Communication: Manuscripts, tables, graphs, posters, orals, and interviews

Haakon Breien Benestad, h.b.benestad@medisin.uio.no

Ref.: ***Research in Medical and Biological Sciences***

Petter Laake, Haakon Breien Benestad, Bjorn Reino Olsen (reds),
Elsevier, London, 2015

Chapters: 13 & 14


STAND UP, SNOOPY.. I'LL TEACH YOU TO WALK ON YOUR HIND LEGS..
IT'S NO FUN TEACHING YOU ANYTHING!!
SCHULZ

First of all: what is your target group?

This example is scarcely appropriate for a general audience:

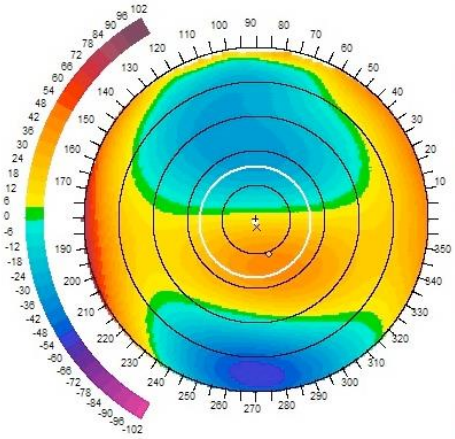
… Placido-derived topographic curvature maps are reference-axis based, and extrapolated three-dimensional information about the corneal physical shape will be bound to the rotational position of the fixating eye.

Precisio
High Definition Surgical Tomography

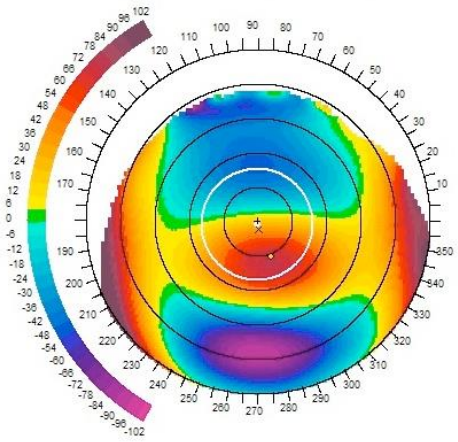
PATIENT

- OS - 2014/05/02 12:34:31 - Type: AA - Surgery - Suggested case: Therapeutic H.O.

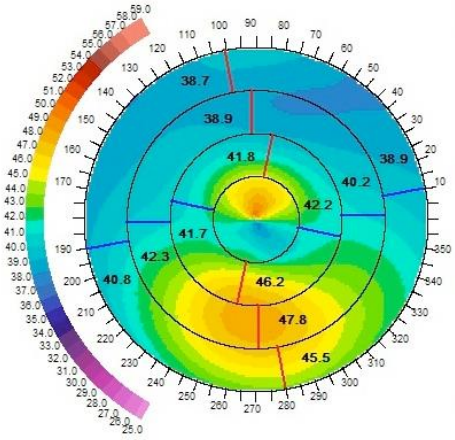
Anterior Elevation map - BFS: 8.28(mm) - KP: 40.78(D)



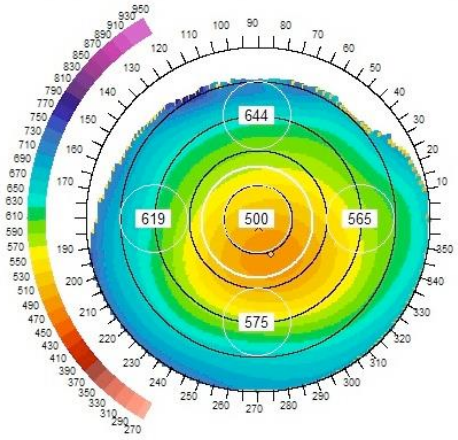
Posterior Elevation map - BFS: 6.78(mm) - KP: 49.79(D)



Anterior Axial Power Map



Pachymetry Map - Min.Thick.: 467 um at X= 0.50 mm Y= -1.00 mm



RELEVANT POINTS LOCATION

Pupil:	X(mm):	-0.024	Y(mm):	-0.079	D(mm): 3.242
Limbus:	X(mm):	0.502	Y(mm):	-0.079	D(mm): 12.656
Fixation:	X(mm):	0.021	Y(mm):	-0.213	
Min.Pach.	X(mm):	0.400	Y(mm):	-1.000	S(um): 466

A.CHAMBER DEPTH (APEX PLANE)

L (mm): 3.384

IRIS PLANE

Angle (°): 5.61°I 7.81°T

CORNEAL INDEX OF REGULARITY

H (um): 40

ANTERIOR ACONIC FITTING SURFACE (KER - AVE)

Diameter (mm):	3.50	Cylinder (D):	2.68
Max Power (D):	43.19	Axis (°):	169
Min Power (D):	40.51	Asphericity:	-2.11

POSTERIOR ACONIC FITTING SURFACE (POST - AVE)

Diameter (mm):	3.50	Cylinder (D):	0.65
Max Power (D):	-5.73	Axis (°):	152
Min Power (D):	-5.08	Asphericity:	-5.78

TOTAL ACONIC FITTING SURFACE (GLO - AVE)

Diameter (mm):	3.50	Cylinder (D):	2.37
Max Power (D):	41.68	Axis (°):	176
Min Power (D):	39.31	Asphericity:	-1.51

ANTERIOR AXIAL POWER (KER - AVE)

	Kmax (D)	Kmin (D)	Cylinder (D)
3 mm:	44.19 @ 78°	41.48 @ 168°	2.72 @ 168°
5 mm:	43.50 @ 92°	40.85 @ 2°	2.65 @ 2°
7 mm:	42.46 @ 100°	39.86 @ 10°	2.61 @ 10°

ANTERIOR TANGENTIAL POWER (KER - AVE)

	Kmax (D)	Kmin (D)	Cylinder (D)
3 mm:	43.39 @ 97°	40.81 @ 7°	2.57 @ 7°
5 mm:	41.30 @ 115°	38.12 @ 25°	3.18 @ 25°
7 mm:	38.35 @ 101°	35.50 @ 11°	2.85 @ 11°

TOTAL POWER (GLO - AVE)

	Kmax (D)	Kmin (D)	Cylinder (D)
3 mm:	43.67 @ 82°	40.64 @ 172°	3.03 @ 172°
5 mm:	43.47 @ 90°	41.14 @ 0°	2.33 @ 0°
6 mm:	43.83 @ 98°	41.40 @ 8°	2.42 @ 8°

Nor are such illustrations easy to grasp for a non-spesialist.

Title

- Use key words communicating kind of work, experimental approach and animal/patients
- Avoid superfluous phrases like “Effects of…”, “A study of …”
- Consider a divided title

Answer the question “What is it all about?”

Transcription coactivator peroxisome proliferator-activated receptor-binding protein/mediator 1 deficiency abrogates acetaminophen hepatotoxicity ***(PNAS*** – piling up of substantives → poor readability?***)***

Wound healing recapitulates morphogenesis in *Drosophila* embryos ***(Nature –*** good title, easy to understand, includes name of experimental animal***)***

Regulation of erythropoiesis in the neonatal mammal during the growth period. Studies in the mouse, rat and rabbit. ***(PhD thesis)***
Better(?):

[Regulation of erythropoiesis in neonatal mice, rats and rabbits. "Neonatal" and "growth period" express the same. Subtitles may be used profitably, but here it reads easier without.**]**

Introduction

- Introduce main theme in one or two sentences
- Historical background. NB ‘leitmotif’ (“rød tråd”)
- Problem/hypothesis
- Intention/goal/importance
- (Overview design/main results in brief)

Answer the question “Why did you do it? Why was it important?”

Introduction, example

Despite its wide acceptance, **coronary angioplasty is limited by rates of restenosis** of 30 to 60 percent.[1] In recent years, much has been learned about **the mechanism of restenosis**, which can be divided into **two broad components**. The **first**, **recoil and remodeling**, involves the mechanical collapse and constriction of the treated vessel. The **second** component, **intimal hyperplasia**, is the proliferative response to injury, … **Coronary stents** provide a luminal scaffolding that virtually **eliminates recoil and remodeling** … Stents, **however**, do not decrease and in fact **increase** the proliferative component of **restenosis**.
In recent years, … **local, catheter-based ionizing radiation … reduced neointimal proliferation in animal models** … Encouraged by these reports, we designed a double-blind, placebo-controlled, randomized trial to **test this new treatment in patients** … The objective of our trial was **to determine the safety and efficacy** …

Length: 1-1.5 pp; size 12; double line spacing

Try to avoid acronyms and abbreviations in text, tables and graphs!

«The role of ABCG2 in AM, COS and CES – especially relevant to HFSC and IFE – may be important for CLAU and KLAL in LSCD.»

Materials and Methods

- **Patients**: Numbers, gender, age, randomization, inclusion & exclusion criteria, drop-outs, etc. Written informed consent; regional ethics committee
- **Animals**: Species, sex, age, weight, source, conditioning, anaesthesia, analgesia, euthanasia, etc. Compliance with regulations
- **Chemicals** (designation, source/vendor, address)
- **Other materials**
- **Instruments/apparatus/equipment**
- (Experimental **design**)
- **Methods/procedures**: References! - but detail modifications. This is the cookbook, permitting reproduction by a competent worker
- (Methodological considerations)
- **Statistics**: means vs. medians; 95% conf. limits/SE(M) vs. SD; parametric vs. non-parametric; one-sided vs. two-sided; significance level; power analysis; correlation analysis; etc.

Answer the question “How did you do it?”

METHODS

Study Design

A complete description of the design of the study has been published elsewhere.[18] The research protocol was reviewed and approved by the relevant institutional review boards.

(Points to consider are written with colored letters in this and the folowing pictures)

METHODS, cont.

Study Subjects

After giving written, informed consent, 159 subjects, 40 to 65 years of age, who were sedentary, were overweight or mildly obese (body-mass index ..., 25 to 35), and had dyslipidemia (either an LDL cholesterol concentration of ... or an HDL cholesterol concentration below 1.0 mmol per liter for men or below 1.2 mmol per liter for women), were randomly assigned to one of three exercise groups or a non-exercising control group. Subjects were recruited continuously between January 1999 and June 2000, and the exercise program was completed by April 2001. Of the 159 randomized subjects, 48 (30.2 percent) dropped out of the study, 15 (9.4 percent) had an excessively low rate of adherence to exercise, 10 (6.3 percent) had incomplete lipid data, and 2 (1.3 percent) had excessive weight loss, leaving 84 subjects in the main analysis.

Materials and methods

Animals

We used adult rats of the strains Wistar and PVG (RT7.1 and RT7.2). Recipient rats were male while donor rats were of both sexes. All rats were maintained on a standard laboratory diet with water ad libitum and kept in a controlled environment with a 12-h light/dark cycle. The experimental protocol was approved by the Experimental Animal Board under the Norwegian Ministry of Agriculture. [Also name the vendor.]

Materials and methods, cont.

Reagents, solutions and culture media

Fluorescein isothiocyanate (FITC)-conjugated HIS41 (mouse anti-rat RT7.2) was obtained from the Department of Anatomy, University of Oslo, Norway. Polystyrene microbeads (Polybead, diam. 0.365 mm) were obtained from Polysciences Inc. (Warrington, PA, USA). Clodronate- and phosphate-buffered saline (PBS)-containing liposomes were prepared as previously described (25).

Materials and methods, cont.

Estimation of blood volume

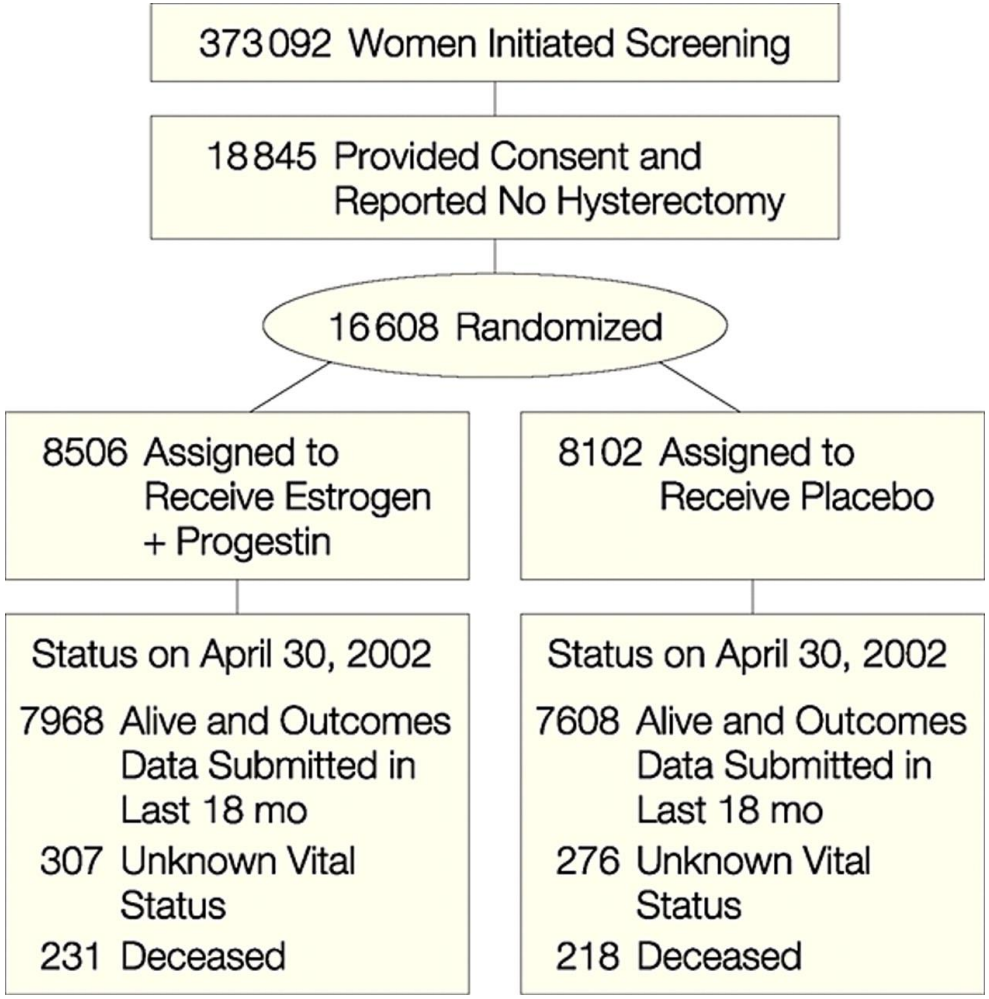
The total blood volume of male PVG rats, weighing 200–250 g, was estimated by injecting ^{51}Cr-labeled erythrocytes i.v. as described (26). Radioactivity of a blood sample was measured with a MINAXI Gamma Counter (United Technologies, Packard, IL, USA).

Statistics

The non-parametric Mann–Whitney's test was used to test differences between groups. Two-sided P-values <0.05 were considered statistically significant. Results are presented as mean and SEM.

Profile of the Estrogen Plus Progestin Component of the Women's Health Initiative

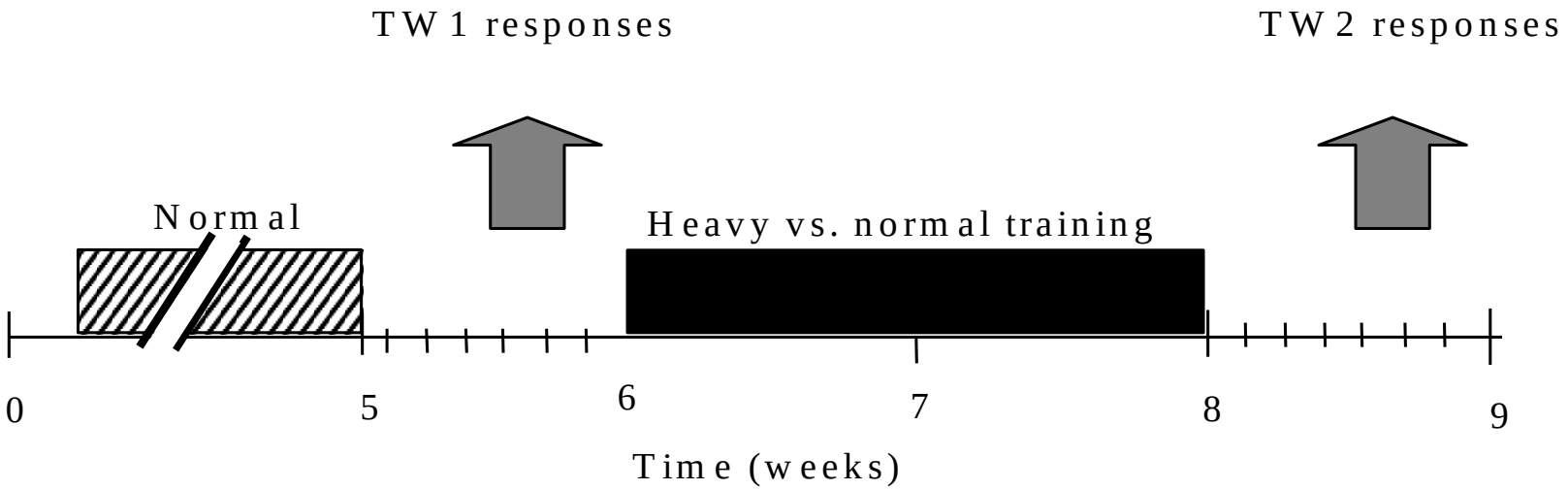
A nice way to give an overview over a large clinical material



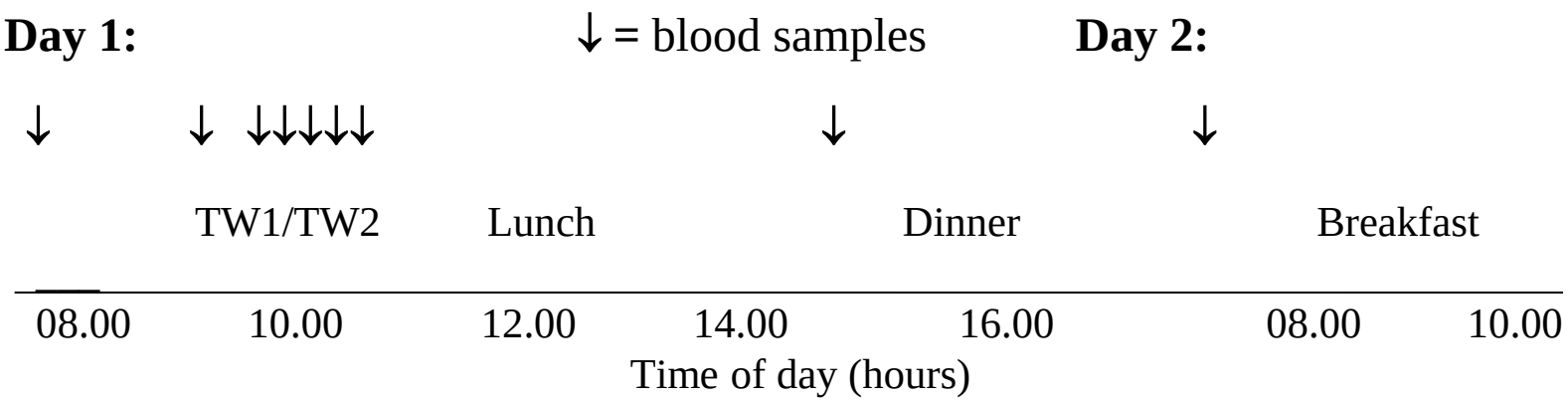
Writing Group for the Women's Health Initiative Investigators, JAMA 2002;288:321-333.

The Russian author Ivan S. Turgenyev (1818-1883): "A picture may instantly present what a book could set forth only in a hundred pages".

Experimental design



Experimental design, cont.



A NOTE ON DATA ANALYSIS:

«Pearson or Spearman correlation coefficient was applied to seek possible correlations.»

Why two correlation tests? Beware flip-flop between allegedly equivalent test procedures! Or justify why more than one procedure is necessary.

Parameter	r	P
K_{max}		
Inferior	-0.201	.149
Center	-0.465	.000
Min	-0.340	.013
Min-Max	-0.337	.013
St Dev	0.412	.002
Min_{Area}	-0.310	.024
Min_{Area}-$Para_{rest}$	-0.327	.017
IRI		
Inferior	-0.393	.004
Center	-0.290	.035
Min	-0.500	.000
Min-Max	-0.439	.001
St Dev	0.441	.001
Min_{Area}	-0.362	.008
Min_{Area}-$Para_{rest}$	-0.337	.014

«In all analyses, a *P* value of less than .05 was considered statistically significant.»

