

<<生物数学 第2卷 第3版>>

图书基本信息

书名：<<生物数学 第2卷 第3版>>

13位ISBN编号：9787510052750

10位ISBN编号：7510052750

出版时间：2013-1

出版时间：J.D.莫里 (J.D.Murray) 世界图书出版公司北京公司 (2013-01出版)

作者：J.D.莫里

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

<<生物数学 第2卷 第3版>>

内容概要

《生物数学(第2卷)(第3版)》是近代生物数学方面的名著。

第三版，在原来版本的基础上做了全面修订。

近年来这个科目的茁壮成长和新知识点的不断涌现，新的版本将原来的一卷集分成上下两卷，扩大了知识容量，第二卷绝大多数是新增知识点。

书中对生物学中的反应扩散方程和形态发生学的数学理论及最新研究成果作了全面介绍，是学习与研究生物数学的一部不可多得的参考书。

<<生物数学 第2卷 第3版>>

作者简介

作者：（美国）莫里（Murray J.D.）

书籍目录

CONTENTS, VOLUME II Preface to the Third Edition Preface to the First Edition 1. Multi-Species Waves and Practical Applications 1.1 Intuitive Expectations 1.2 Waves of Pursuit and Evasion in Predator-Prey Systems 1.3 Competition Model for the Spatial Spread of the Grey Squirrel in Britain 1.4 Spread of Genetically Engineered Organisms 1.5 Travelling Fronts in the Belousov-Zhabotinskii Reaction 1.6 Waves in Excitable Media 1.7 Travelling Wave Trains in Reaction Diffusion Systems with Oscillatory Kinetics 1.8 Spiral Waves 1.9 Spiral Wave Solutions of - Reaction Diffusion Systems Exercises 2. Spatial Pattern Formation with Reaction Diffusion Systems 2.1 Role of Pattern in Biology 2.2 Reaction Diffusion (Turing) Mechanisms 2.3 General Conditions for Diffusion-Driven Instability: Linear Stability Analysis and Evolution of Spatial Pattern 2.4 Detailed Analysis of Pattern Initiation in a Reaction Diffusion Mechanism 2.5 Dispersion Relation, Turing Space, Scale and Geometry Effects in Pattern Formation Models 2.6 Mode Selection and the Dispersion Relation 2.7 Pattern Generation with Single-Species Models: Spatial Heterogeneity with the Spruce Budworm Model 2.8 Spatial Patterns in Scalar Population Interaction Diffusion Equations with Convection: Ecological Control Strategies 2.9 Nonexistence of Spatial Patterns in Reaction Diffusion Systems: General and Particular Results Exercises 3. Animal Coat Patterns and Other Practical Applications of Reaction Diffusion Mechanisms 3.1 Mammalian Coat Patterns-- 'How the Leopard Got Its Spots' 3.2 Teratologies: Examples of Animal Coat Pattern Abnormalities 3.3 A Pattern Formation Mechanism for Butterfly Wing Patterns 3.4 Modelling Hair Patterns in a Whorl in *Acetabularia* 4. Pattern Formation on Growing Domains: Alligators and Snakes 4.1 Stripe Pattern Formation in the Alligator: Experiments 4.2 Modelling Concepts: Determining the Time of Stripe Formation 4.3 Stripes and Shadow Stripes on the Alligator 4.4 Spatial Patterning of Teeth Primordia in the Alligator: Background and Relevance 4.5 Biology of Tooth Initiation 4.6 Modelling Tooth Primordium Initiation: Background 4.7 Model Mechanism for Alligator Teeth Patterning 4.8 Results and Comparison with Experimental Data 4.9 Prediction Experiments 4.10 Concluding Remarks on Alligator Tooth Spatial Patterning 4.11 Pigmentation Pattern Formation on Snakes 4.12 Cell-Chemotaxis Model Mechanism 4.13 Simple and Complex Snake Pattern Elements 4.14 Propagating Pattern Generation with the Cell-Chemotaxis System 5. Bacterial Patterns and Chemotaxis 5.1 Background and Experimental Results 5.2 Model Mechanism for *E. coli* in the Semi-Solid Experiments 5.3 Liquid Phase Model: Intuitive Analysis of Pattern Formation 5.4 Interpretation of the Analytical Results and Numerical Solutions 5.5 Semi-Solid Phase Model Mechanism for *S. typhimurium* 5.6 Linear Analysis of the Basic Semi-Solid Model 5.7 Brief Outline and Results of the Nonlinear Analysis 5.8 Simulation Results, Parameter Spaces and Basic Patterns 5.9 Numerical Results with Initial Conditions from the Experiments 5.10 Swarm Ring Patterns with the Semi-Solid Phase Model Mechanism 5.11 Branching Patterns in *Bacillus subtilis* 6. Mechanical Theory for Generating Pattern and Form in Development 6.1 Introduction, Motivation and Background Biology 6.2 Mechanical Model for Mesenchymal Morphogenesis 6.3 Linear Analysis, Dispersion Relation and Pattern Formation Potential 6.4 Simple Mechanical Models Which Generate Spatial Patterns with Complex Dispersion Relations 6.5 Periodic Patterns of Feather Germs 6.6 Cartilage Condensations in Limb Morphogenesis and Morphogenetic Rules 6.7 Embryonic Fingerprint Formation 6.8 Mechanochemical Model for the Epidermis 6.9 Formation of Microvilli 6.10 Complex Pattern Formation and Tissue Interaction Models Exercises 7. Evolution, Morphogenetic Laws, Developmental Constraints and Teratologies 7.1 Evolution and Morphogenesis 7.2 Evolution and Morphogenetic Rules in Cartilage Formation in the Vertebrate Limb 7.3 Teratologies (Monsters) 7.4 Developmental Constraints, Morphogenetic Rules and the Consequences for Evolution 8. A Mechanical Theory of Vascular Network Formation 8.1 Biological Background and Motivation 8.2 Cell-Extracellular Matrix Interactions for Vasculogenesis 8.3 Parameter Values 8.4 Analysis of the Model Equations 8.5 Network Patterns: Numerical Simulations and Conclusions 9. Epidermal Wound Healing 9.1 Brief History of Wound Healing 9.2 Biological Background: Epidermal Wounds 9.3 Model for Epidermal Wound Healing 9.4 Nondimensional Form, Linear Stability and Parameter Values 9.5 Numerical Solution for the Epidermal Wound Repair Model 9.6 Travelling Wave Solutions for the Epidermal Model 9.7 Clinical Implications of the Epidermal Wound Model 9.8

