAL PROGRAMS CAN BE UNRAVELED THROUGH THE INTEGRATION OF SYSTEMATIC EXPERIMENTATION WITH THE COMPUTATIONAL ANALYSIS OF THE GENERATED OMICS DATA MOLECULAR SYSTEMS BIOLOGY THIS RESEARCH TOPIC INTENDS TO DEEPEN IN THE DIFFERENT PLANT DEVELOPMENTAL PATHWAYS AND HOW THE CORRESPONDING GENE NETWORKS EVOLVED FROM A MOLECULAR SYSTEMS BIOLOGY PERSPECTIVE GLOBAL APPROACHES FOR PHOTOPERIOD CIRCADIAN CLOCK AND HORMONE REGULATED PROCESSES PATTERN FORMATION PHASE TRANSITIONS ORGAN DEVELOPMENT ETC WILL PROVIDE NEW INSIGHTS ON HOW PLANT COMPLEXITY WAS BUILT DURING EVOLUTION UNDERSTANDING THE INTERFACE AND INTERPLAY BETWEEN DIFFERENT REGULATORY NETWORKS WILL ALSO PROVIDE FUNDAMENTAL INFORMATION ON PLANT BIOLOGY AND FOCUS ON THOSE TRAITS THAT MAY BE IMPORTANT FOR NEXT GENERATION AGRICULTURE

Regulatory Delegation in the European Union

2018

GENETIC REGULATORY NETWORKS GRNS IN BIOLOGICAL ORGANISMS ARE PRIMARY ENGINES FOR CELLS TO ENACT THEIR ENGAGEMENTS WITH ENVIRONMENTS VIA INCESSANT CONTINUALLY ACTIVE COUPLING IN DIFFERENTIATED MULTICELLULAR ORGANISMS TREMENDOUS COMPLEXITY HAS ARISEN IN THE COURSE OF EVOLUTION OF LIFE ON EARTH ENGINEERING AND SCIENCE HAVE SO FAR ACHIEVED NO WORKING SYSTEM THAT CAN COMPARE WITH THIS COMPLEXITY DEPTH AND SCOPE OF ORGANIZATION ABSTRACTING THE DYNAMICS OF GENETIC REGULATORY CONTROL TO A COMPUTATIONAL FRAMEWORK IN WHICH ARTIFICIAL GRNS IN ARTIFICIAL SIMULATED CELLS DIFFERENTIATE WHILE CONNECTED IN A CHANGING TOPOLOGY IT IS POSSIBLE TO APPLY DARWINIAN EVOLUTION IN SILICO TO STUDY THE CAPACITY OF SUCH DEVELOPMENTAL DIFFERENTIATED GRNS TO EVOLVE IN THIS VOLUME AN EVOLUTIONARY GRN PARADIGM IS INVESTIGATED FOR ITS EVOLVABILITY AND ROBUSTNESS IN MODELS OF BIOLOGICAL CLOCKS IN SIMPLE DIFFERENTIATED MULTICELLULARITY AND IN EVOLVING ARTIFICIAL DEVELOPING ORGANISMS WHICH GROW AND EXPRESS AN ONTOGENY STARTING FROM A SINGLE CELL INTERACTING WITH ITS ENVIRONMENT EVENTUALLY INCLUDING A CHANGING LOCAL NEIGHBOURHOOD OF OTHER CELLS THESE METHODS MAY HELP US UNDERSTAND THE GENESIS ORGANIZATION ADAPTIVE PLASTICITY AND EVOLVABILITY OF DIFFERENTIATED BIOLOGICAL SYSTEMS AND MAY ALSO PROVIDE A PARADIGM FOR TRANSFERRING THESE PRINCIPLES OF BIOLOGY S SUCCESS TO COMPUTATIONAL AND ENGINEERING CHALLENGES AT A SCALE NOT PREVIOUSLY CONCEIVABLE