Bonferroni or other adaptation of p-values to multiple testing?

Results

- **Brief descriptions** of (main) results, with reference to graphs and tables
- **Tell a story**, in a logical sequence – try to start with the important message(s)/findings
- You may have to start by **validating methods** or experimental design (or →"Supplementary materials")
- **Do not repeat data** that are already in tables or can be read from graphs, but **describe differences** in magnitude (%) and courses of developments, etc.
- Some **premises** (with references) may be given, as well as interpretations, to make this chapter "reader friendly"
- Avoid repetition of uncertainties (95% conf. intervals; SE(M)), n, and P-values from table and figure legends.
- **Figures (graphs) and tables**: Raw data; normalized data; representative experiment?

Answer the question "What did you find?"

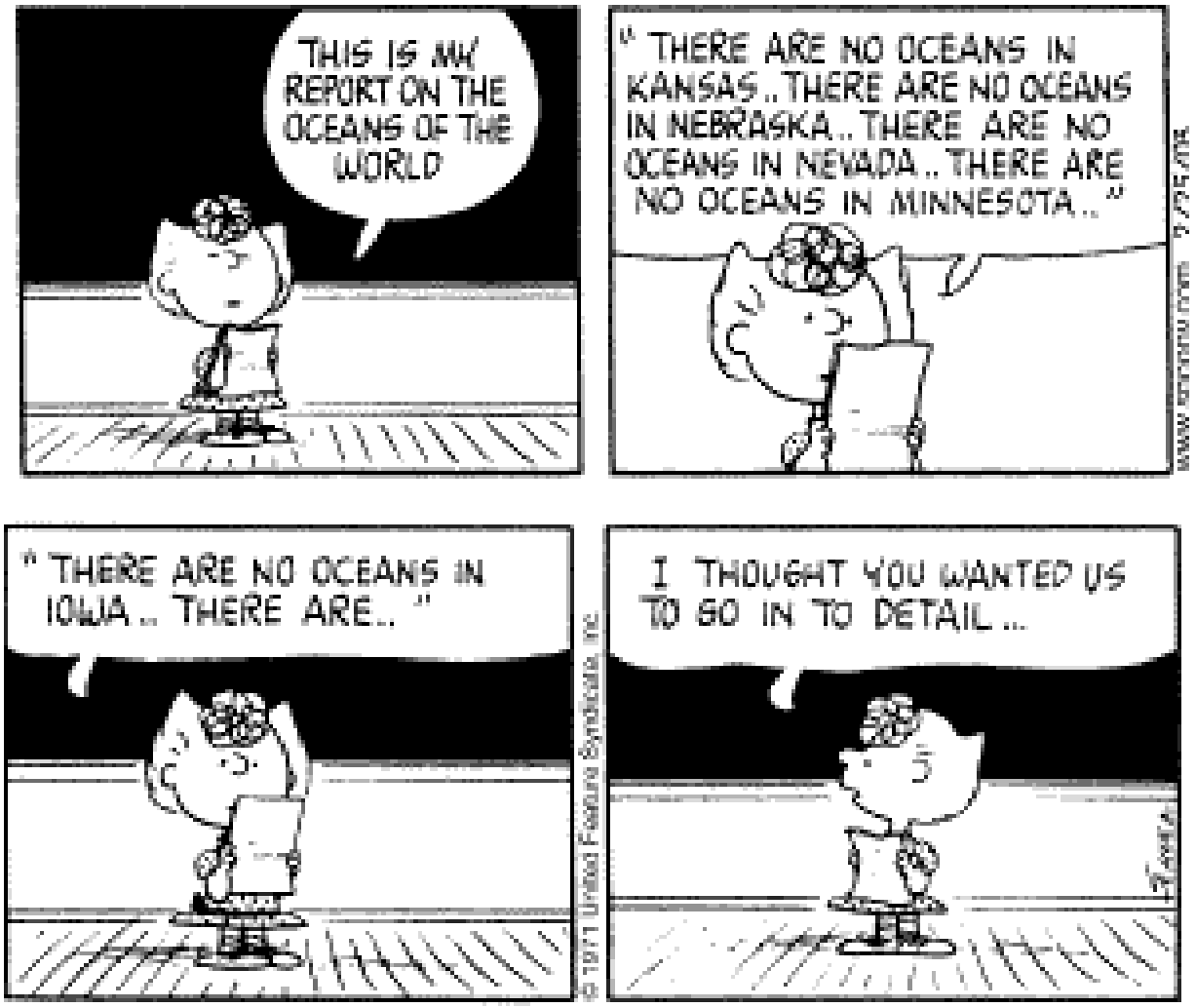
Epidermal Sensing of Oxygen Is Essential for Systemic Hypoxic Response

Boutin A.T. et al., Cell 133, 223–234, April 18, 2008

Results description example, nice flow of argument:

- HIF-1$^{\alpha}$ [hypoxia-induced factor]is extensively expressed in the normal epidermis
- Loss of HIF-1α in keratinocytes prevents a systemic hypoxic response
- Deletion of VHL in the epidermis [The VHL gene is a negative regulator of HIF-α function]
- Constitutive or induced loss of VHL in the epidermis dramatically increases blood EPO levels
- Etc. –logical steps in the story [except that the findings may be wrong!]

Results: Don’t start with trivialities!



Discussion

- ***Recapitulate*** the *main* findings, in relation to your problem/(null) hypothesis
- **Interpret** your results – possibly considering several options (references!)
- **Discuss the validity** of your findings – corroborating or contradicting other published results? Again: thorough and just references!
- If nobody else found what you found: Why? What are the **premises** for your results?
- **Generalizability? Transfer value? Importance? Novelty?**
- **[Strengths/limitations]**
- **Unsolved questions** – future research projects
- **Conclusion(s)** – avoid platitudes!

Answer the question "What does it mean?"

DISCUSSION

U. Veronesi et al. (2002) TWENTY-YEAR FOLLOW-UP OF A RANDOMIZED STUDY COMPARING BREAST-CONSERVING SURGERY WITH RADICAL MASTECTOMY FOR EARLY BREAST CANCER. New Eng J Med 347: 1227-32

[Recapitulation]

Our results show that the long-term survival of women with early breast cancer who were treated with breast-conserving surgery and postoperative radiotherapy to the ipsilateral breast was virtually identical to the rate among women who underwent radical mastectomy. …

[Comparison with others' results]

Our observation is in line with the 20-year results of trial B-06 of the National Surgical Adjuvant Breast and Bowel Project, …

DISCUSSION, cont.

[Possible objections]

Although scattered radiation beams certainly reached the opposite breast, the incidence of contralateral breast carcinomas was lower in the group that underwent breast-conserving surgery plus radiotherapy than in the radical-mastectomy group. This finding suggests that the doses of radiotherapy delivered in the study were not carcinogenic.

DISCUSSION, cont.

[Validity]

Our data apply only to patients with a primary tumor of limited size (maximal diameter, 2 cm). Other studies have successfully used breast-conserving procedures in women with larger primary tumors.[15-17]

DISCUSSION, cont.

[We were among the first…]
The early results of our study were confirmed by other European and American trials in 1983[16] and 1985.[17]

[Conclusion]
We believe that as a result of these trials, about 300,000 women with early breast cancer worldwide each year undergo breast-conserving surgery rather than radical mastectomy.

≤ 3 pages; font 12; double-spaced

Common faults in Discussion

- **Repetition** from Introduction
- Too much **duplication(s)** from Results
- Too long: extrapolation of actual findings; **extravagant** generalization(s)
- **Exaggerated** statement of importance
- Discussion of **trivialities**
- **Too few explanations**

Abstract

- Background/Objective: **Why** do it?
- (Materials and) Methods: **How** you did it
- Results: **What** you found. (Conditions for finding what you found)
- Conclusion(s)/**Interpretations**: What does it mean? (What next?)

Abstract, cont.

- Do not mention dubious findings!
- Be informative, not indicative!
- Key words/index words: MeSH terms
- Remember: Abstract will have many more readers than the rest of your paper!
- See “Instructions to authors”! Structured or non-structured abstract; restricted number of words, etc.

BMJ 1999;319:1600-1602 (18 December)

Shaken, not stirred: bioanalytical study of the antioxidant activities of martinis

Abstract

[Colored sentences should be omitted?]

Background: Moderate consumption of alcoholic drinks seems to reduce the risks of developing cardiovascular disease, stroke, and cataracts, perhaps through antioxidant actions of their alcohol, flavonoid, or polyphenol contents. "Shaken, not stirred" routinely identifies the way the famous secret agent James Bond requires his martinis.

Objectives: As Mr Bond is not afflicted by cataracts or cardio-vascular disease, an investigation was conducted to determine whether the mode of preparing martinis has an influence on their antioxidant capacity.

Design: Stirred and shaken martinis were assayed for their ability to quench luminescence by a luminescent procedure in which hydrogen peroxide reacts with luminol bound to albumin. Student's *t* test was used for statistical analysis.

Shaken, not stirred: bioanalytical study of the antioxidant activities of martinis, cont.

Background: Moderate consumption of alcoholic drinks seems to reduce the risks of developing cardiovascular disease, stroke, and cataracts, perhaps through antioxidant actions of their alcohol, flavonoid, or polyphenol contents. "Shaken, not stirred" routinely identifies the way the famous secret agent James Bond requires his martinis.

Objectives: As Mr Bond is not afflicted by cataracts or cardio-vascular disease, an investigation was conducted to determine whether the mode of preparing martinis has an influence on their antioxidant capacity.

Shaken, not stirred: bioanalytical study of the antioxidant activities of martinis, cont.

Results: Shaken martinis were more effective in deactivating hydrogen peroxide than the stirred variety, and both were more effective than gin or vermouth alone (0.072% of peroxide control for shaken martini, 0.157% for stirred *v* 58.3% for gin and 1.90% for vermouth). The reason for this is not clear, … control martinis through which either oxygen or nitrogen was bubbled did not differ in their ability to deactivate hydrogen peroxide (0.061% *v* 0.057%) and did not differ from the shaken martini. Moreover, preliminary experiments indicate that martinis are less well endowed with polyphenols than Sauvignon white wine or Scotch whisky (0.056 mmol/l (catechin equivalents) shaken, 0.060 mmol/l stirred *v* 0.592 mmol/l wine, 0.575 mmol/l whisky).

Shaken, not stirred: bioanalytical study of the antioxidant activities of martinis, cont.

Conclusions: 007's profound state of health may be due, at least in part, to compliant bartenders.

Avoid trivialities!

What he says:	What he means:
Introduction.	
"It has long been known that..."	I haven't bothered to look up the original reference.
"This appears to be an unexplored area...."	I've been so busy writing that I have had no time to look into the matter
".....of great theoretical and practical importance."	......interesting to me.
"While it has not been possible to provide definite answers to these questions "	The experiments didn't work out, but I figured I could at least get a publication out of it.

Results

"Typical results are shown ..."	The best results are shown.
"Some of the observations were clearly atypical and were omitted from the study"	To include them would ruin the findings.
"It is evident from the table ...."	My conclusions are not contradicted by the table.
Three of the samples were chosen for detailed study"	The results on the others didn't make sense and were ignored.

Discussion	
"It is suggested that ...."	I think
"It is believed that ....“	
"It may be that ....“	
"Well known"	(i) I happen to know it; (ii) well known to some of us.
"It might be argued that ...."	I have such a good answers to this objection that I shall now raise it.
"Correct within an order of magnitude"	Wrong.
"The most reliable values are those of Jones“	He was a student of mine.

What he says:

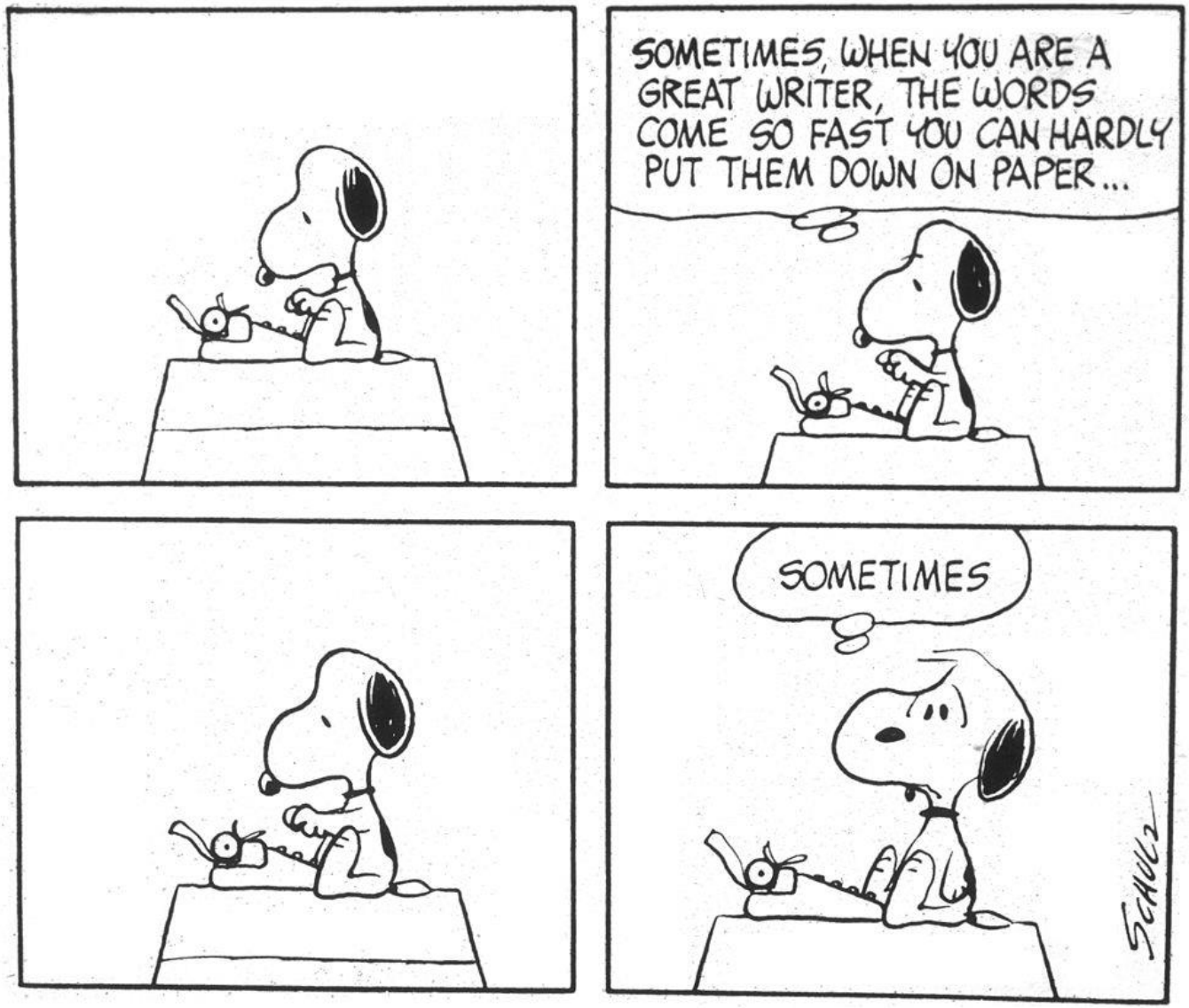
Acknowledgments

"Thanks are due to Joe Glotz for assistance with the analysis and to Dave Doc for valuable discussions ...."

What he means:

Glotz did the work and Doc explained what it meant.

Writer's block?



Tables and figures (graphs): General aspects

- Important data that must be presented – in text, table, or figure?
- Prepare tables and figures before drafting the manuscript. Make several versions
- The message of tables and figures must be easy to grasp – read apart from the main text
- Table title as well as the first sentence of the legend to figures should be a concise description of the main message

General aspects, cont.

- State units of measurements (**SI units**); means/medians; SD/quartile interval/**CV**; 95% **confidence intervals**/SE(M); number of replicate analyses (**n**); number of replicate experiments; **range** (in absolute terms) of 100%-values
- Tables and figures of same design: **consistency**?
- **Aesthetic quality** acceptable?
- Can you clarify or **simplify** by deletion or transfer to table footnotes or figure legends?
- **Rehearsal**!!

Tables

- When precise numerical **values** are important, or the data are too **numerous or complex** for a graph
- Repeated or easily calculable data: delete or transfer to **footnotes**
- **Same kind** of data: preferably **in columns**, not rows
- Column succession that facilitates comprehension

Table Z: *Cellularity and differential counts of peritoneal exudate cells, accumulated one hour after injection of chemoattractant FMLP*

	Dose of chemoattractant, μg	Treatment time, h	Total cellularity (x 10^6)	Differential counts (%)		
				Macrophages	Lymphocytes	Neutrophils
Saline control	0	1	5.8±3.2	76.6±8.6	16.5±8.6	6.1±4.7
Treatment with FMLP	25	1	14.0±5.6	63.4± 8.6	26.8±8.8	9.1±5.2
FMLP	50	1	21.1±7	63.9+11.7	23.0±9.5	12.1±7
FMLP	100	1	25.5±5.4	64.5±10.1	16.8±7.7	17.6±8.8

- **Redundancies** should be removed : column 1 (col. 2 be headed: dose of FMLP (preferably given in μmol or nmol); col. 3 deleted
- **N**?
- SEMs indicate that the data be presented **without decimals** (as has in fact been done inconsistently), according to the "significant digits" convention
- **Inappropriateness of** parametric methods (i.e. calculation of **SEM**) applied to data that are not normally distributed: Cell counts can apparently have negative values here!

Tables, cont.

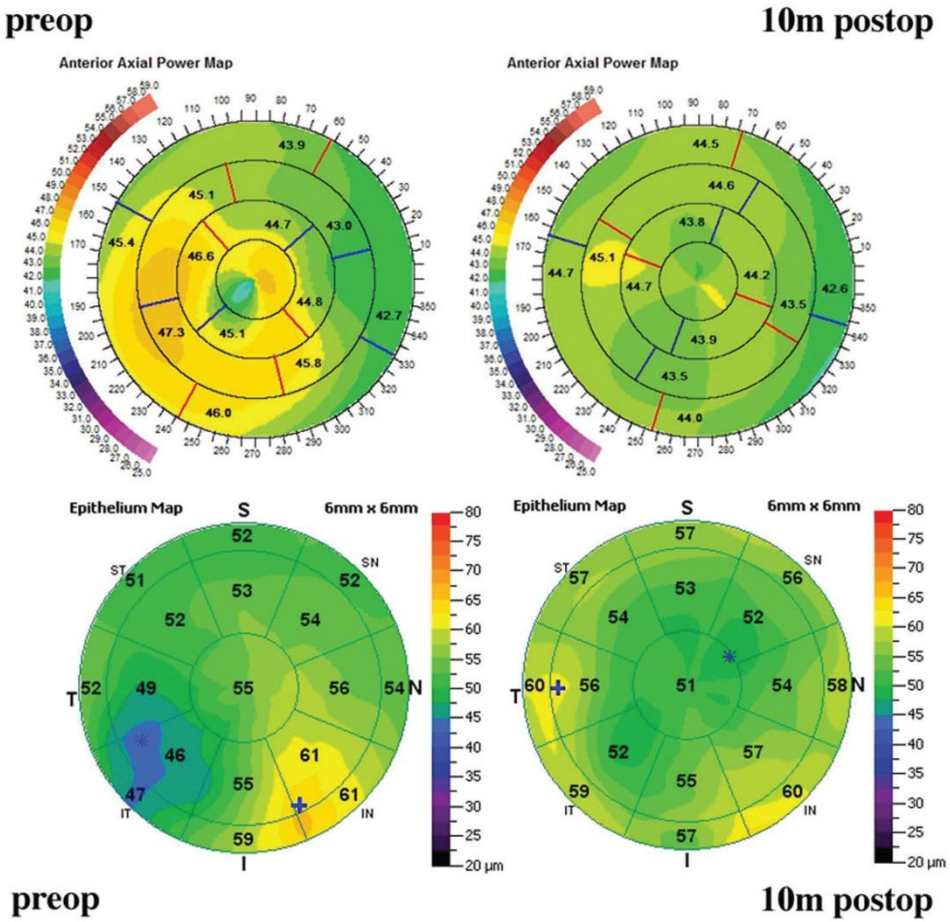
- Number of **significant digits** determined by uncertainty (95% c.i./SEM) of location parameter, which may have 2 sign. digits (and then the same for mean or median: 1.12 (1.00-1.25) nmol/L·min; *vs*. 1.1224 (1.1215-1.1268) nmol/L·min
- **nmol** better than 10^{-9} mol; **ND** better than **-**; no vertical **lines** and no horizontal ones in data field

Figures (Graphs, etc.)