Mechanisms of Epidermal Repair in Embryos 9.9 Actin Alignment in Embryonic Wounds:A Mechanical Model 9.10 Mechanical Model with Stress Alignment of the Actin Filaments in Two Dimensions 10.Dermal Wound Healing 10.1 Background and Motivation--General and Biological 10.2 Logic of Wound Healing and Initial Models 10.3 Brief Review of Subsequent Developments 10.4 Model for Fibroblast-Driven Wound Healing:Residual Strain and Tissue Remodelling 10.5 Solutions of the Model Equations and Comparison with Experiment 10.6 Wound Healing Model of Cook (1995) 10.7 Matrix Secretion and Degradation 10.8 Cell Movement in an Oriented Environment 10.9 Model System for Dermal Wound Healing with Tissue Structure 10.10 One-Dimensional Model for the Structure of Pathological Scars 10.11 Open Problems in Wound Healing 10.12 Concluding Remarks on Wound Healing 11.Growth and Control of Brain Tumours 11.1 Medical Background 11.2 Basic Mathematical Model of Glioma Growth and Invasion 11.3 Tumour Spread In Vitro:Parameter Estimation 11.4 Tumour Invasion in the Rat Brain 11.5 Tumour Invasion in the Human Brain 11.6 Modelling Treatment Scenarios:General Comments 11.7 Modelling Tumour Resection in Homogeneous Tissue 11.8 Analytical Solution for Tumour Recurrence After Resection 11.9 Modelling Surgical Resection with Brain Tissue Heterogeneity 11.10 Modelling the Effect of Chemotherapy on Tumour Growth 11.11 Modelling Tumour Polyclonality and Cell Mutation 12.Neural Models of Pattern Formation 12.1 Spatial Patterning in Neural Firing with a Simple Activation-Inhibition Model 12.2 A Mechanism for Stripe Formation in the Visual Cortex 12.3 A Model for the Brain Mechanism Underlying Visual Hallucination Patterns 12.4 Neural Activity Model for Shell Patterns 12.5 Shamanism and Rock Art Exercises 13.Geographic Spread and Control of Epidemics 13.1 Simple Model for the Spatial Spread of an Epidemic 13.2 Spread of the Black Death in Europe 1347-1350 13.3 Brief History of Rabies:Facts and Myths 13.4 The Spatial Spread of Rabies Among Foxes I:Background and Simple Model 13.5 The Spatial Spread of Rabies Among Foxes U:Three-Species (SIR) Model 13.6 Control Strategy Based on Wave Propagation into a Nonepidemic Region:Estimate of Width of a Rabies Barrier 13.7 Analytic Approximation for the Width of the Rabies Control Break 13.8 Two-Dimensional Epizootic Fronts and Effects of Variable Fox Densities:Quantitative Predictions for a Rabies Outbreak in England 13.9 Effect of Fox Immunity on the Spatial Spread of Rabies Exercises 14.Wolf Territoriality,Wolf-Deer Interaction and Survival 14.1 Introduction and Wolf Ecology 14.2 Models for Wolf Pack Territory Formation:Single Pack--Home Range Model 14.3 Multi-Wolf Pack Territorial Model 14.4 Wolf-Deer Predator-Prey Model 14.5 Concluding Remarks on Wolf Territoriality and Deer Survival 14.6 Coyote Home Range Patterns 14.7 Chippewa and Sioux Intertribal Conflict c1750--1850 Appendix A.General Results for the Laplacian Operator in Bounded Domains Bibliography Index

