Preface

Experiments using amphibian embryos have led the way in understanding signaling events in the early development of vertebrates. The power of amphibian embryology stems from the ability to obtain embryos of all stages and from the large size of the embryos. These attributes have made detailed fate maps possible, and allow embryos to be microinjected and micromanipulated relatively easily. In addition, many amphibian species develop rapidly, so that the interesting stages of axis formation and tissue differentiation are accessible in a relatively short time. Over the years, *Xenopus* has come to dominate experimental embryology in amphibians: *Xenopus* is easy to keep, and ovulates at any time of year in response to simple hormone injection.

This is an exciting time in the *Xenopus* field. During the past several years, many new techniques have been devised or adapted for *Xenopus*. These techniques include whole mount in situ hybridization and immunocytochemistry that allow visualization of gene expression in the intact embryo. Transgenic technology has for the first time led to the correctly regulated expression of promoters in *Xenopus* embryos, eliminating previous problems of mosaic and inefficient expression from DNA expression vectors. Expression cloning has led to the isolation of powerful inducing molecules. Inducible gene expression systems can control the timing of gene expression in gain-of-function assays, whereas dominant-negative proteins have been instrumental in eliminating gene function. Together, these techniques have led to sophisticated new understanding of early *Xenopus* development and continue to ensure *Xenopus* a prominent position in the group of "model organisms."

Given the growth of techniques available for work with *Xenopus*, it is time to collect a comprehensive series of protocols in one place. This book arose from a course first taught at Cold Spring Harbor Laboratory in April 1991. Various in-house protocols were cobbled together, and in subsequent years, the lab manual became more extensive, and more accurate. However, to turn this from a collection of informal protocols into something more

comprehensive and comprehensible took more than a rash promise by the authors. Much of the credit for the completion of the manual goes to the marathon efforts and cajoling of Mary Cozza and Siân Curtis at Cold Spring Harbor Laboratory Press.

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