- To illustrate **trends, relationships, or proportions**; visual aids to complex concepts; etc.
- Common types: **Line drawings** (for continuous variables, with e.g. time or amount on x-axis); **column (or bar) charts** for discrete (discontinuous) variables and ratios; **scatter diagrams** to visualize co-variation or dispersion of raw data; **histograms** to illustrate distribution of continuous data.
- **Splitting** a graph in two; **combining** two to one; mount together in panels A, B, C, etc.?

Figures, cont.

- **Beware the size** of marker lines, numbers and letters: Reduced size in printed version
- **x/y axes**: not longer than necessary; do not number all marker lines; broken or displaced axes; short and informative designations
- **Standard symbols and curves** – do not vary both. Broken curves. Do not extrapolate outside data range
- **Columns and bars:** Wider than the space between them; include **n** and **measure of uncertainty**
- **Explanations** in the figure space – for oral presentations only?

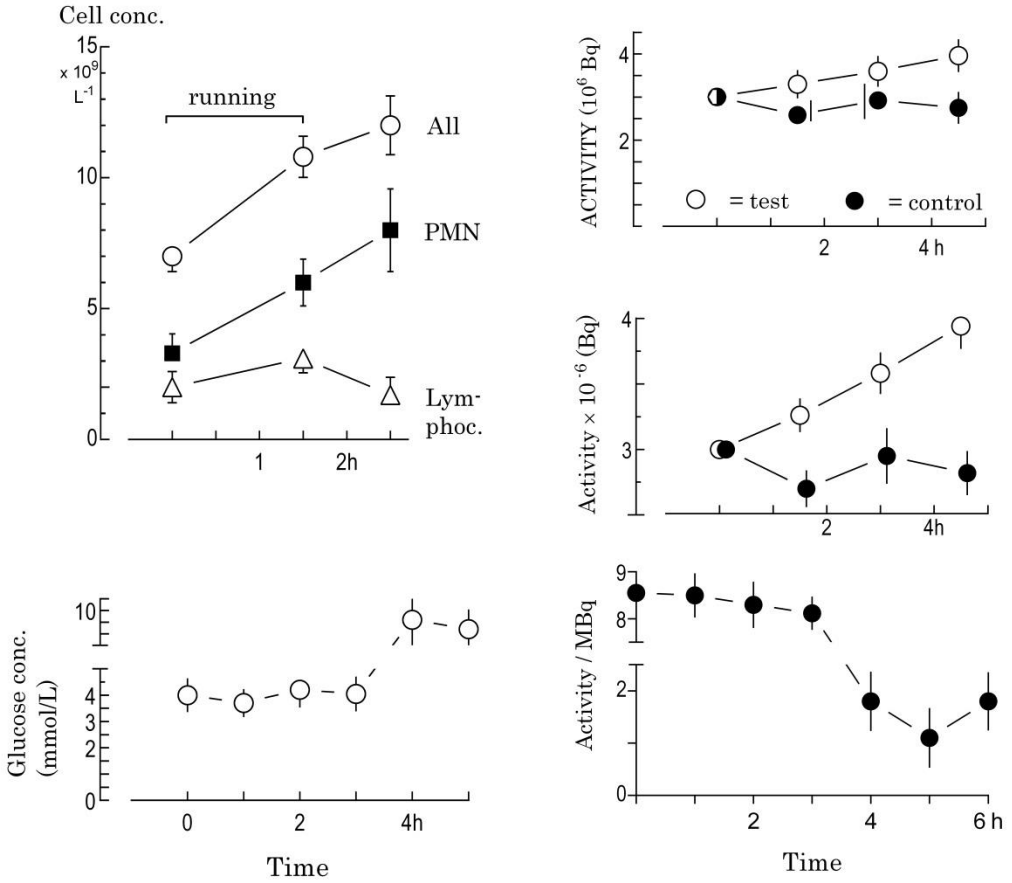


It a good idea to start the figure legend with a title that explains what the figure/graph is intended to document, the conclusion.

Figure 1. Corneal axial curvature map obtained by … (upper row) and epithelial thickness mapping obtained by … (lower row) of one eye preoperatively (left) and 10 months postoperatively (right).

Figures: *Five panels illustrating various ways of constructing line graphs, some of them not recommendable*

- Various ways of labelling the axes (3 right panels)
- Misleading impressions (2 upper right panels)
- Axis displacements (lower left)
- Marking of discontinuities (2 lower panels)
- Explanations in the figure space
- Displacement of symbols (2 upper right panels)
- Utility of combining panels (2 left panels)



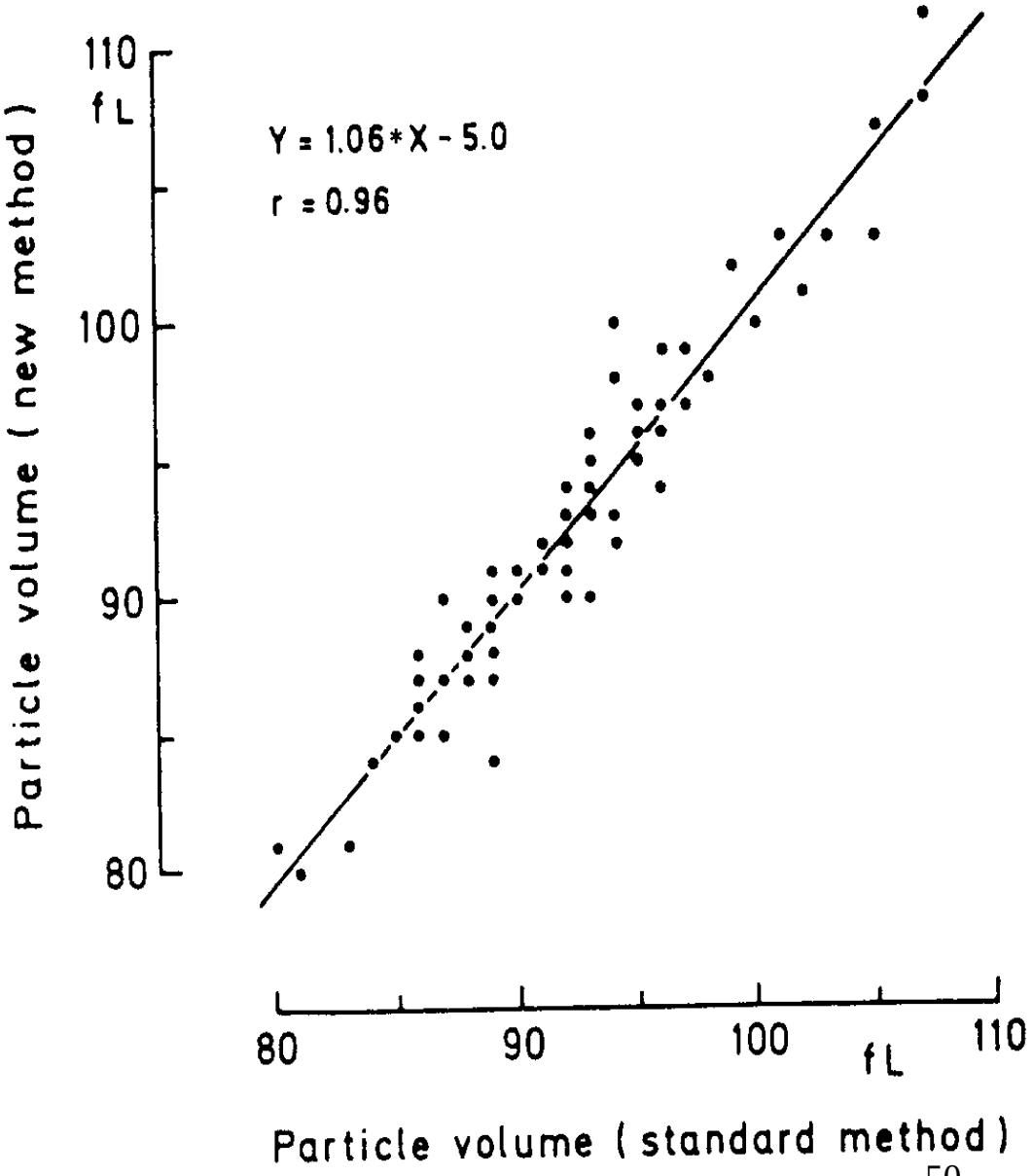
- Usage of the SI system and avoidance of powers of 10 (2 lower panels)
- Better readability of lower case letters
- Aesthetic appeal of spacing (curves between points).

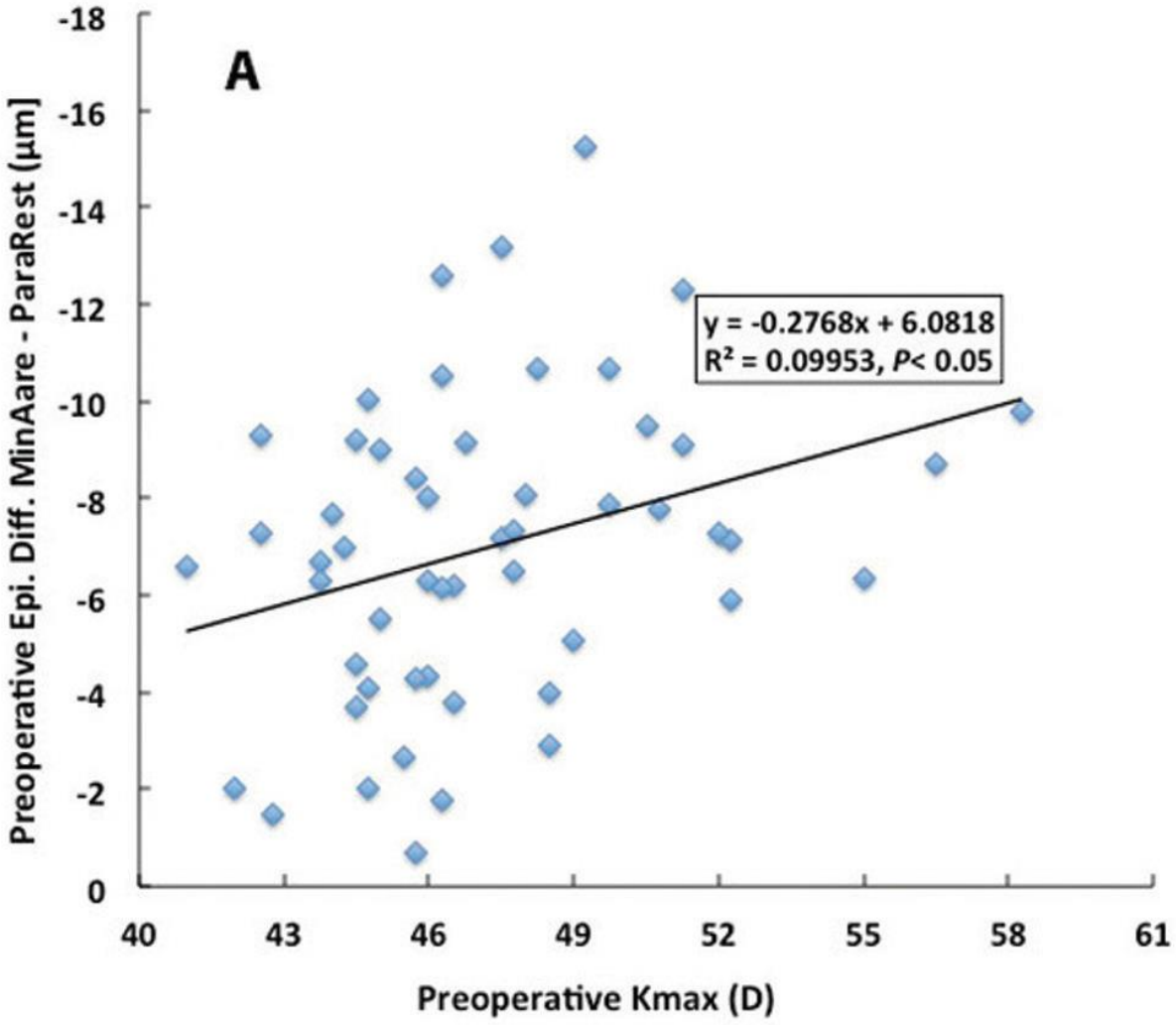
Example of scatter plot

- Sometimes the regression line should be omitted and the formula and r-value given in the text or the figure legend.

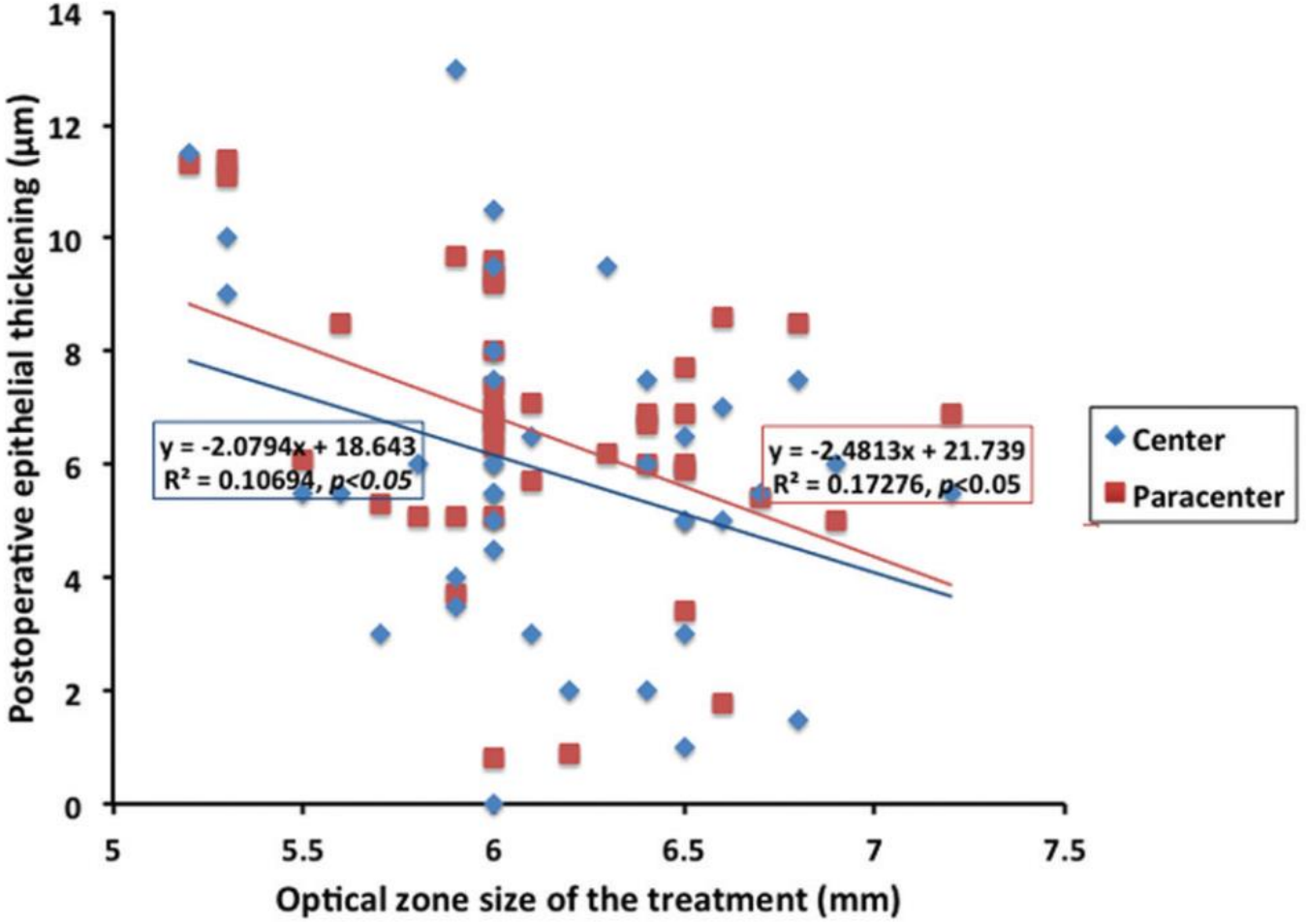
- The probability (p) that r ≠ 0 should also be shown.

- Alternatively, the 95% confidence intervals of the coefficients may be presented (slope or declination: 1.00-1.13; intercept: -11 - +1).





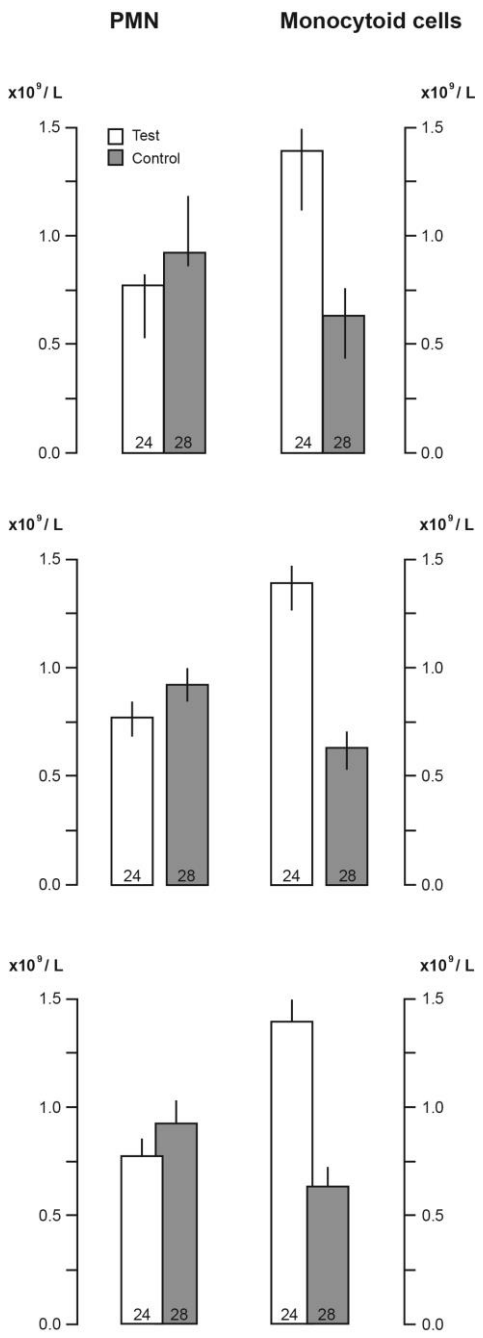
Do such weak correlations have any clinical significance?



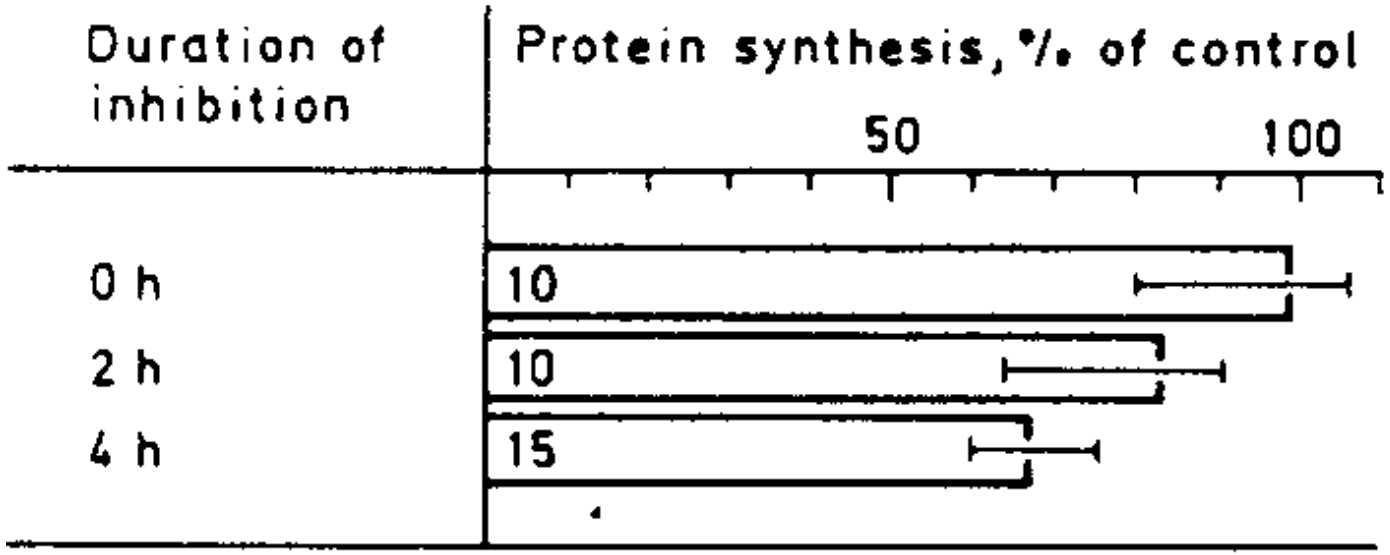
Not a very beautiful graph; rather overloaded. And the correlation – at face value – of e.g. brown-square data is not very convincing? Too many significant digits?

