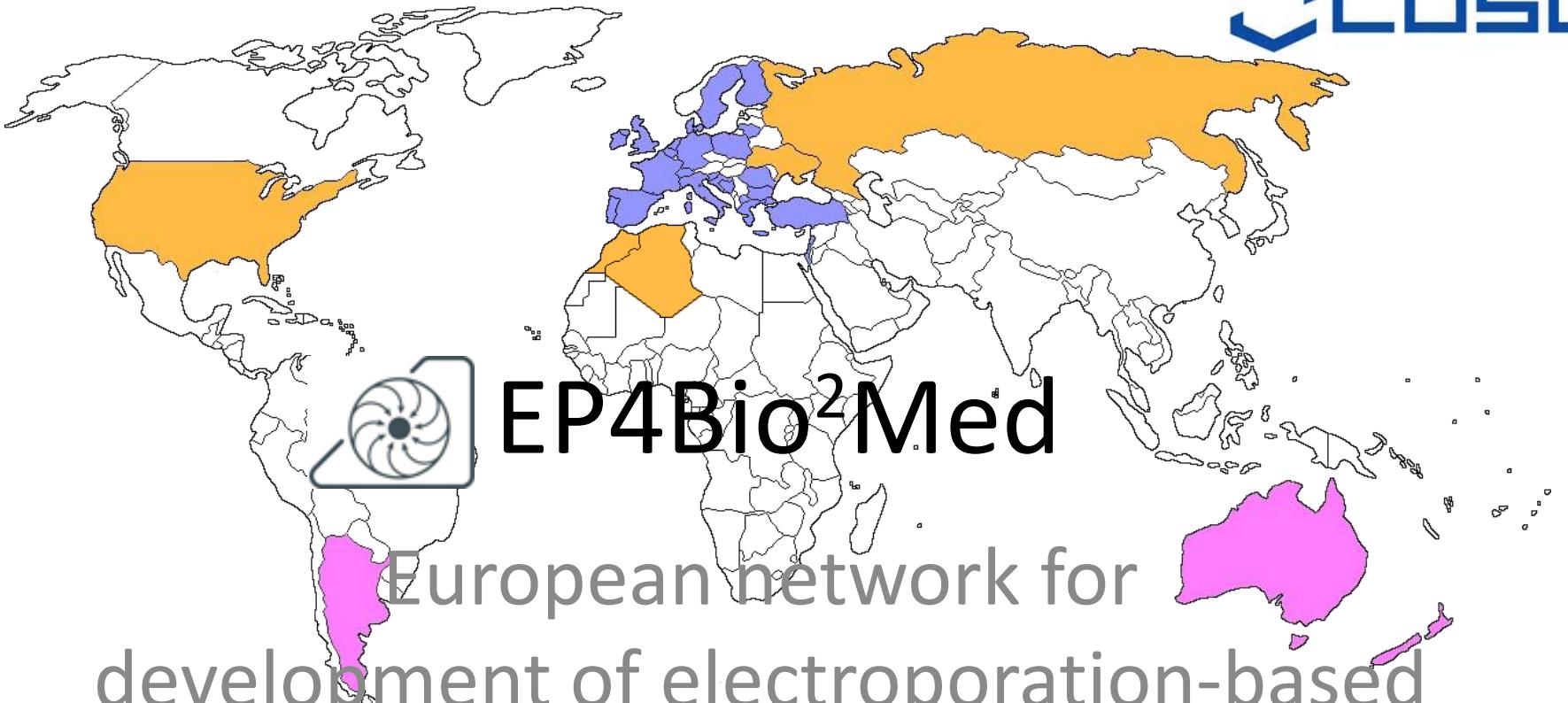


Vrste grafov in vizualni pripomočki

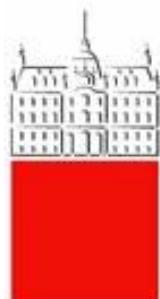
Različni podatki/kvantitativne informacije

- Podatki v zemljevidih (data maps)
- Časovna odvisnost (time-series)
- Relacijski grafi (relational graphs)
- Primerjava „obdelav“ (bar graphs)
- Organizacijski grafi
- Procesni grafi (flow charts)
- Risbe (drawings)
- ...



EP4Bio²Med

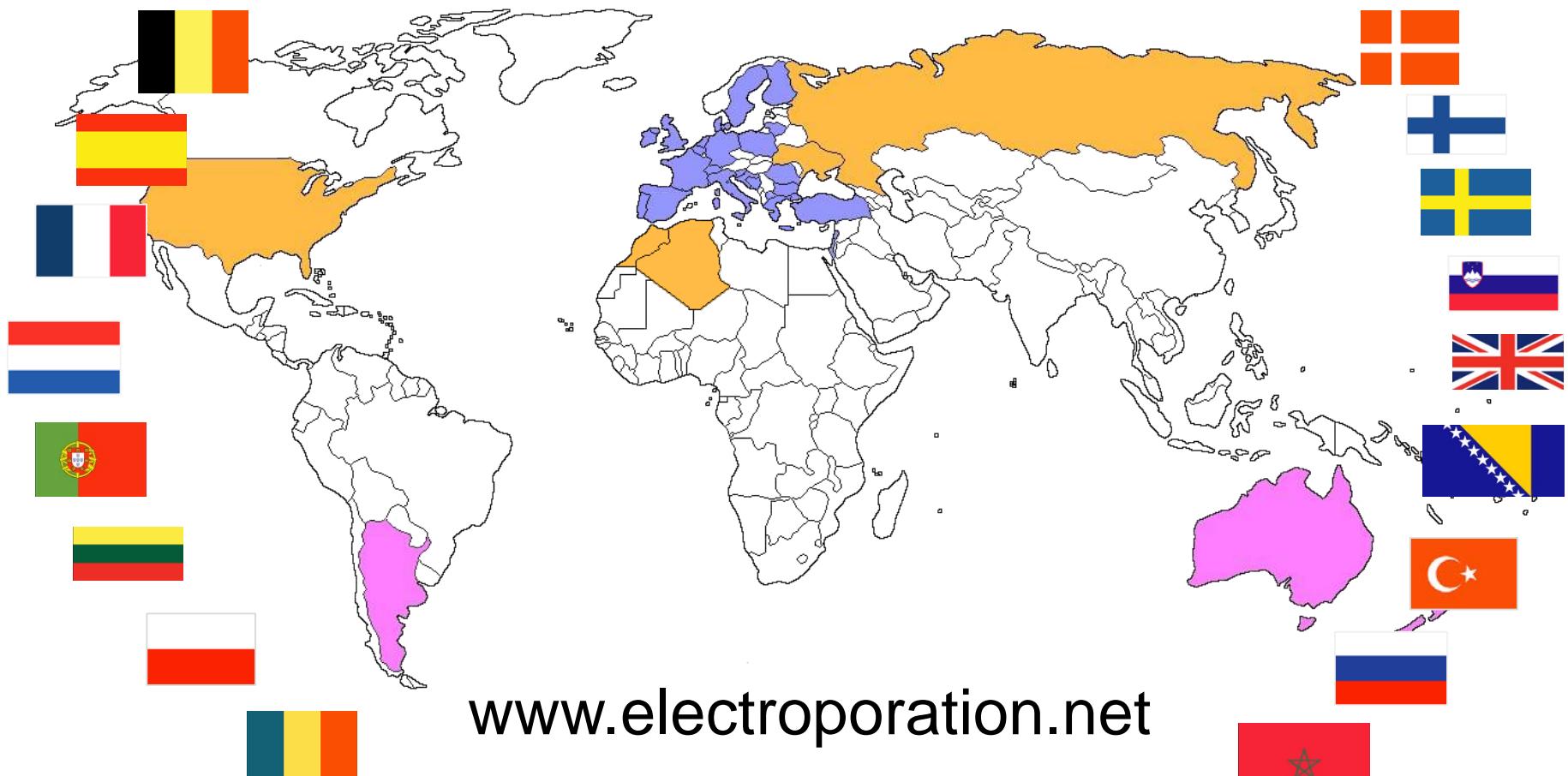
European network for
development of electroporation-based
technologies and treatments



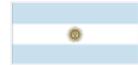
Damjan Miklavcic
University of Ljubljana
Slovenia
damjan.miklavcic@fe.uni-lj.si



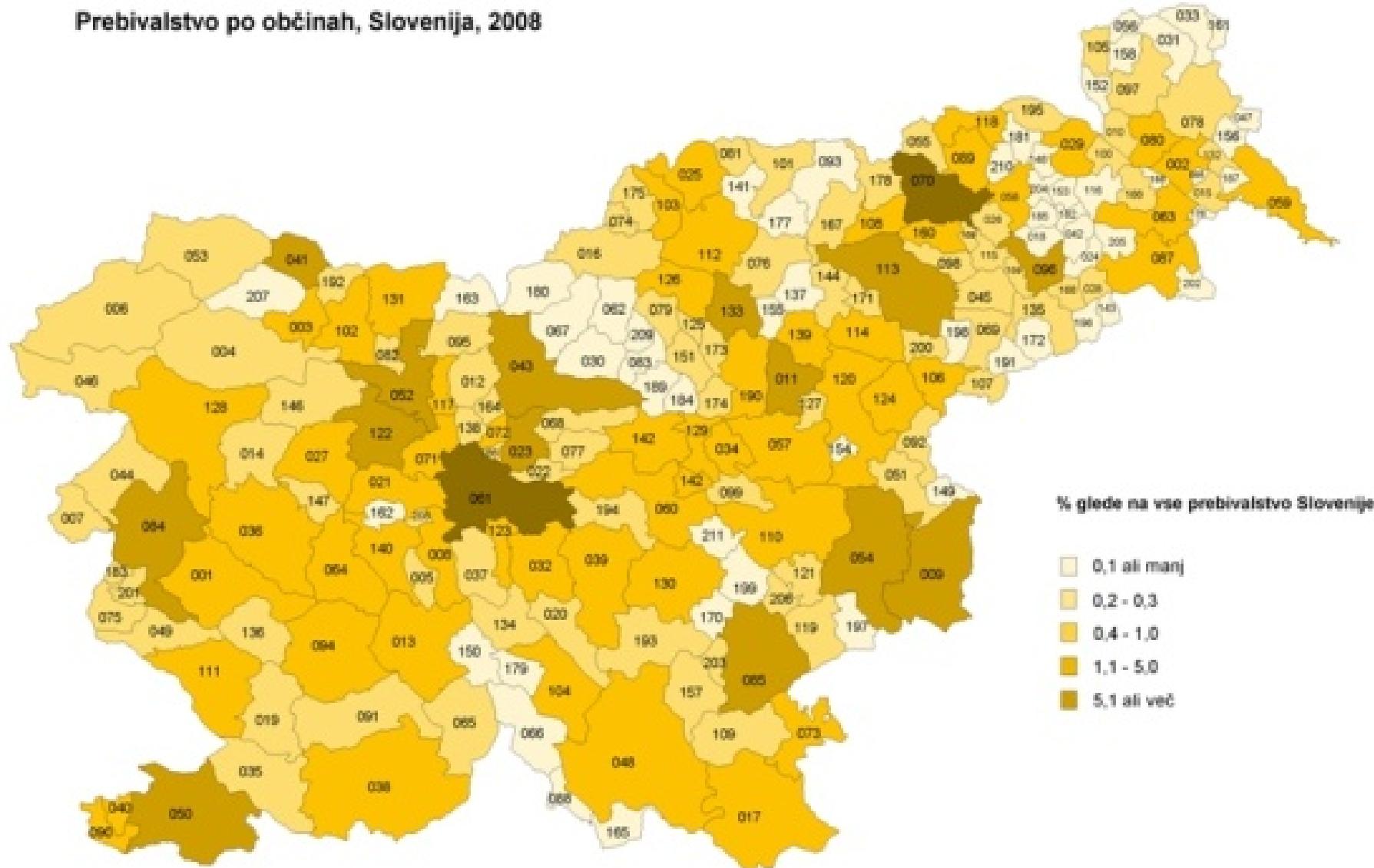
ccost



www.electroporation.net

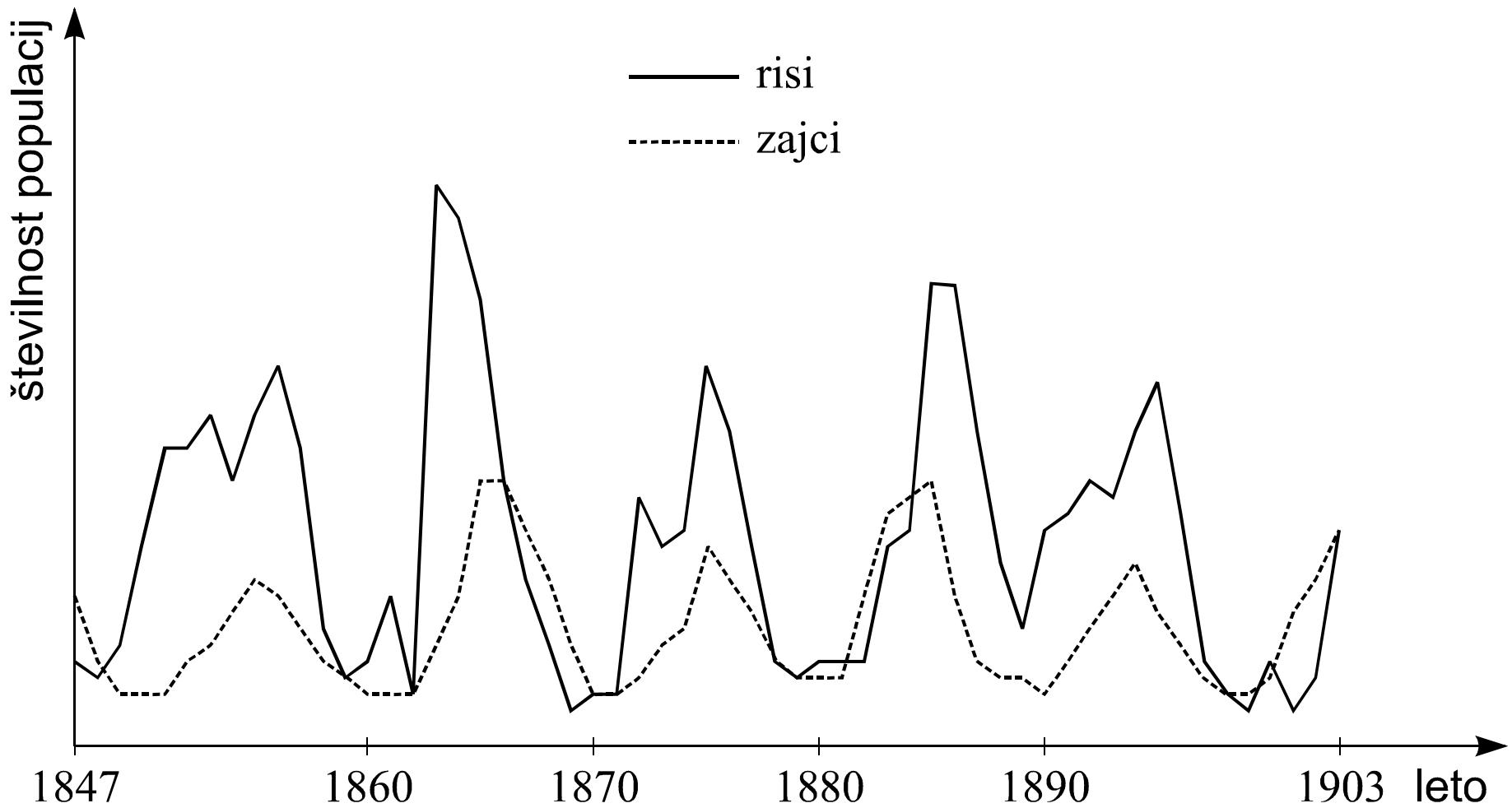


Prebivalstvo po občinah, Slovenija, 2008



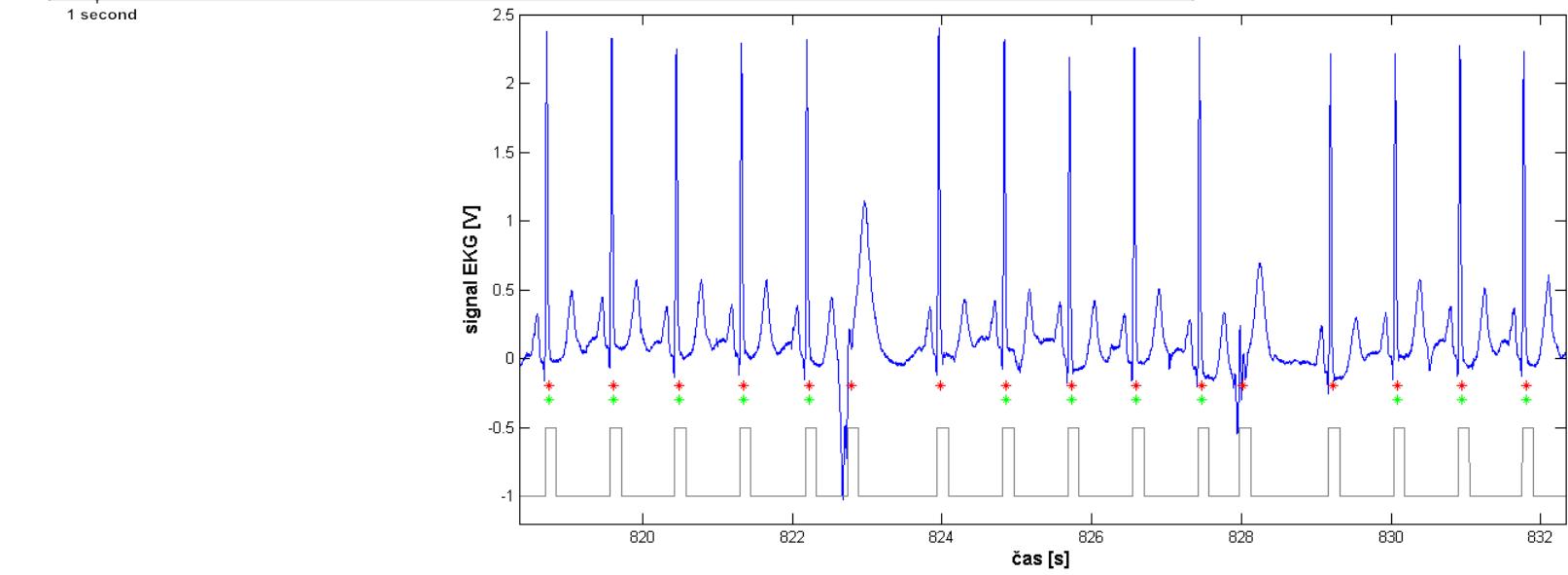
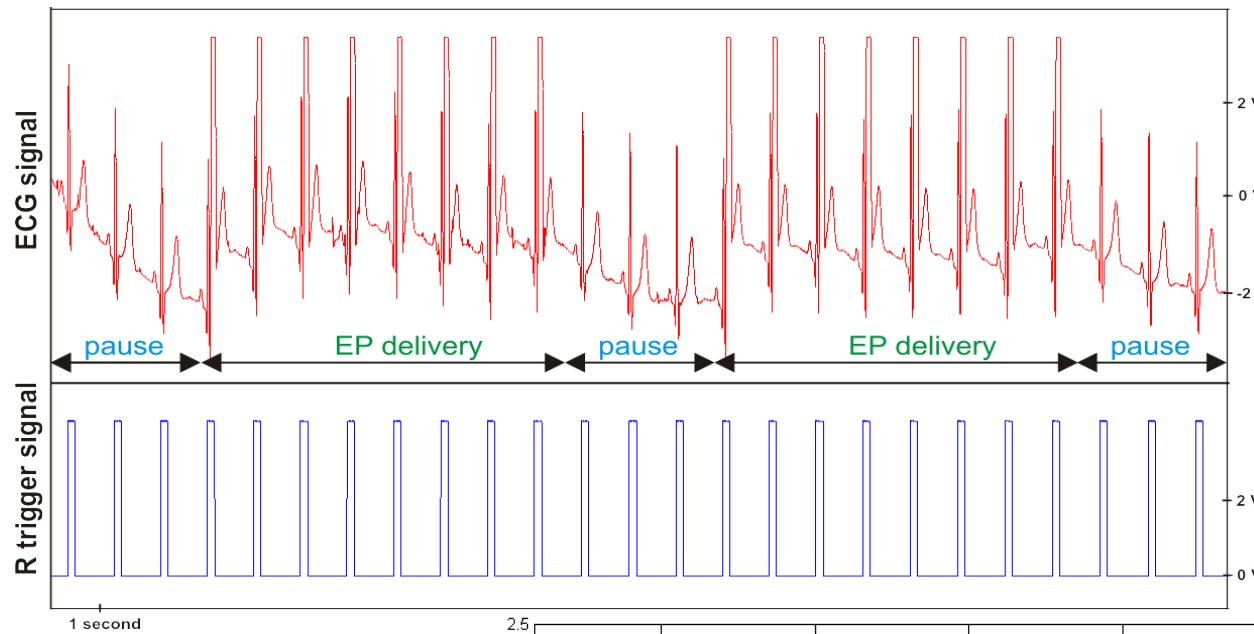
Viva Statistiki und Republike Slovenske in Georgien uprava Republike Slovenske

