Mincorso in Competenze Bibliografiche

Anatomy of a Scientific Publication

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NATURAL & LIFE SCIENCES

Main Types Of Scientific Publication

- **text book**
- **specialized text / handbook**
- **chapter in thematic book**
- **congress proceeding**
- **articles on internet**
- **patent**
- **technical report**
- **poster**
- **peer reviewed scientific articles** → **scientific journal**

online sources

- **PubMed Central / MEDLINE - LS**
- Chemical Abstracts Service - Chem
- Google (NOT FILTERED)
- Google scholar
- Commercial databases (**ISI, Scopus**)
- University electronic library services
- Journal Publishers web page

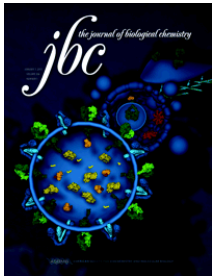
TYPES OF SCIENTIFIC JOURNAL

- **multidisciplinary**

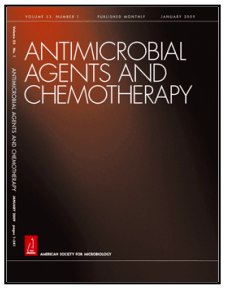
  (eg., Nature, Science, PNAS)

- **monodisciplinary**

  (eg., Biochemistry, J. Biological Chem.)

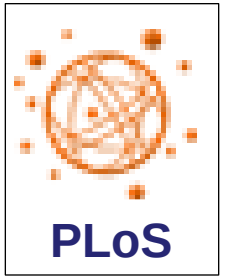


- **sectorial** (eg., J. Peptide Science, Antimicrobial Agents & Chemotherapy)



- **solo online**

  (es., BioMedCentral, PLOS)



TYPES OF SCIENTIFIC ARTICLES

- **Full article** - full description of new data / knowledge
- **Communication/Letter/Note** - brief description of new data / knowledge
- **Review article** - compendium of known data / knowledge by expert
- **Comment** - discussion of another author's article
- **Editorial** - comment by the editor of a special issue on its contents

ANATOMY OF A SCIENTIFIC ARTICLE

1) Title

Mode of action of human β-defensin 3 against *Staphylococcus aureus* and transcriptional analysis of responses to defensin challenge

2) Authors

Vera Sass[a], Ulrike Pag[a], Alessandro Tossi[b], Gabriele Bierbaum[c], Hans-Georg Sahl[a,*]

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Received 17 August 2007; received in revised form 12 November 2007; accepted 16 January 2008

Life Sciences:

- 1st author
- Last author
- corresponding author

3) Affiliations

- single group
- multiple groups
- international collaboration

4) Date of receipt and acceptance

Indication of easy/difficult peer review process

ANATOMY OF A SCIENTIFIC ARTICLE (cont.)

5) **Abstract / Synopsis** - simple

letter limit - compound (Objectives, Methods, Conclusions)

6) **Key Words**

7) **Abbreviations**

Abstract

A template based on positional residue frequencies in the N-terminal stretch of natural α-helical antimicrobial peptides was used to prepare sequence patterns and to scan the Swiss-Prot Database, using the ScanProsite tool. This search identified a segment in pilosulin 1, a cytotoxic peptide from the venom of the jumper ant *Myrmecia pilosula*, as a potential novel antimicrobial peptide sequence. This segment, corresponding to the 20 N-terminal residues, was synthesized and its structural properties and biological activities were investigated. It showed a potent and broad spectrum antimicrobial activity including standard and multi-drug resistant gram-positive and gram-negative bacteria and *Candida albicans*, confirming the validity of the search method. A rational redesign approach resulting in four amino acid substitutions yielded a variant with improved antibacterial and significantly reduced hemolytic activity.

Keywords: Antimicrobial peptide; Sequence template; Cytotoxicity; Venom; Pilosulin

[1] *Abbreviations used:* BSA, bovine serum albumin; ONPG, *o*-nitrophenyl-β-D-galactopyranoside; PBS, phosphate buffered saline.

ANATOMY OF A SCIENTIFIC ARTICLE (cont.)

