

Reviews in Computational Biology

4. Structuring & Outlining



James Smith

January, 2013

Structuring & Outlining

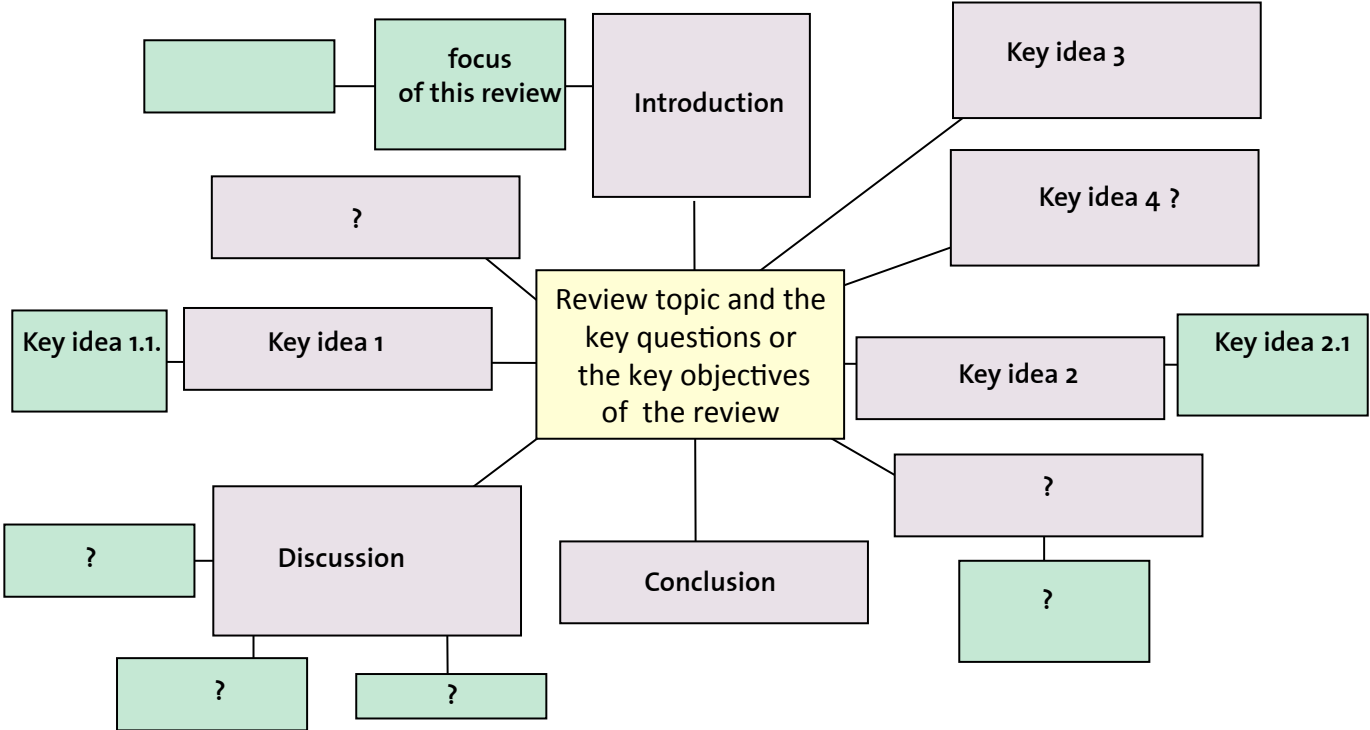
- Ideas/general concepts
- Navigates/signposts the narrative
- Not detail but a schema....

Structuring & Outlining

- Does the reader notice?
- Does it keep the interest?
- Does it convey the arguments?

An example structure/outline

Review



Exercise 1

- “Reconstructing a Structure”
- 4 teams of “Technical Editors”
 - 1. Groups paragraphs in sections and subsections with headings - Draw a schema of the structure
 - 2. Provide 2 alternative structures that might work - Draw a schema of the structure

Group A Cannot change, Group B can change

Discussion

- What are the shortcomings?

For your own reviews

- 1) Introductory paragraph or sentence(s)
- 2) 3 Sections (ideas) for your manuscript
- 3) Conclusion paragraph or sentence(s)

Reviews with clear structure & outline

- The Annual Reviews Series
- Structure is presented as a Table of Contents

The Abstract reflects the Table of Contents

Orthologs, Paralogs, and Evolutionary Genomics¹

Eugene V. Koonin

National Center for Biotechnology Information, National Library of Medicine,
National Institutes of Health, Bethesda, Maryland 20894;
email: koonin@ncbi.nlm.nih.gov

Abstract

Orthologs and paralogs are two fundamentally different types of homologous genes that evolved, respectively, by vertical descent from a single ancestral gene and by duplication. Orthology and paralogy are key concepts of evolutionary genomics. A clear distinction between orthologs and paralogs is critical for the construction of a robust evolutionary classification of genes and reliable functional annotation of newly sequenced genomes. Genome comparisons show that orthologous relationships with genes from taxonomically distant species can be established for the majority of the genes from each sequenced genome. This review examines in depth the definitions and subtypes of orthologs and paralogs, outlines the principal methodological approaches employed for identification of orthology and paralogy, and considers evolutionary and functional implications of these concepts.

