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Nota di contenuto	HIGH CONTENT SCREENING; CONTENTS; Preface; Contributors; SECTION I ESSENTIALS OF HIGH CONTENT SCREENING; 1. Approaching High Content Screening and Analysis: Practical Advice for Users; 1.1 Introduction; 1.2 What is HCS and Why Should I Care?; 1.3 How does HCS Compare with Current Assay Methods?; 1.4 The Basic Requirements to Implement HCS; 1.4.1 Cell Banking; 1.4.2 Plating, Cell Density, and the Assay Environment; 1.4.3 Compound Addition and Incubation; 1.4.4 Post-Assay Processing; 1.4.5 HCS Imaging Hardware; 1.4.6 HCS Analysis Software; 1.4.7 Informatics; 1.5 The Process 1.6 An Example Approach 1.7 Six Considerations for HCS Assays; 1.7.1 Garbage In, Garbage Out (GIGO); 1.7.2 This Is Not a Plate Reader; 1.7.3 Understand Your Biology; 1.7.4 Subtle Changes Can Be Measured and Are Significant; 1.7.5 HCS Workflow - Flexibility is the Key; 1.7.6 HCS is Hard - How Do I Learn It and Become Proficient at It?; References; 2. Automated High Content Screening Microscopy; 2.1 Introduction; 2.2 Automated HCS Imaging Requirements; 2.3 Components of Automated Imaging Platforms; 2.3.1 Fluorescence Imaging and Multiplexing; 2.3.2

Light Sources
2.3.3 Optical Designs: Confocal Versus Wide-Field 2.3.4 Objectives; 2.3.5 Detectors; 2.3.6 Autofocus; 2.3.7 Environmental Controls and On-Board Liquid Handling Capabilities; 2.4 Imaging Platform Software; 2.5 Data Storage and Management; 2.6 Selecting an HCS Platform; 2.7 Comparison of a SAPK Activation HCS Assay Read on an ArrayScan(®) 3.1, an ArrayScan(®) V(Ti), and an IN Cell 3000 Automated Imaging Platform; References; 3. A Primer on Image Informatics of High Content Screening; 3.1 Background; 3.2 HCS Image Processing; 3.2.1 Image Pre-Processing
3.2.2 Cell Detection, Segmentation, and Centerline Extraction 3.2.2.1 Cell Detection; 3.2.2.2 Particle Detection; 3.2.2.3 Cell Segmentation; 3.2.2.4 Centerline/Neurite Extraction; 3.2.3 Cell Tracking and Registration; 3.2.3.1 Simple Matching Algorithm; 3.2.3.2 Mean Shift; 3.2.3.3 Kalman Filter; 3.2.3.4 Mutual Information; 3.2.3.5 Fuzzy-System-Based Tracking; 3.2.3.6 Parallel Tracking; 3.2.4 Feature Extraction; 3.2.4.1 Features Extracted from Markov Chain Modeling of Time-Lapse Images; 3.3 Validation; 3.4 Information System Management; 3.5 Data Modeling
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4.2.2 Sources of Variability

Sommario/riassunto

The authoritative reference on High Content Screening (HCS) in biological and pharmaceutical research, this guide covers: the basics of HCS: examples of HCS used in biological applications and early drug discovery, emphasizing oncology and neuroscience; the use of HCS across the drug development pipeline; and data management, data analysis, and systems biology, with guidelines for using large datasets. With an accompanying CD-ROM, this is the premier reference on HCS for researchers, lab managers, and graduate students.