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# Embryonic Development Of The Central Nervous System

A discussion of the  
neural crest and  
neural crest cells,

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Development Of  
dealing with their  
The Central  
discovery, their  
Nervous System  
embryological and  
evolutionary  
origins, their  
cellular derivatives  
- in both agnathan  
and jawed  
vertebrates or  
gnathostomes -  
and the broad  
topics of migration

Read Online  
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Development Of  
and differentiation  
The Central  
in normal  
Nervous System  
development. The  
book also  
considers what  
goes wrong when  
development is  
misdirected by  
mutations, or by  
exposure of  
embryos to  
exogenous agents

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such as drugs,  
alcohol, or excess  
vitamin A, and  
includes  
discussions of  
tumours and  
syndromes and  
birth defects  
involving neural  
crest cells.  
This volume deals  
with brain

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development  
malformations of  
the central  
nervous system,  
showcasing a  
unique approach  
that furthers  
research through  
systematic  
integration of  
exciting new  
developments from

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fields including  
molecular  
genetics,  
neuroimaging, and  
neuropathology.  
By integrating data  
and research from  
these disciplines,  
better  
conceptualization  
of the mechanisms  
of the

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developmental  
processes is  
achieved.

Clinicians will find  
invaluable insights  
into complex  
issues, including  
midline  
hypoplasias,  
disorders of  
segmentation of  
the neural tube,

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and  
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hamartomatous  
disorders of

cellular lineage,  
amongst others.

The clinical  
manifestations of  
central nervous  
system

malformations are  
also discussed,  
along with new



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advancements in MRI techniques and analysis, including volumetric morphology, spectroscopy, and functional neuroimaging. Sections dedicated to management and treatment are

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also included in an effort to aid clinicians in their goal of providing better care for individuals affected by these types of malformations. \* A single source that encompasses the various aspects of

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Development Of  
cerebral  
malformations \* A  
unique approach  
that furthers  
research through  
systematic  
integration of  
exciting new  
developments from  
fields including  
molecular  
genetics,

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Embryonic  
Development Of  
neuroimaging, and  
The Central  
neuropathology \*  
Nervous System  
New diagnostic  
tools,  
management  
protocols, and  
treatments for  
patient care  
Because of the  
recent advances in  
embryo modeling  
techniques, and at

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the request of the  
Office of Science  
Policy in the Office  
of the Director at  
the National  
Institutes of  
Health, the  
National  
Academies of  
Sciences,  
Engineering,  
hosted a 1-day

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public workshop  
The Central  
that would explore  
Nervous System  
the state of the  
science of  
mammalian  
embryo model  
systems. The  
workshop, which  
took place on  
January 17, 2020,  
featured a  
combination of

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presentations,  
panels, and  
general

discussions, during  
which panelists  
and participants  
offered a broad  
range of  
perspectives.

Participants  
considered  
whether embryo

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model systems -  
The Central  
especially those  
Nervous System  
that use

nonhuman primate  
cells - can be used  
to predict the  
function of  
systems made with  
human cells.

Presentations  
provided an  
overview of the



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Development Of

current state of the  
science of in vitro  
development of

human

trophoblast. This  
publication

summarizes the  
presentation and  
discussion of the  
workshop.

Embryonic

Development of

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Dopamine and  
The Central  
Nervous System  
Serotonin in  
Epilepsy

Advances in the  
Biosciences  
Effects on Motor  
Neuron  
Development of  
Altering Peripheral  
Targets in  
Embryonic  
Leeches (Hirudo

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Embryonic  
Development Of  
Verbana)  
The Central  
Fifth Edition  
Nervous System

Embryonic  
Development in  
the Common Frog  
(*Rana Temporaria*  
L.) with Particular  
Reference to  
Acidity and  
Temperature  
Print+CourseSmart  
A version of the

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OpenStax text  
The embryonic development of the Central Nervous System (CNS) requires an orchestrated series of events tightly regulating the patterning and regionalization of the neural tube, as well as the proliferation and

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differentiation of distinct neuronal populations. All these events are controlled by cascades of activation of transcription factors that regulate the expression of specific subsets of genes in restricted regions and neuronal populations of the developing

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CNS. Among these transcription factors, homeobox-containing proteins play a crucial role, and altered expression of these factors can impact embryonic and adult CNS functions. In particular, homeobox-containing genes have been described to crucially regulate

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differentiation of  
dopaminergic and  
serotonergic neurons  
during brain  
development.

