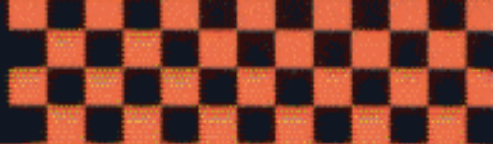


CRASH COURSE



Metabolism and Nutrition

SECOND EDITION

Roach, Benyon

Faculty Advisor **Marek Dominiczak**

Series Editor **Dan Horton-Szar**



- New edition of the best-selling revision tool for basic sciences integrating clinical topics
- Concise text and clear illustrations make information accessible and easy to retain
- Expanded self-assessment section including MCQs and short-answer questions

Contents

| | |
|------------------|------|
| Preface | v |
| Acknowledgements | vii |
| Dedication | viii |

Part I: Metabolic Processes and Nutrition

| | |
|---|-----------|
| 1. Overview of Metabolism | 3 |
| Useful definitions | 3 |
| Basic principles of bioenergetics | 4 |
| 2. Carbohydrate and Energy Metabolism | 7 |
| Glycolysis and its regulation | 7 |
| Central role of acetyl CoA | 15 |
| The tricarboxylic acid cycle | 19 |
| Generation of ATP | 25 |
| Glycogen metabolism | 29 |
| Role of 2,3-bisphosphoglycerate | 37 |
| Fructose, galactose, ethanol and sorbitol | 40 |
| 3. Production of NADPH | 47 |
| Pentose phosphate pathway and pyruvate-malate cycle | 47 |
| The roles of NADPH | 50 |
| 4. Lipid Metabolism and Transport | 55 |
| Lipid biosynthesis | 55 |
| Lipid breakdown | 63 |
| Cholesterol metabolism | 69 |
| Transport of lipids | 73 |
| Ketone bodies and ketogenesis | 80 |
| 5. Protein Metabolism | 83 |
| Biosynthesis of non-essential amino acids | 83 |
| Protein breakdown and the disposal of nitrogen | 87 |
| Formation of glucose from non-carbohydrate sources | 95 |
| Disorders of amino acid metabolism | 100 |
| Amino acid metabolism in individual tissues | 102 |

| | |
|---|------------|
| 6. Purines, Pyrimidines and Haem | 107 |
| One-carbon pool | 107 |
| Purine metabolism | 108 |
| Pyrimidine metabolism | 117 |
| Haem metabolism | 121 |
| 7. Glucose Homeostasis | 131 |
| The states of glucose homeostasis | 131 |
| Diabetes mellitus | 136 |
| 8. Nutrition | 143 |
| Basic principles of human nutrition | 143 |
| Energy balance | 144 |
| Protein nutrition | 148 |
| Vitamins | 152 |
| Minerals | 170 |

Part II: Clinical Assessment of Metabolic Disease

| | |
|---|------------|
| 9. Common Presentations of Metabolic Disease | 185 |
| Common presenting complaints | 185 |
| 10. History and Examination | 191 |
| Things to remember when taking a history | 191 |
| Communication skills | 193 |
| Examination | 195 |
| 11. Further Investigations | 207 |
| Routine investigations | 207 |
| Assessment of nutritional status | 214 |

Part III: Self-assessment

| | |
|----------------------------------|-----|
| Multiple-choice Questions (MCQs) | 221 |
| Short-answer Questions (SAQs) | 231 |
| Essay Questions | 233 |
| MCQ Answers | 235 |
| SAQ Answers | 245 |

| | |
|--------------|------------|
| Index | 251 |
|--------------|------------|