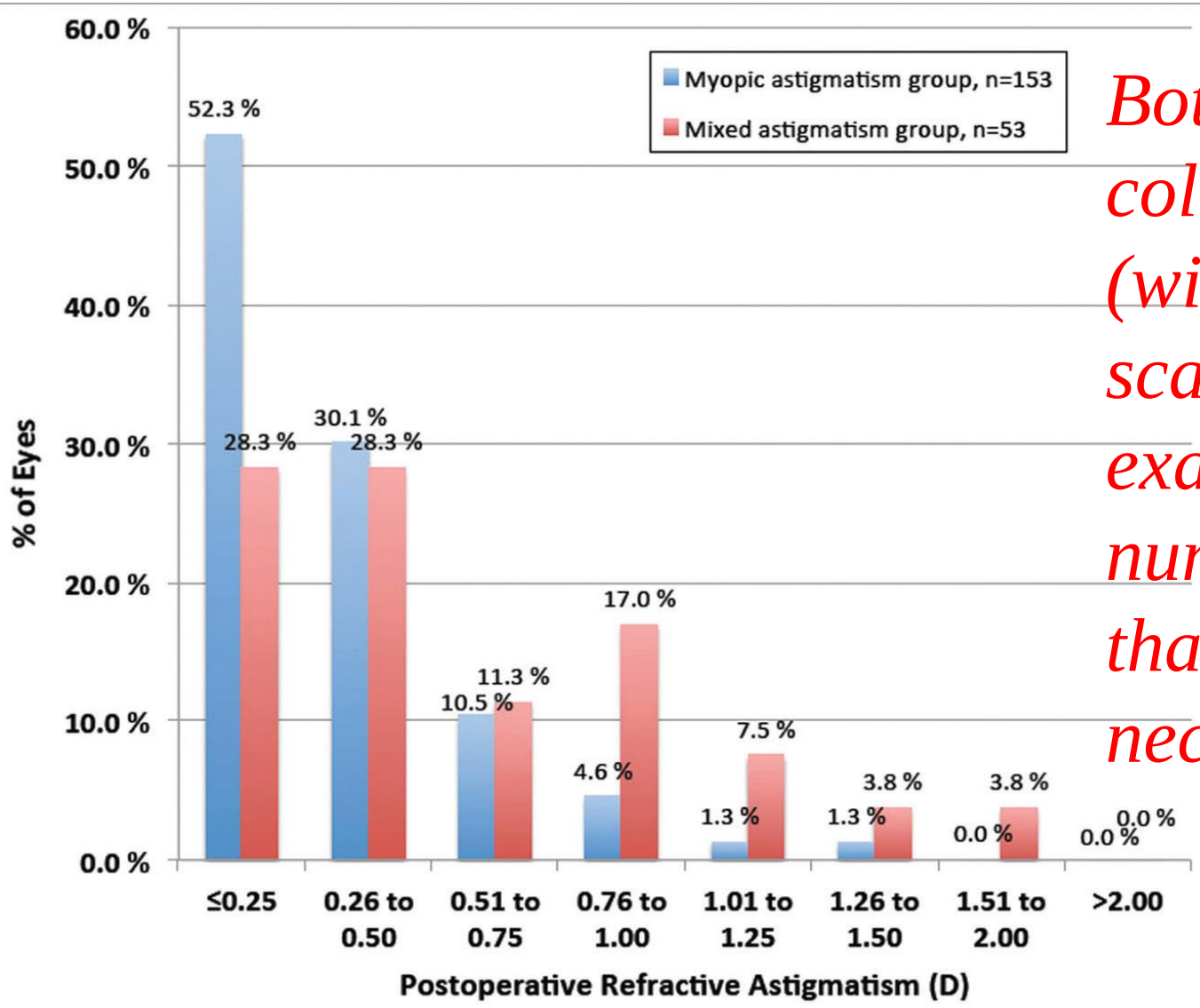
Various types of column graphs.

Note two Y scales, different positions of the colums and number of replicate analyses indicated.



Bar chart


Duration of inhibition
Protein synthesis, % of control
50
100
0 h
10
2 h
10
4 h
15

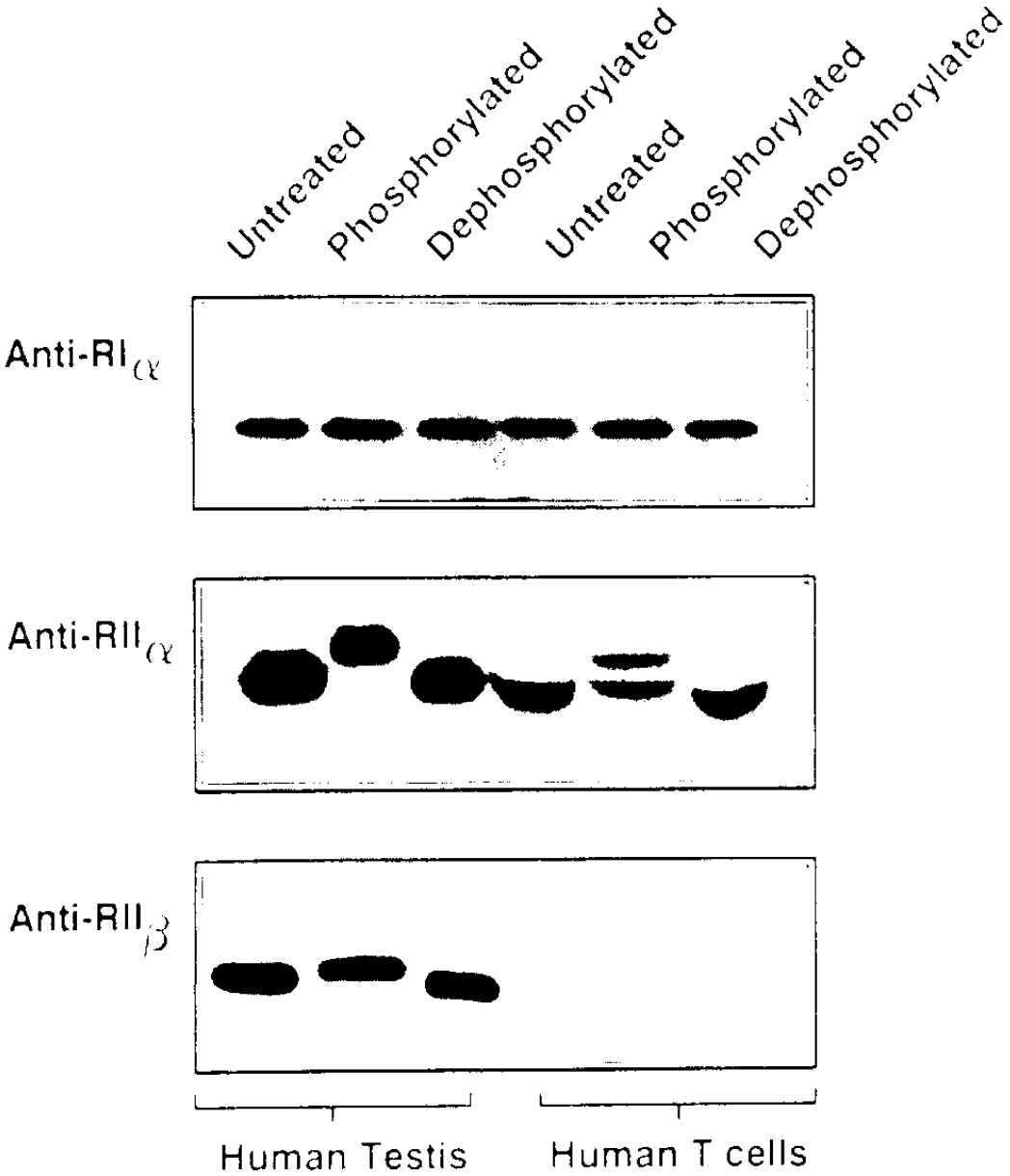


Both columns (with Y axis scale) and exact data as numerals: is that necessary?

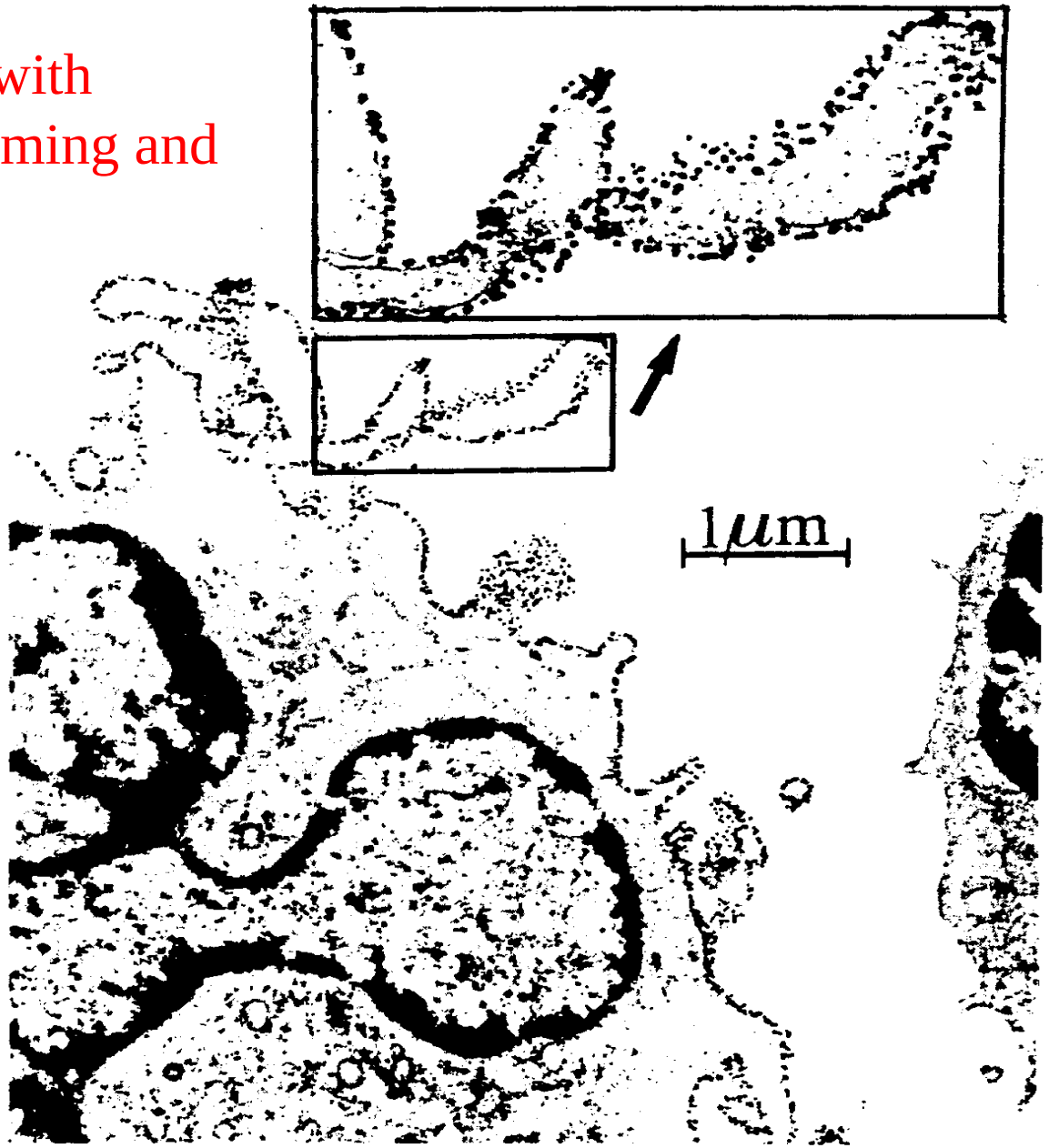
Figures, cont.

- (Micro)**photographs** (for authentication) or **drawings** (for clarity and emphasis of the essentials)? **Add letters, arrows, scales**, brief explanations to photos. **Cropping and framing** to set off important detail

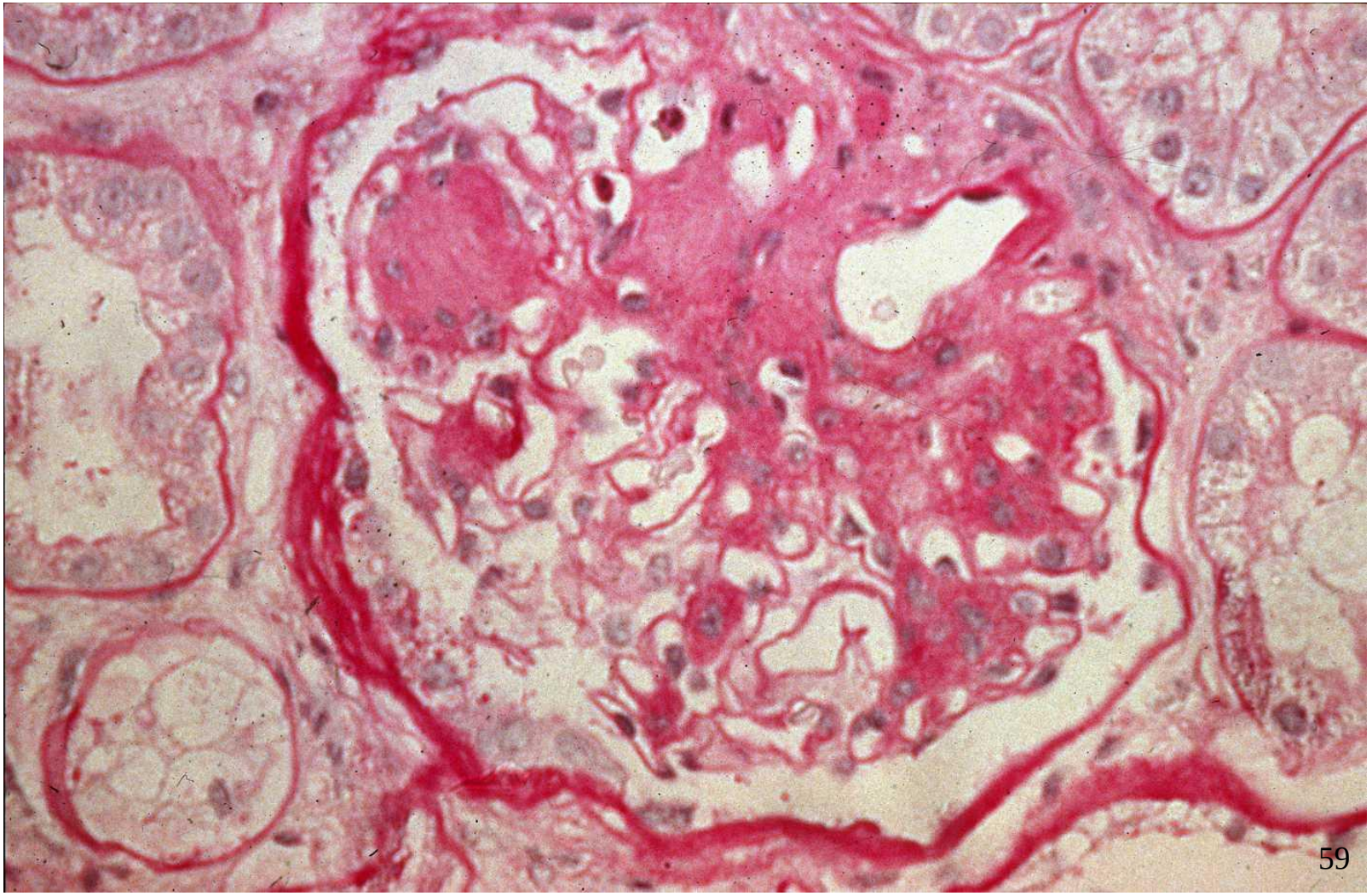
Nice illustration!

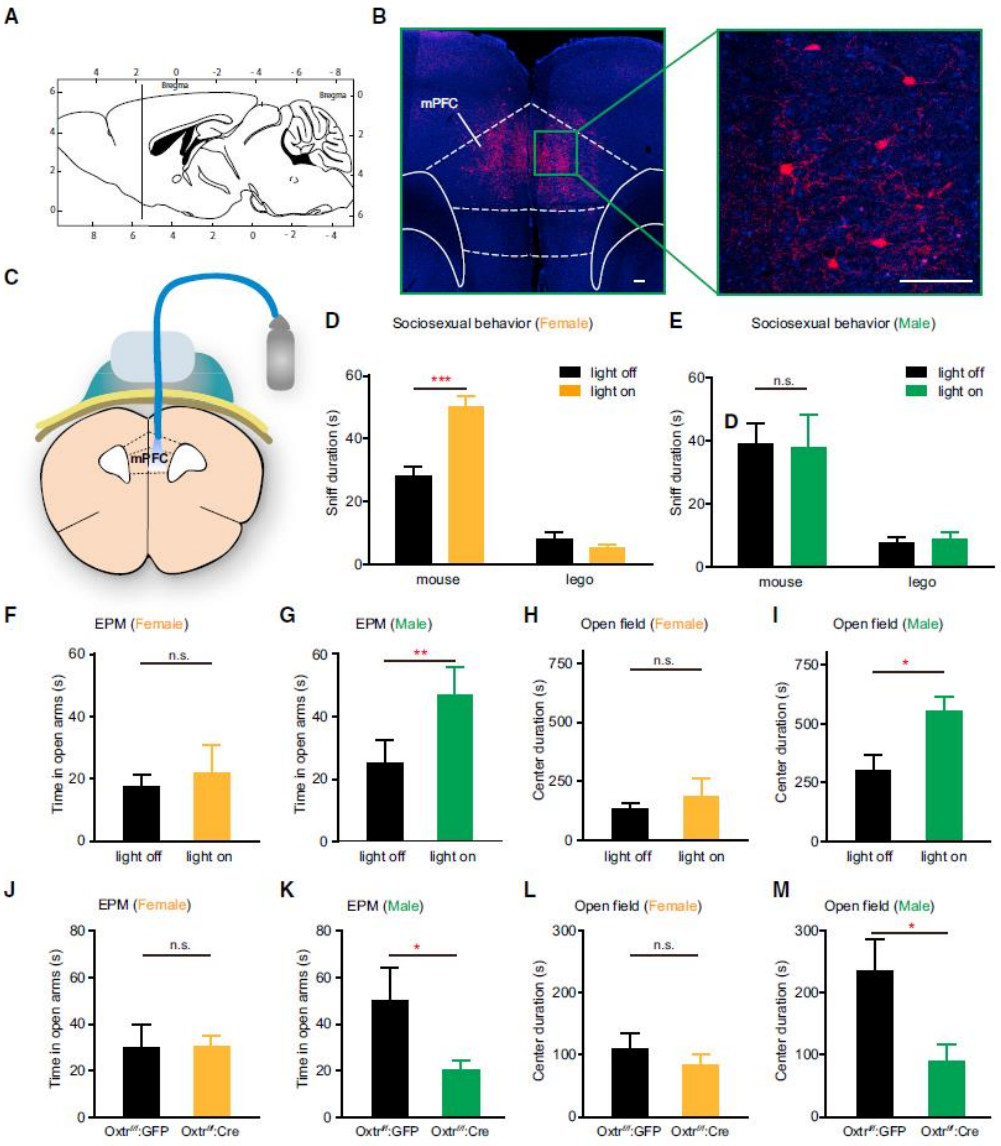


Micrograph with cropping, framing and scale



Again, pictures with or without explanatory cartoons, arrows etc. can save many words





A moderne design, from *Cell*, when the total number of figures is restricted

You may have to re-write your MS:

"You did 35 drafts before submitting this paper. Why so many?"

"I'm a little bit of an obsessive when it comes to wording. This is an abstract, somewhat difficult subject and the challenge is to write something clear for the reader."