5) **Abstract / Synopsis** - simple

letter limit - compound (Objectives, Methods, Conclusions)

6) **Key Words**

7) **Abbreviations**

8) **Introduction**

9) **Materials & Methods** ↑↓

10) **Results**

11) **Discussion**

12) **Conclusions**

} can be combined

IMRD or IRDM

Figure & Tables

14) **Acknowledgments** - **Conflict of Interests**

15) **References**

16) **Supplementary materials** (only online)

The publication process

1) Choose appropriate journal (subject, impact, prestige etc.)

2) Submit manuscript (Text, Figures, Supplementary material)

3) Editor - 1st decision: (Is subject/quality suitable for journal ?)

- NO → rewrite and choose another journal
- YES → manuscript to 2-4 independent peer reviewers

4) peer review decision: 2-8 weeks

novelty – validity – accuracy

- accept *sicut est* (very rare)

- accept with minor modification → answer reviewers questions
  → make suggested modifications

- qualified accept with major modification → new experiments
  → answer reviewer's questions
  → extensive rewriting

- refuse → rewrite using reviewer critiques and choose other journal

Organization of a manuscript:

VALID ALSO FOR THESIS OR REPORT

- **Title:** precise and informative → attract readers on Pubmed BAIT
- **Abstract:** provides key information HOOK
- **Introduction:** why is it important (scientific background)
- **Materials/Methods:** how you did it (reproducibility)
- **Results:** presents data (accurate & reliable)
- **Discussion:** interprets data (concise & convincing)
- **Conclusions:** what was learned (relevance of new knowledge)

A good scientific publication has:

- clear and concise presentation and discussion of data
- all necessary information on methods used
- complete set of figures and tables
- adequate supplementary material

Scientific article style

reader friendly

maximum parsimony

- **simple, clear, & relevant**
  - not too compressed – no jargon or excessive abbreviation
  - avoid elaborate stile and hyperbolae (e.g. *extremely*).

- **present tense:**
  - to describe known facts or results (... *membranes are composed of phospholipids*...)
  - to compare data (... *these values are greater than*...)
  - to interpret data (... *our results confirm that*...)

- **past tense:**
  - to describe results of experiments (*the membrane was depolarized after treatment with the drug*.)

- **future tense:**
  - for proposed experiments (.... *more experiments will be carried out to determine if* .....)

- **active/passive:** use in balanced manner

  (*...we show that the conformation is helical...)*

  (...spectra were measured using a Jasco 100 CD spectrometer.)

A GOOD TITLE  (→ summarize to **RUNNING TITLE**)

- **minumum number of words** (avoid too much detail)
- **accurately describes the content** (not too generic)
- **! attention to the word order** (can change the meaning)
- **should be appealing** (good bait on PubMed)
- **avoid acronyms, symbols, overused terms** (e.g. *novel*)
- **order the information** (first essential then qualifying information)
- **correct use of *compound titles*** (only if necessary & in right sequence)

☒ *HIV-Infected Individuals: HIV Persistence and the Prospect of Long-Term Remissions*

☑ *HIV Persistence and the Prospect of Long-Term Remissions for HIV-Infected Individuals*

☒ *Selectivity, Synergism, and Cellular Regulation of Antibiotics Targeting Ribosomes*

☑ *Antibiotics Targeting Ribosomes: Selectivity, Synergism, and Cellular Regulation*

Title and abstract are always available DO NOT cite based only on these

….. Neandertal Genome (SCIENCE 328:723-25, 2010)

It is now possible to perform whole-genome shotgun sequencing as well as capture of specific genomic regions for extinct organisms. However, targeted resequencing of large parts of nuclear genomes has yet to be demonstrated for ancient DNA. Here we show that hybridization capture on microarrays can successfully recover more than a megabase of target regions from Neandertal DNA even in the presence of ~99.8% microbial DNA. Using this approach, we have sequenced ~14,000 protein-coding positions inferred to have changed on the human lineage since the last common ancestor shared with chimpanzees. By generating the sequence of one Neandertal and 50 present-day humans at these positions, we have identified 88 amino acid substitutions that have become fixed in humans since our divergence from the Neandertals. (124 words)

- normally one paragraph, < 250 words.
- present/past tense (results/finished experiments)
- only cite absolutely necessary references (in full)
- reduce acronyms and symbols to a minimum
- include key quantitative parameters

passive

active

INTRODUCTION

- justification of the work done.
- brief overview on the state of the art. Puts your work in context.
- cites relevant literature - provides background & motivation for your work
- briefly indicates the author's intentions and how their work fills a gap in the current knowledge