Hudson Bay - Kanada

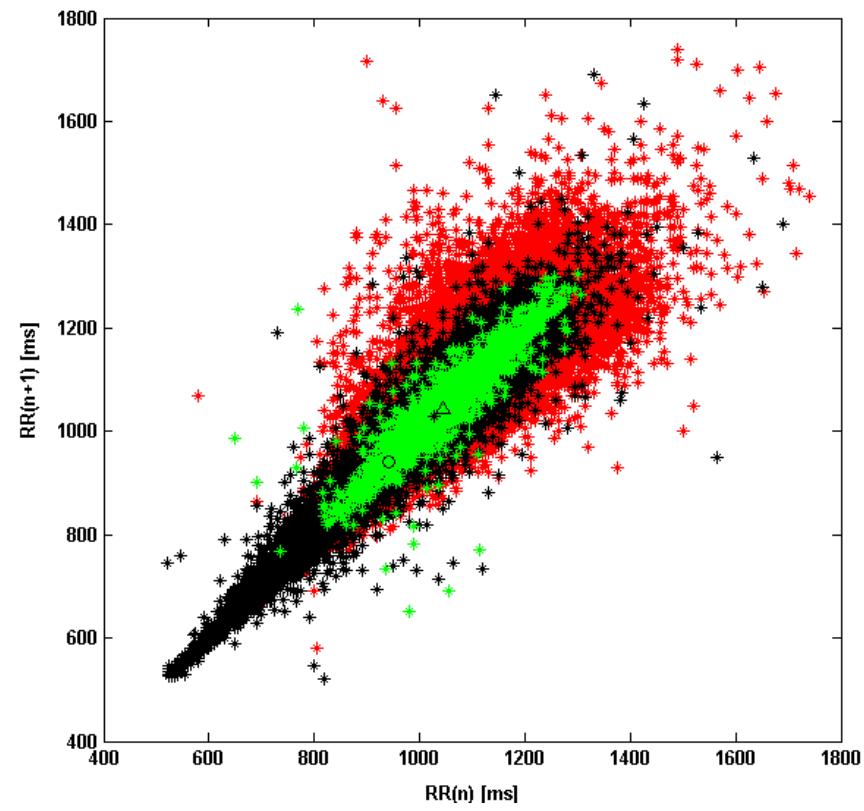
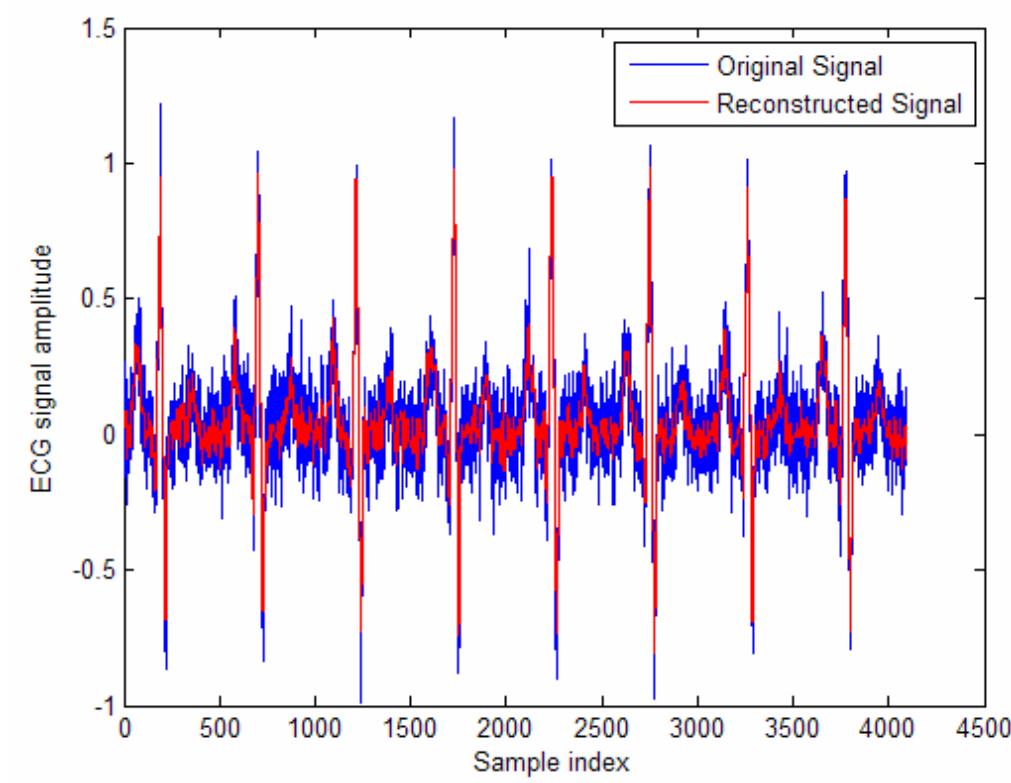


Vir: L. Vodovnik, D. Miklavčič, T. Kotnik. Biološki sistemi, Založba FE in FRI, Ljubljana, 1998.

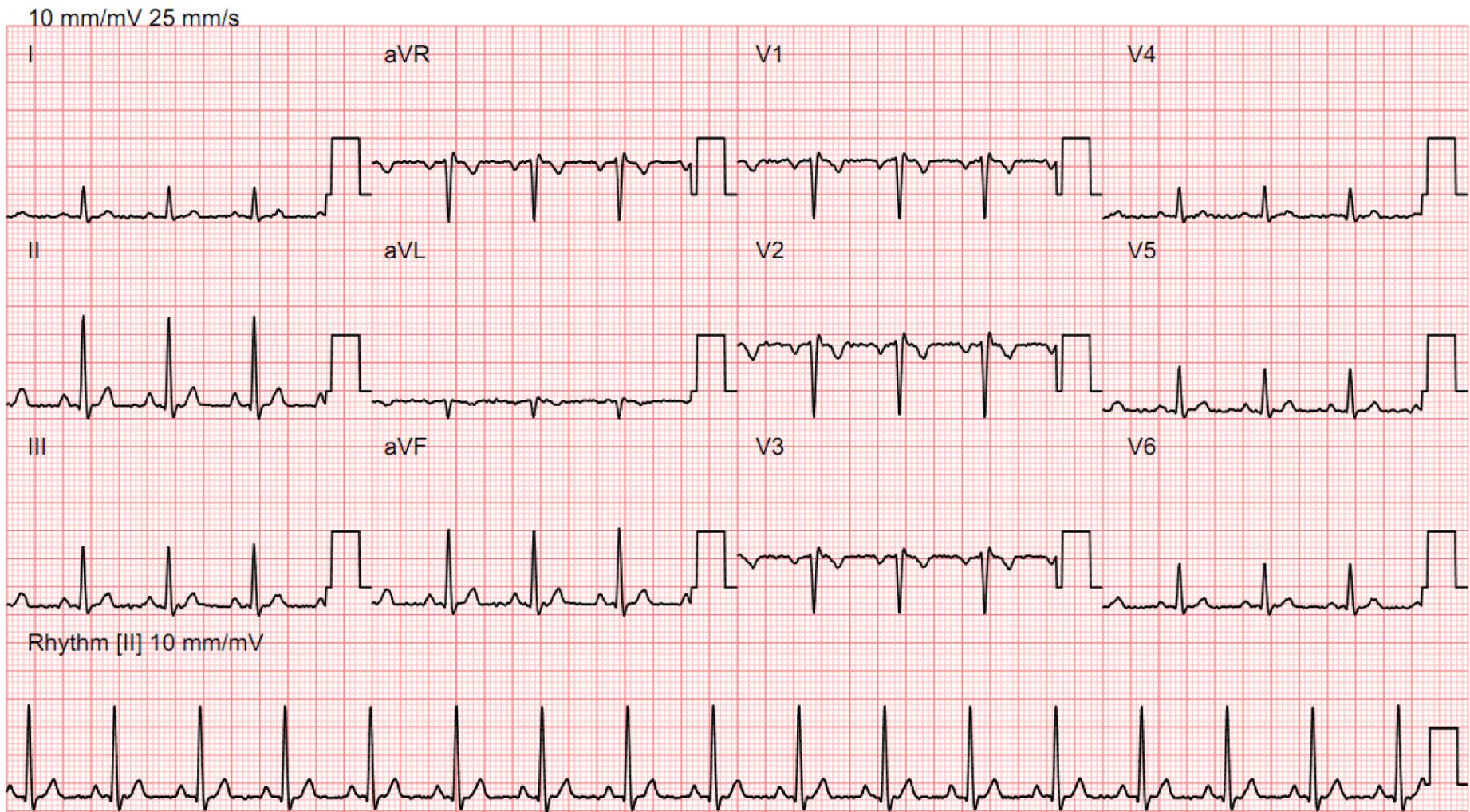
EKG



EKG



EKG

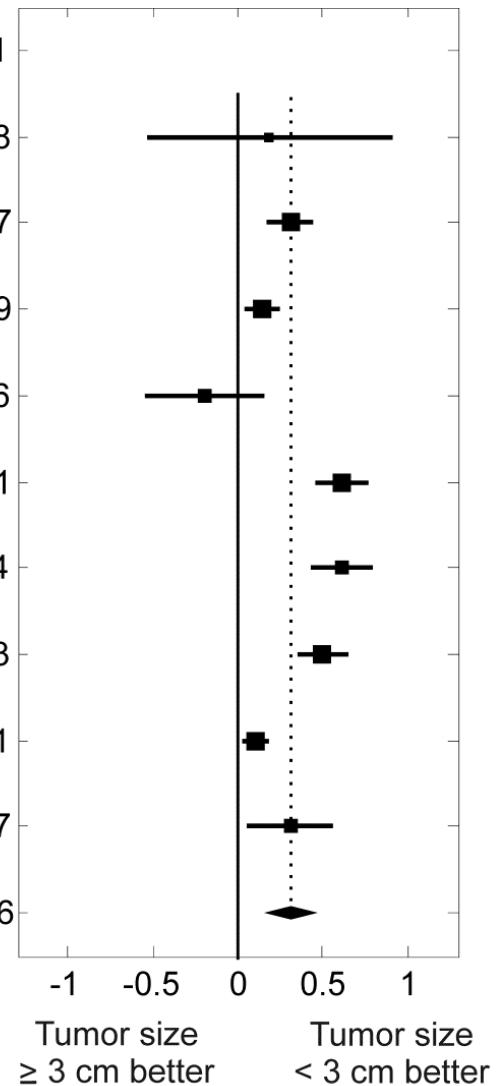


META-ANALIZA

Reference	RD	w%	CI low	CI up	N
Byrne, 2005	0.19	3.58	-0.54	0.92	18
Campana, 2009	0.31	12.98	0.18	0.44	267
Curatolo, 2011	0.14	13.51	0.04	0.24	489
Landstrom, 2010	-0.20	8.45	-0.55	0.15	6
Larkin, 2007	0.62	12.57	0.46	0.77	111
Matthiessen, 2011	0.61	11.98	0.43	0.80	94
Quaglino, 2008	0.50	12.65	0.35	0.66	233
Rols, 2000	0.10	13.82	0.03	0.18	61
IO data	0.31	10.45	0.05	0.57	187
Summary	0.31	100.00	0.15	0.47	1466

Test for overall effect: $Z = 3.81$ ($p = 0.00014$)

Heterogeneity: $Q = 71.34$, $df = 8$ ($p < 0.0001$), $I^2 = 89\%$



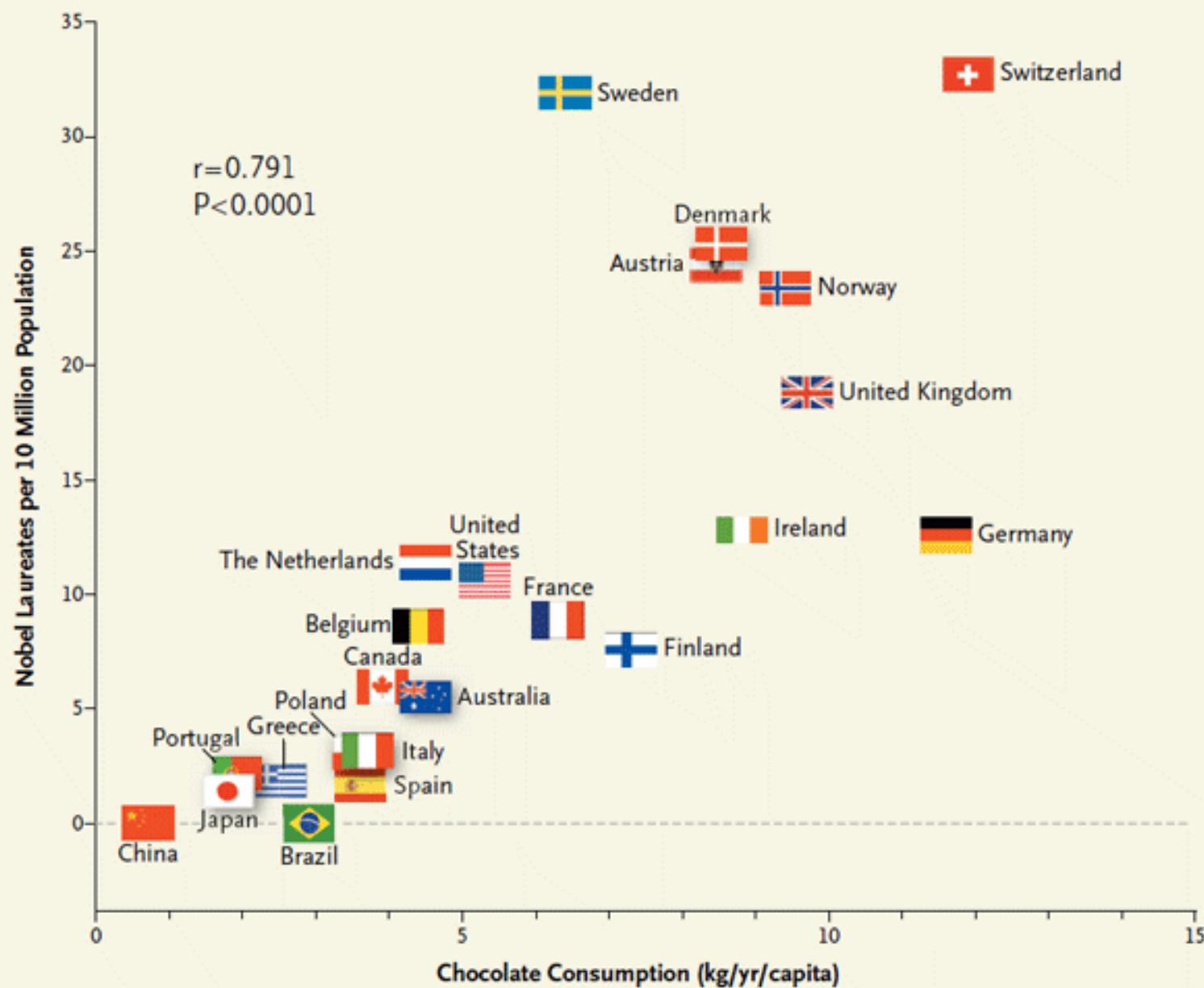
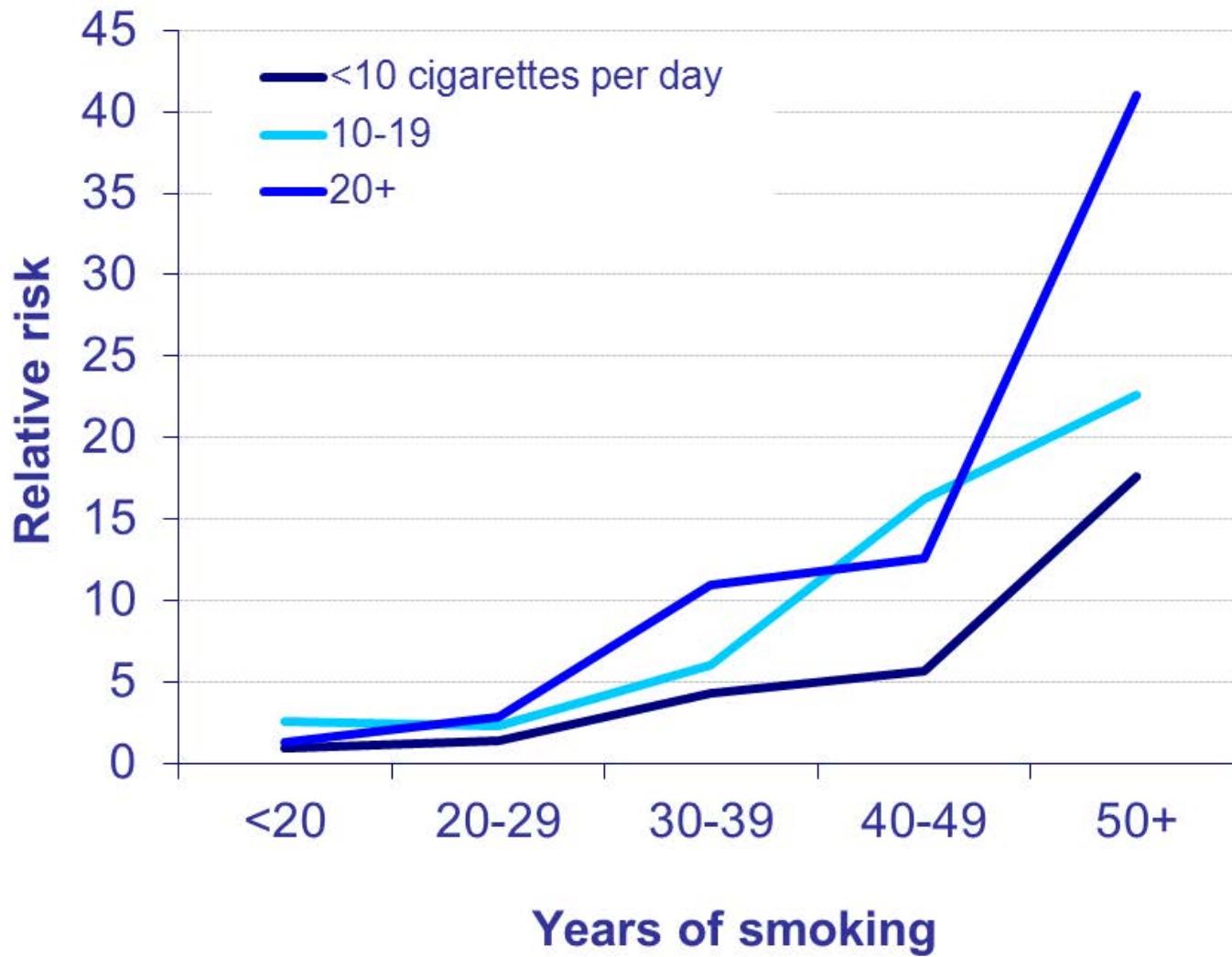
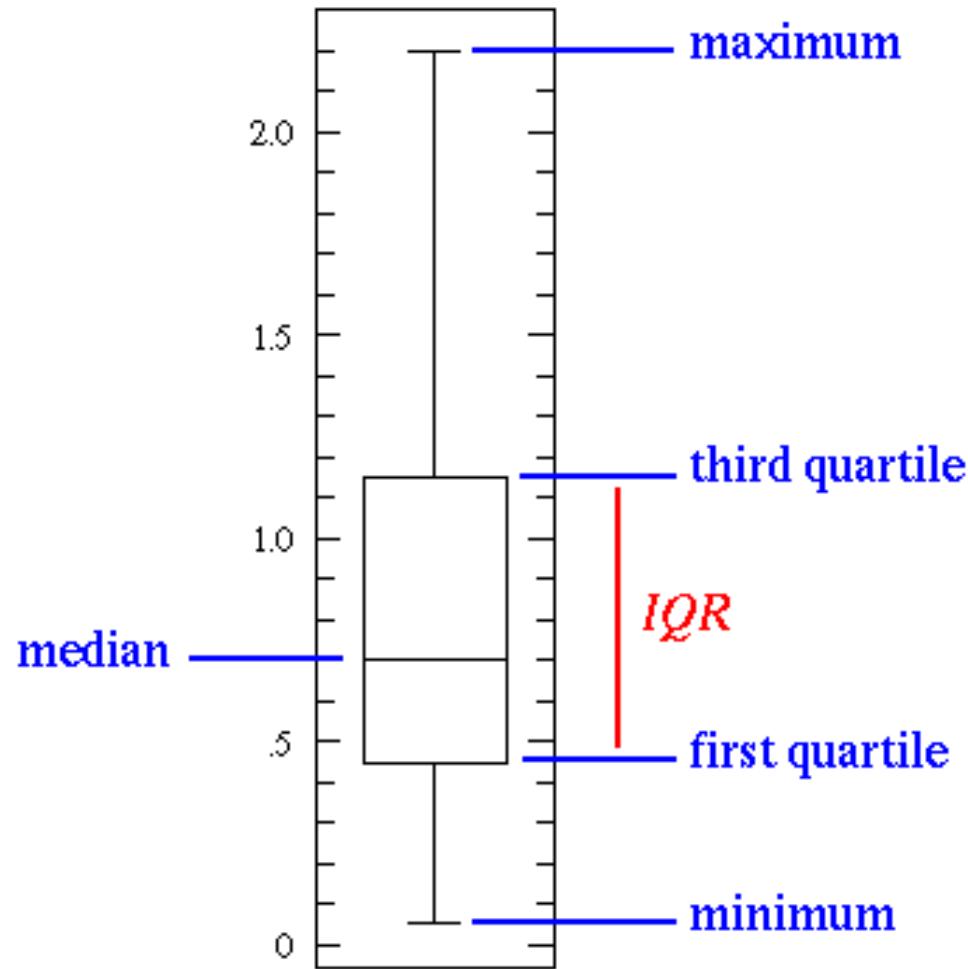


Figure 1. Correlation between Countries' Annual Per Capita Chocolate Consumption and the Number of Nobel Laureates per 10 Million Population.