Classical  
pharmacological  
studies clearly showed  
that both dopamine  
and serotonin  
markedly regulate  
seizure susceptibility  
through specific

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receptor pathways.

Our recent studies, performed on classical and conditional knockout mouse lines, demonstrate that altered embryonic development of dopaminergic and serotonergic neurons results in altered seizure susceptibility in the adult life.



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Gynecologic and  
Urologic Pathology  
Developments of the  
Avian Embryo  
Preimplantation  
Embryo Development  
The Roles of Rb,  
P107, and E2f4 in  
Bone Formation and  
Embryonic  
Development  
Effects of  
Temperature and

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Moisture on  
Embryonic  
Development in  
Chrysemys Picta  
Bellii in Central  
Washington

***This book  
presents in-depth  
coverage of both  
the clinical and  
molecular  
biological***

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Development Of

**aspects of human  
development. It  
examines the**

**relationship**

**between basic**

**science and**

**embryology, and**

**describes**

**potential clinical**

**disorders arising**

**out of**

**embryologic**

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***problems. A  
strong clinical  
focus, practical  
design, and  
superb artwork-  
with more than  
150 images new  
to this edition-  
allow for quick  
comprehension  
and easy  
application of the***

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***latest knowledge  
in this rapidly  
advancing field.***

***A user-friendly  
design enables  
you to review the  
material in  
several ways,  
and online  
access to***

***Student Consult  
enhances your***

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***study of the  
subject and  
exponentially  
boosts your  
reference power.  
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friendly design  
allowing students  
to review material  
in flexible ways  
and instructors to  
tailor the book to***

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***their specific  
needs. Reflects  
the most current  
advances in  
molecular  
biology and  
genetics. Offers  
chapters with  
illustrated  
timelines of the  
relevant  
embryologic***

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***stage. Contains a  
high-quality full-  
color art***

***program, with  
excellent line  
diagrams with a  
three-***

***dimensional  
aspect, many  
color***

***photographs of  
clinical***



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Development Of  
**disorders,  
excellent black  
and white electro  
nphotomicrograp  
hs, and line  
drawings  
showing  
sequential stages  
of development.  
Presents clinical  
cases in each  
chapter that**

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***place the content into a real-life context. Begins each chapter with a summary providing at-a-glance reference to key information.***

***Features Clinical Tasters following the summaries at***

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***the start of each chapter that present a clinical case example related to the material for that chapter. Offers new chapters covering morphogenesis and dysmorphogenesis, for***

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***expanded explanations of the making of an embryo, focusing on cell-cell signaling pathways.***

***Emphasizes important content through clinical (In the Clinic) and research (In the***

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Development Of  
**Lab) boxes -**  
The Central  
**many new to this**  
Nervous System  
**edition.**

**Concludes each  
chapter with lists  
of references for  
further in-depth  
study. Includes  
access to  
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at [www.studentconsult.com](http://www.studentconsult.com),**

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and illustrations  
of the book  
online, and fully  
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titles . 200***

***USMLE-style***

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***questions to help  
you assess your  
mastery of the  
material .***

***embryology***

***animations that  
bring the topic to  
life . and much  
more!***

***The formation of  
a complex  
multicellular***

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***organism from a single cell is one of the most amazing processes of biology.***

***Embryonic development is characterised by the careful regulation of cellular***



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***behaviours such that cells proliferate, migrate, differentiate and form tissues at the correct place and time. These processes are genetically controlled and depend both on***

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***the history of  
cells, their  
lineage, and on  
the activities of  
signalling  
pathways, which  
coordinate the  
cell interactions  
leading to  
organogenesis.  
The aim of the  
Frontiers***

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Embryonic  
Development Of  
**research topic**  
**“Signalling**  
**pathways in**  
**embryonic**  
**development”**  
**has been to**  
**provide a forum**  
**for experts in cell**  
**and**  
**developmental**  
**biology to share**  
**recent advances**

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***in the field of  
signalling during  
embryonic  
development.***

***Sixteen articles  
in a variety of  
formats are  
united in this  
Topic, offering a  
valuable  
collection for  
researchers***

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Development Of  
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***looking for an  
update in the  
knowledge of  
signalling  
pathways  
operating during  
embryogenesis.  
The works,  
focused mainly  
on vertebrates,  
explore different  
aspects of this***

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***theme from cell  
communication  
to organ***

***formation and  
have implications  
for areas as  
distant as  
evolution or  
pathology.***

***Understanding  
developmental  
signalling***

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Development Of  
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***pathways is  
important for  
several reasons.***