Evolution of Gene Regulatory Networks in Plant Development

2020

THE INFERENCE OF GENE REGULATORY NETWORKS IS OF GREAT INTEREST AND HAS VARIOUS APPLICATIONS THE RECENT ADVANCES IN HIGH THROUGHOUT BIOLOGICAL DATA COLLECTION HAVE FACILITATED THE CONSTRUCTION AND UNDERSTANDING OF GENE REGULATORY NETWORKS IN MANY MODEL ORGANISMS HOWEVER THE INFERENCE OF GENE NETWORKS FROM LARGE SCALE HUMAN GENOMIC DATA COULD BE CHALLENGING GENERALLY IT IS DIFFICULT TO IDENTIFY THE CORRECT REGULATORS FOR EACH GENE IN THE LARGE SEARCH SPACE GIVEN THAT THE HIGH DIMENSIONAL GENE EXPRESSION DATA ONLY PROVIDES SMALL NUMBER OF OBSERVATIONS FOR EACH GENE IN THIS THESIS WE PROPOSE A BAYESIAN APPROACH INTEGRATING EXTERNAL DATA SOURCES WITH KNOCKDOWN DATA FROM HUMAN CELL LINES TO INFER REGULATORY GENE NETWORKS IN PARTICULAR WE ASSEMBLE MULTIPLE DATA SOURCES INCLUDING GENE EXPRESSION DATA GENOME WIDE BINDING DATA GENE ONTOLOGY AND KNOWN PATHWAYS AND EMPLOY A SUPERVISED LEARNING FRAMEWORK TO COMPUTE PRIOR PROBABILITIES OF REGULATORY RELATIONSHIPS WE SHOW THAT OUR INTEGRATED METHOD IMPROVES

THE ACCURACY OF INFERRED GENE NETWORKS WE PRESENT OUR ASSESSMENT RESULTS AGAINST BENCHMARK METHOD AND DATA IN DIFFERENT FORMS FIGURES GRAPHS AND TABLES WE ILLUSTRATE OUR RESULTS IN TWO DIFFERENT HUMAN CELL LINES AND DEMONSTRATE THE GENERALITY OF OUR RESULTS

The Complexity of Gene Regulatory Networks in a Photosynthetic Model Organism

2012-08-14

THIS BOOK PROVIDES METHODS AND TECHNIQUES USED IN CONSTRUCTION OF GLOBAL TRANSCRIPTIONAL REGULATORY NETWORKS IN DIVERSE SYSTEMS VARIOUS LAYERS OF GENE REGULATION AND MATHEMATICAL AS WELL AS COMPUTATIONAL MODELING OF TRANSCRIPTIONAL GENE REGULATION WRITTEN IN THE HIGHLY SUCCESSFUL METHODS IN MOLECULAR BIOLOGY SERIES FORMAT CHAPTERS INCLUDE INTRODUCTIONS TO THEIR RESPECTIVE TOPICS LISTS OF THE NECESSARY MATERIALS AND REAGENTS STEP BY STEP READILY REPRODUCIBLE LABORATORY PROTOCOLS AND TIPS ON TROUBLESHOOTING AND AVOIDING KNOWN PITFALLS AUTHORITATIVE AND CUTTING EDGE MODELING TRANSCRIPTIONAL REGULATION METHODS AND PROTOCOLS AIMS TO PROVIDE AN IN DEPTH UNDERSTANDING OF NEW TECHNIQUES IN TRANSCRIPTIONAL GENE REGULATION FOR SPECIALIZED AUDIENCE