C. Bustamante commenting on his paper:

Verification of the Crooks fluctuation theorem and recovery of RNA folding free energies

D. Collin, F. Ritort, C. Jarzynski, S. B. Smith, I. Tinoco, Jr and C. Bustamante, *Nature* **437**, 231-234 (8 September 2005)

How to get out of a dissertation-writing rut

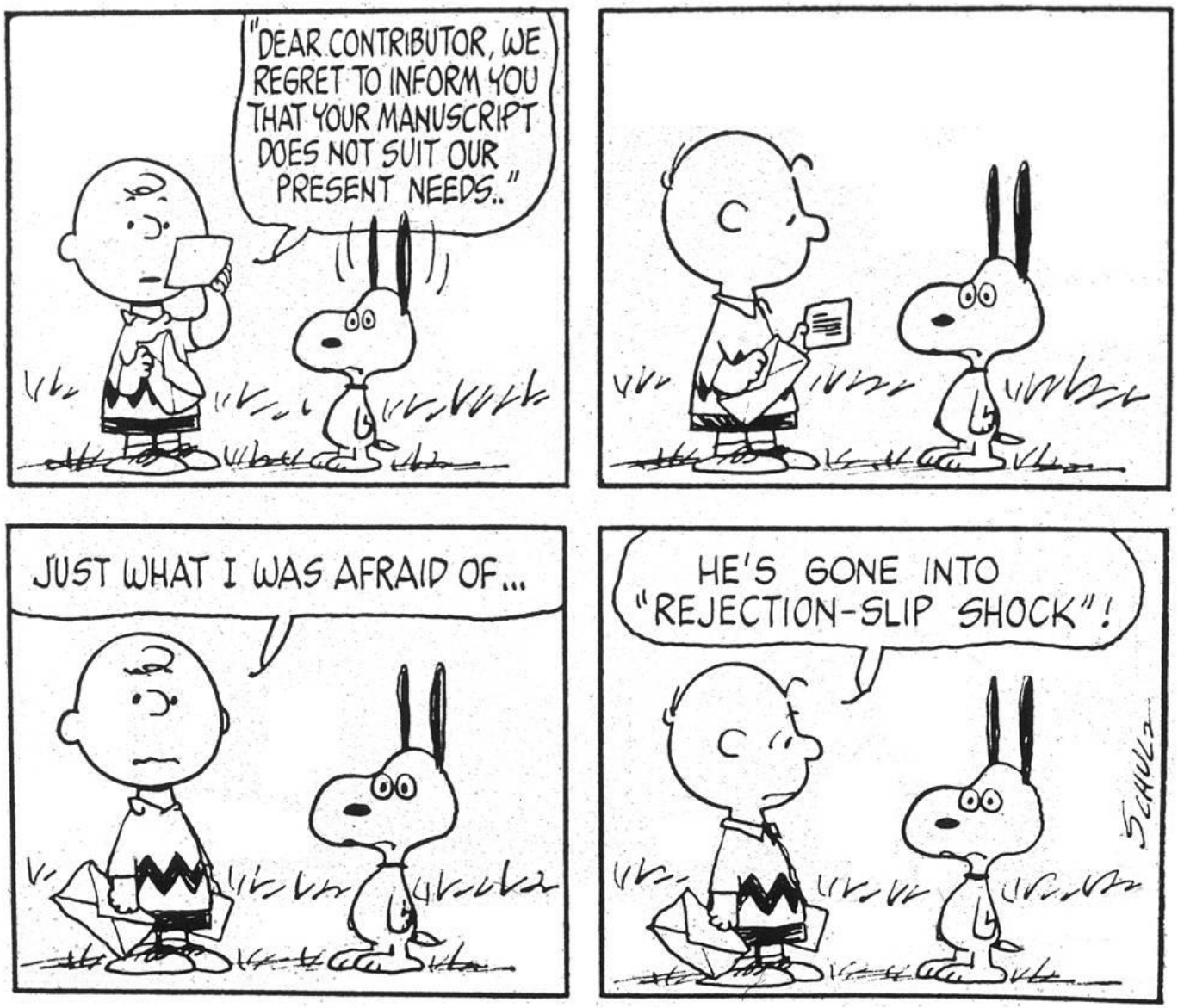
in: Gardiner M & Kearns H. Turbocharge your writing today. *Nature (2011)* 475: 129–130

- **Write before you feel ready** — because you might never feel ready. … people magically feel ready when there is an imminent deadline.
- **Don't wait to have a clear picture** of the paper. As you start putting down your ideas, you may actually clarify them.
- **Snack write** — work in short, frequent bursts instead of waiting to sit down for big blocks of time. Those blocks hardly ever come, and … they don't usually get used very productively.

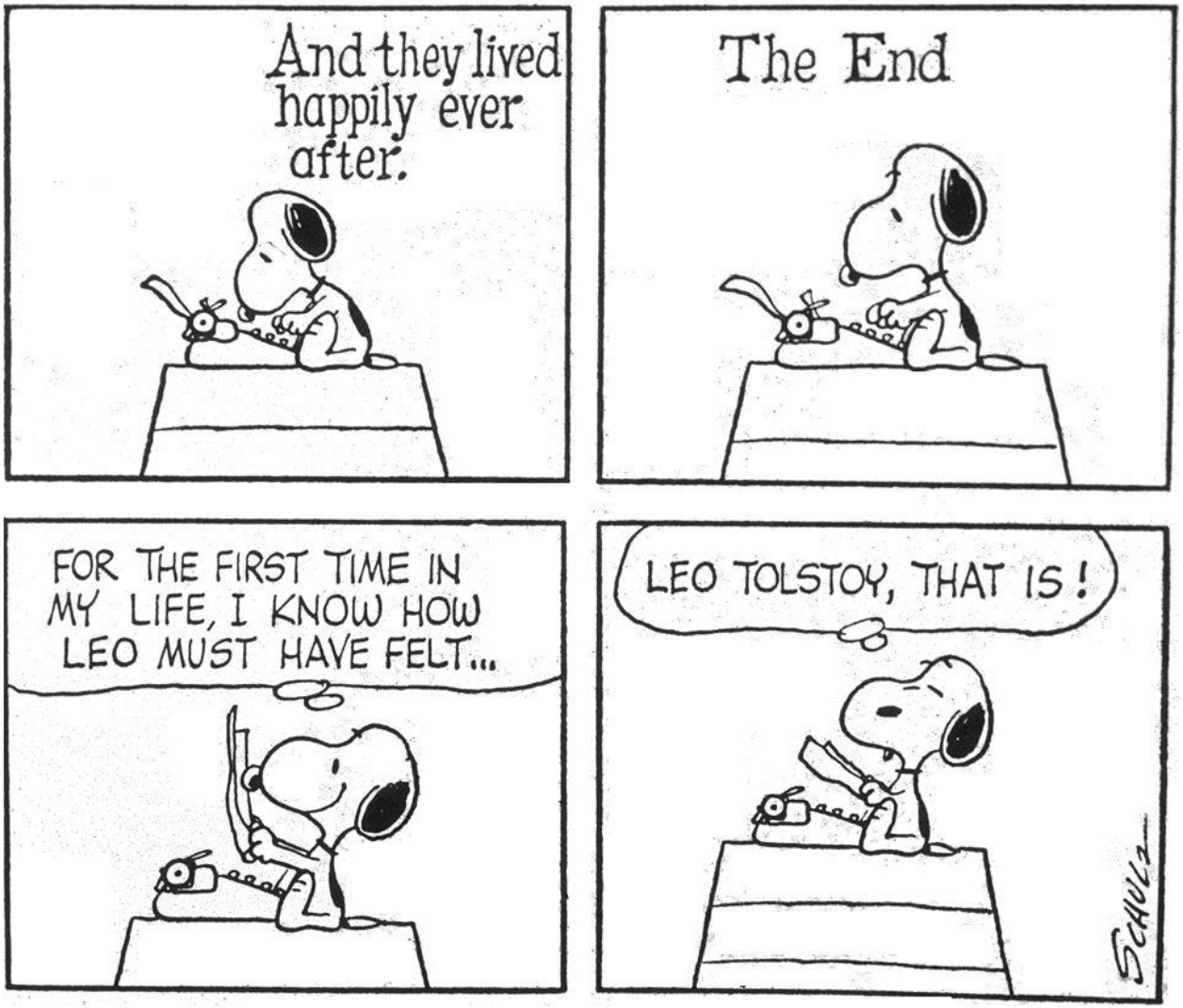
How to get out of a dissertation-writing rut, cont.

- **Set specific times** in your schedule for writing — don't leave it to chance, because chances are it won't happen.
- Writing means **putting new words on the page** or substantially rewriting old words. It does not mean editing, reading, referencing or formatting …
- If you refrain from writing because you worry that what you write won't be good enough, … **to write well, you first have to write.**
- To really increase the quality … **get feedback** from mentors and colleagues — it can be painful, but it works.

Despite a *lege artis* written MS, this may be the result:



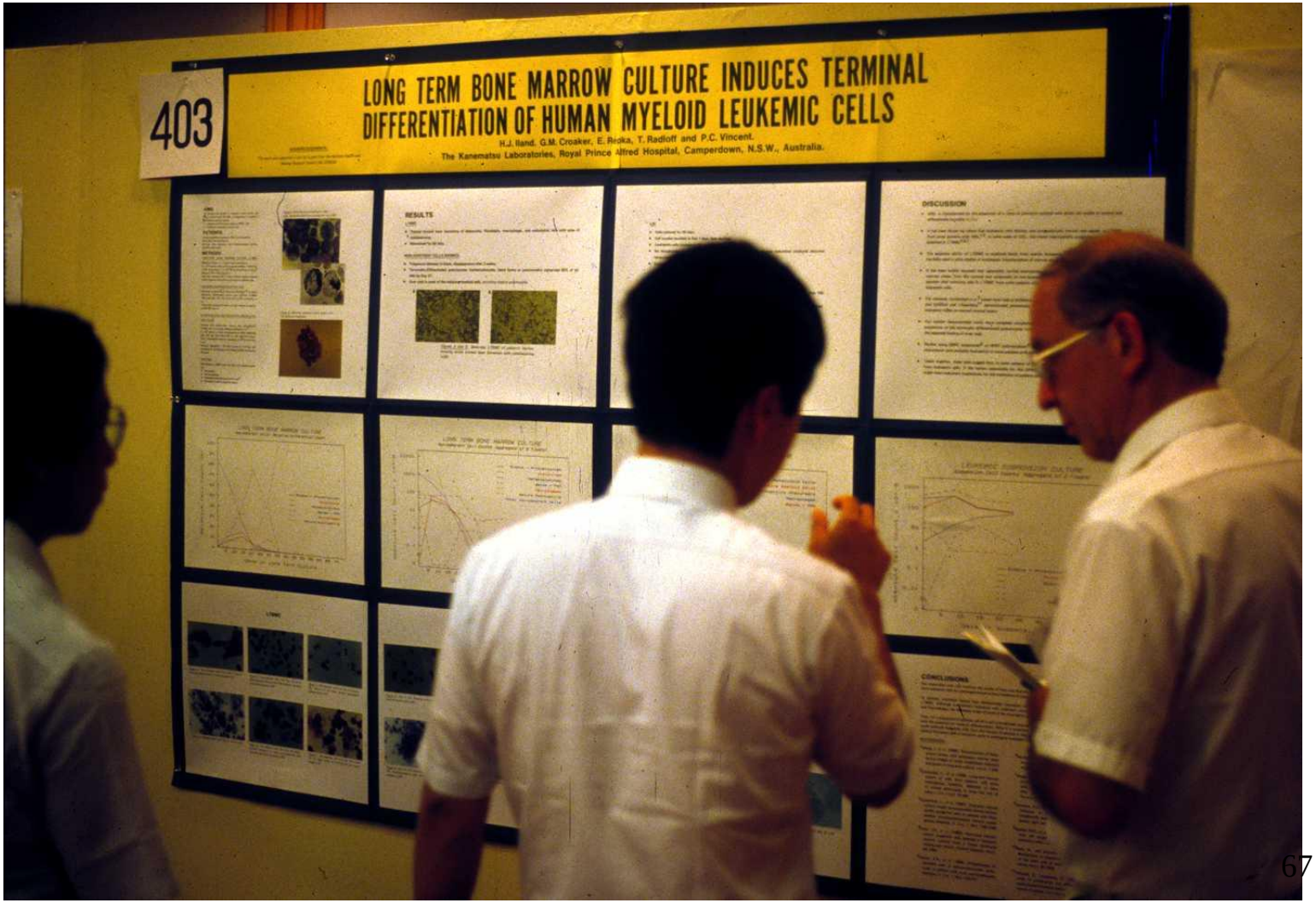
- But let us hope this be the end:



A typical submission letter might read:

Dear Editor,
I have enclosed a manuscript in quadruplicate, "Membrane ... " by .... I hope you may find the paper suitable for publication in Exp. XX. The investigation concerns ...., which we feel falls within the scope of your journal. All data presented in the article are original data of the authors and have not been published previously. We now submit the article to your journal only. The manuscript has been reviewed and approved by my co-authors. The authors hereby declare that they have no competing financial interests. [This last point, as well as the contributions by each co-author, may have to be declared separately].
Yours sincerely

Poster demonstration – an opportunity for networking and establishment of friendship



- *Vs. soporific lectures?*

Brown BS (1996) Communicate your science! …

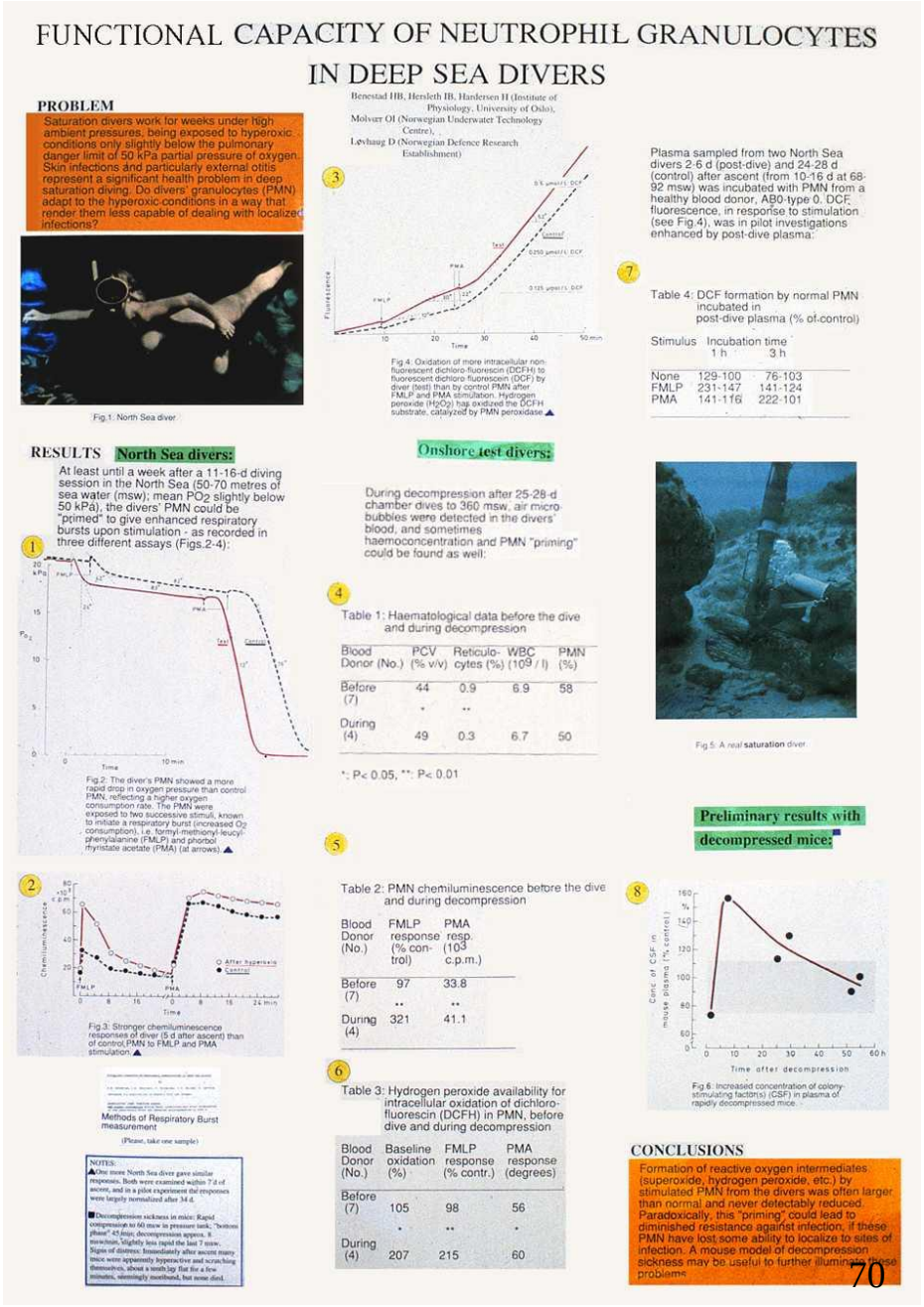
Producing Punchy Posters.

Trends Cell Biol 6: 37-39.

- P- prepared & planned
- O- One main theme
- S- simple pictures
- T- tables minimal
- E- explains itself
- R- readable at 2 metres

”Let thy words be few!” At least the heading, the problem and the conclusions should be readable at a distance of >3 m.

(Tell your story in table headings and figure legends. This poster should have been rectified as indicated in the next picture.)



FUNCTIONAL CAPACITY OF NEUTROPHIL GRANULOCYTES IN DEEP SEA DIVERS

PROBLEM

Saturation divers work for weeks under high ambient pressures, being exposed to hyperoxic conditions only slightly below the pulmonary danger limit of 50 kPa partial pressure of oxygen. Skin infections and particularly external otitis represent a significant health problem in deep saturation diving. Do divers' granulocytes (PMN) adapt to the hyperoxic conditions in a way that render them less capable of dealing with localized infections?

Benestad HB, Hersleth IB, Hardersen H (Institute of Physiology, University of Oslo), Molvær OI (Norwegian Underwater Technology Centre), Løvhaug D (Norwegian Defence Research Establishment)

Fig.1. North Sea diver

Fig.4. Oxidation of more intracellular non-fluorescent dichloro-fluorescin (DCFH) to fluorescent dichloro-fluorescein (DCF) by diver (test) than by control PMN after FMLP and PMA stimulation. Hydrogen peroxide (H_2O_2) has oxidized the DCFH substrate, catalyzed by PMN peroxidase.

Plasma sampled from two North Sea divers 2-6 d (post-dive) and 24-28 d (control) after ascent (from 10-16 d at 68-92 msw) was incubated with PMN from a healthy blood donor, AB0-type 0. DCF fluorescence, in response to stimulation (see Fig.4), was in pilot investigations enhanced by post-dive plasma:

Table 4: DCF formation by normal PMN incubated in post-dive plasma (% of control)

Stimulus	Incubation time 1 h	3 h
None	129-100	76-103
FMLP	231-147	141-124
PMA	141-116	222-101

RESULTS **North Sea divers:**

At least until a week after a 11-16-d diving session in the North Sea (50-70 metres of sea water (msw); mean PO_2 slightly below 50 kPa), the divers' PMN could be "primed" to give enhanced respiratory bursts upon stimulation - as recorded in three different assays (Figs.2-4):

Fig.2: The diver's PMN showed a more rapid drop in oxygen pressure than control PMN, reflecting a higher oxygen consumption rate. The PMN were exposed to two successive stimuli, known to initiate a respiratory burst (increased O_2 consumption), i.e. formyl-methionyl-leucyl-phenylalanine (FMLP) and phorbol myristate acetate (PMA) (at arrows).

Onshore test divers:

During decompression after 25-28 d chamber dives to 360 msw, air micro-bubbles were detected in the divers' blood, and sometimes haemoconcentration and PMN "priming" could be found as well:

Table 1: Haematological data before the dive and during decompression

Blood Donor (No.)	PCV (% v/v)	Reticulo-cytes (%)	WBC (10^9 / l)	PMN (%)
Before (7)	44	0.9	6.9	58
	*	**		
During (4)	49	0.3	6.7	50

*: P< 0.05, **: P< 0.01

Fig.5: A real saturation diver

Preliminary results with decompressed mice:

Table 2: PMN chemiluminescence before the dive and during decompression

Blood Donor (No.)	FMLP response (% control)	PMA resp. (10^3 c.p.m.)
Before (7)	97	33.8
	**	**
During (4)	321	41.1

Fig.3: Stronger chemiluminescence responses of diver (5 d after ascent) than of control PMN to FMLP and PMA stimulation

Table 3: Hydrogen peroxide availability for intracellular oxidation of dichloro-fluorescin (DCFH) in PMN, before dive and during decompression

Blood Donor (No.)	Baseline oxidation (%)	FMLP response (% contr.)	PMA response (degrees)
Before (7)	105	98	56
	*	**	*
During (4)	207	215	60

Fig.6: Increased concentration of colony-stimulating factor(s) (CSF) in plasma of rapidly decompressed mice.