***It gives us  
information about  
basic  
mechanisms of  
cell function and  
interactions  
needed for  
morphogenesis  
and***

Read Online  
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Development Of  
**organogenesis. It  
uncovers the  
basis of  
congenital  
malformations,  
since errors at  
any step of cell  
signalling during  
development are  
a major cause of  
defects. This  
fundamental**



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Development Of  
*insight gives us  
clues to  
understand the  
mechanisms  
operating in  
evolution that  
explain diversity  
in form and  
function. And  
finally, it allows  
the identification  
of possible*

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Development Of  
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***causes of  
disease in the  
adult organism  
(such as cancer  
or degenerative  
diseases)  
pinpointing  
possible targets  
for therapeutic  
approaches.  
This volume  
contains the***

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***Proceedings of  
the Serono  
Symposium on  
Pre implantation  
Embryo  
Development,  
held in Newton,  
Massachusetts,  
in 1991. The idea  
for the  
symposium grew  
out of the 1989***

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***Serono  
Symposium on  
Fertilization in  
Mammals\* at  
which  
preimplantation  
development was  
the predominant  
suggestion for a  
follow-up topic.  
This was indeed  
a timely subject***

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Embryonic  
Development Of  
***in view of the  
recent  
resurgence of  
interest in this  
fundamental  
phase of  
embryogenesis  
and its relevance  
to basic research  
and applied  
fertility studies in  
humans, food-***

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***producing  
animals, and  
endangered  
species. The  
symposium  
brought together  
speakers from a  
broad range of  
disciplines in  
order to focus on  
key regulatory  
mechanisms in***

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Development Of  
**embryo  
development,  
using a wide  
variety of animal  
models, and on  
representative  
topics in human  
preimplantation  
embryogenesis.  
The culmination  
of  
preimplantation**

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***development is a blastocyst containing the first differentiated embryonic tissues and capable of initiating and sustaining pregnancy. The central objective of the***



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***symposium was to throw light on the regulation of cellular and molecular events underlying blastocyst formation. It was particularly appropriate that the date of the symposium***

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***marked the 20th anniversary of the publication of the classic volume *Biology of the Blastocyst*, the proceedings of an international workshop held in 1970. This book, which***

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***summarized most  
of the information  
then available on***

***this topic in***

***mammals, was***

***edited by the***

***pioneer in***

***blastocyst***

***research, Dr.***

***Richard Blandau,***

***who was the***

***guest speaker at***

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*the symposium.*

*The Neural Crest*

*Fetal MRI*

*Atlas of Chick*

*Development*

*Development of*

*the Nervous*

*System*

*Anatomy &*

*Physiology*

" . . . but our

knowledge is so

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weak that no  
philosopher  
will ever be  
able to  
completely  
explore the  
nature of even  
a fly . . . " \*

Thomas Aquinas  
"In Symbolum  
Apostolorum"

079 RSV p/96

This is a

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monograph on  
embryogenesis  
of the fruit  
fly *Drosophila*  
*melanogaster*  
conceived as a  
reference book  
on morphology  
of embryonic  
development. A  
monograph of  
this extent and  
content is not

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yet available  
in the  
literature of  
Drosophila  
embryology,  
and we believe  
that there is  
a real need for  
it. Thanks to  
the progress  
achieved during  
the last ten  
years in the

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fields of developmental and molecular genetics, work on *Drosophila* development has considerably expanded creating an even greater need for the information



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that we present  
here. Our own  
interest for  
wildtype  
embryonic  
development  
arose several  
years ago, when  
we began to  
study the  
development of  
mutants. While  
those studies

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were going on  
we repeatedly  
had occasion to  
state in  
sufficiencies  
in the existing  
literature  
about the  
embryology of  
the wildtype,  
so that we  
undertook  
investigating

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many of these  
problems by  
ourselves.

Convinced that  
several of our  
colleagues will  
have  
encountered  
similar  
difficulties we  
decided to  
publish the  
present

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monograph.

Although not  
expressely  
recorded,  
Thomas Aquinas  
probably  
referred to the  
domestic fly  
and not to the  
fruit fly.

Irrespective of  
which fly he  
meant, however,

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we know that  
Thomas was  
right in any  
case.

This is the  
most  
comprehensive  
book to be  
written on the  
subject of  
fetal MRI. It  
provides a  
practical hands-

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on approach to  
the use of stat  
e-of-the-art  
MRI techniques  
and the  
optimization of  
sequences.