Computational Genetic Regulatory Networks: Evolvable, Self-organizing Systems

2017

RENOWNED AUTHORS UNDER THE EXPERT GUIDANCE OF THE EDITOR ALAIN A M FILLOUX HAVE CONTRIBUTED AUTHORITATIVE UP TO DATE REVIEWS OF THE CURRENT RESEARCH AND THEORIES ON REGULATORY NETWORKS IN BACTERIA THE VOLUME CONTAINS CRITICAL REVIEWS WRITTEN BY THE LEADING RESEARCH SCIENTISTS IN THIS TOPICAL FIELD THE AUTHORS FULLY EXPLORE VARIOUS REGULATORY NETWORKS DISCUSS VARIATIONS OF COMMON THEMES AND PROVIDE FRESH INSIGHTS INTO BACTERIAL REGULATORY MECHANISMS TOPICS INCLUDE THE SIGMA NETWORK IN ESCHERICHIA COLI CONTROL OF BACTERIAL VIRULENCE ECF SIGMA FACTORS QUORUM SENSING CYCLIC DI GMP RNA

Integrating External Biological Knowledge in the Construction of Regulatory Networks from LINCS Data

2022-07-27

THIS BOOK PRESENTS RECENT METHODS FOR SYSTEMS GENETICS SG DATA ANALYSIS APPLYING THEM TO A SUITE OF SIMULATED SG BENCHMARK DATASETS EACH OF THE CHAPTER AUTHORS RECEIVED THE SAME DATASETS TO EVALUATE THE PERFORMANCE OF THEIR METHOD TO BETTER UNDERSTAND WHICH ALGORITHMS ARE MOST USEFUL FOR OBTAINING RELIABLE MODELS FROM SG DATASETS THE KNOWLEDGE GAINED FROM THIS BENCHMARKING STUDY WILL ULTIMATELY ALLOW THESE ALGORITHMS TO BE USED WITH CONFIDENCE FOR SG STUDIES E G OF COMPLEX HUMAN DISEASES OR FOOD CROP IMPROVEMENT THE BOOK IS PRIMARILY INTENDED FOR RESEARCHERS WITH A BACKGROUND IN THE LIFE SCIENCES NOT FOR COMPUTER SCIENTISTS OR STATISTICIANS

Modeling Transcriptional Regulation

2012

A PROPOSAL FOR A NEW MODEL OF THE EVOLUTION OF GENE REGULATION NETWORKS AND DEVELOPMENT THAT DRAWS ON WORK FROM ARTIFICIAL INTELLIGENCE AND PHILOSOPHY OF MIND EACH OF US IS A COLLECTION OF MORE THAN TEN TRILLION CELLS BUSY PERFORMING TASKS CRUCIAL TO OUR CONTINUED EXISTENCE GENE REGULATION NETWORKS CONSISTING OF A SUBSET OF GENES CALLED TRANSCRIPTION FACTORS CONTROL CELLULAR ACTIVITY PRODUCING THE RIGHT GENE ACTIVITIES FOR THE MANY SITUATIONS THAT THE MULTIPLICITY OF CELLS IN OUR BODIES FACE GENES WORKING TOGETHER MAKE UP A TRULY INGENIOUS SYSTEM IN THIS BOOK ROGER SANSOM INVESTIGATES HOW GENE REGULATION WORKS AND HOW SUCH A REFINED BUT SIMPLE SYSTEM EVOLVED SANSOM DESCRIBES IN DETAIL TWO FRAMEWORKS FOR UNDERSTANDING GENE REGULATION THE FIRST DEVELOPED BY THE THEORETICAL BIOLOGIST STUART KAUFFMAN HOLDS THAT GENE REGULATION NETWORKS ARE FUNDAMENTALLY SYSTEMS THAT REPEAT PATTERNS OF GENE EXPRESSION SANSOM FINDS KAUFFMAN S FRAMEWORK AN INADEQUATE EXPLANATION FOR HOW CELLS OVERCOME THE DIFFICULTY OF DEVELOPMENT SANSOM PROPOSES AN ALTERNATIVE THE CONNECTIONIST FRAMEWORK DRAWING ON WORK FROM ARTIFICIAL INTELLIGENCE AND PHILOSOPHY OF MIND HE ARGUES THAT THE KEY LIES IN HOW MULTIPLE TRANSCRIPTION FACTORS COMBINE TO REGULATE A SINGLE GENE ACTING IN A WAY THAT IS QUALITATIVELY CONSISTENT THIS ALLOWS THE EXPRESSION OF GENES TO BE FINELY TUNED TO THE VARIABLE MICROENVIRONMENTS OF CELLS BECAUSE OF THE NATURE OF BOTH DEVELOPMENT AND ITS EVOLUTION WE CAN GAIN INSIGHT INTO THE DEVELOPMENTAL PROCESS WHEN WE IDENTIFY GENE REGULATION NETWORKS AS THE CONTROLLERS OF DEVELOPMENT THE INGENUITY OF GENES IS EXPLAINED BY

