

Contents

<i>Preface</i>	<i>v</i>
<i>Contributors</i>	<i>ix</i>
1 Real-Time Measurements of Intracellular cAMP Gradients Using FRET-Based cAMP Nanorulers	1
<i>Charlotte Kayser, Martin J. Lohse, and Andreas Bock</i>	
2 Assaying Protein Kinase A Activity Using a FRET-Based Sensor Purified from Mammalian Cells	15
<i>Ashton J. Curtis, Ryan S. Dowsell, and Matthew G. Gold</i>	
3 MultiFRET: A Detailed Protocol for High-Throughput Multiplexed Ratiometric FRET	33
<i>Masoud Ramuz, Ivan Diakonov, Chris Dunsby, and Julia Gorelik</i>	
4 Photoactivated Adenylyl Cyclases as Optogenetic Modulators of Neuronal Activity	61
<i>Thilo Henss, Martin Schneider, Dennis Vettkötter, Wagner Steuer Costa, Jana F. Liewald, and Alexander Gottschalk</i>	
5 Imaging the cAMP Signaling Microdomain of the Primary Cilium Using Targeted FRET-Based Biosensors	77
<i>Danielle T. Arena and Aldebaran M. Hofer</i>	
6 Methods to Assess Phosphodiesterase and/or Adenylyl Cyclase Activity Via Heterologous Expression in Fission Yeast	93
<i>Marek Domin and Charles S. Hoffman</i>	
7 Time-Domain Fluorescence Lifetime Imaging of cAMP Levels with EPAC-Based FRET Sensors	105
<i>Olga Kukk, Jeffrey Klarenbeek, and Kees Jalink</i>	
8 Disruptors of AKAP-Dependent Protein–Protein Interactions	117
<i>Ryan Walker-Gray, Tamara Pallien, Duncan C. Miller, Andreas Oder, Martin Neuenschwander, Jens Peter von Kries, Sebastian Diecke, and Enno Klussmann</i>	
9 Micro-2D Cell Culture for cAMP Measurements Using FRET Reporters in Human iPSC-Derived Cardiomyocytes	141
<i>Andreas Koschinski and Manuela Zaccolo</i>	
10 Automated Image Analysis of FRET Signals for Subcellular cAMP Quantification	167
<i>Silas J. Leavesley, Naga Annamdevula, Santina Johnson, D. J. Pleshinger, and Thomas C. Rich</i>	
11 In Vivo cAMP Dynamics in <i>Drosophila</i> Larval Neurons	181
<i>Isabella Maiellaro</i>	
12 Live Cell Imaging of Cyclic Nucleotides in Human Cardiomyocytes	195
<i>Kira Beneke and Cristina E. Molina</i>	

13	Optogenetic Control of Heart Rhythm: Lightly Guiding the Cardiac Pace	205
	<i>Lolita Dokshokova, Nicola Pianca, Tania Zaglia, and Marco Mongillo</i>	
14	Live Imaging of cAMP Signaling in <i>D. discoideum</i> Based on a Bioluminescent Indicator, Nano-lantern (cAMP)	231
	<i>Kazuki Horikawa and Takeharu Nagai</i>	
15	Generation of Transgenic Mice Expressing Cytosolic and Targeted FRET Biosensors for cAMP and cGMP	241
	<i>Roberta Kurelić and Viacheslav O. Nikolaev</i>	
16	How to Make the CUTiest Sensor in Three Simple Steps for Computational Pedestrians	255
	<i>Florencia Klein, Cecilia Abreu, and Sergio Pantano</i>	
17	Ion Channel-Based Reporters for cAMP Detection	265
	<i>Thomas C. Rich, Wenkuan Xin, Silas J. Leavesley, C. Michael Francis, and Mark Taylor</i>	
18	Quantitative Phosphoproteomics to Study cAMP Signaling	281
	<i>Katharina Schleicher, Svenja Hester, Monika Stegmann, and Manuela Zaccolo</i>	
19	Biochemical Analysis of AKAP-Anchored PKA Signaling Complexes	297
	<i>Dominic P. Byrne, Mitchell H. Omar, Eileen J. Kennedy, Patrick A. Evers, and John D. Scott</i>	
20	Fluorescent Translocation Reporters for Sub-plasma Membrane cAMP Imaging	319
	<i>Oleg Dyachok, Yunjian Xu, Olof Idevall-Hagren, and Anders Tengholm</i>	
21	A Live-Cell Imaging Assay for Nuclear Entry of cAMP-Dependent Protein Kinase Catalytic Subunits Stimulated by Endogenous GPCR Activation	339
	<i>Grace E. Peng and Mark von Zastrow</i>	
22	Measuring Spatiotemporal cAMP Dynamics Within an Endogenous Signaling Compartment Using FluoSTEP-ICUE	351
	<i>Julia C. Hardy, Sohun Mehta, and Jin Zhang</i>	
	<i>Index</i>	367