

Contents

Chapter 1	Introductory Notes	1
1.1	Inspiring Hierarchical	1
1.2	Encoding Instructive	2
1.3	Starting Lowest	3
1.4	Picturing Biological	3
	References	4
Chapter 2	Recycling Hereditary	5
2.1	Coding Dual	5
2.1.1	Deoxyribonucleic	6
2.1.1.1	Building up in Two	6
2.1.1.2	Keeping in Shape	8
2.1.2	Priming Topological	10
2.1.2.1	Resequencing Basic	11
2.1.2.1.1	Choosing the Fittest	11
2.1.2.1.2	Evolving Diverse	12
2.1.2.2	Primary Motifs	15
2.1.2.2.1	Gluing Universal	15
2.1.2.2.2	Alienating Axial	16
2.2	Fixing Spatial	27
2.2.1	Hinting Geometric: Secondary Motifs	27
2.2.1.1	Crossing Double	27
2.2.1.1.1	Reporting Visible	28
2.2.1.1.2	Translating Symmetrical	31
2.2.1.2	Extending Cohesive	35
2.2.1.2.1	Sharing Mutual	35
2.2.1.2.2	Multiplying Traversal	36
2.2.1.2.3	Tiling Square	42

RSC Nanoscience and Nanotechnology No. 7

Bionanodesign

By M Ryadnov

© Maxim Ryadnov 2009

Published by the Royal Society of Chemistry, www.rsc.org

2.3	Scaffolding Algorithmic	45
2.3.1	Pursuing Autonomous	46
2.3.1.1	Lengthening to Shorten	46
2.3.1.2	Gathering to Limit	48
2.3.2	Assigning Arbitrary	51
2.3.2.1	Synchronising Local	51
2.3.2.2	Prescribing General	52
2.3.3	Adding up to Third	57
2.3.3.1	Wrapping to Shut	57
2.3.3.2	Framing to Classify	61
2.4	Outlook	63
	References	64
Chapter 3	Recaging Within	75
3.1	Enclosing to Deliver	76
3.1.1	Transporting Foreign	76
3.1.1.1	Fitting Flat and Straight	77
3.1.1.2	Spiralling Along	82
3.1.2	Packing Out and In	83
3.1.2.1	Spooling Around	84
3.1.2.2	Tunnelling Through	85
3.1.3	Escaping Walled	87
3.1.3.1	Capturing On and Off	87
3.1.3.2	Storing Exchangeable	90
3.2	Reacting Nano	92
3.2.1	Clustering Spherical	93
3.2.1.1	Contriving Consistent	93
3.2.1.2	Scaling Hosting	96
3.2.2	Following Linear	102
3.2.2.1	Channelling Inner	102
3.2.2.2	Converting Outer	103
3.3	Repairing from Inside	106
3.3.1	Uninviting Levy	107
3.3.2	Necessitating Exterior	108
3.3.2.1	Antagonising Dressing	108
3.3.2.1.2	Renting Occasional	112
3.3.2.2	Phasing Wet	115
3.3.2.2.1	Facing Concentric	115
3.3.2.2.2	Encircling Between	117
3.3.2.2.3	Singling Out Unique	118
3.3.3	Sharing the Balance	120
3.3.3.1	Driving Symmetrical	121
3.3.3.2	Sealing Annular	123
3.4	Outlook	126
	References	127

Chapter 4 Reassembling Multiple	146
4.1 Keeping All in Touch	147
4.1.1 Unravelling the Essential	149
4.1.1.1 Winding Three in One	149
4.1.1.2 Aligning Stagger	149
4.1.1.3 Tapering Polar	152
4.1.1.4 Branching and Stretching	153
4.1.2 Replicating Apparent	156
4.1.2.1 Scraping Refusal	156
4.1.2.2 Tempting Compatible	159
4.1.2.3 Likening Synthetic	162
4.1.2.4 Recovering Intelligent	165
4.2 Restoring Available	167
4.2.1 Prompting Longitudinal	168
4.2.1.1 Invoking Granted	169
4.3 Reposing Modular	171
4.3.1 Displacing Coil	175
4.3.2 Settling Lateral	179
4.3.2.1 Bundling Exclusive	179
4.3.2.2 Permitting Distinctive	182
4.3.2.3 Inviting Captive	184
4.3.3 Clearing Limiting	187
4.3.3.1 Equilibrating Transitional	187
4.3.3.2 Extracting Minimal	189
4.4 Gambling Beyond	191
4.4.1 Guiding Proliferative	191
4.4.1.1 Feeding Proximate	192
4.4.1.2 Rooting Renewal	193
4.4.2 Accepting Inescapable	194
4.4.2.1 Patterning Positional	195
4.4.2.2 Relating Interfacial	198
4.4.2.3 Grafting Integral	201
4.5 Outlook	202
References	203
Chapter 5 Concluding Remarks	222
5.1 Learning Fluent	222
5.2 Parsing Semantic	223
5.3 Drawing Pragmatic	223
Chapter 6 Revealing Contributory	225
Subject Index	230

A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away.

Antoine de Saint-Exupery

There's plenty of room at the bottom

Richard Phillips Feynman