Fetal  
pathological  
conditions and  
methods of  
prenatal MRI  
diagnosis are

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discussed by  
organ system,  
and the

available  
literature is  
reviewed.  
Interpretation  
of findings and  
potential  
artifacts are  
thoroughly  
considered with  
the aid of

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numerous high-  
quality  
illustrations.

In addition,  
the  
implications of  
fetal MRI are  
explored from  
the medico-  
legal and  
ethical points  
of view. This  
book will serve



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as a detailed  
The Central  
resource for  
Nervous System  
radiologists,  
obstetricians,  
neonatologists,  
geneticists,  
and any  
practitioner  
wanting to gain  
an in-depth  
understanding  
of fetal MRI  
technology and

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applications.  
In addition, it  
will provide a  
reference  
source for  
technologists,  
researchers,  
students, and  
those who are  
implementing a  
fetal MRI  
service in  
their own

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facility.  
The Central  
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Advances in the  
Biosciences 13:  
Hormones and  
Embryonic  
Development  
investigates  
various aspects  
of hormones and  
embryonic  
development,  
including their  
physiological

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and  
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pharmacological  
effects. More  
specifically,  
this volume  
considers which  
maternal  
hormones are  
essential for  
normal  
mammalian  
embryonic  
development, as

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well as the time course of the occurrence of endocrine systems during mammalian fetal development. In addition, it examines the role of maternal or fetal hormones in the

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induction and  
differentiation  
processes  
during  
embryonic or  
fetal  
development.  
Comprised of 13  
chapters, this  
book begins  
with an  
analysis of the  
metabolic

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effects of  
insulin and  
glucagon in  
fetal and  
newborn rats,  
as well as  
their  
physiologic  
significance  
during the  
perinatal  
period in rat  
and other

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species. The next chapter deals with sexual differentiation in the rat fetus; how hormones regulate sexual development and disrupt sexual differentiation; the role of



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progesterone  
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and estrone in  
pregnant rats  
fed a protein-  
free diet; and  
effects of  
brain implants  
of testosterone  
propionate in  
newborn  
hamsters on  
sexual differen-  
tiation. The

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link between diethylstilbestrol ingestion during pregnancy and development of clear-cell adenocarcinoma in the vagina and cervix of the female offspring is also examined.

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This monograph will be of interest to biologists, bioscientists, physiologists, and pharmacologists.

Larsen's Human Embryology  
Role of the Corpus Luteum  
in Embryonic

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Nervous System  
Development and  
Embryonic Loss  
in Ponies and  
Heifers

The Developing  
Human:  
Clinically  
Oriented  
Embryology With  
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Examining the  
*Page 84/183*

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State of the  
Science of  
Mammalian

Embryo Model  
Systems  
Organ  
Development

**(Cont.) Analyzing  
embryos at e13.5,  
we find that the  
combined loss of  
pRb and p107  
affects the**

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**development of a variety of organs, including the central nervous system, limbs, blood vessel endothelial cells, and heart. These data demonstrate novel, cooperative functions for pRb and p107 in murine embryogenesis. Altogether, these**

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Development Of

**studies provide evidence of much broader and novel roles for pRb, p107, and E2F4 in the development and differentiation of murine embryonic tissues. The formation of blood vessels is an essential aspect of embryogenesis in vertebrates. It is a**

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**central feature of  
numerous post-  
embryonic  
processes,  
including tissue  
and organ growth  
and regeneration.  
It is also part of  
the pathology of  
tumour formation  
and certain  
inflammatory  
conditions. In  
recent years,**



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**comprehension of  
the molecular  
genetics of blood  
vessel formation  
has progressed  
enormously and  
studies in  
vertebrate model  
systems, especially  
the mouse and the  
zebrafish, have  
identified a  
common set of  
molecules and**

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**processes that are conserved throughout vertebrate embryogenesis while, in addition, highlighting aspects that may differ between different animal groups. The discovery in the past decade of the crucial role of new**

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**blood vessel  
formation for the  
development of  
cancers has  
generated great  
interest in  
angiogenesis (the  
formation of new  
blood vessels from  
pre-existing ones),  
with its major  
implications for  
potential cancer-  
control strategies.**

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**In addition, there are numerous situations where therapeutic treatments either require or would be assisted by vasculogenesis (the de novo formation of blood vessels). In particular, post-stroke therapies could include**