Methods of Respiratory Burst measurement

(Please, take one sample)

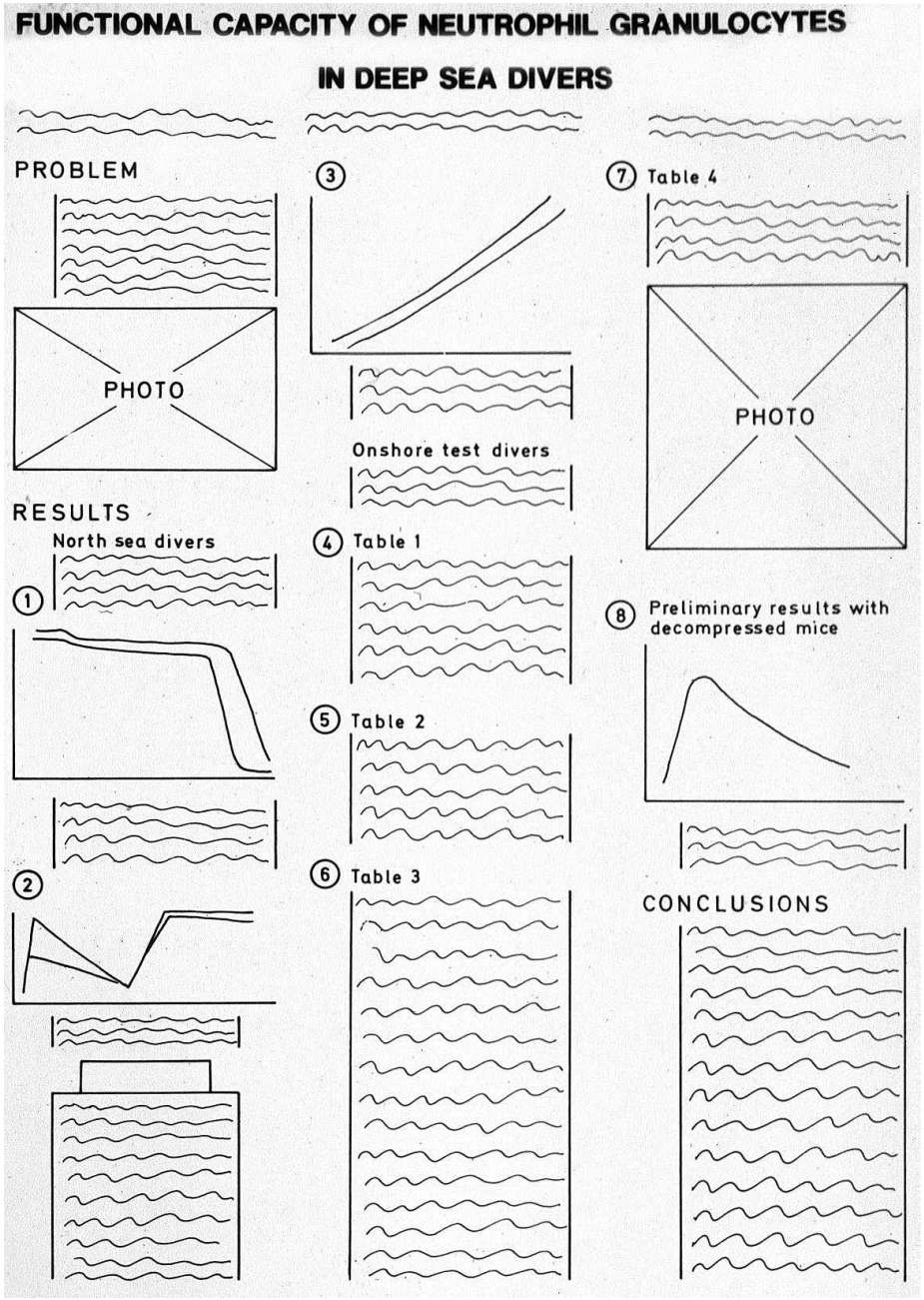
NOTES:

▲The more North Sea diver gave similar responses. Both were examined within 7 d of ascent, and in a pilot experiment the responses were largely normalized after 34 d.

■Decompression sickness in mice: Rapid compression to 60 msw in pressure tank; "bottom phase" 45 min; decompression approx. 8 msw/min. Slightly less rapid the last 7 msw. Signs of distress: Immediately after ascent many mice were apparently hyperactive and scratching themselves, about a tenth lay flat for a few minutes, seemingly moribund, but none died.

CONCLUSIONS

Formation of reactive oxygen intermediates (superoxide, hydrogen peroxide, etc.) by stimulated PMN from the divers was often larger than normal and never detectably reduced. Paradoxically, this "priming" could lead to diminished resistance against infection, if these PMN have lost some ability to localize to sites of infection. A mouse model of decompression sickness may be useful to further illuminate these problems.


FUNCTIONAL CAPACITY OF NEUTROPHIL GRANULOCYTES
IN DEEP SEA DIVERS
PROBLEM
PHOTO
RESULTS
North sea divers
1
2
3
Onshore test divers
4 Table 1
5 Table 2
6 Table 3
7 Table 4
PHOTO
8 Preliminary results with decompressed mice
CONCLUSIONS

Organic Life in outer Space

By NN, MM, OO, Institute of astrobiological research, University of Oslo

Problem: *Do life forms similar to those we know from the earth exist on outer space planets, and can modern super-spectroscopic techniques identify such organisms?*

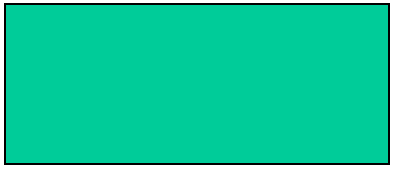
Fig. 1. Signal spectra received by apparatus X from planet Y indicate presence of organic molecules

Fig. 2. Decomposition of spectroscopic data shows that the source includes a new type of nuclear acid……
……
……

Handout: Take a copy!

xxxxxxxxxxxxxxxxxxxx

Table 1. Decoding of nuclear acid sequences obtained from outer space



Footnotes

……
……
……

Box 1. Mathematical modeling suggests the presence of higher forms of life on planets in outer space.

……
……
……

…

Table 2. New amino acids and their preponderance in extra-terrestrial organisms.

Fig. 3. Reconstruction of insectoid from planet Y.

……
……..

Fig. 4. Tentative anatomy of ET from planet Y.

……
……
……..

Conclusions

Life exists on planet Y; its highest developed form being the famous ET, but with a smaller brain and bigger hands than generally appreciated.

Autoregulation of GDNF levels in the VTA induces long-lasting inhibition of excessive alcohol consumption

Segev Barak[1], Viktor Kharazia[1] Somayeh Ahmadiantehrani[1,2] and Dorit Ron[1,2,3]

[1]The Ernest Gallo Research Center, [2]The Graduate Program in Pharmaceutical Sciences and Pharmacogenomics, [3]Department of Neurology, University of California, San Francisco

Background

- Glial cell line-derived neurotrophic factor (GDNF) is an essential growth factor for the survival, regeneration and maintenance of midbrain neurons.
- We found that activation of the GDNF signaling pathway in the ventral tegmental area (VTA) of the midbrain results in a reduction of excessive, "binge-like", alcohol consumption in rats *(Carnicella et al, PNAS, 2008; Carnicella et al., Alcohol, 2009).*
- The effects of GDNF were observed 10 minutes after intra-VTA infusion of GDNF, and were sustained for at least 24 hours *(Carnicella et al, PNAS, 2008; Carnicella et al., Alcohol, 2009).*

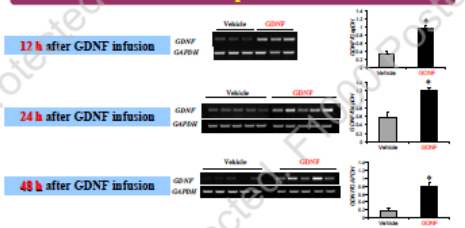
Aim and hypothesis

Aim: To identify the molecular mechanism underlying the long-lasting inhibitory effects of GDNF on alcohol intake.

We previously found that GDNF positively regulates its own expression in the dopaminergic-like cells, SHSY5Y *(Ho&Ron, FASEB 2006).*

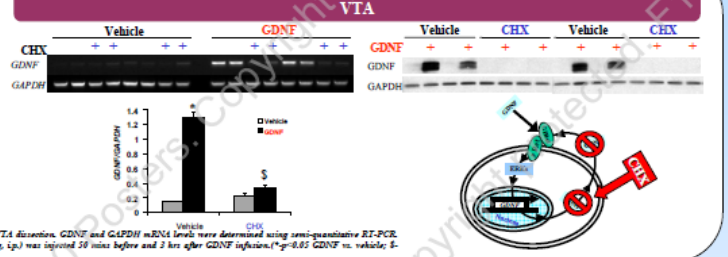
Hypothesis: A GDNF autoregulation loop accounts, at least in part, for the sustained reduction of alcohol intake following infusion of GDNF into the VTA.

1. GDNF induces its own expression *in vivo* in the VTA

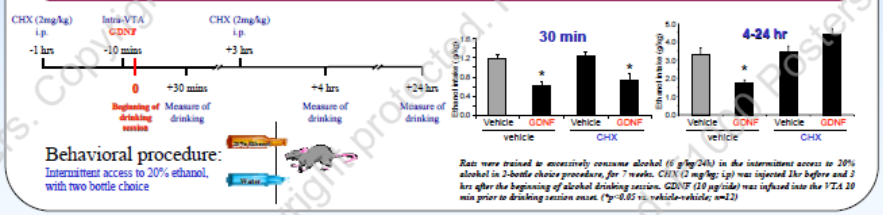


*GDNF (10 μg; unilateral) or vehicle were infused into the VTA of rats 12, 24 or 48 hrs prior to VTA dissection. GDNF and GAPDH mRNA levels were determined using semi-quantitative RT-PCR. GDNF protein levels were determined using western-blot analysis. Cycloheximide (CHX; 2 mg/kg, i.p.) was injected 30 mins before and 3 hrs after GDNF infusion.(*p<0.05 GDNF vs. vehicle; $-p<0.05 CHX vs. vehicle; n=3-5)*

2. Inhibition of protein synthesis using Cycloheximde (CHX) disrupts GDNF autoregulation in the VTA

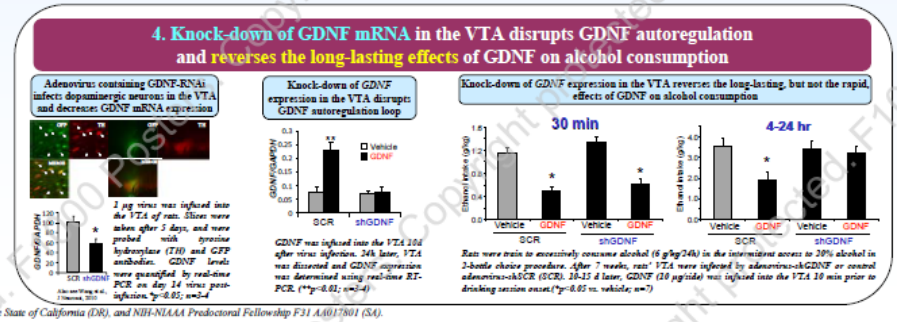


3. Inhibition of protein synthesis reverses the long-lasting, but not the acute effects of GDNF on alcohol consumption



*Rats were trained to excessively consume alcohol (6 g/kg/24h) in the intermittent access to 20% alcohol in 2-bottle choice procedure, for 7 weeks. CHX (2 mg/kg; i.p) was injected 1hr before and 3 hrs after the beginning of alcohol drinking session. GDNF (10 ng/side) was infused into the VTA 10 min prior to drinking session onset. (*p<0.05 vs. vehicle-vehicle; n=12)*

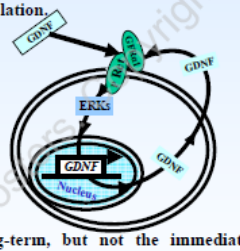
4. Knock-down of GDNF mRNA in the VTA disrupts GDNF autoregulation and reverses the long-lasting effects of GDNF on alcohol consumption



*Rats were train to excessively consume alcohol (6 g/kg/24h) in the intermittent access to 20% alcohol in 2-bottle choice procedure. After 7 weeks, rats' VTA were infected by adenovirus-shGDNF or control adenovirus-shSCR (SCR). 10-15 d later, GDNF (10 ng/side) was infused into the VTA 10 min prior to drinking session onset.(*p<0.05 vs. vehicle; n=7)*

Conclusions

- GDNF activates an autoregulation loop *in vivo* in the VTA, to maintain its expression and translation.



- The long-term, but not the immediate, inhibitory effects of GDNF on alcohol consumption are mediated by the positive GDNF-mediated autoregulatory feedback loop.
- GDNF, or compounds that increase its levels, can evoke a prolonged upregulation of GDNF levels that reduce alcohol intake.

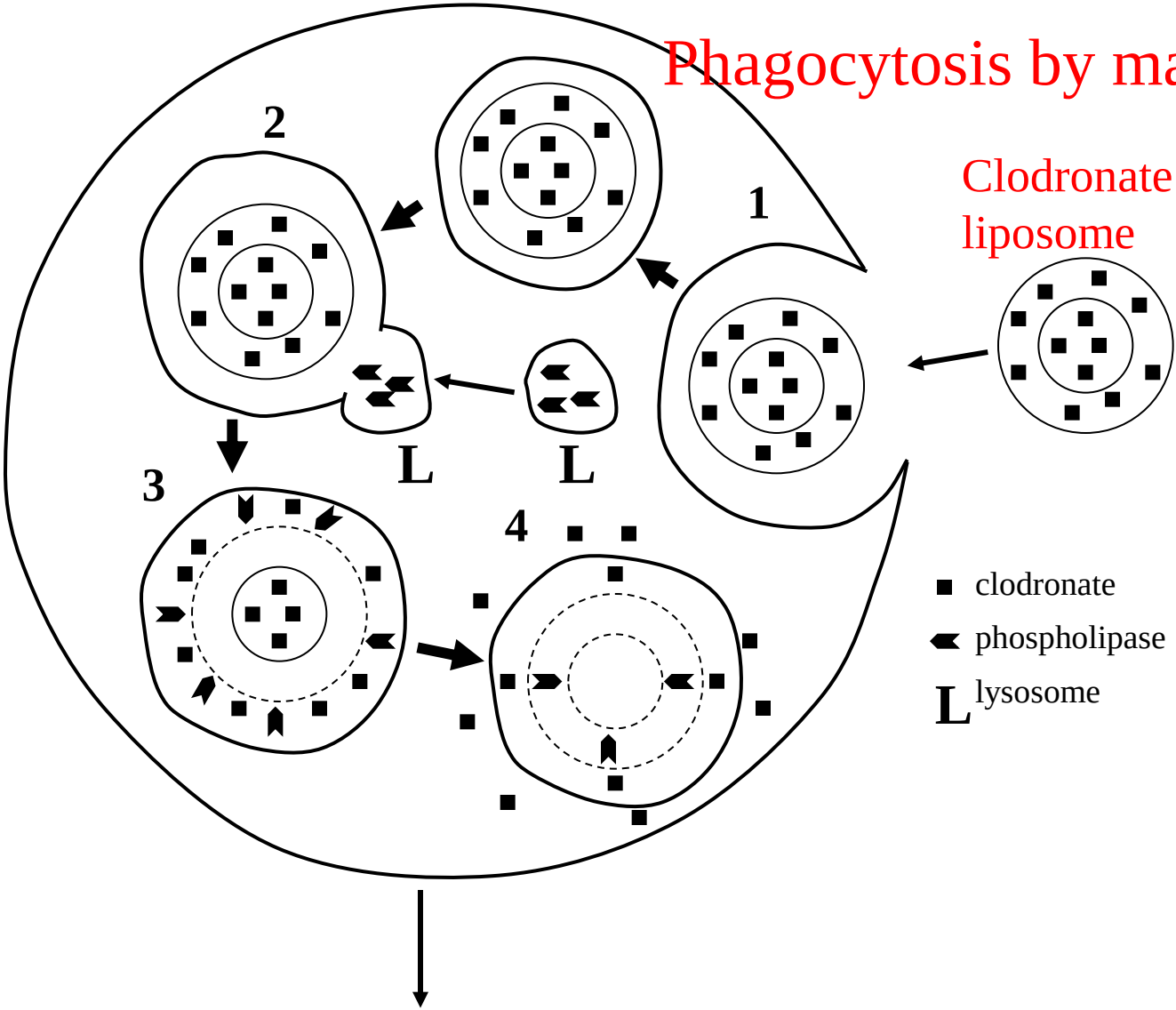
A potential long lasting treatment strategy for alcohol use and abuse disorders.

This research was supported by funds provided by NIH-NIAAA RO1 AA014366 (DR), the State of California (DR), and NIH-NIAAA Predoctoral Fellowship F31 AA017801 (SA).

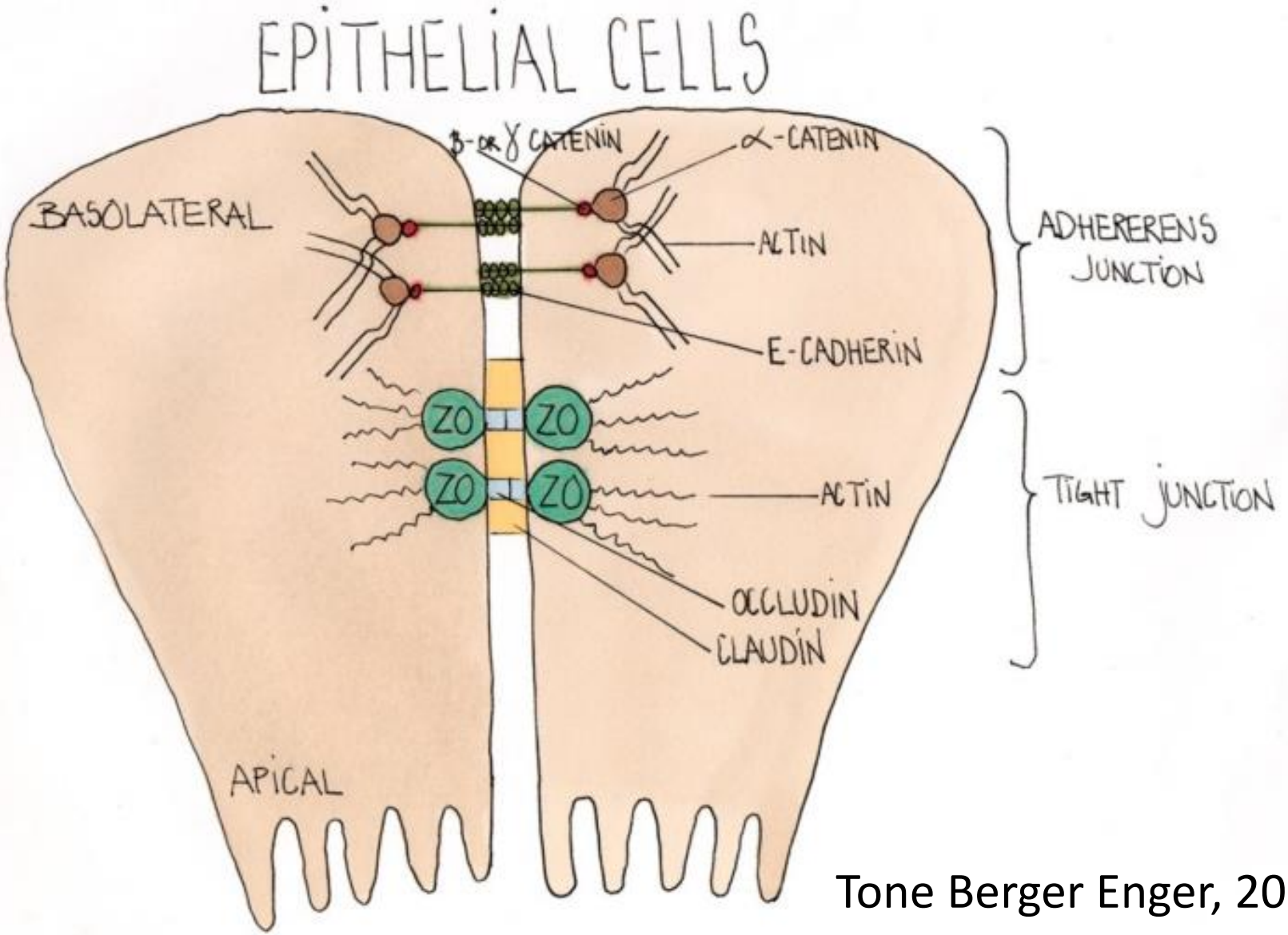
Awarded poster 2010 – too complicated?