章节摘录

版权页：插图： A phenomenological concept of pattern formation and differentiation called positional information was proposed by Wolpert (1969, see the reviews in 1971, 1981). He suggested that cells are preprogrammed to react to a chemical (or morphogen) concentration and differentiate accordingly, into different kinds of cells such as cartilage cells. The general introductory paper by Wolpert (1977) gives a very clear and nontechnical description of development of pattern and form in animals and the concepts and application of his positional information scenario. Although it is a phenomenological approach, with no actual mechanism involved it has given rise to an immense number of illuminating experimental studies, many associated with the development of the limb cartilage patterning in chick embryos and feather patterns on other bird embryos, such as the quail and guinea fowl (see, for example, Richardson et al. 1991 and references there). A literature search of positional information in development will produce an enormous number of references. Although it is a simple and attractive concept, which has resulted in significant advances in our knowledge of certain aspects of development, it is not a mechanism. The chemical prepattern viewpoint of embryogenesis separates the process of development into several steps; the essential first step is the creation of a morphogen concentration spatial pattern. The name 'morphogen' is used for such a chemical because it effects morphogenesis. The notion of positional information relies on a chemical pre-specification so that the cell can read out its position in the coordinates of chemical concentration, and differentiate, undergo appropriate cell shape change, or migrate accordingly. So, once the prepattern is established, morphogenesis is a slave process. Positional information is not dependent on the specific mechanism which sets up the spatial prepattern of morphogen concentration. This chapter is concerned with reaction diffusion models as the possible mechanisms for generating biological pattern.

<<生物数学 第2卷 第3版>>

编辑推荐

《生物数学(第2卷)(第3版)》由世界图书出版公司北京公司出版。

<<生物数学 第2卷 第3版>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介, 请支持正版图书。

更多资源请访问:<http://www.tushu007.com>