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**treatments that  
stimulate  
neovascularization  
of the affected  
tissues. The  
development of  
such treatments,  
however, requires  
thoroughly  
understanding the  
developmental  
properties of  
endothelial cells  
and the basic**

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**biology of blood  
vessel formation.**  
While there are  
many books on  
angiogenesis, this  
unique book  
focuses on exactly  
this basic biology  
and explores blood  
vessel formation in  
connection with  
tissue  
development in a  
range of animal

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The Central  
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**models. It includes  
detailed  
discussions of  
relevant cell  
biology, genetics  
and  
embryogenesis of  
blood vessel  
formation and  
presents insights  
into the cross-talk  
between  
developing blood  
vessels and other**

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**tissues. With  
contributions from  
vascular biologists,  
cell biologists and  
developmental  
biologists, a  
comprehensive  
and highly  
interdisciplinary  
volume is the  
outcome.**

**Organ  
Development,  
Volume 132, the**

*Page 96/183*



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**latest release in  
the Current Topics**

**in Developmental**

**Biology series,**

**highlights new**

**advances in the**

**field, with this new**

**volume presenting**

**interesting chapter**

**written by an**

**international board**

**of authors. This**

**volume highlights**

**cogent reviews of**

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The Central  
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**the development, maintenance and regeneration/repair of several organ systems, from eye to kidney, to the musculoskeletal system. Many reviews highlight new techniques or technologies that are currently pushing the field. The role of both**

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**embryonic and  
adult stem cells  
are highlighted  
and senior authors  
are all women  
scientists.  
Provides the  
authority and  
expertise of  
leading  
contributors from  
an international  
board of author  
Presents the latest**

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**release in this**  
**series Updated**  
**release includes**  
**the latest**  
**information on**  
**organ development**  
**Discovering the**  
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**Review of Medical**  
**Embryology**  
**Malformations of**  
**the Nervous**  
**System**  
**Embryonic and**

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Development Of  
**Regenerative  
Development in  
Planarians System  
Programmed Cell  
Death and Central  
Nervous System  
(CNS) Midline  
Function in  
Drosophila  
Embryonic  
Development**  
**The organizer  
area plays a  
central role in**

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Development Of  
**the formation of  
The Central  
Nervous System  
axis and the  
central nervous  
system of all  
vertebrates  
including the  
human fetus. In  
The Vertebrate  
Organizer,  
outstanding  
molecular  
development  
biologists and**

Read Online  
Embryonic  
Development Of  
**embryologists**  
The Central  
**report their**  
Nervous System  
**latest**  
**approaches in**  
**this fascinating**  
**research area**  
**using different**  
**vertebrate model**  
**organisms. The**  
**presented data is**  
**of central**  
**importance for**  
**the**  
**understanding of**

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Embryonic  
Development Of  
**early human  
embryogenesis.  
Why species  
differ in rate of  
development and  
quality of  
offspring is a  
central question  
in life history  
theory. A  
physiological  
trade-off is  
thought to occur  
between the rate**



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Development Of  
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**of development and enhancement of internal systems, such as immune function, which determine high offspring quality. For example, in birds, slow rate of embryonic development is thought to enhance immune**

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Embryonic  
Development Of  
**function;**  
The Central  
**however, tests of**  
Nervous System  
**the trade-off**  
**show mixed**  
**results for adult**  
**and nestling**  
**birds. A**  
**problematic**  
**assumption of**  
**previous tests is**  
**that the length of**  
**the embryonic**  
**period**  
**represents the**

Read Online  
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Development Of  
**intrinsic rate of  
embryonic  
development.**

**Evidence  
indicates that  
temperature  
experienced by  
the avian embryo  
influences rate of  
development  
such that cool  
temperatures  
slow  
development,**

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Development Of  
The Central  
Nervous System

**extend  
development  
period and may  
even compromise  
offspring quality.  
We studied  
coexisting  
species of  
passerines to test  
predictions that  
species with  
slower embryonic  
development  
have higher**

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Embryonic  
Development Of  
measures of  
The Central  
Immune System

**function. We used the absolute length of embryonic period and temperature-corrected embryonic period as measures of rate of development. We also tested the prediction that**

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Development Of  
**species with  
higher parasite  
attack evolved  
stronger immune  
function. We  
found that  
among species,  
measures of  
adult immune  
function are  
positively related  
to the absolute  
length of  
embryonic period**