HOW GENE REGULATION NETWORKS EVOLVE TO CONTROL DEVELOPMENT

Bacterial Regulatory Networks

2014-01-03

THE BOOLEAN NETWORK BN IS A MATHEMATICAL MODEL OF GENETIC NETWORKS AND OTHER BIOLOGICAL NETWORKS ALTHOUGH EXTENSIVE STUDIES HAVE BEEN DONE ON BNS FROM A VIEWPOINT OF COMPLEX SYSTEMS NOT SO MANY STUDIES HAVE BEEN UNDERTAKEN FROM A COMPUTATIONAL VIEWPOINT THIS BOOK PRESENTS RIGOROUS ALGORITHMIC RESULTS ON IMPORTANT COMPUTATIONAL PROBLEMS ON BNS WHICH INCLUDE INFERENCE OF A BN DETECTION OF SINGLETON AND PERIODIC ATTRACTORS IN A BN AND CONTROL OF A BN THIS BOOK ALSO PRESENTS ALGORITHMIC RESULTS ON FUNDAMENTAL COMPUTATIONAL PROBLEMS ON PROBABILISTIC BOOLEAN NETWORKS AND A BOOLEAN MODEL OF METABOLIC NETWORKS ALTHOUGH MOST CONTENTS OF THE BOOK ARE BASED ON THE WORK BY THE AUTHOR AND COLLABORATORS OTHER IMPORTANT COMPUTATIONAL RESULTS AND TECHNIQUES ARE ALSO REVIEWED OR EXPLAINED CONTENTS PRELIMINARIES BOOLEAN NETWORKS DETECTION OF ATTRACTORS DETECTION OF SINGLETON ATTRACTORS DETECTION OF PERIODIC ATTRACTORS IDENTIFICATION OF BOOLEAN NETWORKS CONTROL OF BOOLEAN NETWORKS PREDECESSOR AND OBSERVABILITY PROBLEMS SEMI TENSOR PRODUCT APPROACH ANALYSIS OF METABOLIC NETWORKS PROBABILISTIC BOOLEAN NETWORKS IDENTIFICATION OF PROBABILISTIC BOOLEAN NETWORKS CONTROL OF PROBABILISTIC BOOLEAN NETWORKS READERSHIP GRADUATE STUDENTS AND RESEARCHERS WORKING ON STRING THEORY AND RELATED TOPICS KEYWORDS BOOLEAN NETWORKS BIOINFORMATICS SYSTEMS BIOLOGY COMBINATORIAL ALGORITHMS ATTRACTORSREVIEW KEY FEATURES UNIQUE BOOK FOCUSING ON COMPUTATIONAL ASPECTS OF BOOLEAN NETWORKS PROVIDE COMPUTATIONAL FOUNDATIONS ON BOOLEAN NETWORKS CONTAIN RECENT AND UP TO DATE RESULTS ON ALGORITHMS FOR BOOLEAN NETWORKS

Gene Network Inference

2011

Inference of gene-regulatory networks in primary human hepatocytes

2011-09-30

Ingenious Genes

2018-02-13

Algorithms For Analysis, Inference, And Control Of Boolean Networks

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