Figure 1.1: Relative risk of lung cancer, according to duration and intensity of smoking, men



John Tukey's box plot

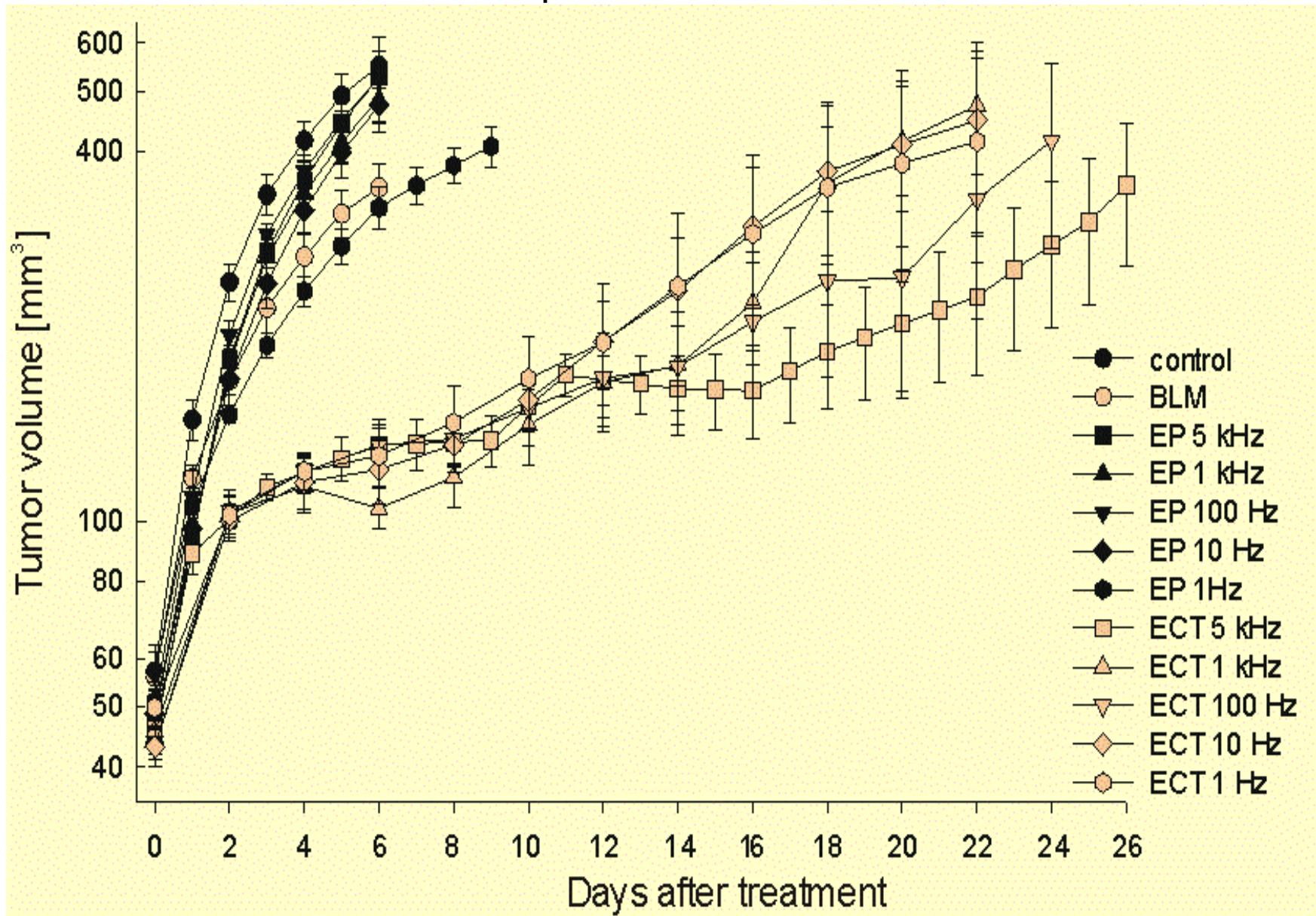


Vizualni pripomočki

- morajo biti dugačni kot za članek ali poster
- velikost in oblika črk (sans serif) in debelina črt
- format (portrait vs. landscape)
- orientacija napisov
- število »odvisnih« spremenljivk
- ne uporablajte barv, »podlag« in animacij samo zato ker jih imate na razpolago

Tumor growth after electrochemotherapy

The results are presented as mean and SE.



Zgodovina teamskega dela

Teamska delo postane najpomembnejši koncept v managementu

1920 1930 1940 1950 1960 1970 1980 1990 2000

Zahodna podjetja spoznajo skrivnost japonskega uspeha

Nemška študija pripelje do "proizvodnih otokov"

Volvo uvede delno avtonomne skupine

Skupine za reševanje problemov (krožki kakovosti)

Skupinsko delo na montažnih trakovih v Toyoti

Raziskava Western Electric – socialni vidik dela

Tekoči trak v tovarni Ford

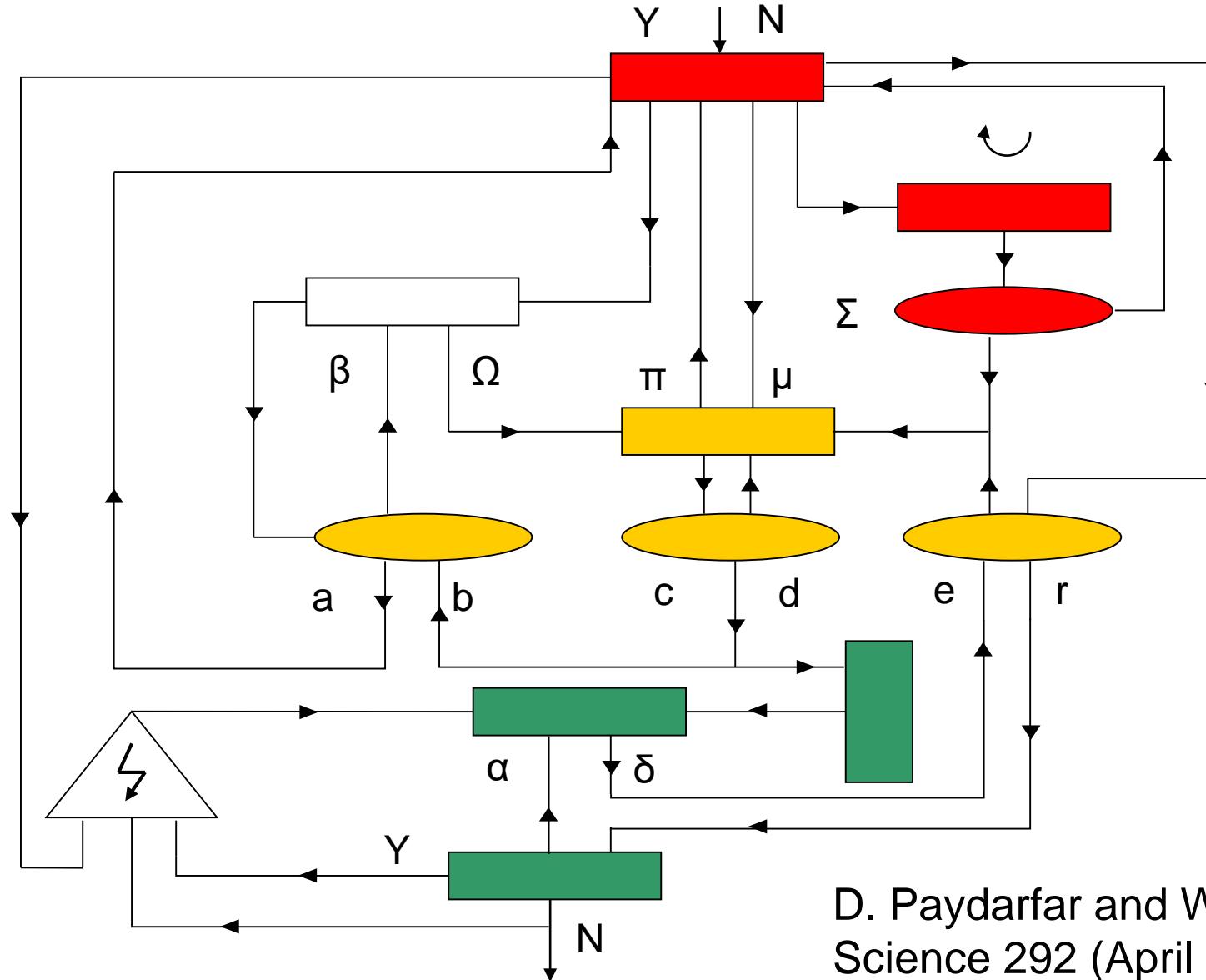
Zgodovina teamskega dela

-
- A vertical timeline chart with a black vertical axis on the left. On the axis, years are marked at ten-year intervals from 1920 to 2000. To the right of each year mark, a horizontal line extends to the right, ending in a short vertical tick. A blue text entry is placed to the right of each tick, describing a significant event in the history of team-based work.
- 1920 – Tekoči trak v tovarni Ford
 - 1930 – Raziskava Western Electric – socialni vidik dela
 - 1940
 - 1950 – Skupinsko delo na montažnih trakovih v Toyoti
 - 1960 – Skupine za reševanje problemov (krožki kakovosti)
 - 1970 – Volvo uvede delno avtonomne skupine
 - 1980 – Nemška študija pripelje do “proizvodnih otokov”
 - 1990 – Zahodna podjetja spoznajo skrivnost japonskega uspeha
 - 2000 – Teamsko delo postane najpomembnejši koncept v managementu

Zgodovina teamskega dela

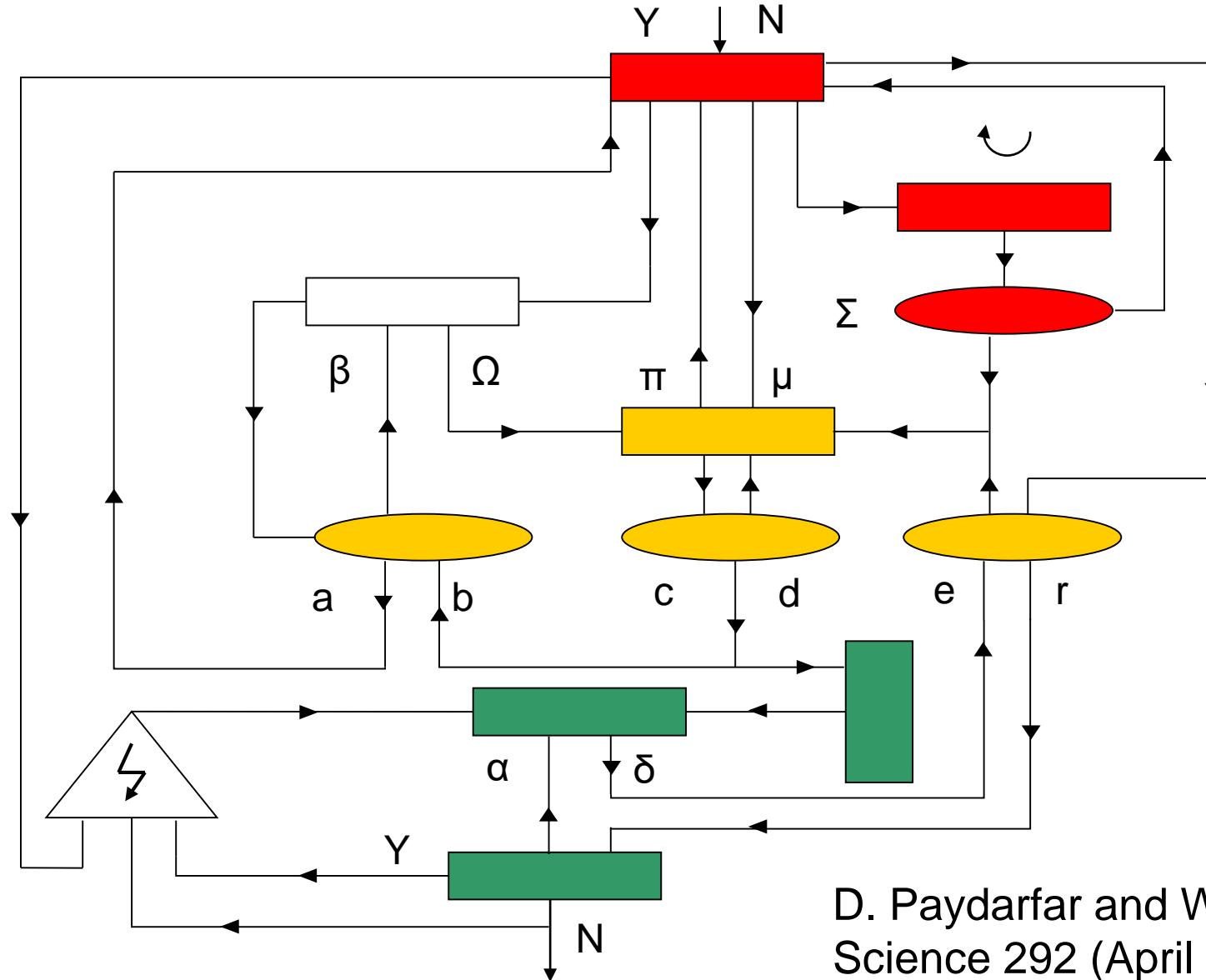
-
- A vertical timeline chart with a black vertical axis on the left. On the axis, years are marked at ten-year intervals from 1920 to 2000. To the right of each year mark, a horizontal line extends to the right, ending in a short vertical tick. A text entry is placed to the right of each tick, describing a significant event in the history of team work.
- 1920 Tekoči trak v tovarni Ford
 - 1930 Raziskava Western Electric – socialni vidik dela
 - 1940
 - 1950 Skupinsko delo na montažnih trakovih v Toyoti
 - 1960 Skupine za reševanje problemov (krožki kakovosti)
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 - 1980 Nemška študija pripelje do "proizvodnih otokov"
 - 1990 Zahodna podjetja spoznajo skrivnost japonskega uspeha
 - 2000 Teamsko delo postane najpomembnejši koncept v managementu

An Algorithm for Discovery



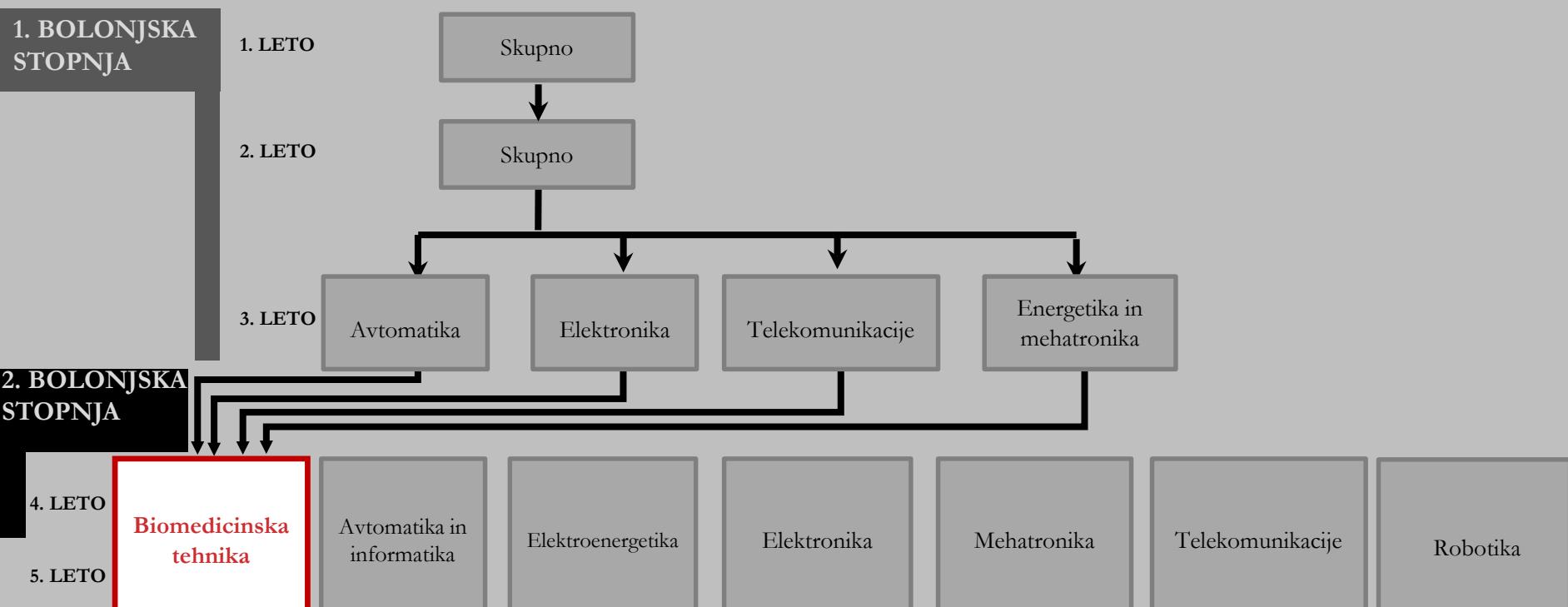
D. Paydarfar and W.J. Schwartz
Science 292 (April 6): 13, 2001.

An Algorithm for Discovery



D. Paydarfar and W.J. Schwartz
Science 292 (April 6): 13, 2001.

Predstavitev študija na Fakulteti za elektrotehniko



Laboratorij za biokibernetiko



$$\frac{dI}{dt} = \kappa e^{-\frac{(t-t_0)^2}{\tau^2}} \\ \left(1 - \frac{dI}{dt} \right) = \left(1 - e^{-\frac{(t-t_0)^2}{\tau^2}} \right)$$

Theory



Model

WG 2: Food processing and pharmaceuticals

WG 3: Medical applications

WG 4: Sustainable environmental applications and biomass processing

Applications

Biomedicine



Food processing



Biomass processing



WG* 1: Basic mechanisms of electroporation and modelling

Basic mechanisms

WG 5:

Technology development and transfer
SCIENTIFIC PROGRESS

KNOWLEDGE TRANSFER

Phenomenon



Experiment



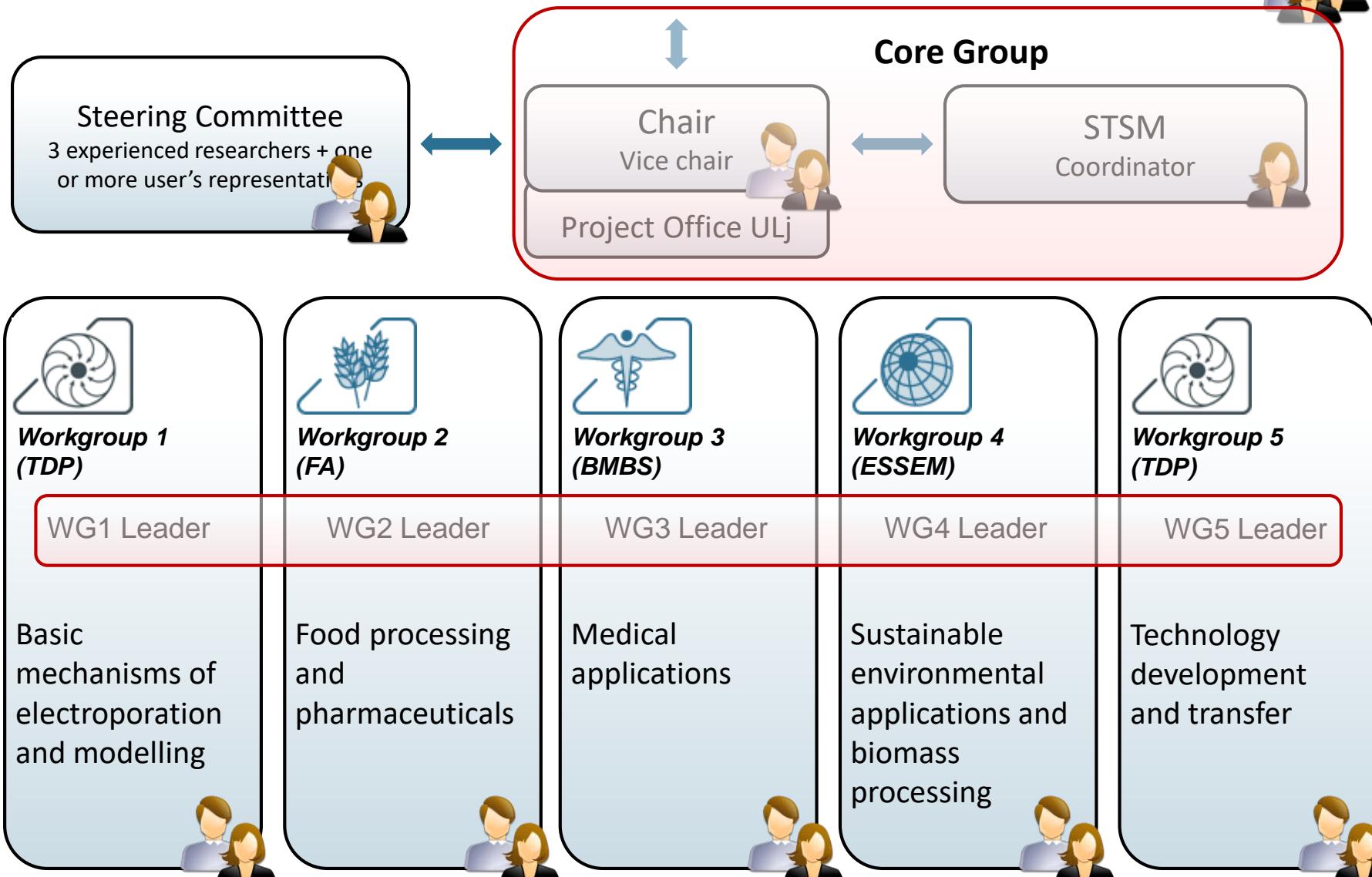
*WG - working group

www.electroporation.net



Management Committee

Making decisions, adopting annual action plan, activities, resolving potential disputes,...