Cartoons can be good learning aids

Phagocytosis by macrophages

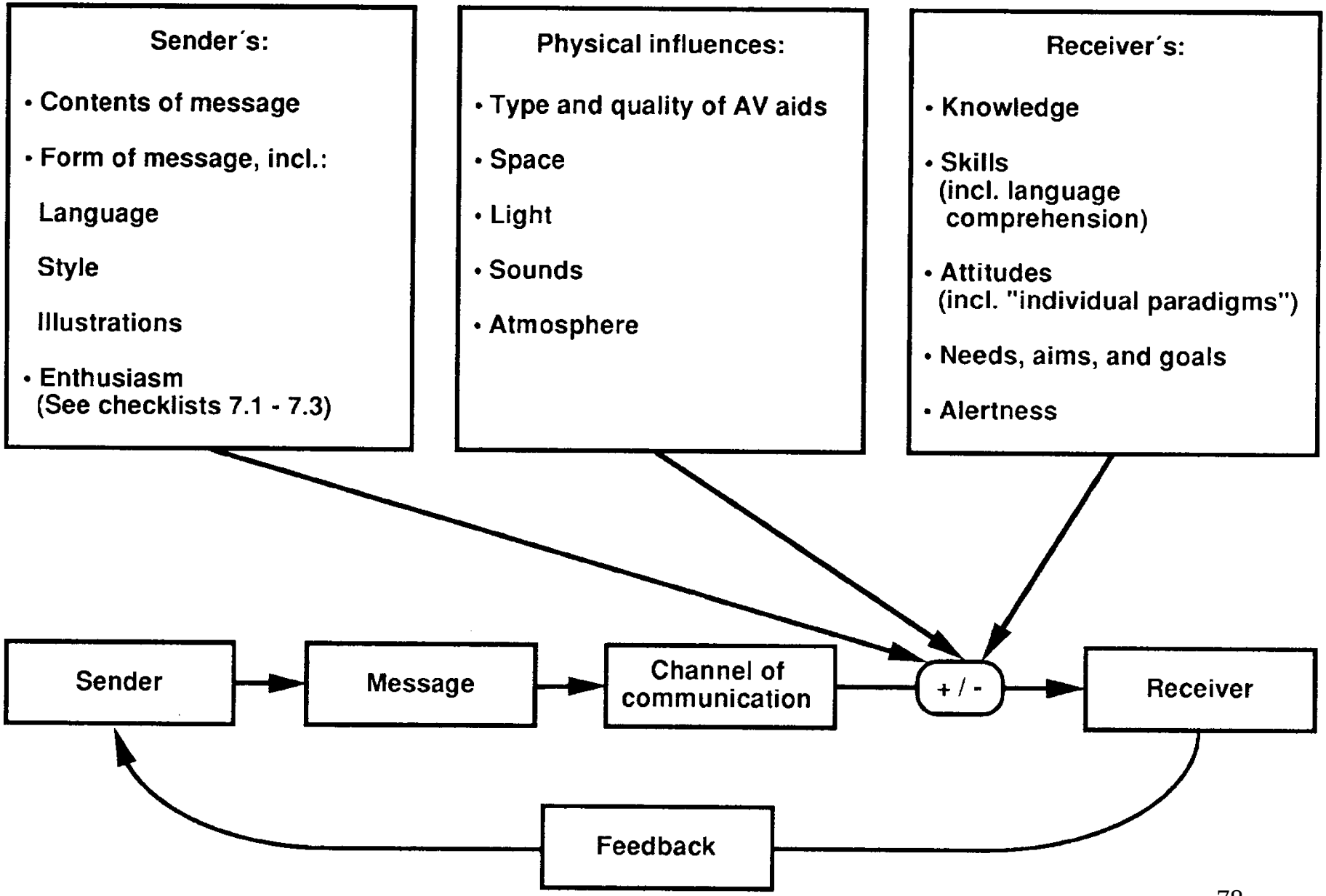


Apoptosis ⟶ Macrophage depletion



Tone Berger Enger, 2014

Oral presentations


Sender's:
• Contents of message
• Form of message, incl.:
Language
Style
Illustrations
• Enthusiasm
(See checklists 7.1 - 7.3)
Physical influences:
• Type and quality of AV aids
• Space
• Light
• Sounds
• Atmosphere
Receiver's:
• Knowledge
• Skills
(incl. language comprehension)
• Attitudes
(incl. "individual paradigms")
• Needs, aims, and goals
• Alertness
Sender
Message
Channel of communication
+ / -
Receiver
Feedback

The oral presentation

- Know your audience!
- Connect your theme to general principles.
- Don´t mention details concerning materials and methods.

- Use ample time (40% ?) to introduce the subject, similar time for the main methods and results (40% ?), and the rest for discussion and conclusions.

- A rule of thumb:

- 80 words per minute,
- a slide: roughly the time of 50 words,
- one new idea every 3 minutes,
- a 10-minute speech: max. 8 slides (preferably not more than 3 of them containing important data).

Checklist: The oral presentation

1) Have you got *a good story* - for this audience?

2) Can you indicate the *general aspects and importance* of your theme/work?

Checklist (continued): The oral presentation

3) Have you scheduled an appropriate part of your allotted time (≈40%?) to presentation of *background and main problem(s)?*

4) Will you stick to the recipe: *"Say what you 're going to say - Say it - Say what you've said - Sit down"?*

5) Can you say it in a *simple and logical* way, with short sentences, in an oral and not written form?

Checklist (continued): The oral presentation

6) Have you *avoided overloading* your speech?

7) Is the *illustrative material easily understandable?*

8) Can you deliver your speech *with enthusiasm,* so that those at the back of the room can see, hear, and *understand you easily?*

9) Have you had *rehearsal(s)* - early enough to be able to improve visual aids and often enough to achieve excellence?

The oral presentation, cont.

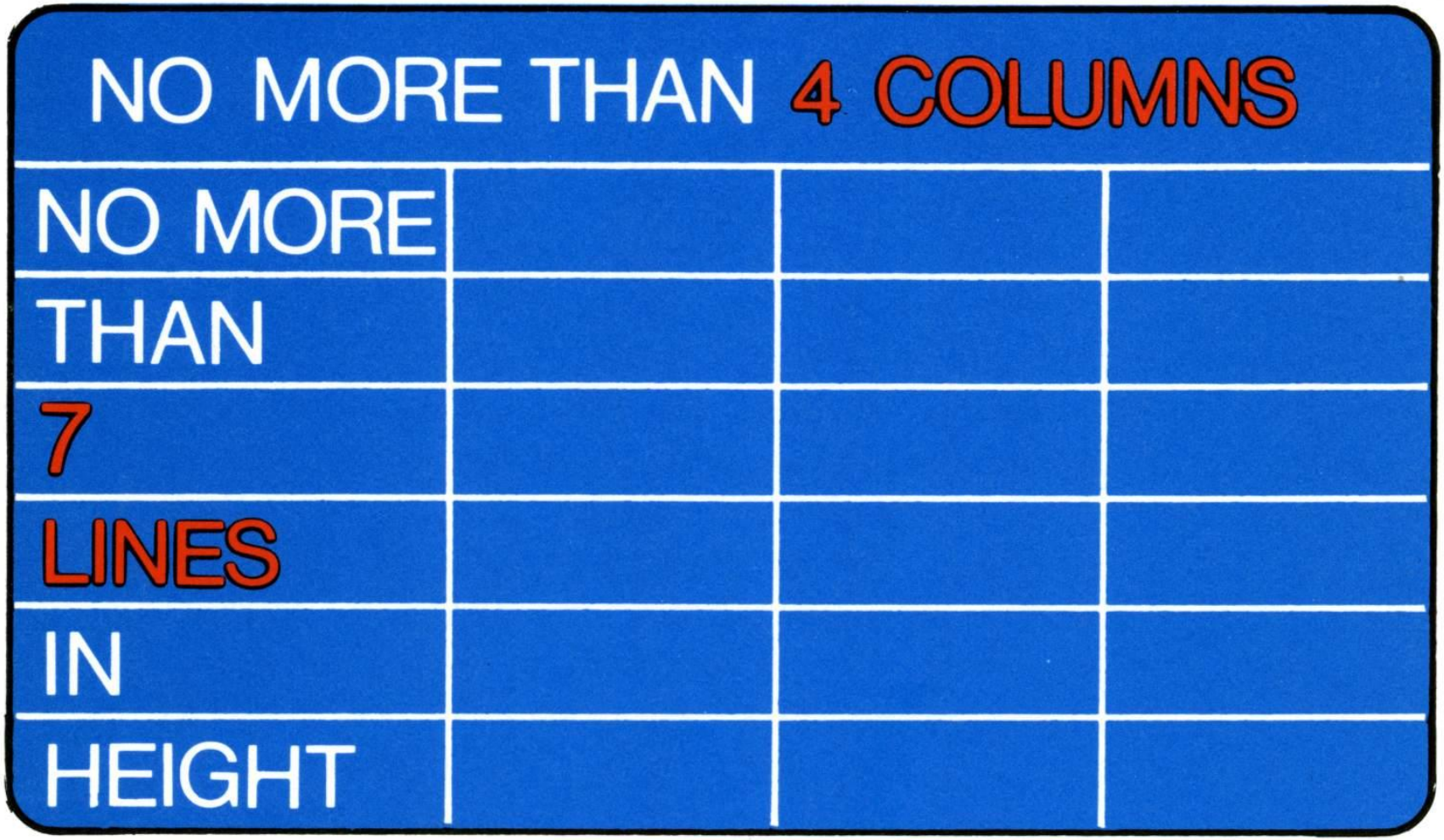
- Each slide should illustrate one – or at most two – points

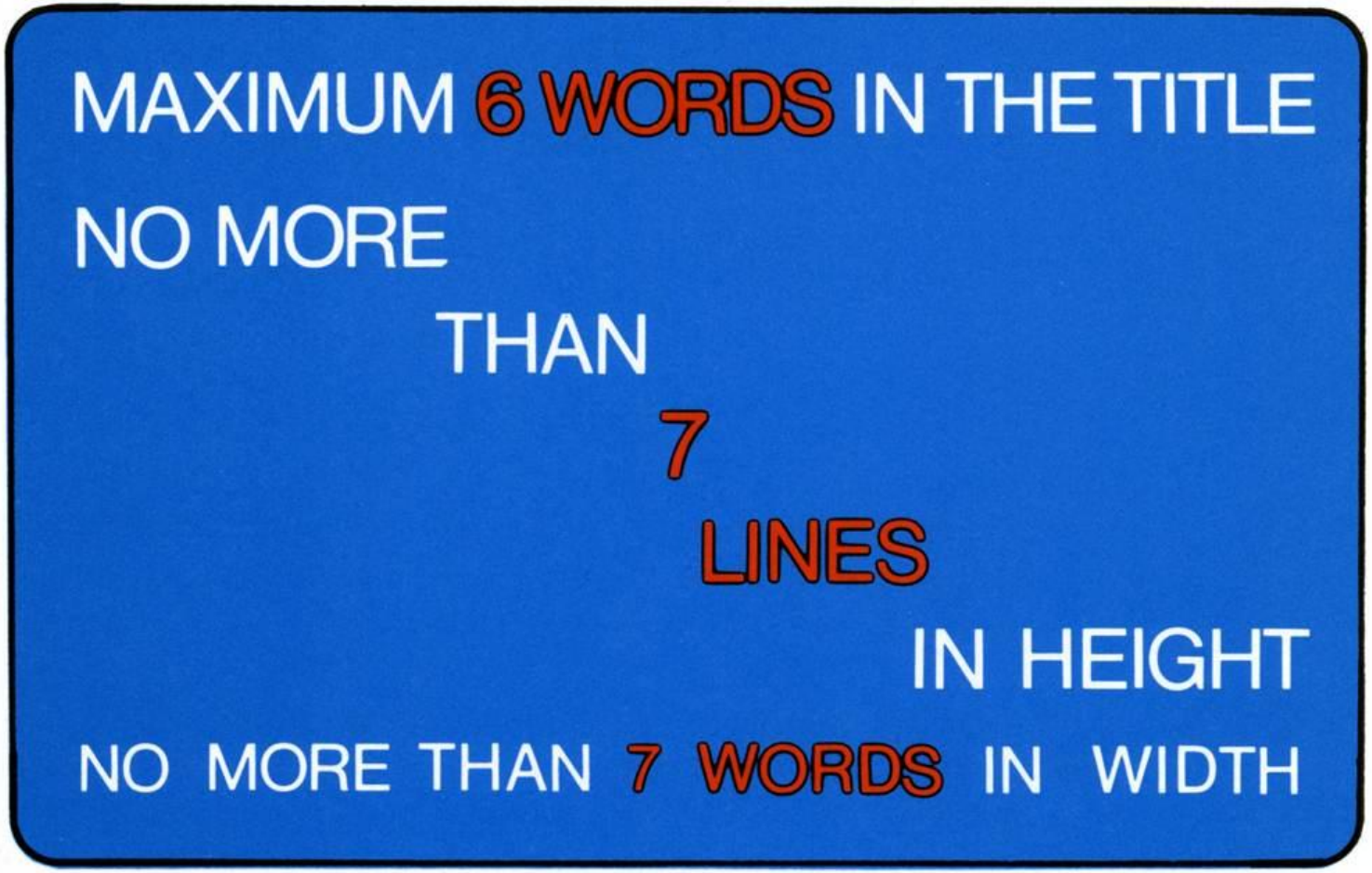
- Illustrations : easy to comprehend

- Tables: simplify!

- Repeat important points, phrasing them in a different way, since micro-sleep is ubiquitous.

- Total time of your presentation should be 90% of the allotted time.


NO MORE THAN 4 COLUMNS
NO MORE
THAN
7
LINES
IN
HEIGHT


MAXIMUM 6 WORDS IN THE TITLE
NO MORE
THAN
7
LINES
IN HEIGHT
NO MORE THAN 7 WORDS IN WIDTH

SLIDE 4

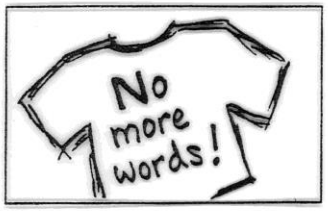
7±2

SLIDE 5

SLIDE 6

SIX words only on each line
LINES ----------
ONLY ----------
ON ----------
EACH ----------
SLIDE ----------

SLIDE 7



Suggestions about the performance

- Prepare thoroughly and rehearse several times!

- Check beforehand that the audio-visual aids really work.

- Give an impression of friendly and relaxed authority...

- Tell your story in plain English. Use short sentences.

- Let everyone see your face and be conscious about the effects of your body language!

- Address people at the back of the room – with enthusiasm!

- Take a deep breath; good breathing allegedly prevents such common faults as dropping the end of the sentence.

Suggestions about the performance

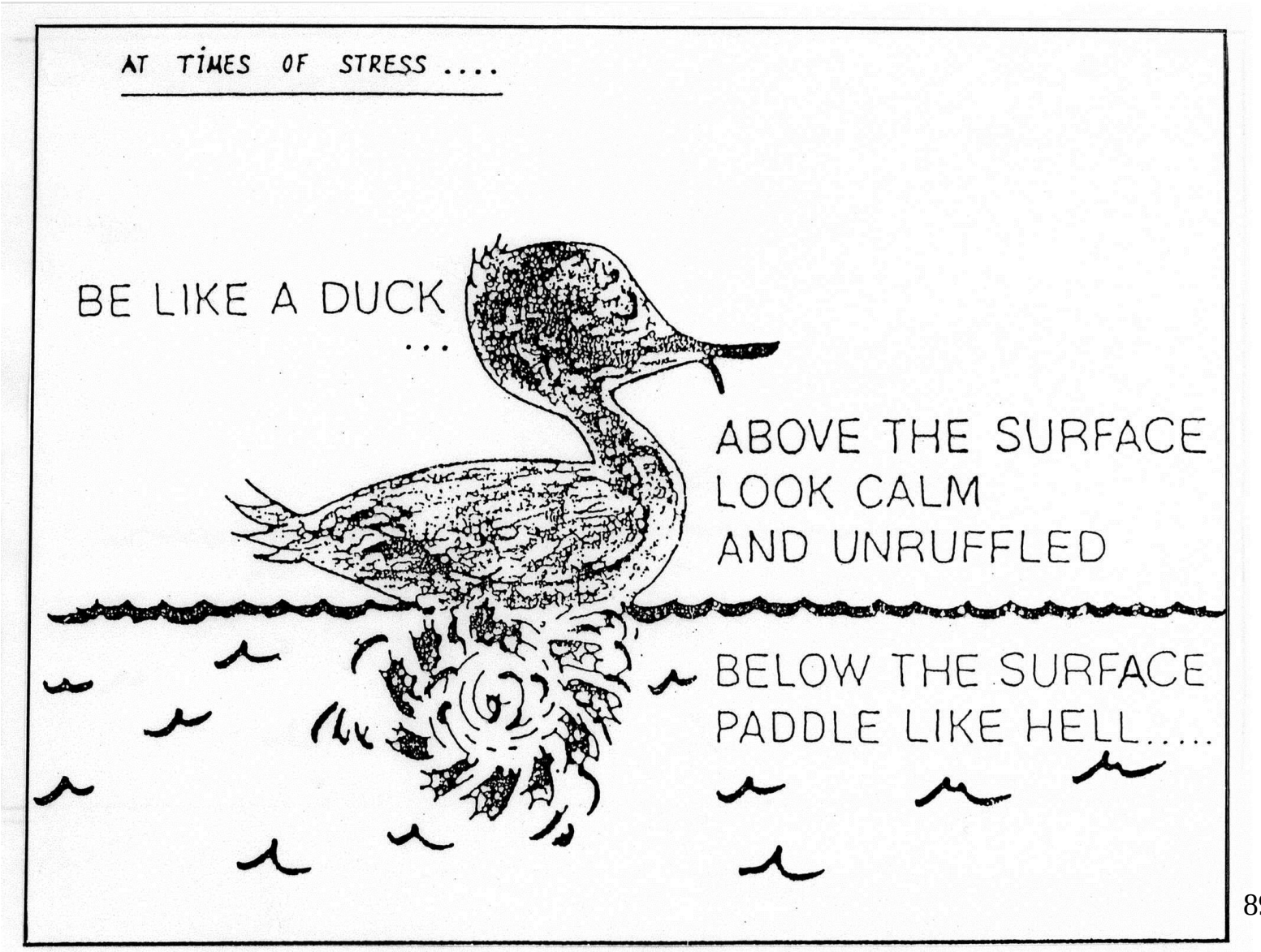
• Make your story as simple, easy to understand, logical and clear-cut as possible.

• After letting the audience have a quick orientating glance at your slide – in silence – you can explain it!

• Laser torches are excellent means of directing the attention of the audience to the essential detail.

• Conclusions (and acknowledgements) on the final slides.

The oral presentation



What does communication depend on?
According to one source:

- **55 %** on personality, charisma, eye contact, movements, looks, clothing, etc.

- **38 %** on your voice (pitch, variation, trustworthiness)

- **7 % -** only **-** on what you in fact say (content)!