Contents

INTRODUCTION.....	310
HISTORY, DETAILED DEFINITIONS, AND CLASSIFICATION OF ORTHOLOGS AND PARALOGS	311
A Super-Brief History of Homology	311
Orthology and Paralogy: Definitions and Complications ..	312
IDENTIFICATION OF ORTHOLOGS AND PARALOGS: PRINCIPLES AND TECHNIQUES	316
EVOLUTIONARY PATTERNS OF ORTHOLOGY AND PARALOGY	321
Coverage of Genomes in Clusters of Orthologs	321
One-to-One Orthologs and Inparalogs	322
Orthologous Clusters and the Molecular Clock	323
Xenologs, Pseudoorthologs, and Pseudoparalogs	324
Protein Domain Rearrangements, Gene Fusions/Fissions, and Orthology	327
FUNCTIONAL CORRELATES OF ORTHOLOGY AND PARALOGY	330
GENERAL DISCUSSION.....	331
Orthology and Paralogy as Evolutionary Inferences and the Homology Debates	331
Generalized Concepts of Orthology and Paralogy	332
CONCLUSIONS.....	333



Access provided by:
University of Cambridge

JOURNALS ▾

SUBSCRIPTIONS ▾

AUTHORS ▾

LIBRARIANS & AGENTS ▾

ABOUT ANNUAL REVIEWS

Annual Reviews publications are among the most highly cited in the scientific literature, and are available in print and online to individuals, institutions, and consortia throughout the world.

[More About Annual Reviews](#)

30,000+

AVAILABLE REVIEW
ARTICLES

[READ MORE](#)

41,000+

AVAILABLE FIGURES
AND IMAGES

[READ MORE](#)

35

TOP-RANKED IMPA
FACTOR JOURNAL

[READ MORE](#)

SEARCH JOURNALS

SEARCH TERMS

Enter Search Term

AUTHORS

Any Author

JOURNALS

Any Journal

BROWSE JOURNALS

SUPPLEMENTAL MATERIALS

SPECIAL COMPILATIONS

Access = from Vol. 1; = to current or back volumes; No icon = to abstracts only

BIOMEDICAL/LIFE SCIENCES

- ANALYTICAL CHEMISTRY
- ANIMAL BIOSCIENCES
- BIOCHEMISTRY
- BIOMEDICAL ENGINEERING

PHYSICAL SCIENCES

- ANALYTICAL CHEMISTRY
- ASTRONOMY AND ASTROPHYSICS
- BIOMEDICAL ENGINEERING
- BIOPHYSICS

SOCIAL SCIENCES

- ANTHROPOLOGY
- CLINICAL PSYCHOLOGY
- ECONOMICS
- ENVIRONMENT AND RESOURCES

NEW IN 2013
**ANNUAL
REVIEW OF
ANIMAL
BIOSCIENCE**

BROWSE JOURNALS

SUPPLEMENTAL MATERIALS

SPECIAL COMPILATIONS

Access = from Vol. 1; = to current or back volumes; No icon = to abstracts only

BIOMEDICAL/LIFE SCIENCES

- . ANALYTICAL CHEMISTRY
- . BIOCHEMISTRY
- . BIOMEDICAL ENGINEERING
- . BIOPHYSICS
- . CELL AND DEVELOPMENTAL BIOLOGY
- . CHEMICAL AND BIOMOLECULAR ENGINEERING
- . CLINICAL PSYCHOLOGY
- . ECOLOGY, EVOLUTION, AND SYSTEMATICS
- . ENTOMOLOGY
- . FOOD SCIENCE AND TECHNOLOGY
- . GENETICS
- . GENOMICS AND HUMAN GENETICS
- . IMMUNOLOGY
- . MARINE SCIENCE
- . MEDICINE
- . MICROBIOLOGY
- . NEUROSCIENCE
- . NUTRITION
- . PATHOLOGY: MECHANISMS OF DISEASE
- . PHARMACOLOGY AND TOXICOLOGY
- . PHYSIOLOGY
- . PHYTOPATHOLOGY
- . PLANT BIOLOGY
- . PSYCHOLOGY
- . PUBLIC HEALTH

PHYSICAL SCIENCES

- . ANALYTICAL CHEMISTRY
- . ASTRONOMY AND ASTROPHYSICS
- . BIOMEDICAL ENGINEERING
- . BIOPHYSICS
- . CHEMICAL AND BIOMOLECULAR ENGINEERING
- . COMPUTER SCIENCE
- . CONDENSED MATTER PHYSICS
- . EARTH AND PLANETARY SCIENCES
- . ENVIRONMENT AND RESOURCES
- . FLUID MECHANICS
- . MARINE SCIENCE
- . MATERIALS RESEARCH
- . NUCLEAR AND PARTICLE SCIENCE
- . PHYSICAL CHEMISTRY

SOCIAL SCIENCES

- . ANTHROPOLOGY
- . CLINICAL PSYCHOLOGY
- . ECONOMICS
- . ENVIRONMENT AND RESOURCES
- . FINANCIAL ECONOMICS
- . LAW AND SOCIAL SCIENCE
- . POLITICAL SCIENCE
- . PSYCHOLOGY
- . PUBLIC HEALTH
- . RESOURCE ECONOMICS
- . SOCIOLOGY

SPECIAL COMPILATIONS

Annual Reviews Special Compilations are web-based collections of previously published articles that provide a unique look into relevant topics as selected by an Annual Reviews expert.

From selected autobiographies of Nobel Laureates in Chemistry to the state of the art in climate change, our experts point out the relevant reviews.

[Visit Our Special Compilations Page](#)

Next week - Editing

- Introduction, middle, conclusion
- Identifies (in)appropriate text
- Improves clarity