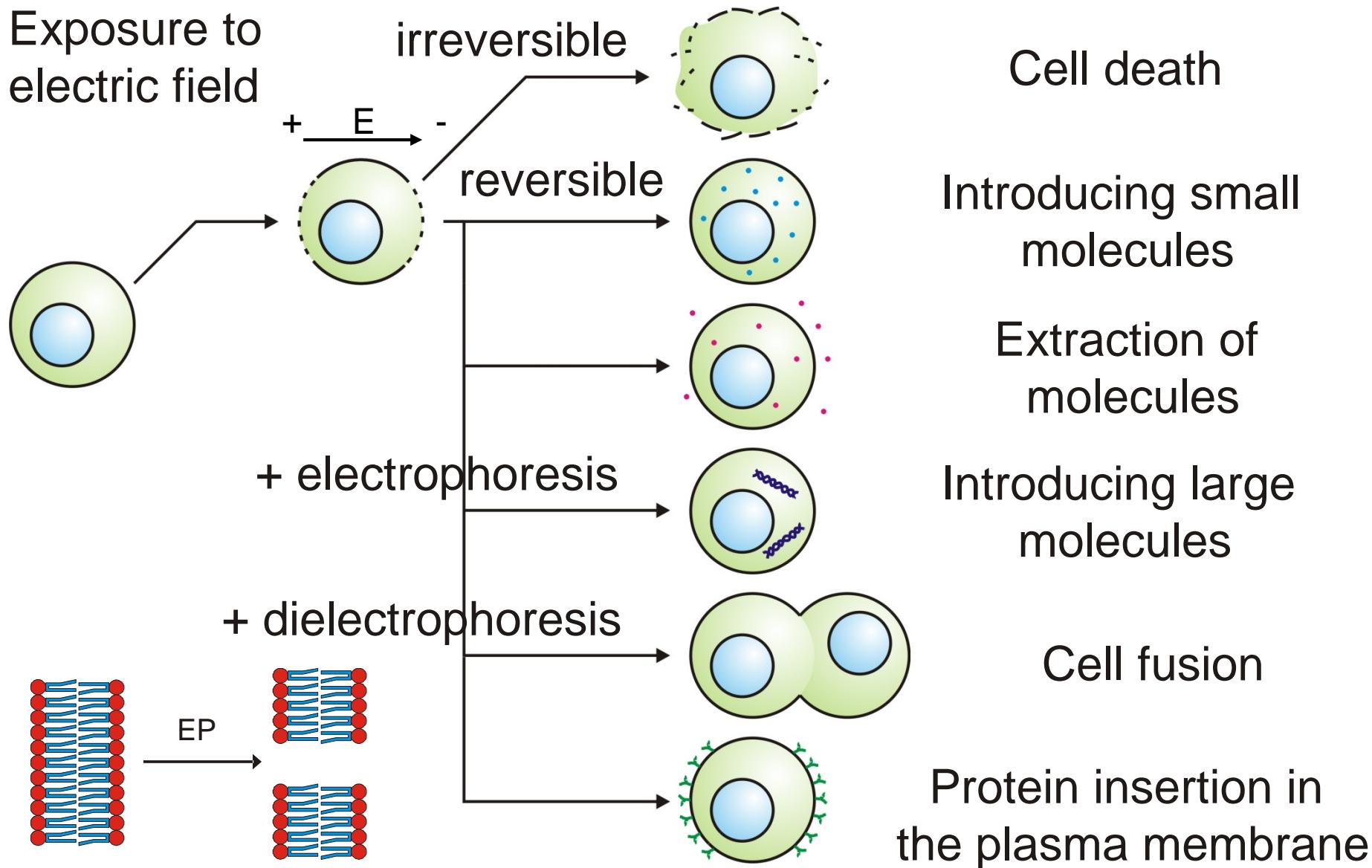


Rak



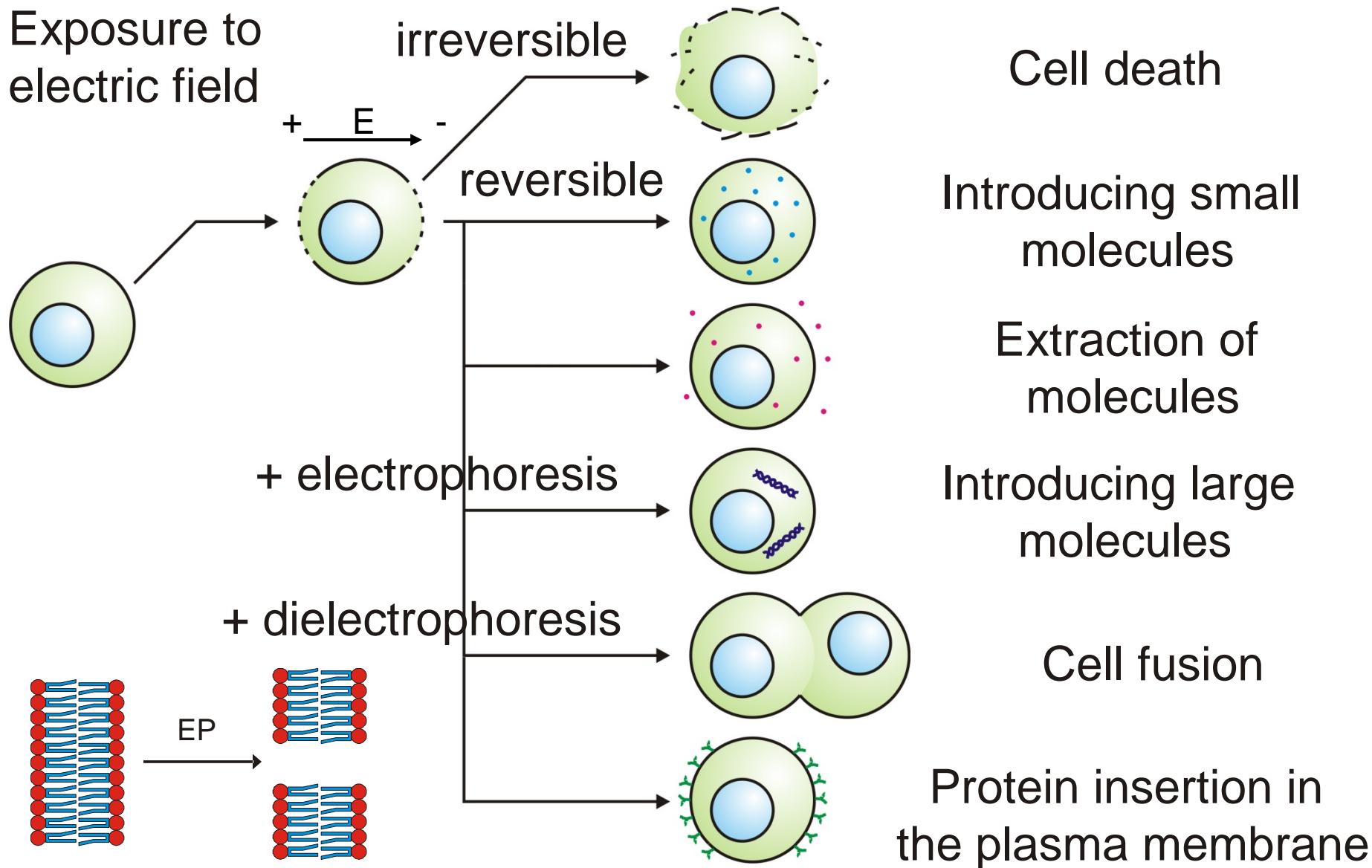
Applications of Electroporation

Exposure to electric field

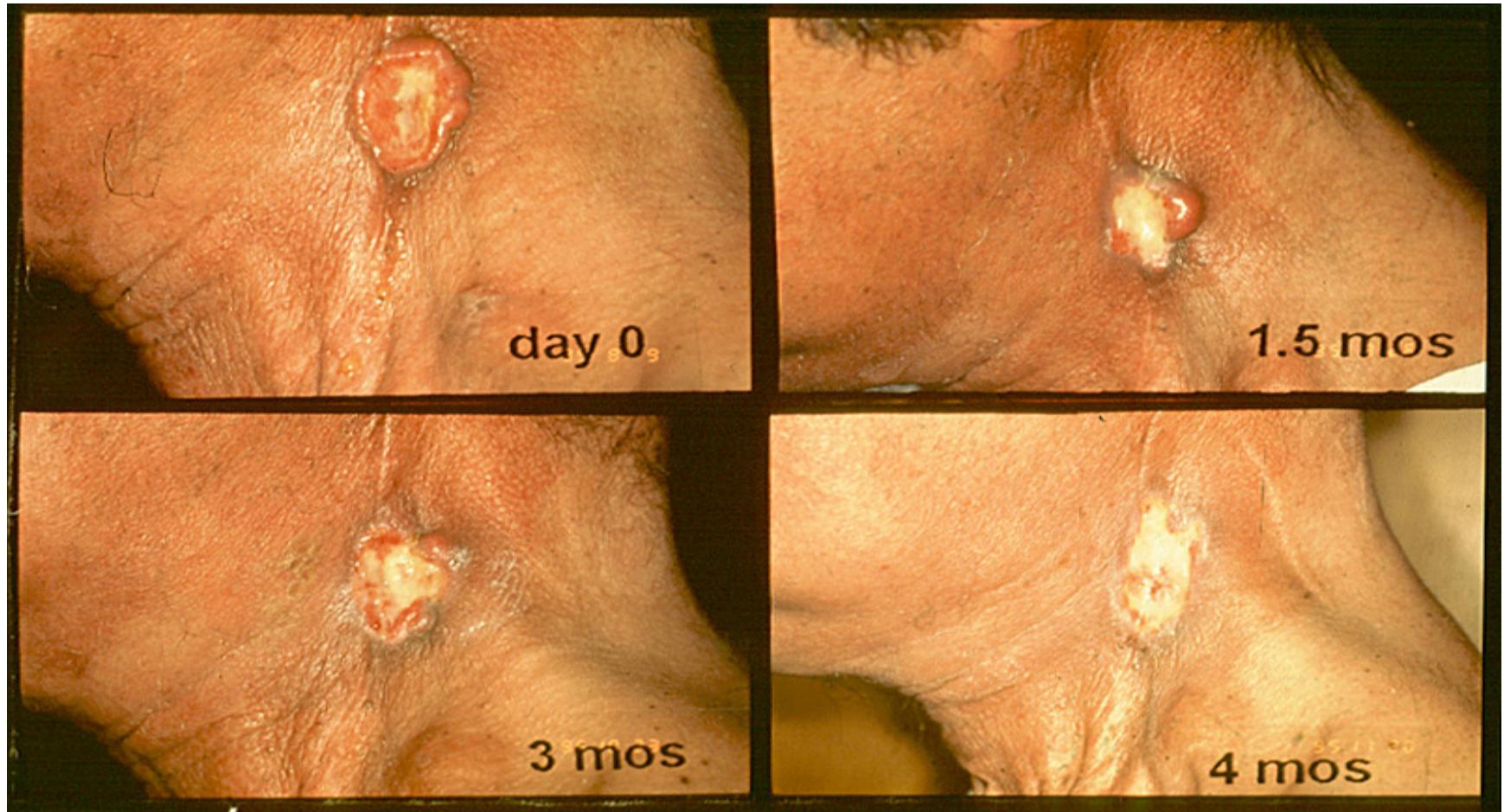


Applications of Electroporation

Exposure to electric field



Antitumor effectiveness of electrochemotherapy with cisplatin on skin metastasis of squamous cell carcinoma of the supraglottis

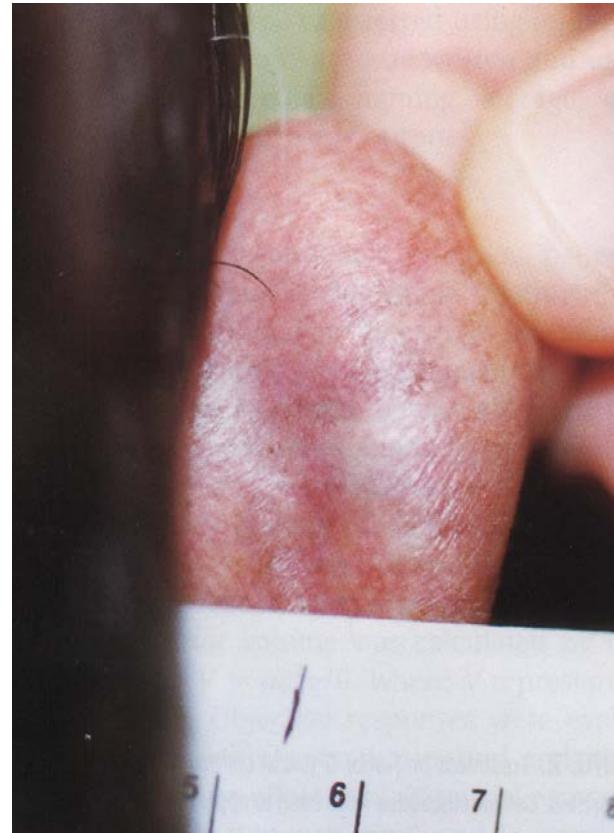


Treatment of basal cell carcinoma

Electrochemotherapy with bleomycin injected intratumorally



Before treatment



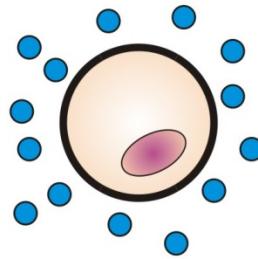
After 32 days

Heller R et al.: Cancer 1998; 83: 148-157

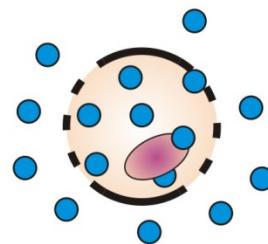
ECT day 0



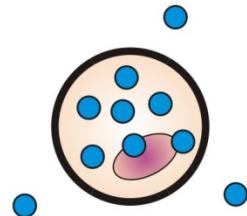
after injection
drug surrounds
the cells



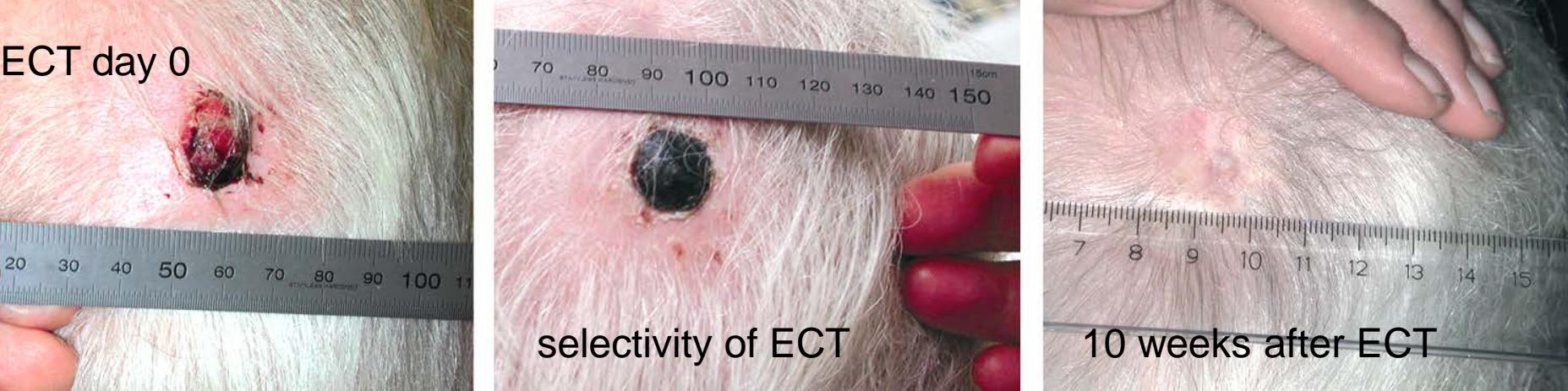
formation of pores
after EP — drug
enters the cells



membrane resealing
— drug entrapped
inside the cells

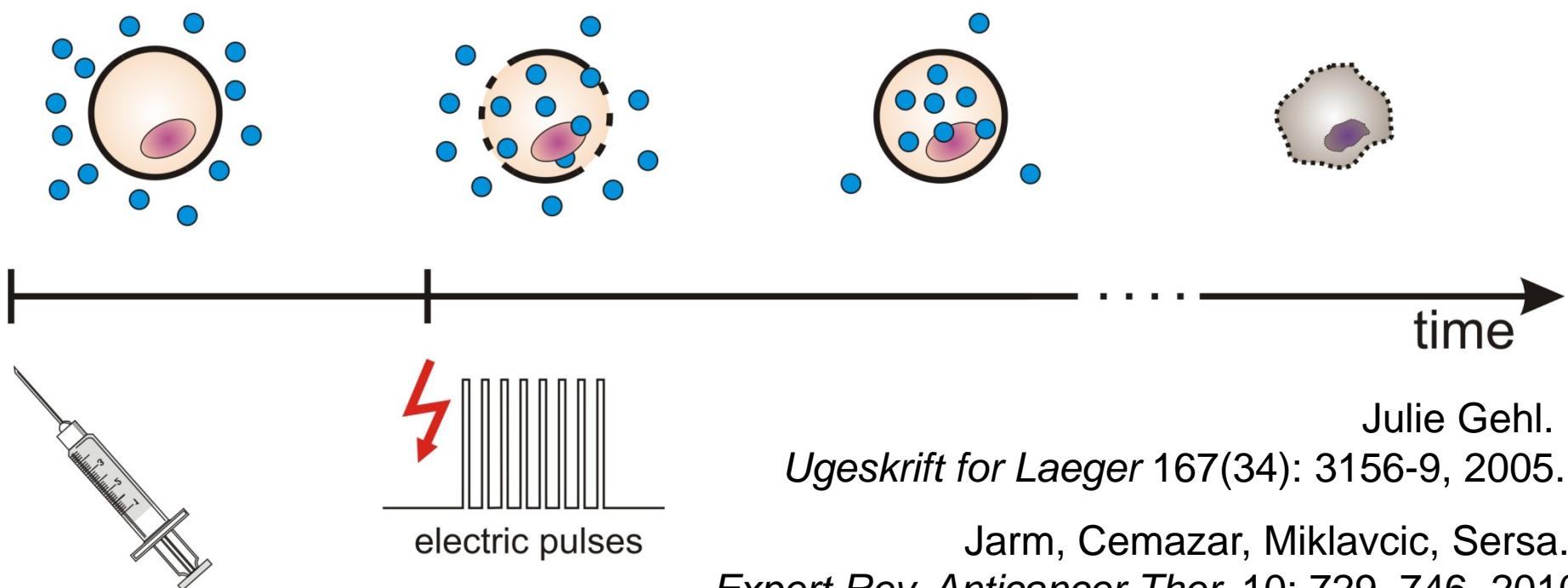


drug kills the cells



selectivity of ECT

10 weeks after ECT



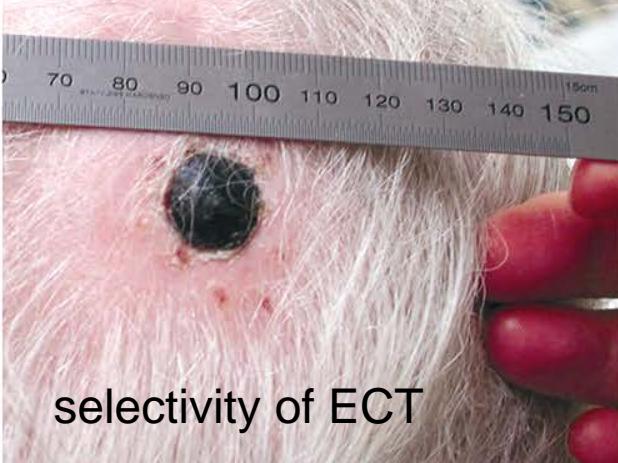
Julie Gehl.

