
Preface

Cell-based microarrays are a technique first described by the Sabatini group in 2001. They detail the printing of cDNA or siRNAs in a vector construct onto a coated glass slide using a robotic microarrayer. The vector constructs are transfected in defined areas within cells grown over the surface of the slide or microplate. These cell-based microarrays can be used for a variety of high-throughput, downstream functional assays.

Since their development in 2001, they have advanced significantly, and this book, intended for molecular biologists, geneticists, immunologists, and biochemists, covers many aspects of their evolution.

Chapter 1 gives a detailed overview of the whole subject area, including a discussion of the first paper describing the technique and detailed descriptions of the current work in overexpression, RNAi, antibody, and small-molecule cell-based microarrays. The overview also covers the adaptation of cell-based microarrays for a variety of cell types, advances in array surface chemistry and transfection efficiencies, and imaging of cell-based microarrays.

Chapters 2, 3, 4, 5, and 6 describe protocols for overexpression arrays and downstream functional assays. In **Chapters 2 and 3**, Lai et al. and Palmer et al. provide clear protocols for array printing and transfection with standard HEK23T cells. In **Chapter 4**, Redmond et al. describe the use of a novel fluorescent reporter, and in **Chapters 5 and 6**, Hu et al. provide a protocol for high-throughput sub-cellular localization, and Erfle et al. include a protocol for high-throughput organelle imaging.

In **Chapter 7**, Niu et al. provide a protocol for a different cell type to standard mammalian cells: yeast cells (also see **Chapter 11** for blood cells).

Chapter 8 discusses a protocol for shRNAs using adenoviruses, and, in **Chapters 8 and 9**, Konrad et al. and Volkmer et al. both discuss the protocols for infectious disease research.

In **Chapters 10 and 11**, Lin et al. and Roupioz et al. provide protocols for antibody arrays and describe their use with different cell types such as blood.

Chapters 12, 13, 14, and 15 discuss protocols for increasing transfection efficiencies on cell-based microarrays. Yamaguchi et al. and Hook et al., in **Chapters 12 and 13**, provide protocols for different slide coatings (also discussed in **Chapter 8**). Pernagallo et al., in **Chapter 14**, discuss the use of polymer arrays for functional tissue modelling, and Kato et al., in **Chapter 15**, discuss the use of electroporation to increase transfection efficiency.

In **Chapter 16**, Damoiseaux et al. provide a protocol discussing the development of cell-based array technology by use of microfluidic image cytometry for the analysis of small diagnostic samples with few cells.

Together, the chapters provide an easy-to-use, up-to-date, and comprehensive set of protocols on every aspect of cell-based microarrays.

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