

---

# Contents

<i>Preface</i> .....	v
<i>Contributors</i> .....	ix
1 Random Migration Assays of Mammalian Cells and Quantitative Analyses of Single Cell Trajectories.....	1
<i>Irene Dang and Alexis Gautreau</i>	
2 Directional Collective Migration in Wound Healing Assays.....	11
<i>Nicolas Molinie and Alexis Gautreau</i>	
3 An In Vitro System to Study the Mesenchymal-to-Amoeboid Transition .....	21
<i>Aleksandra S. Chikina and Antonina Y. Alexandrova</i>	
4 An In Vitro System to Study the Epithelial–Mesenchymal Transition In Vitro.....	29
<i>Natalya A. Gloushankova, Svetlana N. Rubtsova, and Irina Y. Zhitnyak</i>	
5 Detection of Migrasomes .....	43
<i>Yang Chen, Ying Li, Liang Ma, and Li Yu</i>	
6 3D Endothelial Cell Migration.....	51
<i>Kathryn A. Jacobs and Julie Gavard</i>	
7 Transmigration of Leukocytes Across Epithelial Monolayers .....	59
<i>Penny E. Morton and Maddy Parsons</i>	
8 Evaluation of Tumor Cell Invasiveness In Vivo: The Chick Chorioallantoic Membrane Assay .....	71
<i>Selma Maacha and Simon Saule</i>	
9 Analysis of Invasion Dynamics of Matrix-Embedded Cells in a Multisample Format .....	79
<i>Marleen Van Troys, Paola Masuzzo, Lynn Huyck, Karima Bakkali, Davy Waterschoot, Lennart Martens, and Christophe Ampe</i>	
10 Using Systems Microscopy to Understand the Emergence of Cell Migration from Cell Organization.....	119
<i>Staffan Strömblad and John G. Lock</i>	
11 Neuronal Precursor Migration in Ex Vivo Brain Slice Culture.....	135
<i>Fu-Sheng Chou and Pei-Shan Wang</i>	
12 In Vitro Models to Analyze the Migration of MGE-Derived Interneurons.....	145
<i>Claire Leclech and Christine Métin</i>	
13 Cell Migration in Tissues: Explant Culture and Live Imaging .....	163
<i>Ralitzza Staneva, Jorge Barbazan, Anthony Simon, Danijela Matic Vignjevic, and Denis Krndija</i>	
14 Intravital Imaging of Tumor Cell Motility in the Tumor Microenvironment Context.....	175
<i>Battuya Bayarmagnai, Louisiane Perrin, Kamyar Esmaeili Pourfarhangi, and Bojana Gligorijevic</i>	

15	Using the Zebrafish Embryo to Dissect the Early Steps of the Metastasis Cascade .....	195
	<i>Gautier Follain, Naël Osmani, Cédric Fuchs, Guillaume Allio, Sébastien Harlepp, and Jacky G. Goetz</i>	
16	Analysis of In Vivo Cell Migration in Mosaic Zebrafish Embryos .....	213
	<i>Arthur Boutillon, Florence A. Giger, and Nicolas B. David</i>	
17	Analysis of Cell Shape and Cell Migration of <i>Drosophila</i> Macrophages In Vivo .....	227
	<i>Marieke Rüder, Benedikt M. Nagel, and Sven Bogdan</i>	
18	Migration of Q Cells in <i>Caenorhabditis elegans</i> .....	239
	<i>Yongping Chai, Zhiwen Zhu, and Guangshuo Ou</i>	
19	Imaging the Molecular Machines That Power Cell Migration .....	257
	<i>Anika Steffen, Frieda Kage, and Klemens Rottner</i>	
20	A Biologist-Friendly Method to Analyze Cross-Correlation Between Protrusion Dynamics and Membrane Recruitment of Actin Regulators .....	279
	<i>Perrine Paul-Gilloteaux, François Waharte, Manish Kumar Singh, and Maria Carla Parrini</i>	
21	Using Single-Protein Tracking to Study Cell Migration .....	291
	<i>Thomas Orré, Amine Mehidi, Sophie Massou, Olivier Rossier, and Grégory Giannone</i>	
22	Optogenetic Control of Cell Migration .....	313
	<i>Xenia Meshik, Patrick R. O'Neill, and N. Gautam</i>	
23	Electrotaxis: Cell Directional Movement in Electric Fields .....	325
	<i>Jolanta Sroka, Eliza Zimolag, Slawomir Lasota, Włodzimierz Korohoda, and Zbigniew Madeja</i>	
24	Analysis of Random Migration of <i>Dictyostelium</i> Amoeba in Confined and Unconfined Environments .....	341
	<i>Christof Litschko, Julia Damiano-Guercio, Stefan Brühmann, and Jan Faix</i>	
25	Neutrophil Chemotaxis in One Droplet of Blood Using Microfluidic Assays .....	351
	<i>Xiao Wang and Daniel Irimia</i>	
26	Leukocyte Migration and Deformation in Collagen Gels and Microfabricated Constrictions .....	361
	<i>Pablo J. Sáez, Lucie Barbier, Rafaele Attia, Hawa-Racine Thiam, Matthieu Piel, and Pablo Vargas</i>	
27	Microfluidic Devices for Examining the Physical Limits of Migration in Confined Environments .....	375
	<i>Majid Malboubi, Asier Jayo, Maddy Parsons, and Guillaume Charras</i>	
28	Controlling Confinement and Topology to Study Collective Cell Behaviors .....	387
	<i>Guillaume Duclos, Maxime Deforet, Hannah G. Yevick, Olivier Cochet-Escartin, Flora Ascione, Sarah Moitrier, Trinish Sarkar, Victor Yashunsky, Isabelle Bonnet, Axel Buguin, and Pascal Silberzan</i>	
	<i>Index</i> .....	401