Ugeskrift for Laeger 167(34): 3156-9, 2005.

Jarm, Cemazar, Miklavcic, Sersa.

Expert Rev. Anticancer Ther. 10: 729–746, 2010

ECT day 0

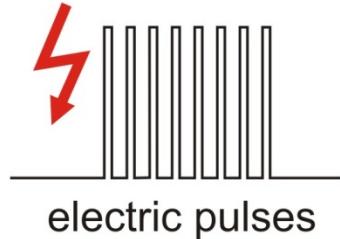
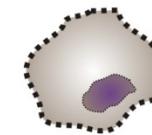
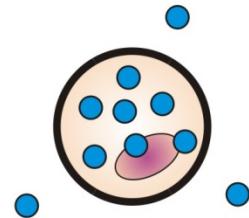
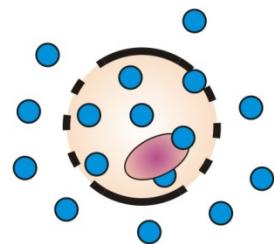
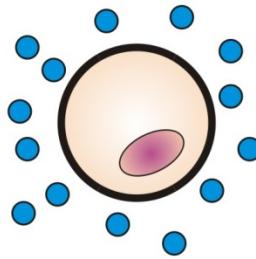


after injection
drug surrounds
the cells

formation of pores
after EP — drug
enters the cells

membrane resealing
— drug entrapped
inside the cells

drug kills
the cells



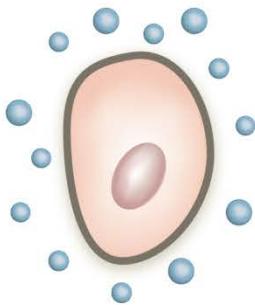
electric pulses

Julie Gehl.

Ugeskrift for Laeger 167(34): 3156-9, 2005.

Jarm, Cemazar, Miklavcic, Sersa.
Expert Rev. Anticancer Ther. 10: 729–746, 2010

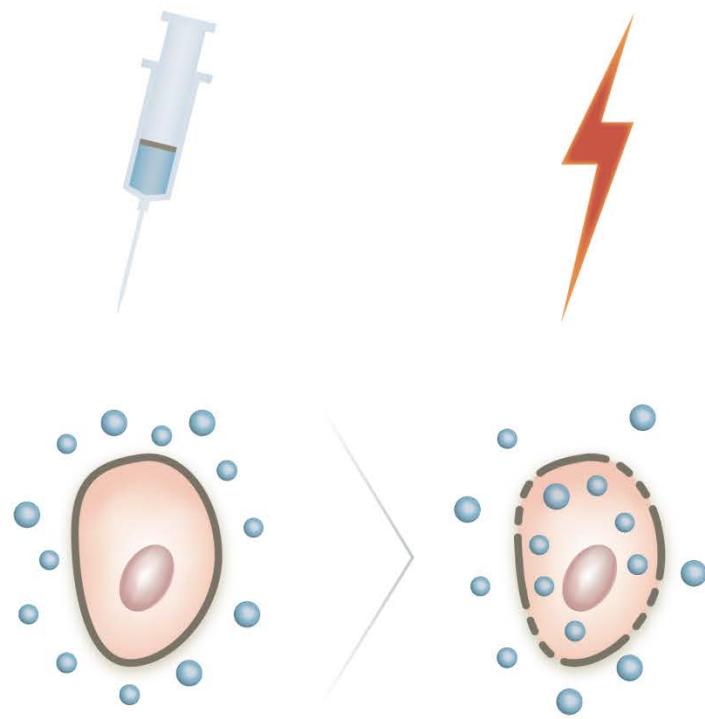
Drug delivery by electroporation



1

After injection,
drug surrounds the cells

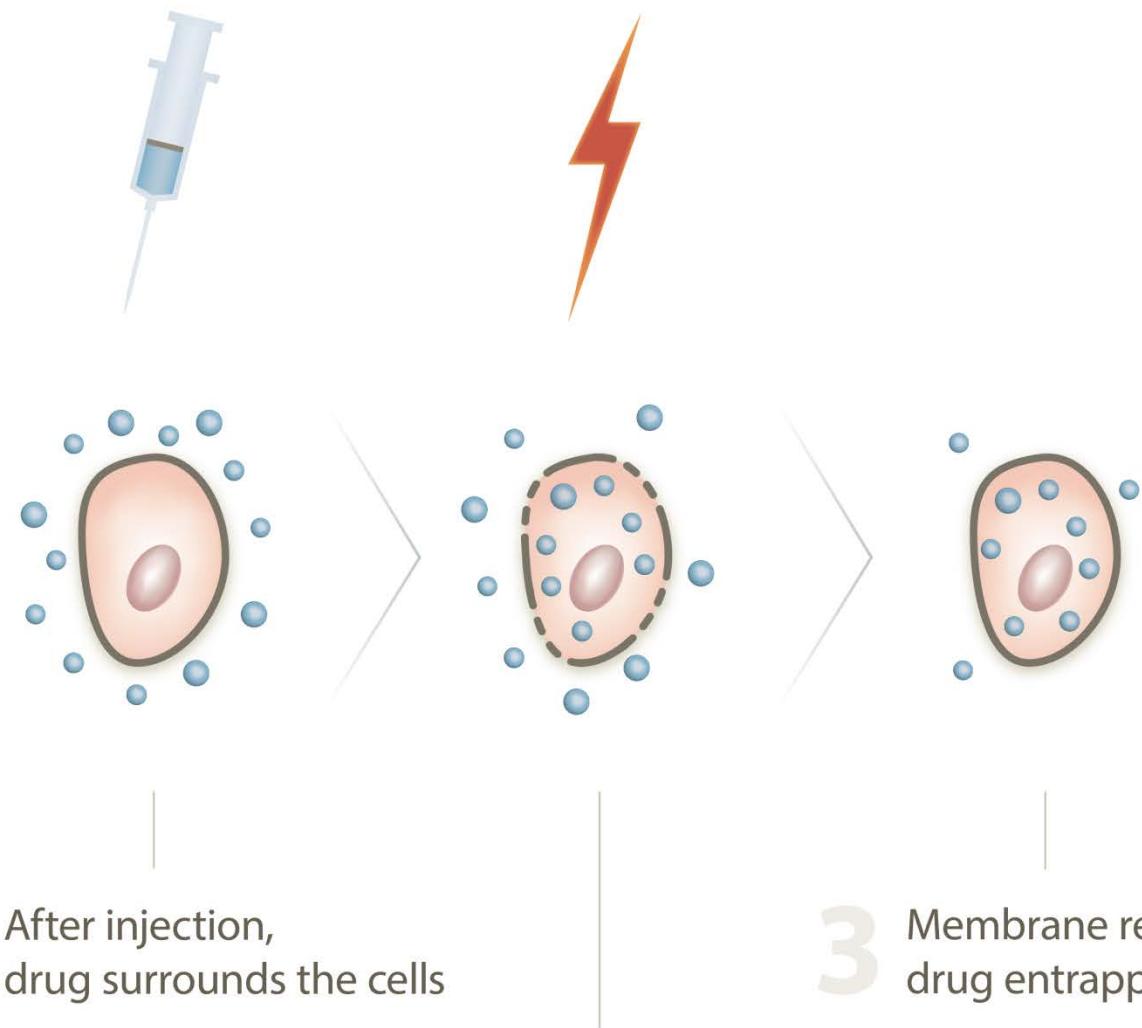
Drug delivery by electroporation



1 After injection,
drug surrounds the cells

2 Pore formation after EP
— drug enters the cells

Drug delivery by electroporation

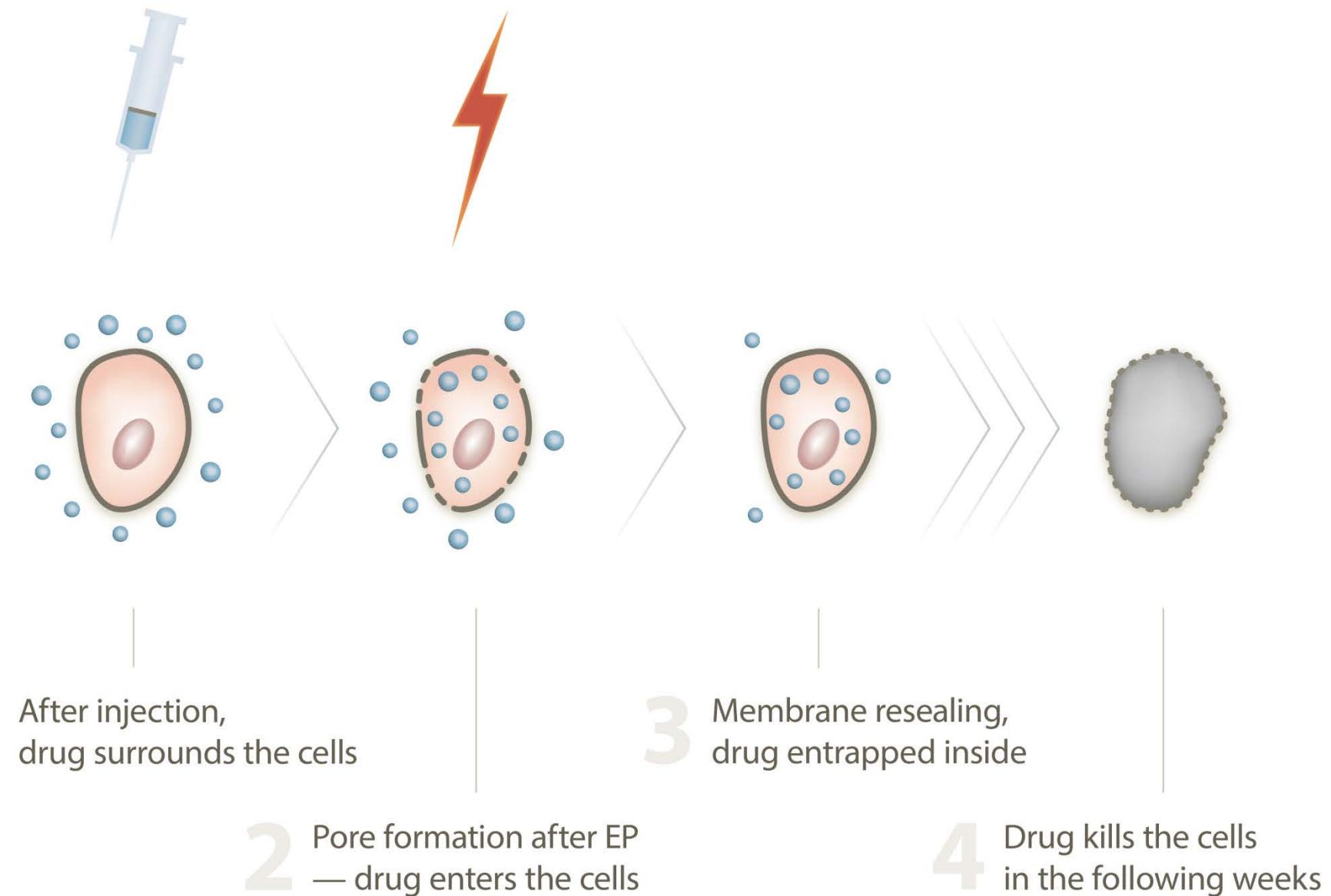


2 Pore formation after EP
— drug enters the cells

1 After injection,
drug surrounds the cells

3 Membrane resealing,
drug entrapped inside

Drug delivery by electroporation



Just-in-time

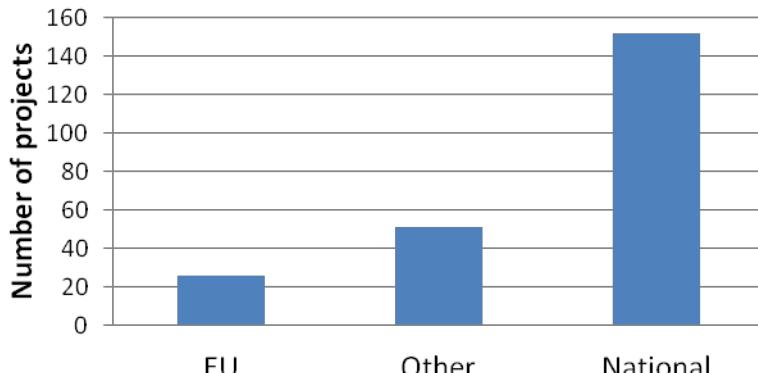


Fresh food

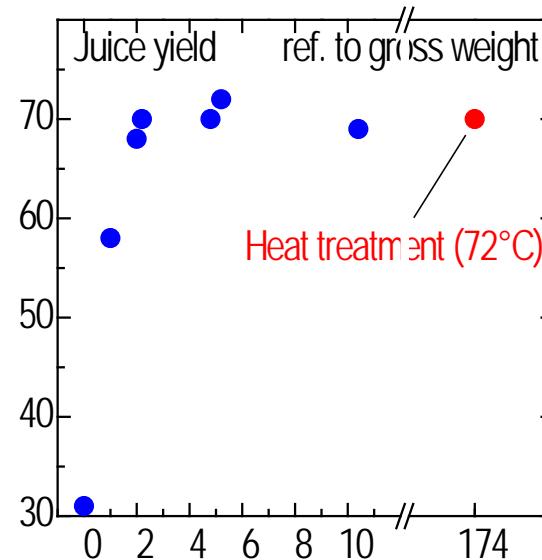
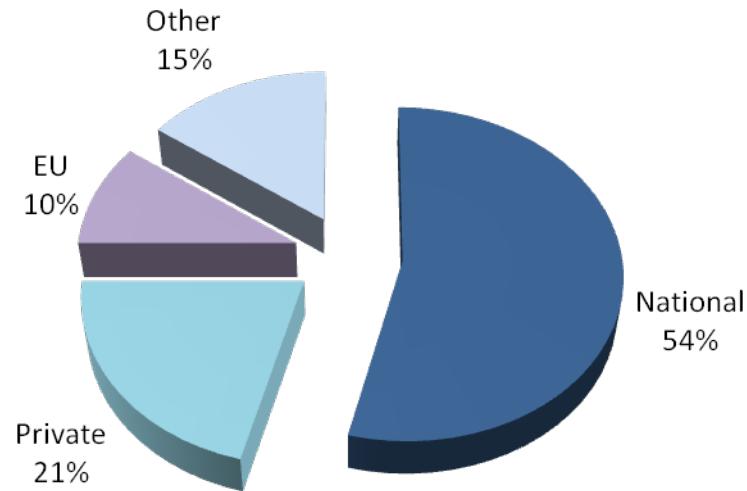