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**but not to temperature-corrected embryonic period. One measure of adult immune function was explained by intestinal parasite intensity suggesting these parasites may exert a selection pressure on certain**

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Development Of  
**components of  
The Central  
Nervous System**

**Nestling immune  
function was not  
related to the  
absolute length  
of embryonic  
period while one  
component of  
nestling immune  
function was  
positively  
associated with t**



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Embryonic  
Development Of  
**temperature-**  
**corrected**  
**embryonic**  
**period. The**  
**discord between**  
**nestling versus**  
**adult immune**  
**function and**  
**their relationship**  
**with absolute**  
**length of**  
**embryonic**  
**periods raises**  
**questions about**

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Development Of  
The Central  
Nervous System

**the importance  
of embryonic  
development in  
determining  
adult immune  
function. Our  
results suggest  
that a  
physiological  
trade-off may be  
occurring  
between rate of  
development and  
certain aspects**

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Embryonic  
Development Of  
**of the immune  
function.**

**This book  
highlights the  
similarities and  
differences in the  
pathology of the  
genital and  
urinary tracts in  
males and  
females.**

**Embryonic  
Development of  
the Zebrafish**

*Page 115/183*

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Development Of  
**Central Nervous  
System**  
The Embryonic  
Development of  
**Drosophila  
melanogaster**  
Human  
Embryology &  
Teratology  
Proceedings of a  
Workshop  
The brain ...  
There is no

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other part of the human anatomy that is so intriguing. How does it develop and function and why does it sometimes, tragically, degenerate? The answers are complex. In

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Discovering the  
Brain, science  
writer Sandra

Ackerman cuts  
through the  
complexity to  
bring this vital  
topic to the  
public. The  
1990s were  
declared the  
"Decade of the

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The Central  
Nervous System  
Brain" by former  
President Bush,  
and the  
neuroscience  
community  
responded with  
a host of new  
investigations  
and  
conferences.  
Discovering the  
Brain is based

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Development Of  
on the Institute  
The Central  
of Medicine  
Nervous System  
conference,  
Decade of the  
Brain: Frontiers  
in Neuroscience  
and Brain  
Research.  
Discovering the  
Brain is a "field  
guide" to the  
brain--an easy-



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to-read  
The Central  
Nervous System  
discussion of the  
brain's physical  
structure and  
where functions  
such as  
language and  
music  
appreciation lie.  
Ackerman  
examines How  
electrical and

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chemical signals are conveyed in the brain. The mechanisms by which we see, hear, think, and pay attention--and how a "gut feeling" actually originates in the brain. Learning

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and memory retention, including parallels to computer memory and what they might tell us about our own mental capacity.

Development of the brain

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throughout the  
life span, with a  
look at the aging  
brain. Ackerman  
provides an  
enlightening  
chapter on the  
connection  
between the  
brain's physical  
condition and  
various mental

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disorders and notes what progress can realistically be made toward the prevention and treatment of stroke and other ailments. Finally, she explores the potential for

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major advances  
during the

"Decade of the  
Brain," with a

look at medical  
imaging

techniques--wha  
t various

technologies can  
and cannot tell

us--and how the  
public and

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private sectors  
can contribute  
to continued  
advances in  
neuroscience.

This highly  
readable volume  
will provide the  
public and policy  
makers--and  
many scientists  
as well--with a

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helpful guide to  
understanding  
the many  
discoveries that  
are sure to be  
announced  
throughout the  
"Decade of the  
Brain."

Development of  
the Nervous  
System, Second



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Edition has been thoroughly revised and updated since the publication of the First Edition. It presents a broad outline of neural development principles as exemplified by

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key experiments  
and  
observations  
from past and  
recent times.  
The text is  
organized along  
a development  
pathway from  
the induction of  
the neural  
primordium to

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the emergence of behavior. It covers all the major topics including the patterning and growth of the nervous system, neuronal determination, axonal navigation and

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targeting,  
synapse  
formation and  
plasticity, and  
neuronal  
survival and  
death. This new  
text reflects the  
complete  
modernization of  
the field  
achieved

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through the use  
of model  
organisms and  
the intensive  
application of  
molecular and  
genetic  
approaches. The  
original, artist-  
rendered  
drawings from  
the First Edition

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and  
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developments  
made in the field  
since the first  
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full color  
throughout, with  
the original,  
artist-rendered  
drawings from  
the first edition  
completely  
redone, revised,



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colorized, and  
updated  
Details four  
main factors of  
human  
embryonic  
development:  
morphology and  
function;  
developmental  
basis for a  
number of