Rhetoric

How to make an argument persuasive enough to change the beliefs of another person? In classical Greek rhetoric:

- *Logos* (using logical arguments such as induction and deduction)
- *Pathos* (creating an emotional reaction in the audience)
- *Ethos* (projecting a trustworthy, authoritative, or charismatic image)

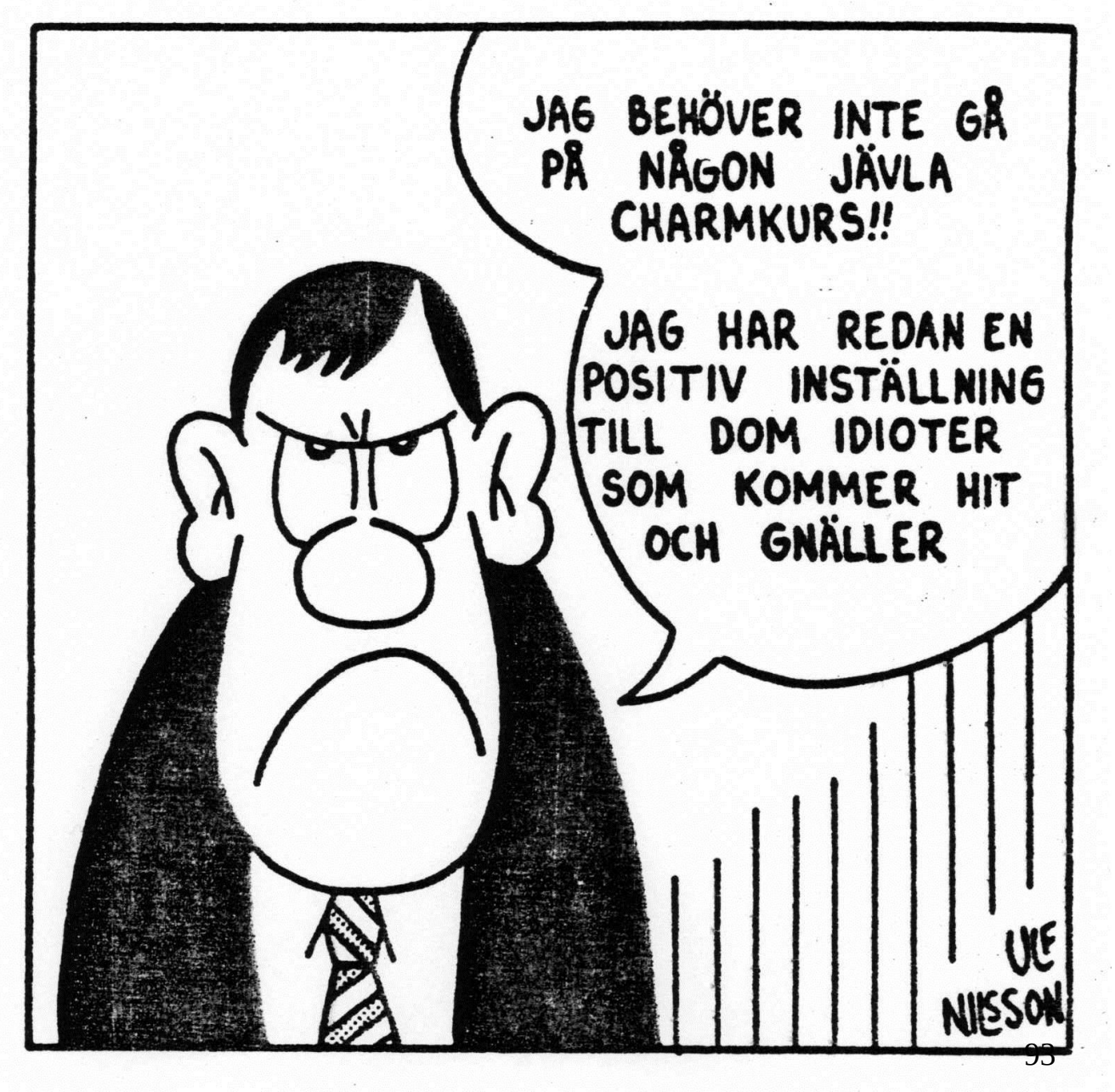
Rhetoric, cont.

Rhetoric also involves what are often called "The flowers of rhetoric". These include:

- *Inventio* (the techniques for thinking up the points to discuss)
- *Schemes* (rhetorical devices that involve artful patterns in sentence structure)
- *Tropes* (rhetorical devices involving shifts in the meaning or use of words).

(”I don’t need any damned charm course! I have already a positive attitude to those idiots …”)

The way you present yourself is important!



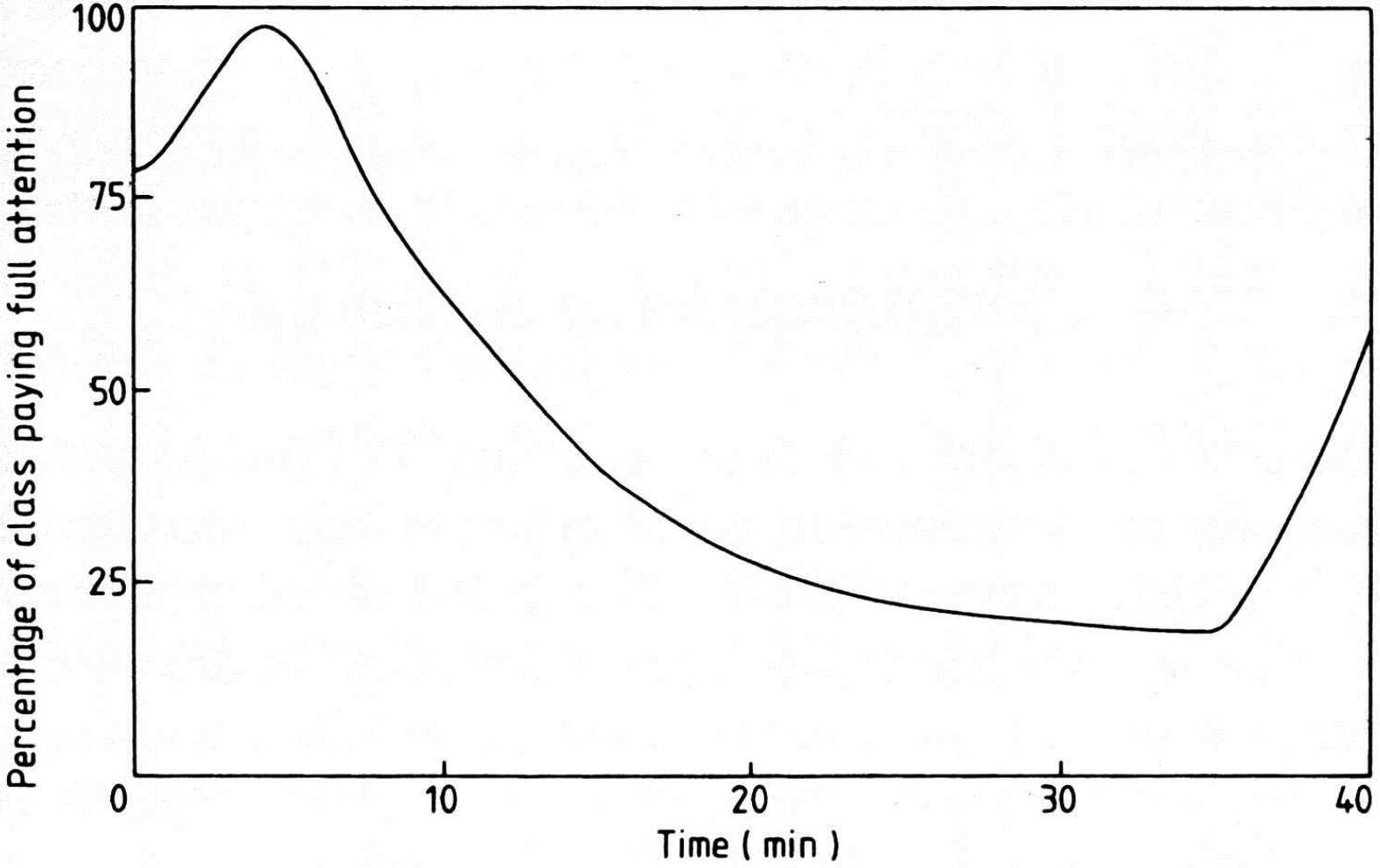


Figure 1 **The attention curve.**[3]

Kenny, P. (1982) "A handbook of public speaking for scientists and engineers", Inst. of Physics Publ., Bristol, 181 pp.

Don’t be a bore:

- Stand up!
- Speak up!
- Shut up!

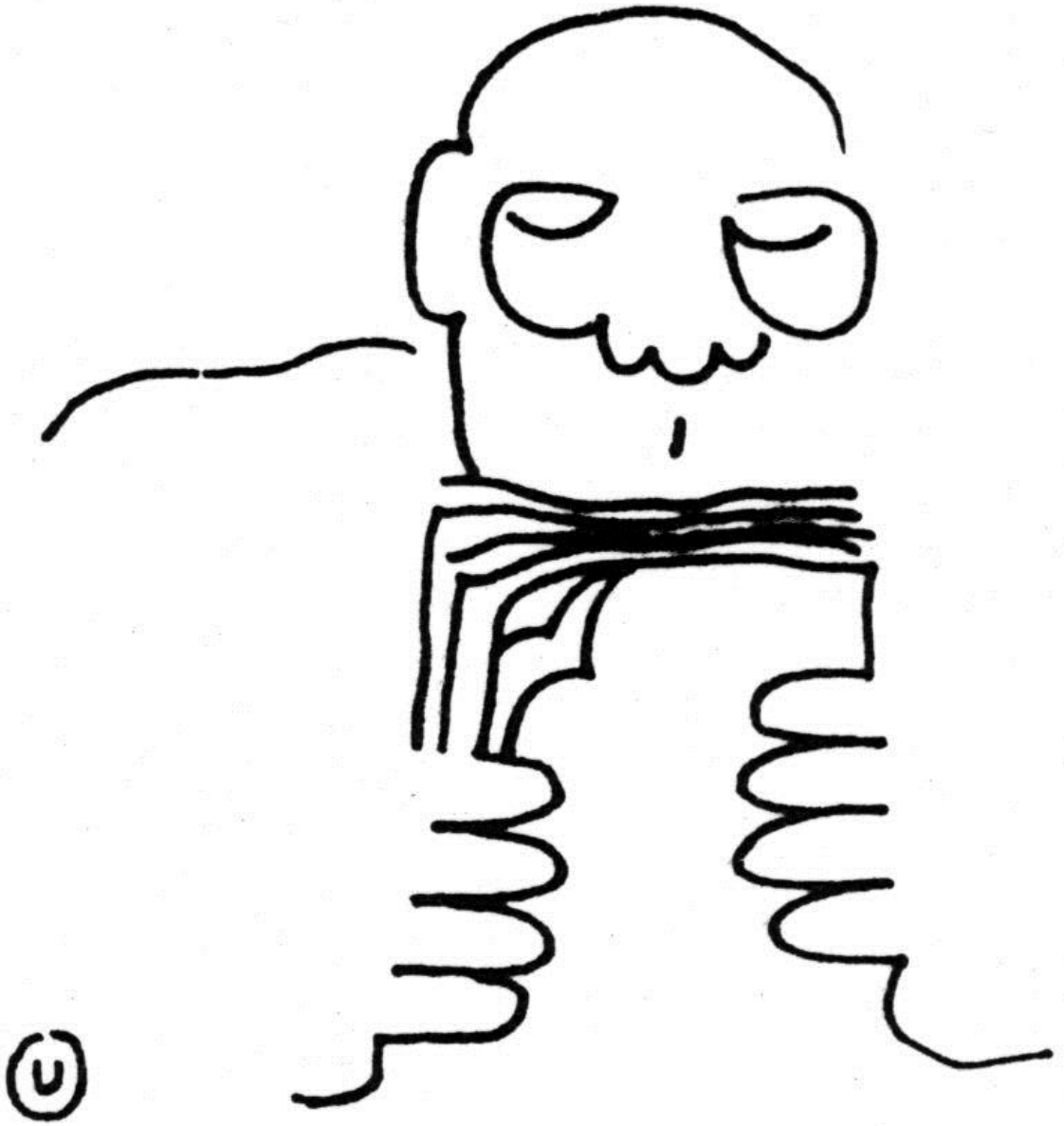
Or:

- *Say what you 're going to say*
- *Say it*
- *Say what you've said*
- *Sit down*


OF COURSE, I REALIZE THAT THERE WILL ALWAYS BE CRITICISM..
ALL MEDIUMS OF ENTERTAINMENT GO THROUGH THIS..EVEN OUR HIGHER ART FORMS HAVE THEIR DETRACTORS...THE THEATRE SEEMS ESPECIALLY VULNERABLE..
AND GOODNESS KNOWS HOW MUCH CRITICISM IS LEVELED AT OUR TELEVISION PROGRAMMING..ONE SOMETIMES WONDERS IF IT IS POSSIBLE EVER TO PLEASE THE VAST MAJORITY OF PEOPLE...
THE MOST RECENT CRITICISM IS THAT THERE IS TOO LITTLE ACTION AND FAR TOO MUCH TALKING IN THE MODERN-DAY COMIC STRIP... WHAT DO YOU THINK ABOUT THIS?
RIDICULOUS!


OOH..
AAA..
OOOO
AHMM
OOO...
OOOH...
OOOH...
OOO...
OOOOOO
OOH..

To use notes is ok, but do not read a manuscript!



More suggestions about performance

• During the discussion of your presentation repeat each question for the benefit of those who didn´t hear them. Aim your reply at the audience.

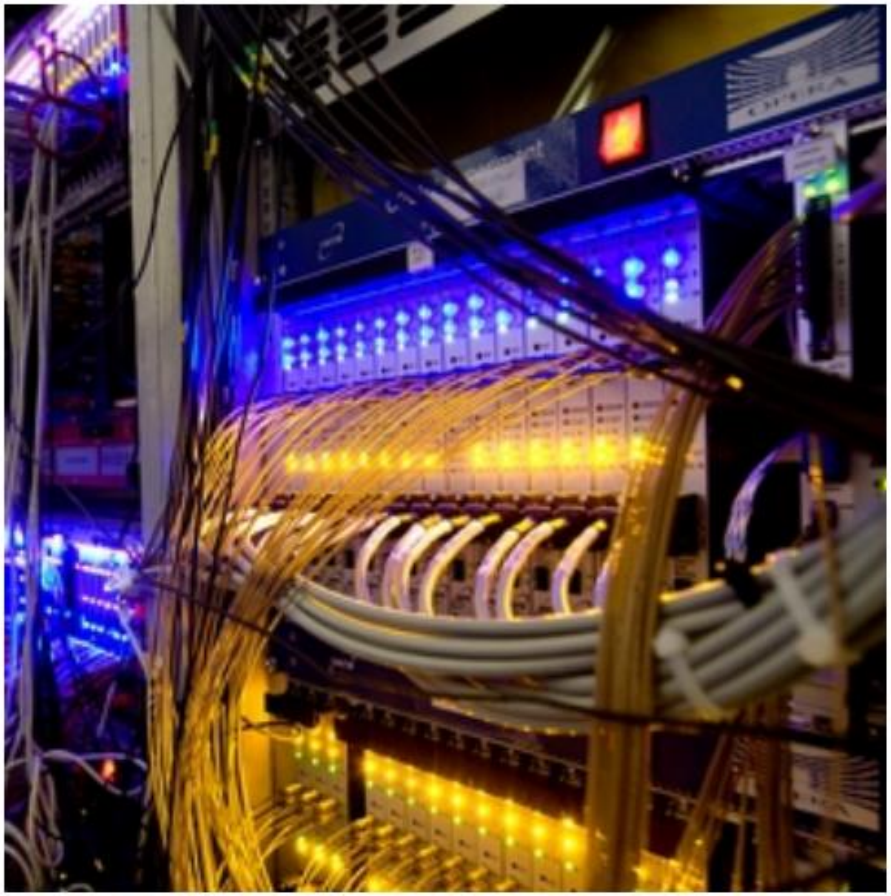
• Thank questioners who make helpful suggestions and try to be polite to the others.

Formidling/Dissemination

Guidelines for ethical practice in research: UiO's 10 Commandments

1. - 8. …

9. You shall strive to be level-headed when you report your results; consequential considerations should include both potential benefits and would-be ethical dilemmas.



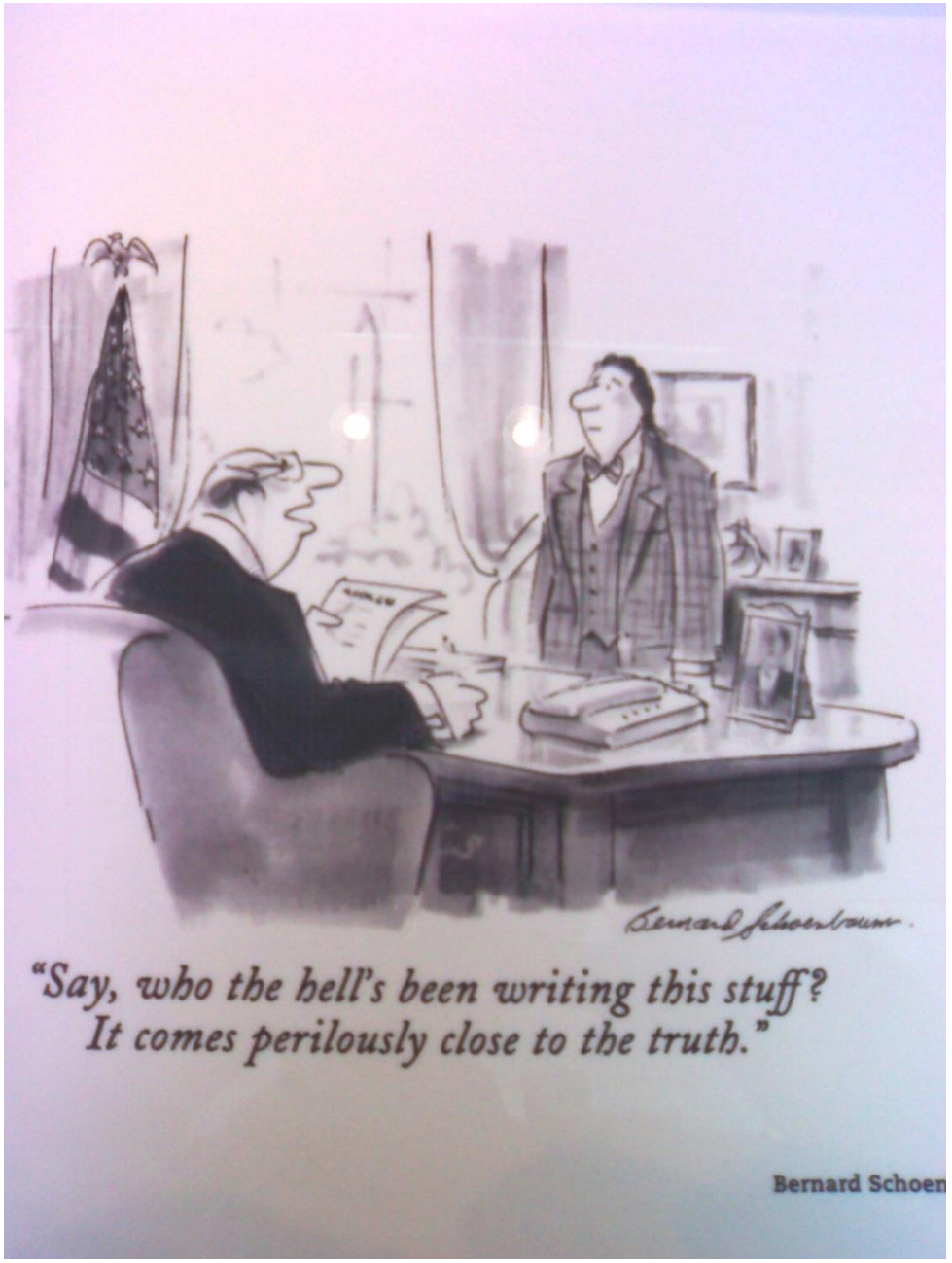
Uenige om nøytrino-publisering

To høyt respekterte forskningsinstitusjoner sendte ut pressemeldinger om nøytrinoer som reiste raskere enn lyset. Forskningen var ikke publisert i et fagfellevurdert tidsskrift.

Caveat

Don't disseminate your scientific findings to the public before your report have been accepted in a scientific journal, as was the case with the discovery of the «neutrino speed» (which proved not to be faster than light)

As a researcher, you should be as objective as possible!



1 April 2005

Act relating to universities and university colleges

Chapter 1. Purpose and scope of the Act

Section 1-1. *Purpose of the Act*

The purpose of this Act is to make provisions for universities and university colleges to

a) provide **higher education** at a high international level.

b) conduct **research** and academic and artistic development work at a high international level.

c) **disseminate knowledge** of the institution's activities and **promote the understanding** and application **of scientific** and artistic **methods and results** in public administration, cultural life and business and industry.

Author check list

- Is your theme relevant, interesting and important for the journal's or newspaper's readers?
- Don't start with trivialities: choose a "decrescendo mode": important points first!
- But perhaps: a catchy case description as introduction?
- Arrange for feedback from peers and «your aunt», and be sure to have the text edited.
- A feature article in a big newspaper may have at least hundred times more readers than your best scientific article!
- Hunt for jargon and abbreviations that need explanation
- Are references or foot notes appropriate?

”… the final challenge – ordeal by media”

Cartoon in the Newseum, Washington DC

Giving interviews

- Before talking to a journalist, demand a **quotation check**. Ask for information on how your answers will appear in context – and best of all: ask if you may see the final draft
- Decide beforehand what is **your goal**. (Our prime minister: ”solidarity”, ”low unemployment”, …)
- **Do not necessarily accept the question** as posed by the interviewer
- Give short, clear and **precise answers** – with minimal hedging/reservations

Giving interviews, contin.

- Beware the dangers of **cross-clipping** (TV, Radio, internet)
- Remember that **everything you say** after entering the building of a broadcasting institution, **may be used** by the program host
- On live radio or TV: Try to get to know at least **the first question** in advance
- Don’t get angry! **Your displayed emotions** and body language should be appropriate to the subject theme

Checklist: Communication in general

1) To whom are you communicating?

2) What do they want/need to know?

3) Have you adapted your article or speech to the answers given to questions 1 and 2?

4) Have you adapted the presentation of your message(s) to your channel of communication (written, oral, etc.)?

5) Are you left with the bare essentials, structured in a simple, logical sequence?

Thank you for your attention!