Najpogostejše vrste grafov

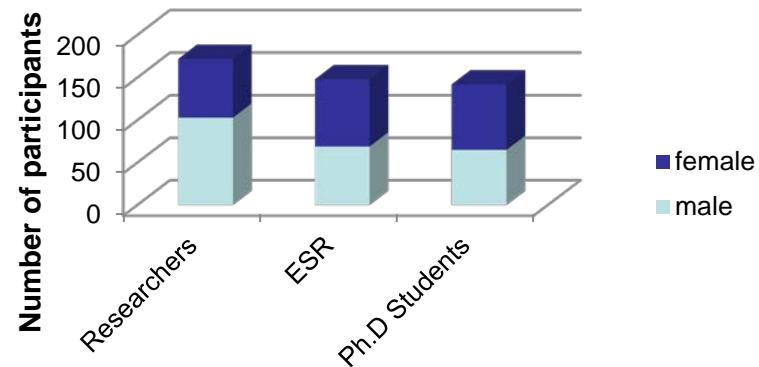
Projects type



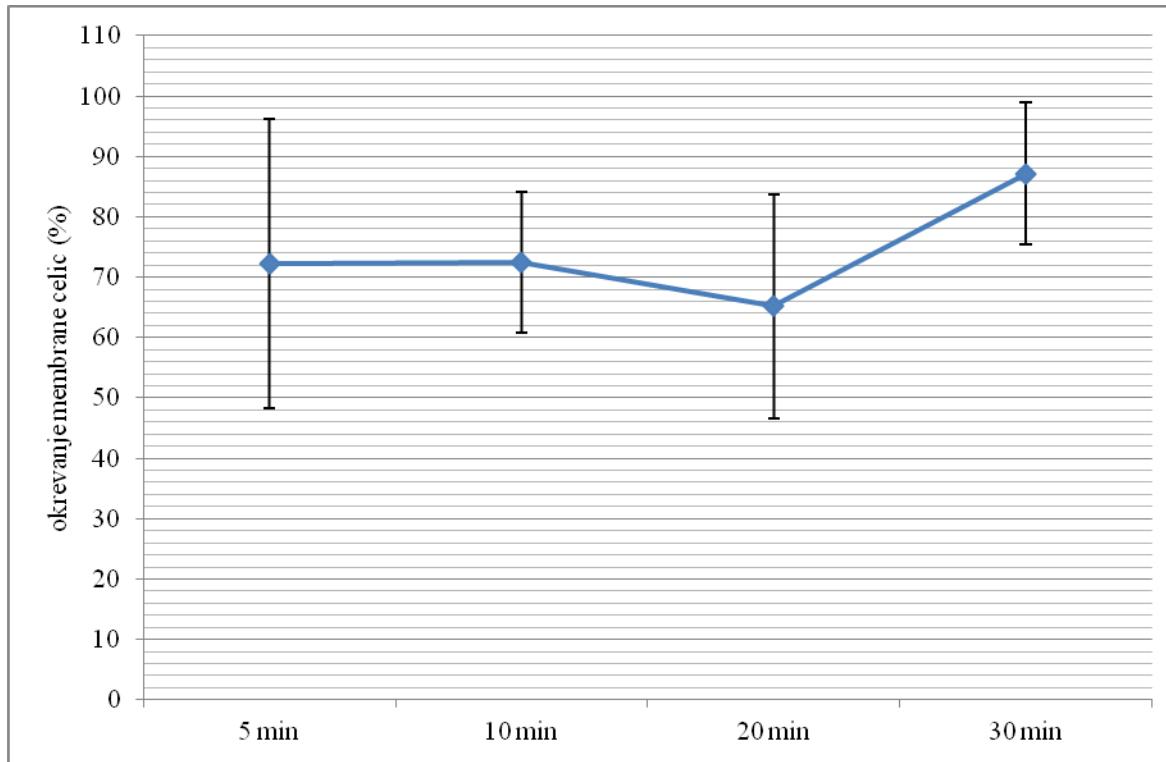
Sources of funding



Participants structure

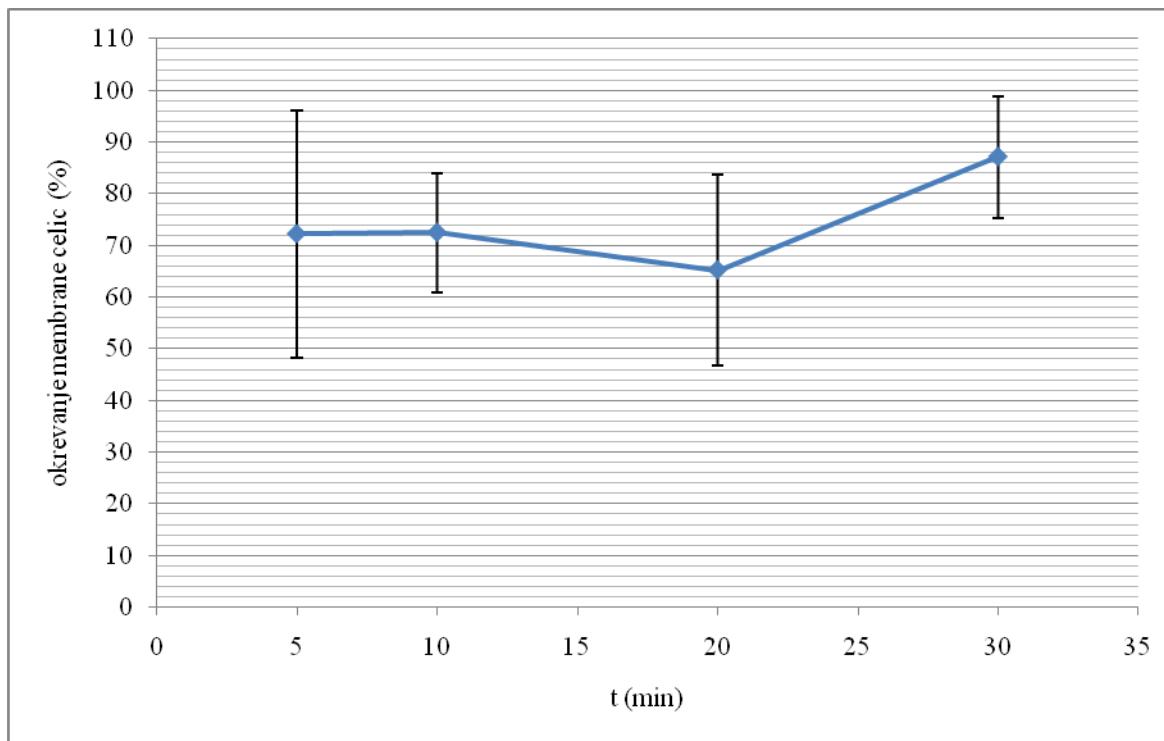


Primer 1

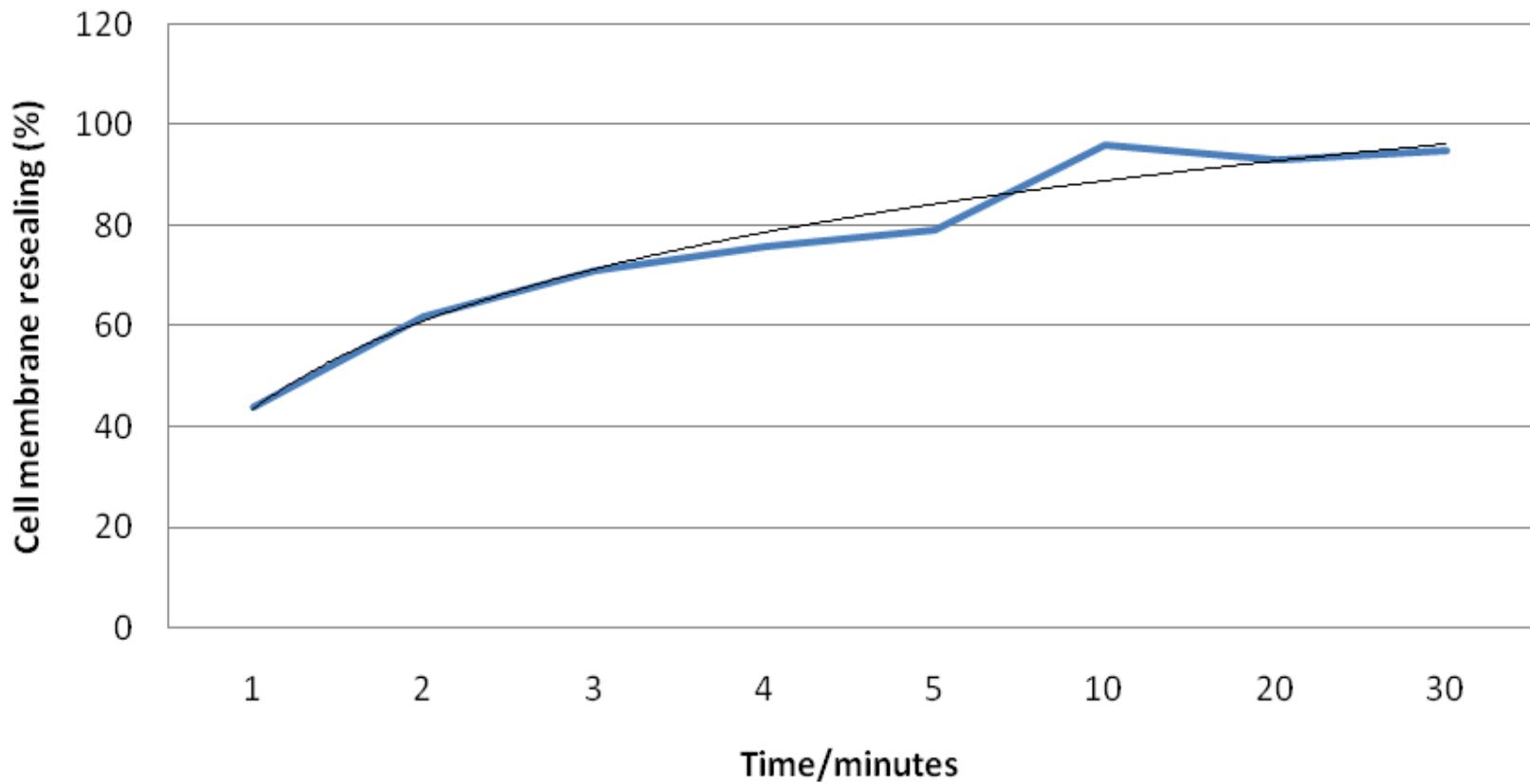


Trying to plot a graph against *value* type of data (e.g. time series) using LINE GRAPH
PROBLEM: the time scale is not realistic (time intervals are not proportional)
CAUSE: the default axis for a line chart is a *category* axis which uses an equal-interval scale

Primer 1 - popravljen

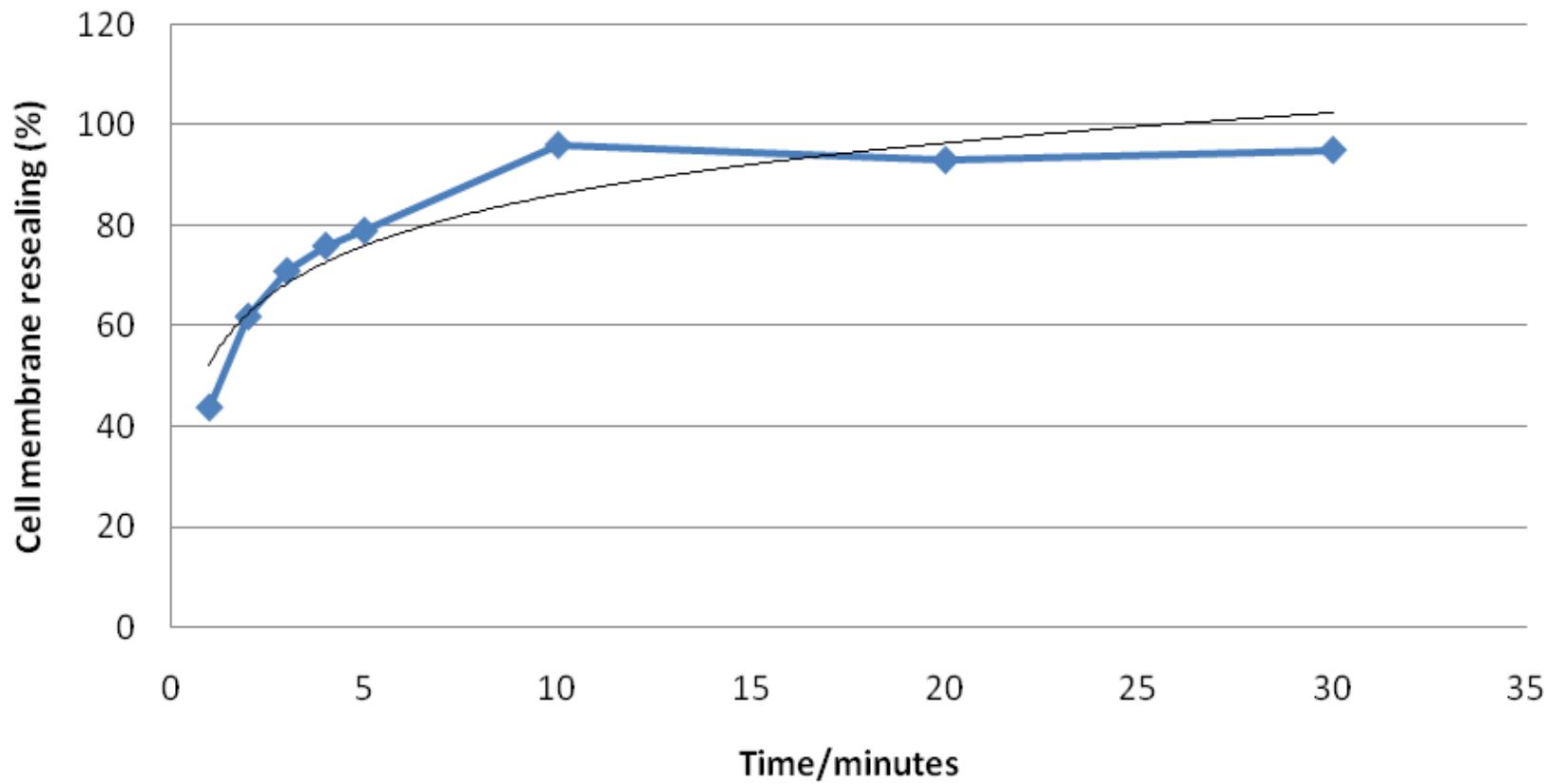


Wrong scale intervals example

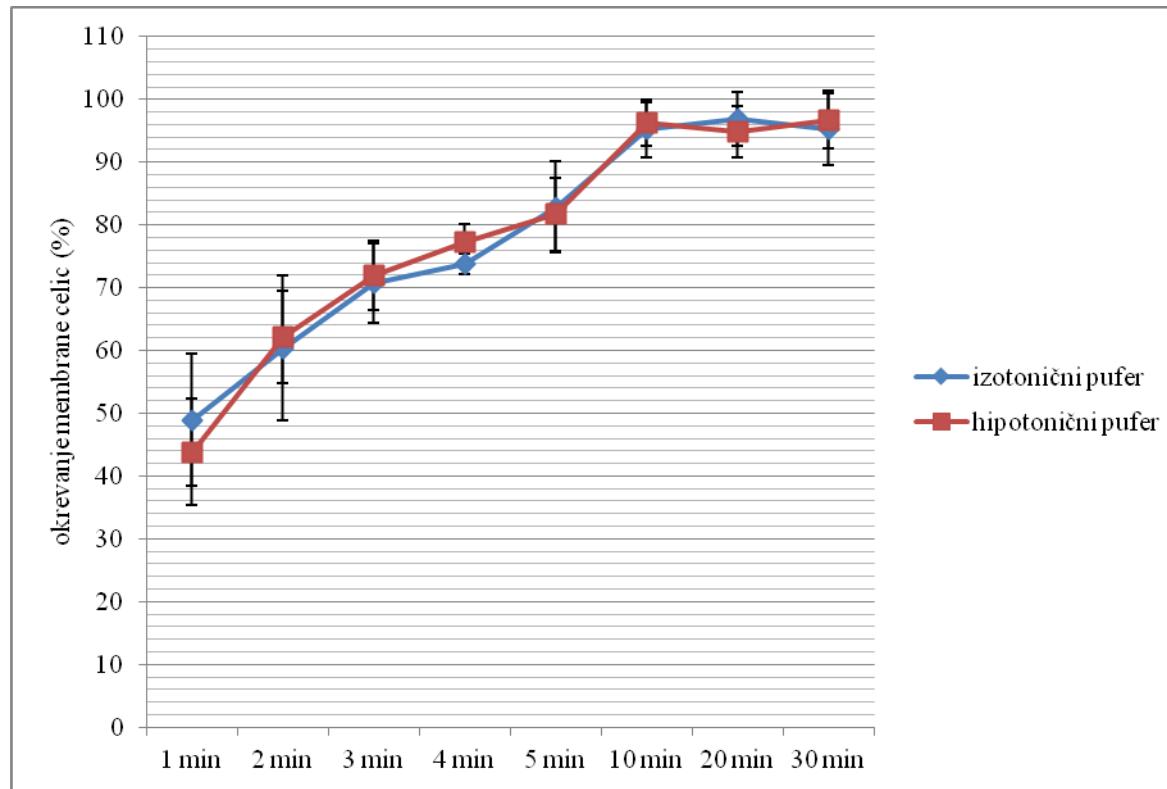


SOLUTION: for *value* type of x-axis data, use SCATTER graph type

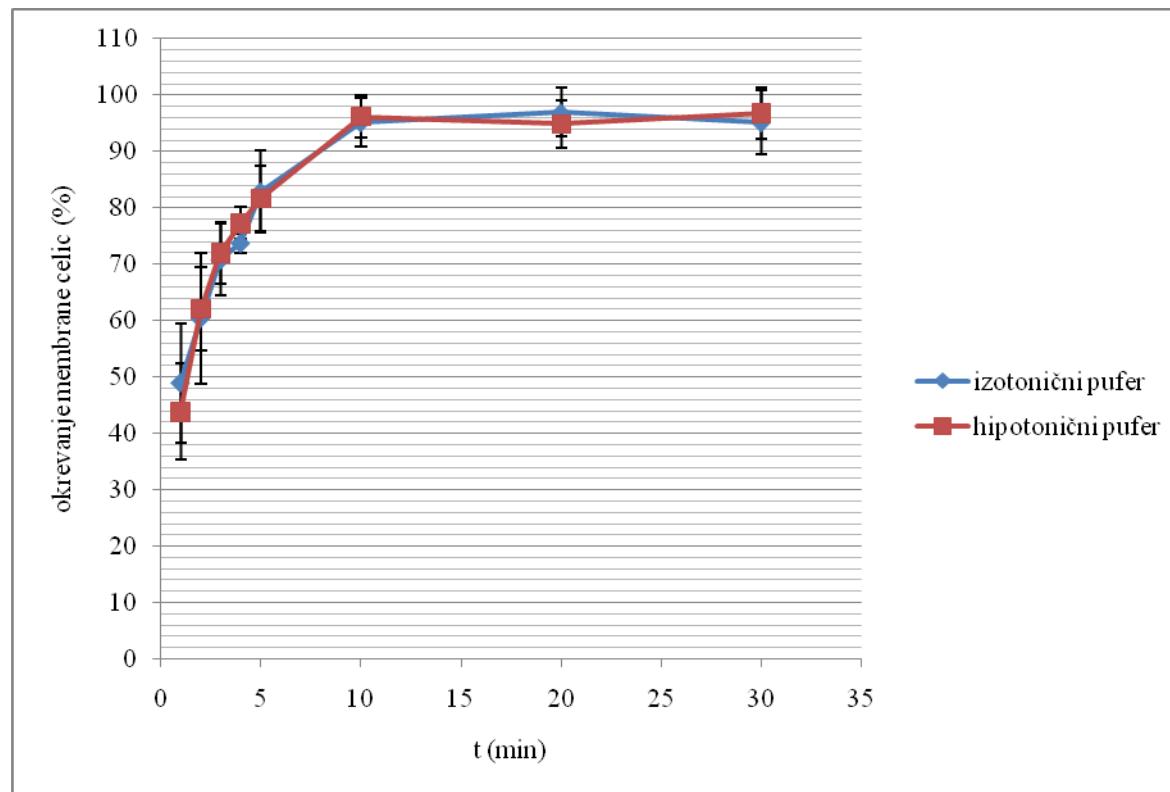
Wrong scale intervals example



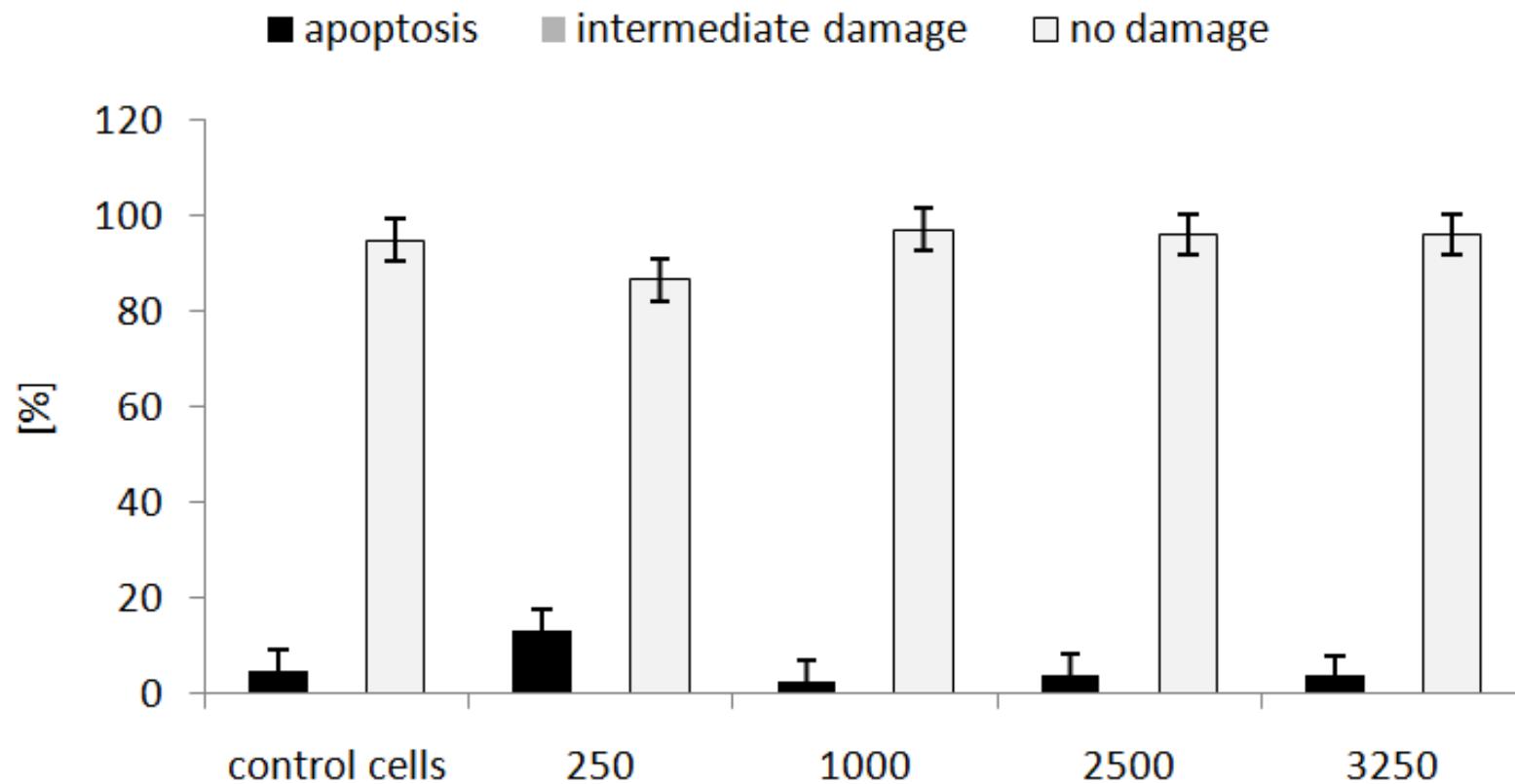
Primer 1b



Primer 1b - popravljen

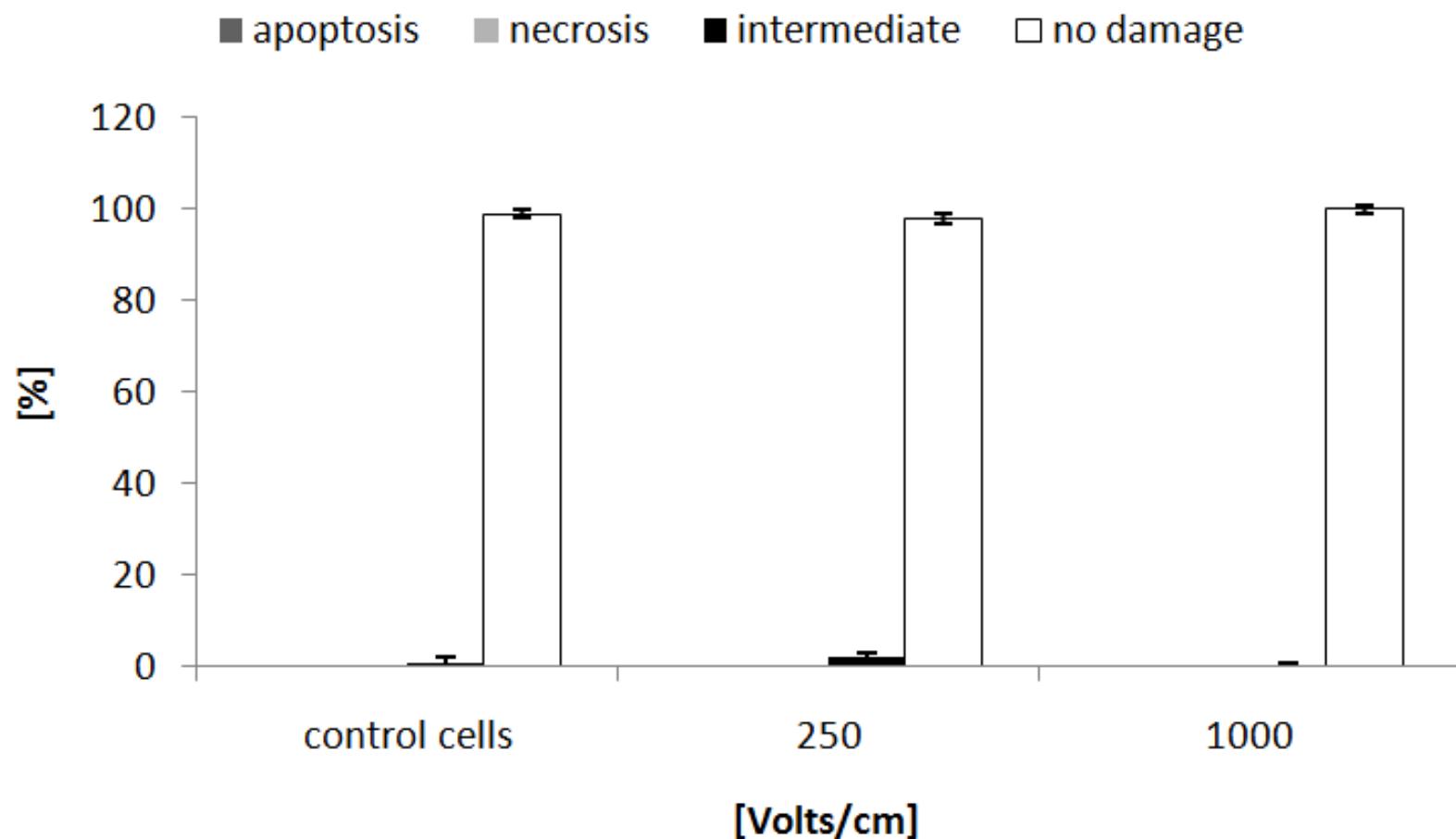


Primer 2a – napačna izbira grafa in območja



Neutral comet assay rat myoblasts after electroporation (5 imp. and 50 μ s).
Error bars shown are means \pm SD for n = 3

Primer 2b – napačna izbira grafa, izbor območja



Alkaline comet assay rat myoblasts after electroporation (5 imp. and 50 μ s). Error bars shown are means \pm SD for n =3.