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congenital  
The Central  
anomalies;  
Nervous System  
technology that  
allows the  
manipulation of  
embryonic  
development;  
and links  
between the  
data generated  
from molecular  
and

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studies.  
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Comprehensive  
Neonatal  
Nursing Care  
Human  
Embryology and  
Developmental  
Biology  
Signalling  
Pathways in  
Embryonic

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Importance of  
Slow Embryonic  
Development in  
Offspring and  
Adult Immune  
Function  
The Formation  
of the Medullary  
Groove and  
Some Other  
Features of

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Development in  
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the

Elasmobranchs,  
*The success of  
Assisted  
Reproductive  
Technology is  
critically dependent  
upon the use of  
well optimized  
protocols, based*

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*upon sound scientific reasoning, empirical observations and evidence of clinical efficacy. Recently, the treatment of infertility has experienced a revolution, with the routine adoption of*

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*increasingly  
specialized  
molecular  
biological  
techniques and  
advanced methods  
for the  
manipulation of  
gametes and  
embryos. This  
textbook – inspired  
by the*

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*postgraduate*  
*degree program at*  
*the University of*  
*Oxford – guides*  
*students through*  
*the*  
*multidisciplinary*  
*syllabus essential*  
*to ART laboratory*  
*practice, from*  
*basic culture*  
*techniques and*



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*micromanipulation*

*to laboratory*

*management and*

*quality assurance,*

*and from*

*endocrinology to*

*molecular biology*

*and research*

*methods. Written*

*for all levels of IVF*

*practitioners,*

*reproductive*

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*biologists and  
technologists  
involved in human  
reproductive  
science, it can be  
used as a  
reference manual  
for all IVF labs and  
as a textbook by  
undergraduates,  
advanced  
students, scientists*

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*and professionals  
involved in  
gamete, embryo or  
stem cell biology.  
During embryonic  
development,  
axons that project  
into the peripheral  
tissue encounter  
many different  
cues that can  
affect their final*

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*phenotype. We have studied the development of individually identified motor neurons in medicinal leeches (Hirudo verbana). We hypothesized that contact with peripheral targets provide signals*

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*that direct the formation of central synaptic connections. To test this hypothesis, we transplanted pieces of body wall into ectopic locations to ask if the central connections of*

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*motor neurons*  
*change when they*  
*contact the*  
*"wrong" peripheral*  
*target. We used*  
*embryos at*  
*47-50% of*  
*development, a*  
*stage at which*  
*neurons are just*  
*beginning to form*  
*their central*

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*electrical connections. We transplanted tissue from a donor embryo and implanted it into the opposite region of a host embryo. We then let our embryos develop to a juvenile stage. External pigment*

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*patterns indicated that transplanted tissues retained their original fate. Immunostaining for acetylated tubulin revealed that the transplanted tissue became innervated, although less densely than un-*



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*manipulated  
tissue. Injections of  
AlexaFlour 488  
dextran into motor  
neurons adjacent  
to an ectopic  
transplant  
indicated that the  
axons of these  
neurons projected  
into the periphery  
similarly to*

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*unaltered controls.  
Injecting Alexa  
Flour 488 plus  
Neurobiotin, which  
crosses gap  
junctions, revealed  
no statistically  
significant  
difference in the  
number of cells  
that were dye-  
coupled to the*

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*filled cell in embryos that received ectopic transplants, although the neurons and connections within the ganglion become markedly un-patterned, suggesting that disrupting the*

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*periphery exerts at least some influence in the central nervous system.*

*In the years since its first publication, O'Rahilly and Muller's Human Embryology and Teratology has been widely*

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*praised as an exceptional reference on normal and abnormal human prenatal development. This revised and expanded Third Edition offers more in-depth coverage of the central*

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*topics in human embryology and incorporates the latest data from ongoing embryological investigations. Authored by two of the world's foremost authorities on the human embryo,*

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*this new edition  
provides a  
comprehensive  
overview of  
general and  
systemic  
development,  
referring  
throughout to the  
internationally  
accepted Carnegie  
system of*

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*embryonic staging.*

*Extensively  
illustrated, the*

*book features*

*nearly 400 figures,*

*including detailed,*

*color-enhanced*

*line drawings that*

*clarify the*

*developmental*

*processes of every*

*major organ and*



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*system. Useful  
recommendations  
for additional  
reading are listed  
at the end of each  
chapter. The Third  
Edition has been  
thoroughly revised  
and updated to  
include: \**

