the descriptive. Many species that could have been included are absent, and hence a second volume is planned: a list of species for inclusion in volume two is given at the front of volume one. This list is now a bit out of date and a more comprehensive list can be found on the relevant website (www.cshprotocols.org/emo). Volume one has a heavy bias towards animals (there are only three plant species included: a moss, a snapdragon and a tomato), and there are only three more plants on the list of eighteen species proposed for volume two. Plant biologists take special note, if something you want to see included is missing or you are angered by the omission of your pet emerging model, the editors openly invite suggestions (you can email them to submitprotocols@cshl.edu).

Each chapter is written to a template, with sections on the general background and history of the organism, its uses, how to find them and keep them, the status of current genomic and genetic resources, and detailed experimental protocols. Different authors invariably bring their own style to their chapter, with some providing much more depth in areas than others. However, the common framework ensures the core relevant information is ever-present. The experimental protocols that accompany each section are a real plus, as they often include those little bits of informal 'how to...', as well as the basic experimental steps that can also be found in publications. Any experimentalist knows the value of this lab knowledge when embarking on something new. I also appreciated the sections on resources (genetic and genomic), as many authors are part of ongoing projects and have included information on their status and how to access data; something that is impossible to find from publications and often hard to track down on the Web.

Will this information help a lab trying to set up a system that is new to them? The answer is undoubtedly, yes. I have been through this process several times, and know it is easy to underestimate the difficulties involved with sourcing specimens, establishing breeding conditions and developing resources and experimental techniques. I would strongly recommend anyone starting work on one of the species covered in this book to read the chapter dedicated to it first. In fact, even if your species is not covered, reading a chapter on a closely related taxon might still be surprisingly helpful. I do, however, have one negative thing to say in this context. There are a couple of species in the book that my lab and I know well, and in one chapter we found a number of errors; little things, like protocol stages mis-numbered, conflicting information in different protocols, taxa misnamed. Easy to spot if you know the species and protocols well, but less so if you are coming to them fresh. I suspect this is a matter of proofreading and that these errors are probably chapter-specific. It won't prevent me from using the book, but it reinforces that, even with such detailed experimental descriptions provided by world experts, you still need to make sure you understand what you are doing at each step and why. Uncritical pursuit of a protocol is inherently risky.

Overall, should you buy this book? Whilst reading a chapter on an organism on which you were initiating work would be highly recommended, I wouldn't suggest buying the book just to get the information on one species; instead individual chapters can be bought online more cost effectively from www.cshprotocols.org/emo. As I write, a few of the volume two chapters are also available, and I imagine others will come online as they are completed. I did, though, enjoy browsing the various species in volume one much more than I anticipated. I think this stems from the 'Background Information and Uses' sections found in each chapter, which together summarise a diversity of data that can only otherwise be found from reading numerous, sometimes arcane, papers or from sporadic focused reviews like the *BioEssays* 'My Favourite Animal' series. From this perspective, having a copy lying around the lab is a nice idea. The adaptability and plummeting cost of genomics, the widening applicability of gene knockdown methodology and a sustained interest in applying these to a wider diversity of species means opportunities to explore new systems will continue to arise. My copy will be in the lab in the hope that students, postdocs and indeed myself will leaf through it in between experiments, and maybe, one day, exploit what they learn.

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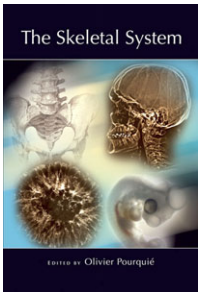
Fleshing out the skeletal system



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The Skeletal System

Edited by Olivier Pourquié

Cold Spring Harbor Laboratory Press (2009) 365 pages
ISBN 978-087969825-6
£61.75/$95 (hardcover)

One of the most prominent features of vertebrate evolution is the formation of the skeletal system, which consists of cartilage and/or bone. The skeletal system is essential to all vertebrate species; it provides the body with shape and form, supports it, protects the internal organs, allows body movement, houses blood stem cells, stores minerals and even acts as an endocrine organ to regulate general metabolism and homeostasis. However, for some time, the biology of the skeletal system escaped most people's attention because it was viewed as not being quite so 'alive' as other tissues and because the high mineral content of the skeleton led people to believe that it consists largely of 'pieces of rock'. Thanks to the recent application of genetic, molecular and cellular tools to the study of the skeletal system, the past two decades have seen a tremendous explosion of seminal discoveries about this biological system. Now one can never deny

that the vertebrate skeleton is just as important, complex and, of course, as scientifically interesting as any of the other organs. As such *The Skeletal System* edited by Olivier Pourquié is published at a good time and offers both global and detailed views of our current understanding of skeletal evolution, development and biology at the molecular level.