MATERIALS / METHODS (NO RESULTS HERE)

- past tense (finished experiments).
- sufficient detail for competent worker to repeat experiments

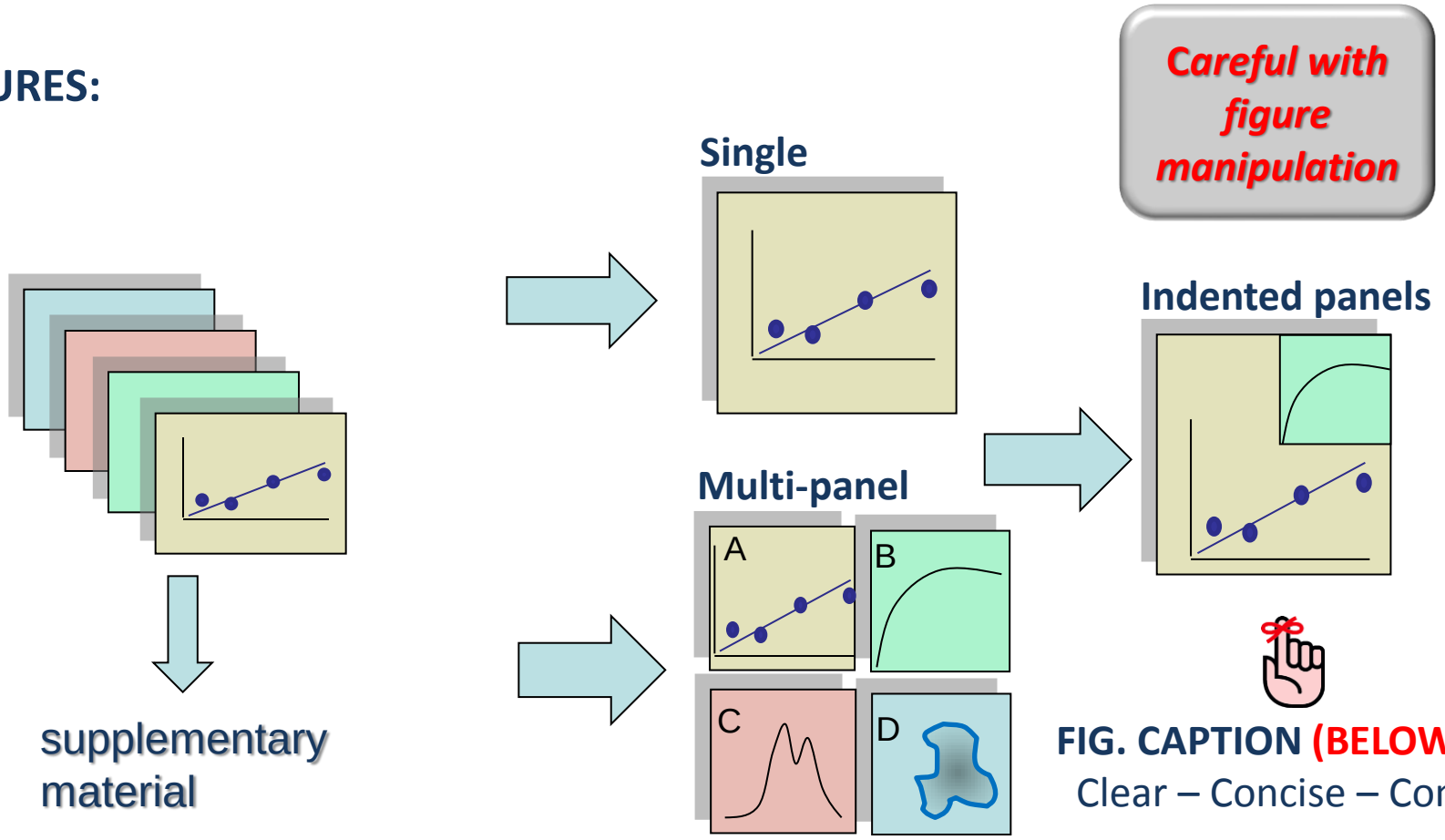
  [….*3 mg of protein in phosphate buffer (pH 7.5)*…..]
- precise but not pedantic

  [….*3 mg of protein were dissolved by stirring in phosphate buffer at pH 7.5 measured with a pH meter*]
- reagents (maker), tissues, strains, methods, instrumentation (with ref.s)
  [… *spectroscopic grade methanol (Sigma) was used as eluent…*]
- data analysis methods and statistical methods (how were they done)
- details of theoretical approaches, instrumental methods →supplementary data

RESULTS

- Data presented in clear figures and tables with concise explanations in the text.
- Selective – relevant data, not too much detail (use supplementary section for details or peripheral data).
- Limit the N° of figures/tables – do not make them too complicated.