Primer 2c – napačna izbira grafa

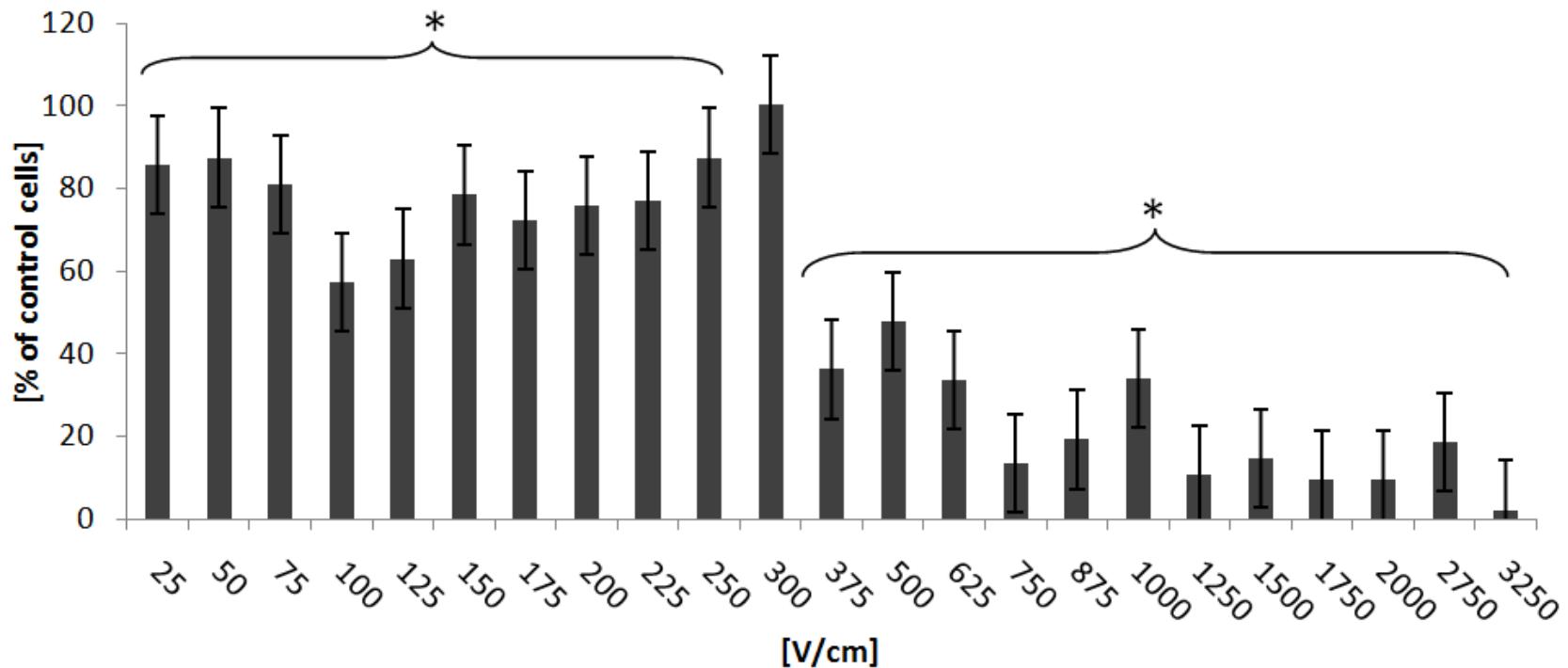
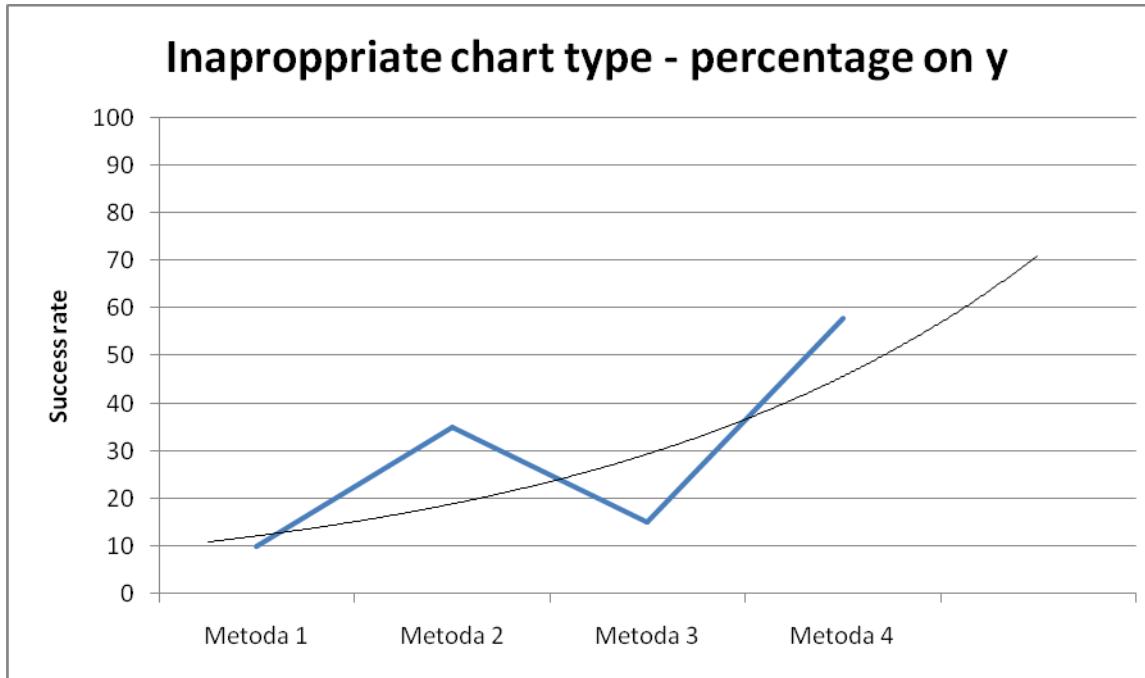


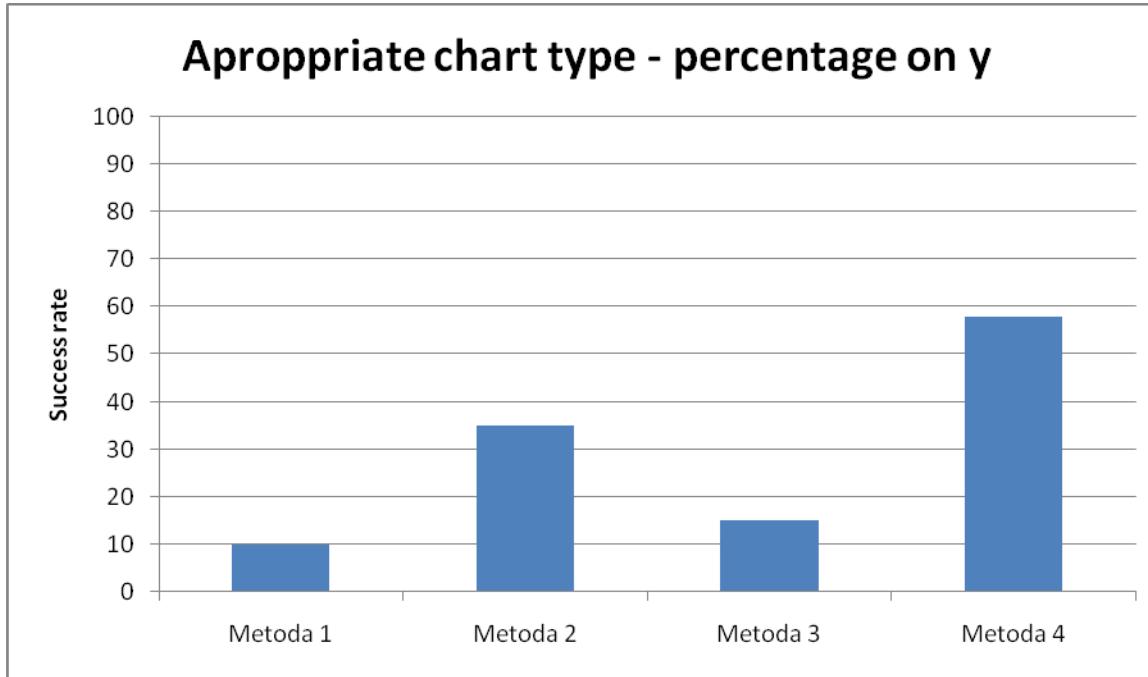
Figure 4. The viability test in rat myoblasts after electroporation (5 imp. and 50 µs). Error bars shown are means \pm SD for n =4.

Primer 3



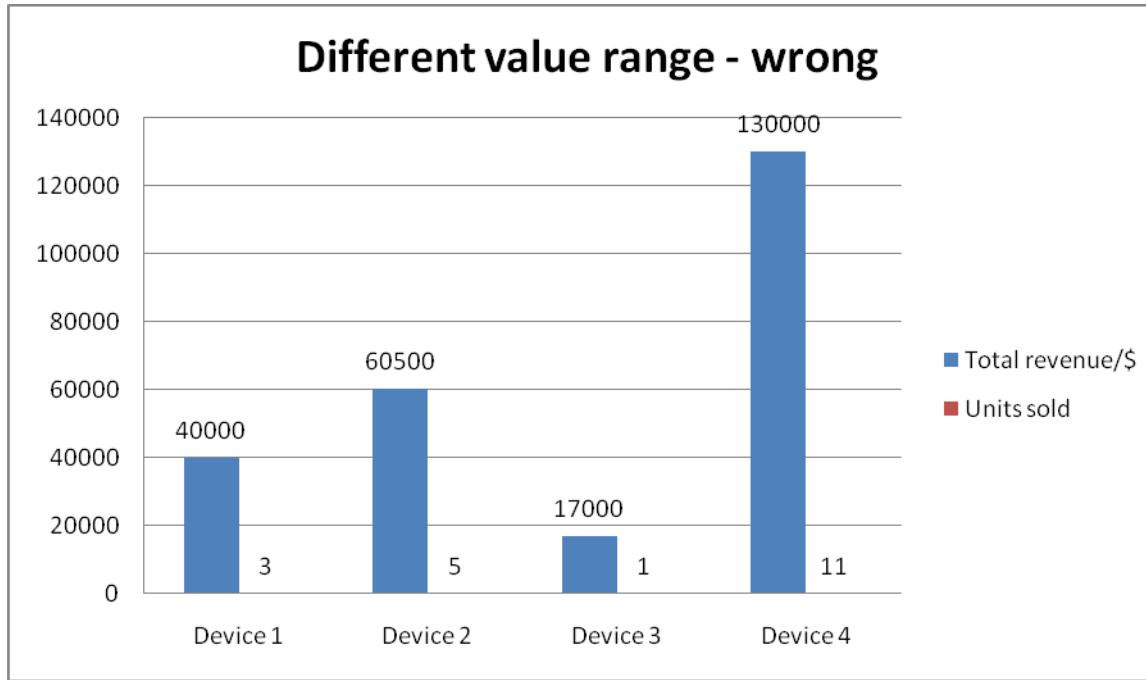
comparing success rates of different methods in % - bar graph is more appropriate than line graph

Primer 3



comparing success rates of different methods in % - bar graph is more appropriate than line graph

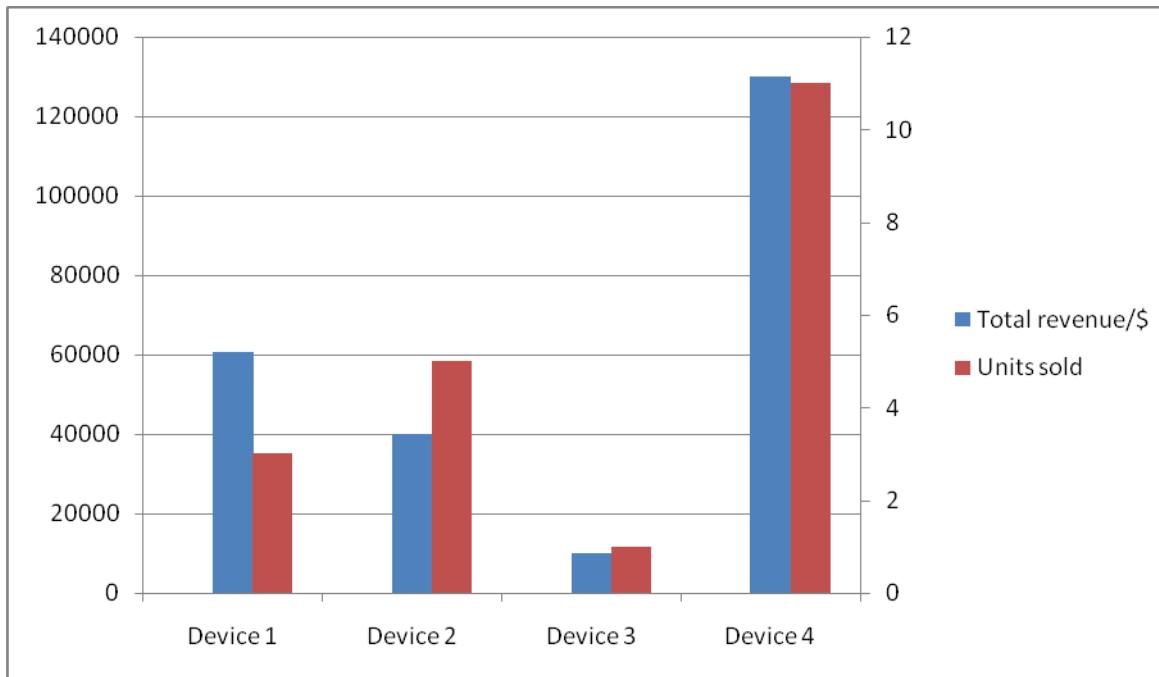
Primer 4 - comparing different aspects of same categories, but value ranges of aspects vary a lot



PROBLEM: value range of units sold is so low compared to value range of total revenue, it doesn't even show in the graph

SOLUTION: include secondary y axis and plot second series against it

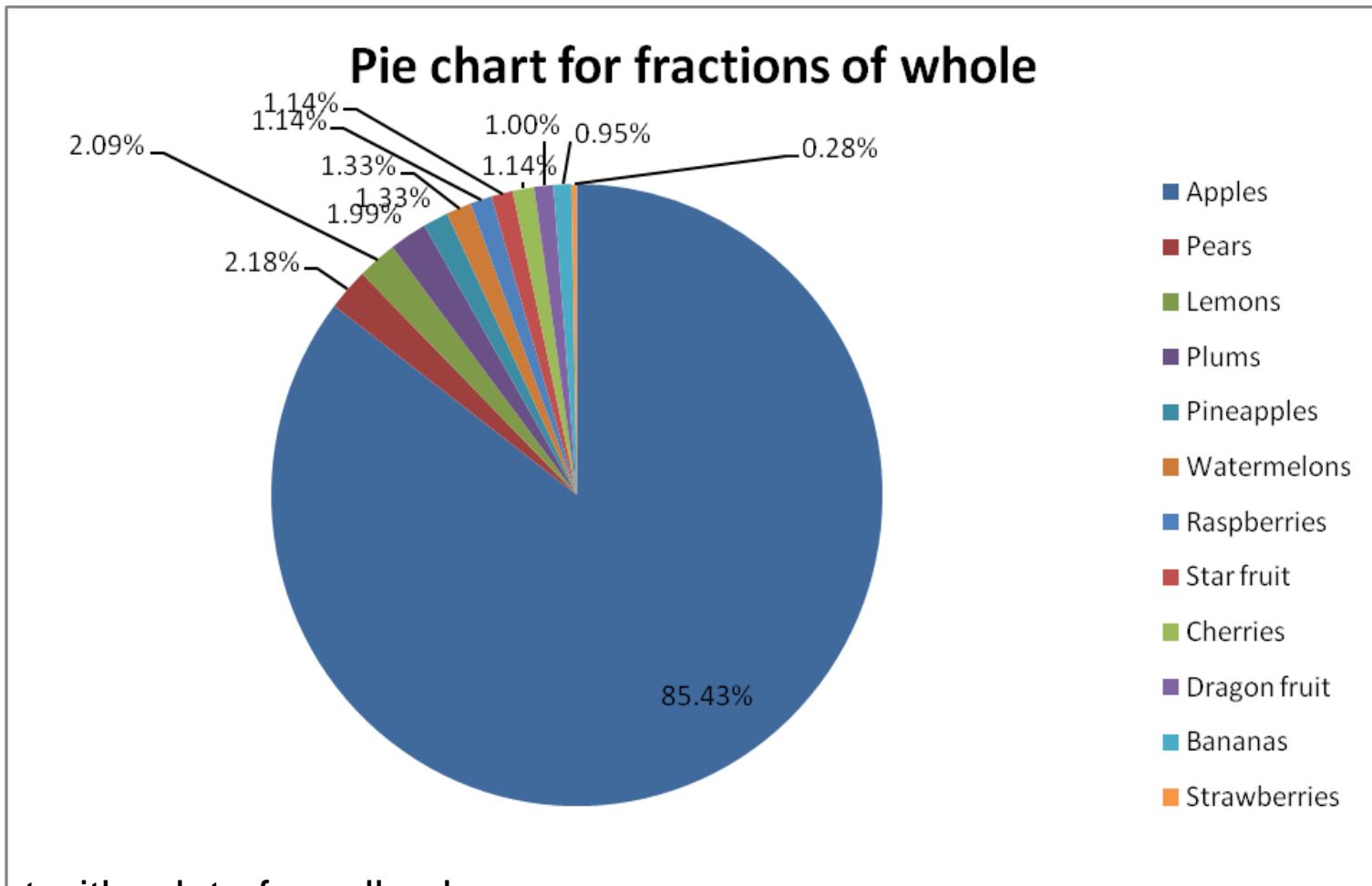
Primer 4 - comparing different aspects of same categories, but value ranges of aspects vary a lot



PROBLEM: value range of units sold is so low compared to value range of total revenue, it doesn't even show in the graph