It is my recommendation that every principal investigator in the skeletal biology field, whether the research is basic or clinically oriented, should be armed with a copy of this book

A distinct strength of the book is that it has 11 chapters all written by leaders in their fields. The book provides a broad coverage of skeletal biology but focuses on three major themes: skeletal development, covering skeleton formation in the limb, craniofacial region and spine; cell differentiation and proliferation in the developing and formed skeleton, and their regulation by signaling molecules and transcription factors; and skeletal mineralization and remodeling. The book also contains chapters on the evolution of the vertebrate skeleton and on human genetic diseases that affect the skeletal system.

For someone (such as a graduate student) who has never formally learned the biology of the skeletal system in depth but is interested in it, this book is a good place to start. The chapters of the book are organized in a way that fits the ontogeny of the skeleton, and are hence very easy to follow. The book first covers skeletal evolution, then patterning and cell differentiation. After describing remodeling, mineralization and extracellular matrix regulation, events that occur specifically and extensively during skeletal formation and homeostasis, it ends with a comprehensive and insightful chapter on skeletal diseases that are caused by abnormal regulation of the skeletal system. Thus, the book can be chosen as a textbook by those who teach graduate courses on this topic too.

For senior basic science researchers and clinicians who are thinking about getting into the skeletal field or who already have established careers in the field, this book is also a great reference. The authors of all of the chapters have provided comprehensive and updated overviews of the field, with much of the information presented concisely and critically summarized by schematic graphics. What is more important is that, along the way, the authors offer their unique vision about the significance, history and impact of the particular subjects that they cover. It is provocative to read their views, for example, on the future directions for the field, which are provided in the concluding remarks and perspective of some chapters. These sections, in particular, offer food for thought for other scientists in the skeletal field and will have a positive impact on the future development of skeletal research. It is my recommendation that every principal investigator in the skeletal biology field, whether the research is basic or clinically oriented, should be armed with a copy of this book.

From every aspect, this book is almost perfect for readers at different levels. However, the field of skeletal biology is moving at a very fast pace. In the past two years, rapid advances have been made in understanding the molecular mechanisms that underlie the role of bone as a crucial endocrine organ that regulates body metabolism and bone mass via the central and sympathetic nervous system. Although these new advances have been mentioned in a couple of chapters, there is obviously a need to expand them into a new chapter. I must say that such hindsight is completely beyond editorial control, but the field will be better served if this new chapter is added to any future edition of this book. In addition, the formation and homeostasis of the cartilage and bone, two major components of the skeletal system, are intimately linked at both molecular and cellular levels in most vertebrate species. As such, readers would have been better served if these two components of the skeletal system were not so clearly separated into distinct chapters or if the chapters had been synthesized in a slightly different way to give more emphasis to the connections between bone and cartilage. Along this line, readers might also want to have more discussion of how signaling molecules, as extrinsic factors, and transcription factors, as intrinsic factors, act together in the same context to regulate the skeletal system.

In summary, I highly recommend this book to researchers interested in exploring skeletal biology and diseases: it is an excellent source of information on the molecular and cellular biology of the skeletal system and belongs in every laboratory of skeletal research.

A guide to the productive poking, prodding and injection of cells

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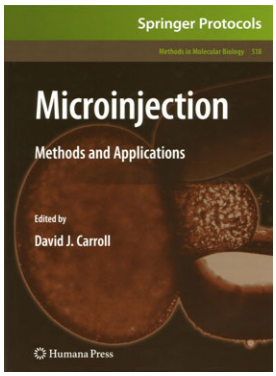

Microinjection: Methods and Applications (Methods in Molecular Biology Vol. 518)

Edited by David J. Carroll

Humana Press (2009) 224 pages
ISBN 978-1-58829-884-3
$99.50 (hardback)

This is just the type of book I would have liked to have had read before I began my own injection studies in the early 1980s. In *Microinjection: Methods and Applications*, David Carroll, the Editor, has assembled a knowledgeable group of practitioners, who describe clearly how to inject molecules, nuclei and cells (sperm) into a range of target cells. The difference between injection then and now, however, is not really how to inject, but what to inject and how to analyze the effects of such manipulations. Again, the chapter authors do a good job of describing various analytical methods, often in great detail.

Cellular injection, which ranges from the injection of somatic cells growing in vitro, to injecting into much larger cells, such as fertilized eggs, has a long history. Its roots are in the work of early cell biologists,