FIGURES:



TABLES

Molecule	MIC (*S. aureus*	MIC (*E.coli*)	MIC (*C. albicans*)	charge
P26A	4, 8	16	2	2
P56V	8	2,4.8	8	1
Q77A	2	4	4	3

Table 1: *Bacteriostatic activity of peptides* **(ABOVE TABLE)**

Molecule	charge	MIC (μM) [a]		
		S. aureus	*E.coli*	*C. albicans*
P26A	+2	4-8	16	2
P56V	+1	8	2-8	8
Q77A	+3	2	4	4

[a] minimal inibiting concentration, determined using the serial dilution method, average of three inependent experiments

DISCUSSION

- Orders and interprets the results (requires organized thinking)
  - intellectual effort for the author, not for the reader.
- Logical & believable explanations supported by data (maximum parsimony).
- Perspective relative to state of the art (new knowledge)
- Contribution to knowledge. Convincing, neither too bold or too timid
- Can use figures e.g. schematic representations of a proposed model

NB - RESULTS & DISCUSSION are often combined

(different rules)
(requires very organised thinking).

Conclusions

- - last paragraph of discussion OR in separate section.
- - lessons learned - knowledge gained - future perspectives -
- NOT a repetition of **Abstract**.

(ABSTRACT/CONCLUSIONS are often the only sections that are carefully read).

Aknowledgements

- Donated material, technical assistance or help with manuscript
- Funding agencies

Conflict of interest

- States if funding/employment could affect interpretation

Reference list

- Complete but not excessive - Accurate and homogeneous

REFERENCES

- Each journal has specific format for literature references
- Programs like ZOTERO very useful to organise them

Vancouver method

Gene-encoded, ribosomally synthesized antimicrobial peptides (AMPs) are an important component of the innate immune response of eukaryotic organisms ranging from plants to invertebrate and vertebrate animals.[1–5] Many AMPs

^{1} (1) [1]

1,2,4 1-5 1,4,9-13

Harvard method

for various cell wall-sorted proteins, which are important in infection and virulence of this pathogen (Perry *et al.*, 2002; Roche *et al.*, 2003). Moreover, the interpeptide is essential for the full expression of methicillin resistance in

(Perry, 2008)
(Perry and Roche, 2008)
(Perry et al., 2008)

Reference list:

Vancouver
order of appearance
1. **Rossi, A .....**
2. **Perrin, J .....**
3. **Aaron,T .....**

Harvard
alphabetical oder
Aaron, T .....
Perrin, J .....
Rossi, A .....

Reference formats

- Extended single reference with title (PREFERABLE)

Pinco L., Pallino M. and Rossi G. (2008) *Antibiotics targetting ribosomes – structure, function and mode of action*. J. Biol. Chem **48:** 165-178.

- Compressed reference – Only 1st author, with title

Pinco L. *et al.,* (2008) *Antibiotics targetting ribosomes – structure, function and mode of action*. J. Biol. Chem 2008, **48:** 165-178.

- Compressed reference – All authors , no title

Pinco L., Pallino M. and Rossi G. *J. Biol. Chem* 2008, **48:** 165-178.

- Highly compressed reference – Only 1st author, no title

Pinco L. *et al., J. Biol. Chem* 2008, **48:** 165-178.

Which ever is choosen must be the same for all the manuscript

Evaluating an authors publication record

- **Method 1:** N° of publications & author placement (e.g. 1°, last)

- **Method 2:** Impact factor of journals in which publications appear

$$\text{journal IF} = \frac{\text{N° citations in period}}{\text{N° articles published}} \quad \text{(e.g. 5 years)}$$

- **Method 3**: N° of citations/publication - ISI (Web of Science)
  - Scopus (Elsevier)
  - Google Scholar

- **Method 4:** H-index (global citations)

h publications each cited at least h times

- reflects both N° publications and N° of citations
- depends on the age of scholar h ≈ age in service
- sometimes limited to a period (5 or 10 years)