*Elaboration of the  
nervous system to*

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*conform to the  
second edition of  
the authors' The  
Embryonic Human  
Brain \**

*Reorganization of  
the chapters on the  
heart and eye, and  
clarification of the  
liver, vertebrae,  
and  
neuroteratology \**

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*Expanded tables  
explaining the  
initial appearance  
of features in each  
body system \**

*Further indications  
of precise  
embryonic stages \**

*35 new drawings  
and 27 new  
photomicrographs  
in color \**

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*Numerous new  
references \*  
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terminology,  
standardized  
according to the  
accepted usage  
The undisputed  
authority on human  
embryology and  
embryonic  
abnormalities,*

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*Human  
Embryology and  
Teratology, Third  
Edition belongs in  
the library of every  
physician,  
biologist, student,  
and research  
scientist whose  
research is  
concerned with  
human anatomical*

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*development. Its authoritative, concise, and thoroughly illustrated presentation also makes it an ideal reference for practitioners in all medical and surgical subspecialties.*

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Organizer  
Hormones and  
Embryonic  
Development  
Textbook of  
Clinical  
Embryology  
The Neural Crest  
in Development  
and Evolution  
Researches Upon*

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Development Of  
*Nemerteans and  
Planarians*  
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This 1999 edition of  
The Neural Crest  
contains  
comprehensive  
information about the  
neural crest, a  
structure unique to  
the vertebrate  
embryo, which has  
only a transient  
existence in early



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embryonic life. The ontogeny of the neural crest embodies the most important issues in developmental biology, as the neural crest is considered to have played a crucial role in evolution of the vertebrate phylum. Data that analyse neural crest ontogeny in murine and

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zebrafish embryos have been included in this revision. This revised edition also takes advantage of recent advances in our understanding of markers of neural crest cell subpopulations, and a full chapter is now devoted to cell lineage analysis. The major research

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breakthrough since the first edition has been the introduction of molecular biology to neural crest research, enabling an elucidation of many molecular mechanisms of neural crest development. This book is essential reading for students and researchers in developmental

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biology, cell biology,  
and neuroscience.

This outstanding work  
is the only modern  
book devoted to the  
chick embryo and has  
been an essential  
resource for  
geneticists, molecular  
and developmental  
biologists, and other  
life scientists who use  
the chick embryo as  
their research model.

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This new enlarged and updated second edition is published in response to continuing demand. The text provides a detailed description of development, from fertilization to hatching, with emphasis on the earlier stages though also covering individual organ

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There are reviews of  
the more recent  
molecular research  
and a new section  
highlighting the  
important landmarks  
in the history of chick  
embryology which  
have had an impact  
on our understanding  
of developmental  
processes. The book  
is beautifully

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illustrated with 74 text-figures and over 500 photographs, including nearly 200 new scanning electron micrographs.

New to This Edition: \*

Updated and expanded text to accompany diagrams

\* More than 200 new labelled scanning electron micrographs showing individual

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tissues in great detail

\* Reviews of recent  
molecular research\*

Discusses the roles of  
genes such as Hox  
genes, BMPs, and  
sonic hedgehog  
during early

development \* New  
sections on genetical  
anomalies,

techniques, and the  
poultry industry

In this book we have



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described the major events of embryonic development and considered the underlying mechanisms which result in the production of a viable hatchling. We have, as the subtitle of the book indicates, concentrated on behavioural and physiological topics: it

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is not our purpose to consider the early embryology of the bird - which is adequately covered by other texts - but we have included morphogenetic information where appropriate. The form of the book was dictated by a belief that interest in this aspect of

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development is not confined to embryologists, biochemists and physiologists. Therefore after describing the conditions in which the egg normally develops we have considered first the whole embryo: what it is like at different stages, what it does,

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how it gets from one position to another within the shell and how, later, it comes to interact with the wider environment of the nest. Only after this have we considered the development of the nervous and sensory mechanisms on which this transformation depends and on the

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problem of the level of behavioural maturity with which the chick emerges from the egg. With the main lines of development described we have, in the second part of the book, turned to a detailed consideration of the physiology of development: ranging from what may be conveniently

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described as the 'life-  
support' systems -

gaseous exchange,

provision of energy,

etc. - to the of

hormones in avian

development.

Vascular

Development

I. Embryonic

Development of

Planocera Elliptica

Introduction to

Embryonic

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Development  
A Behavioural and  
Physiological Study