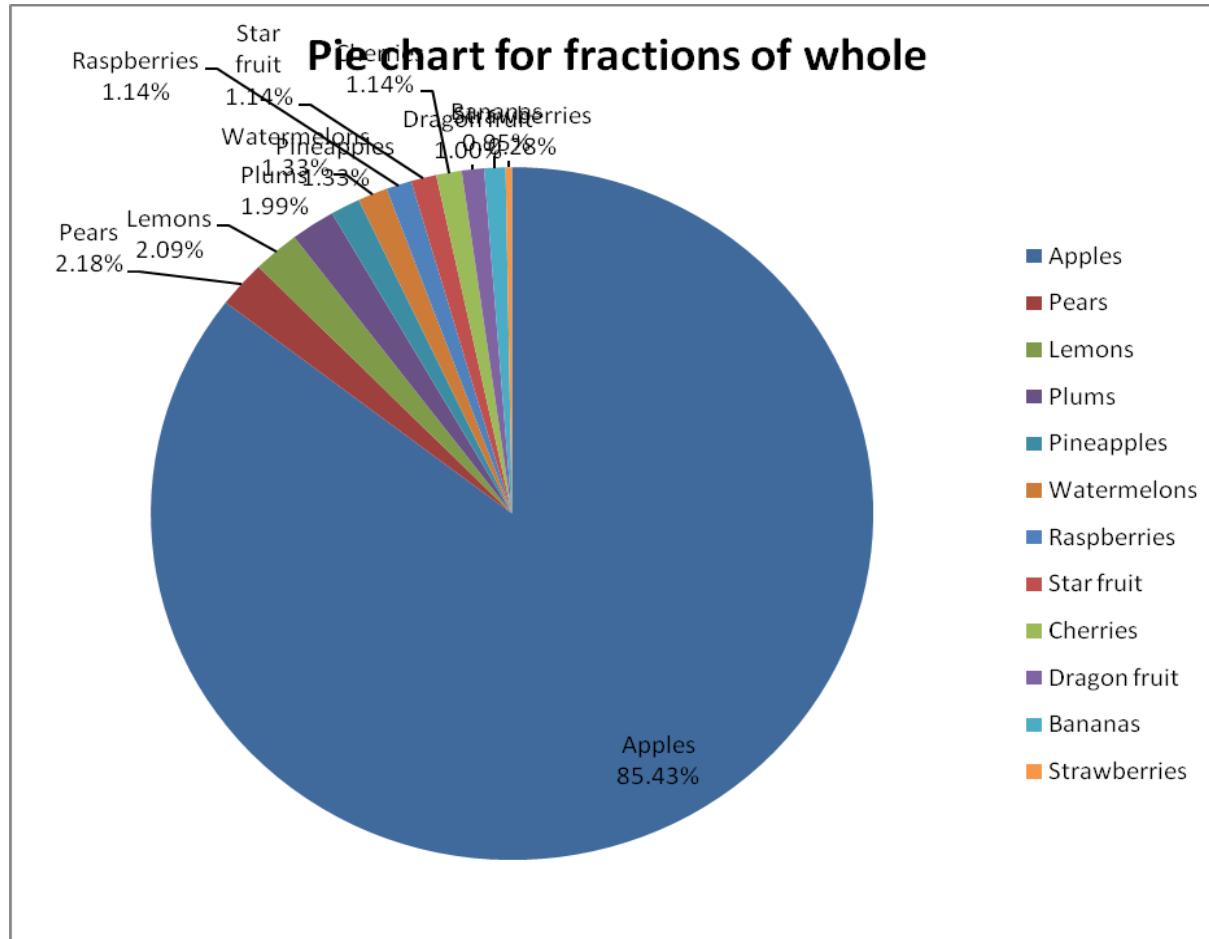
SOLUTION: include secondary y axis and plot second series against it

Primer 5 – delež celote

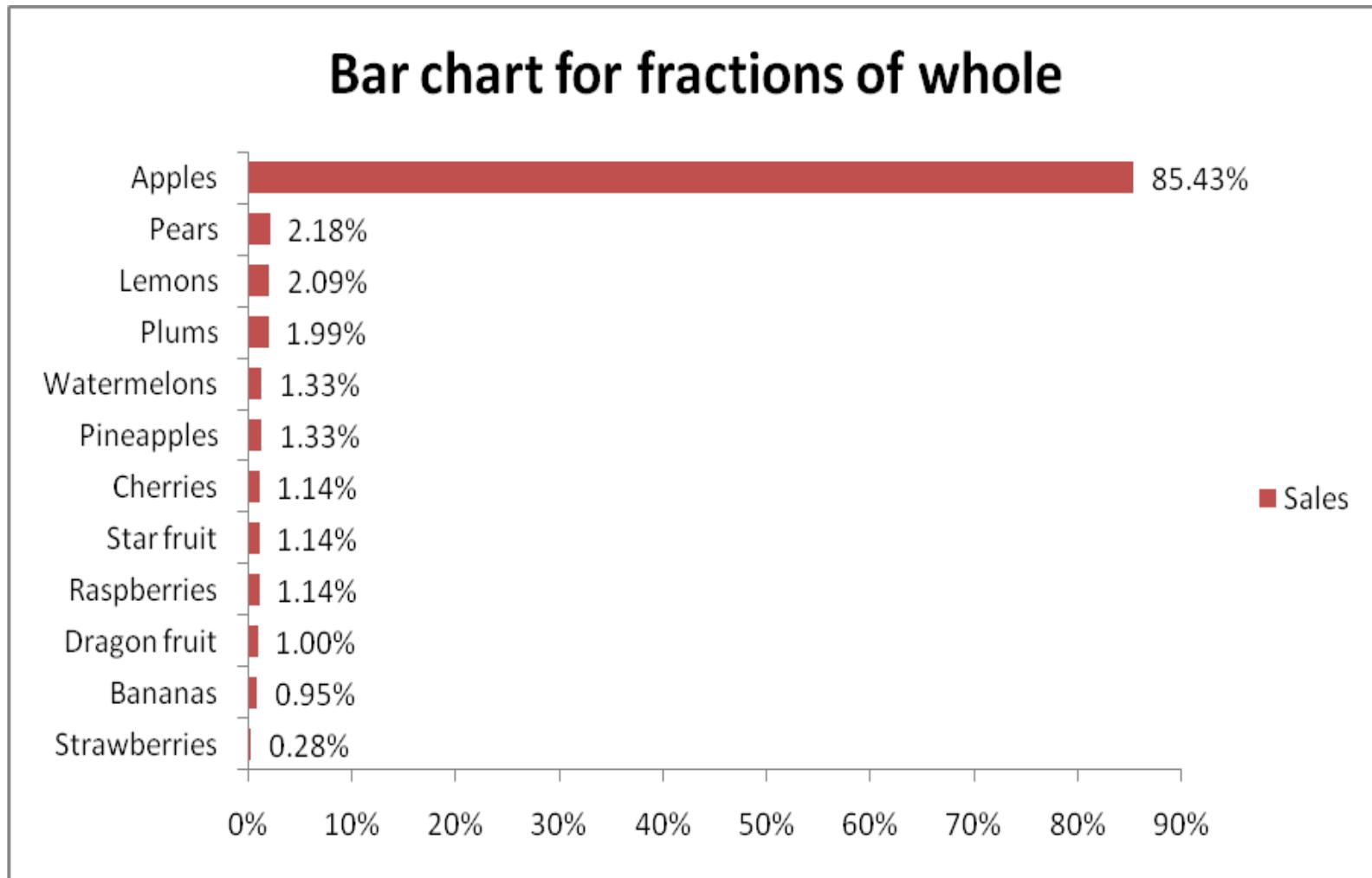


- pie chart with a lot of small values
- too many values
- difficult to discern them
- too many colors (colorblind?)

Trying to put category labels...even worse.

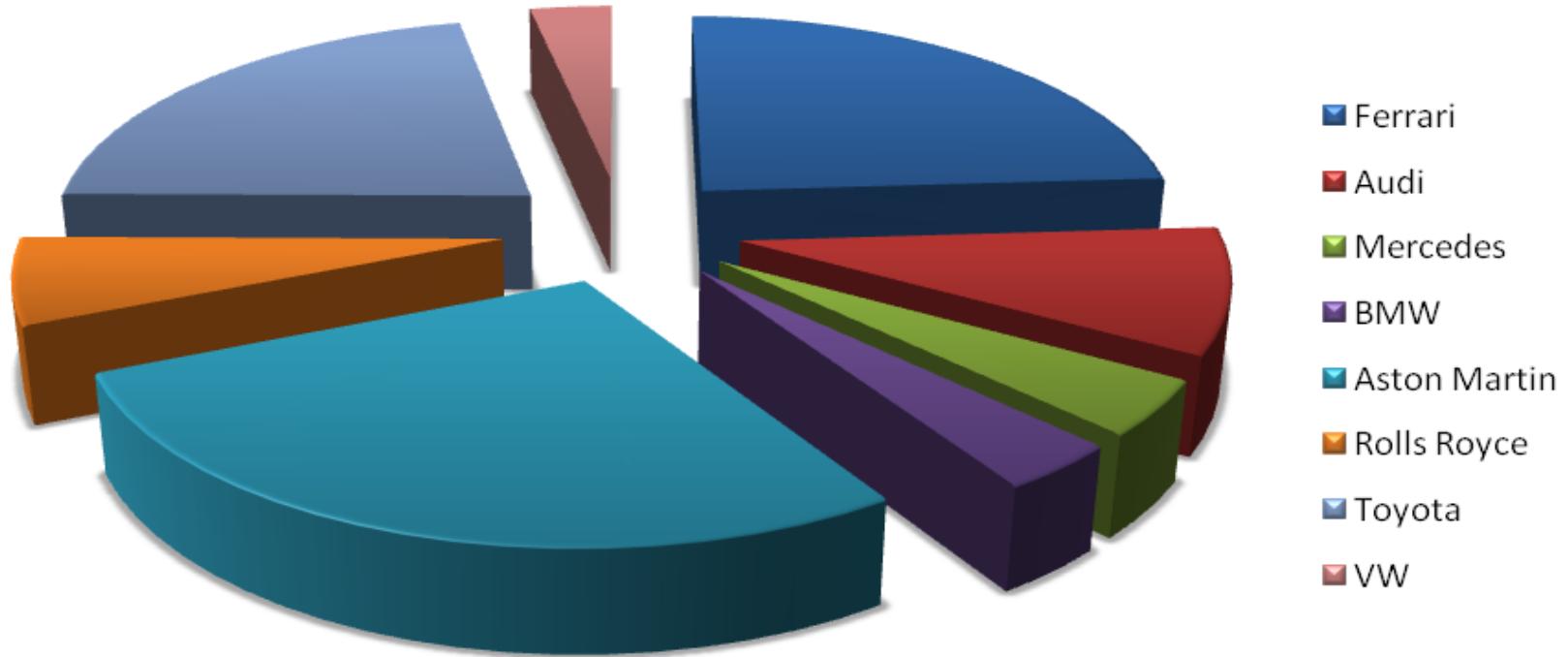


Correct choice: bar with values written for each category

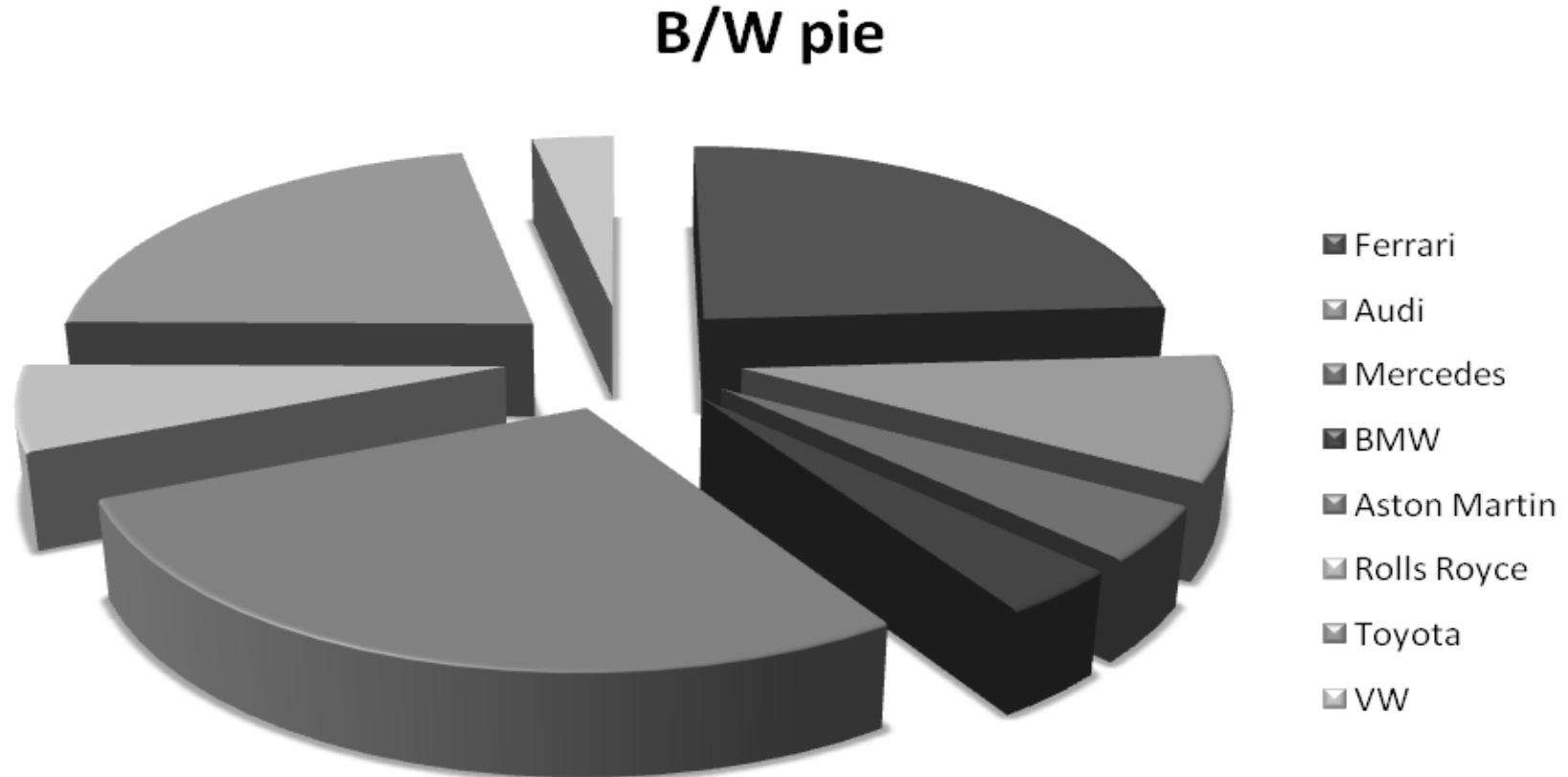


Primer 6 – uporaba barv

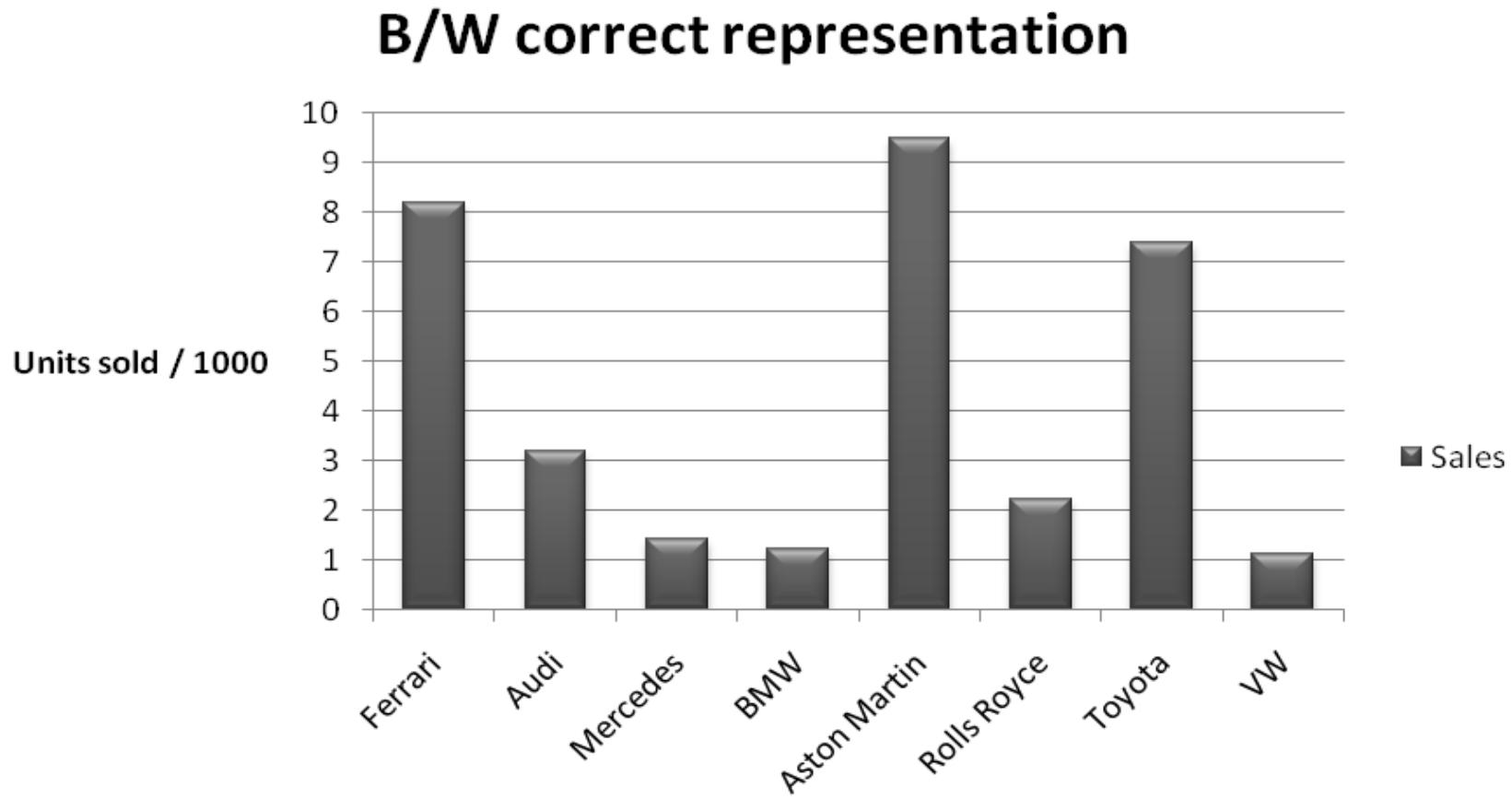
Colorful pie



Primer 6 – always have in mind the media where the graph will be distributed; if it may need to be converted to grayscale, the graph will end up looking like this:

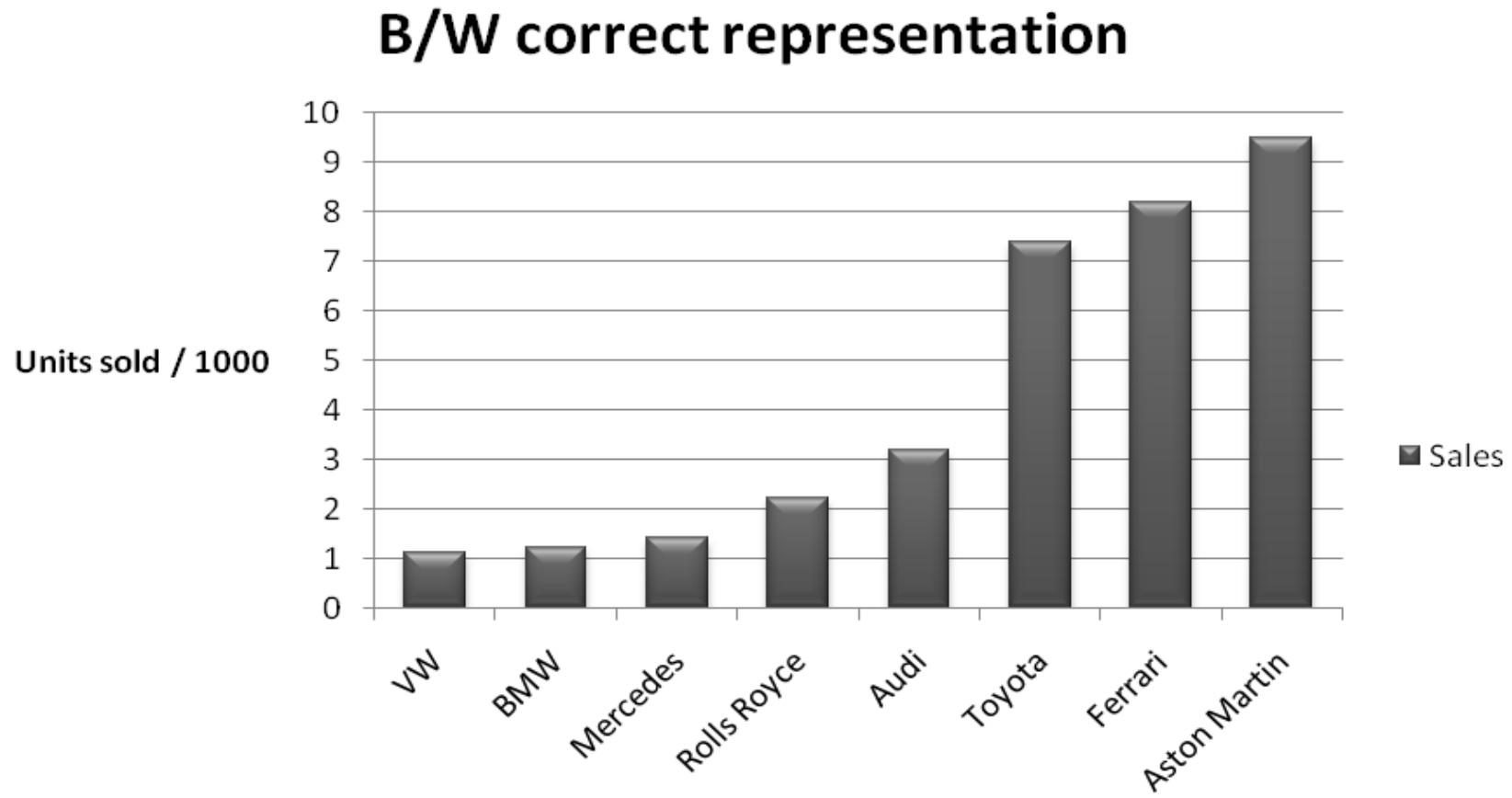


Primer 6 – uporaba barv



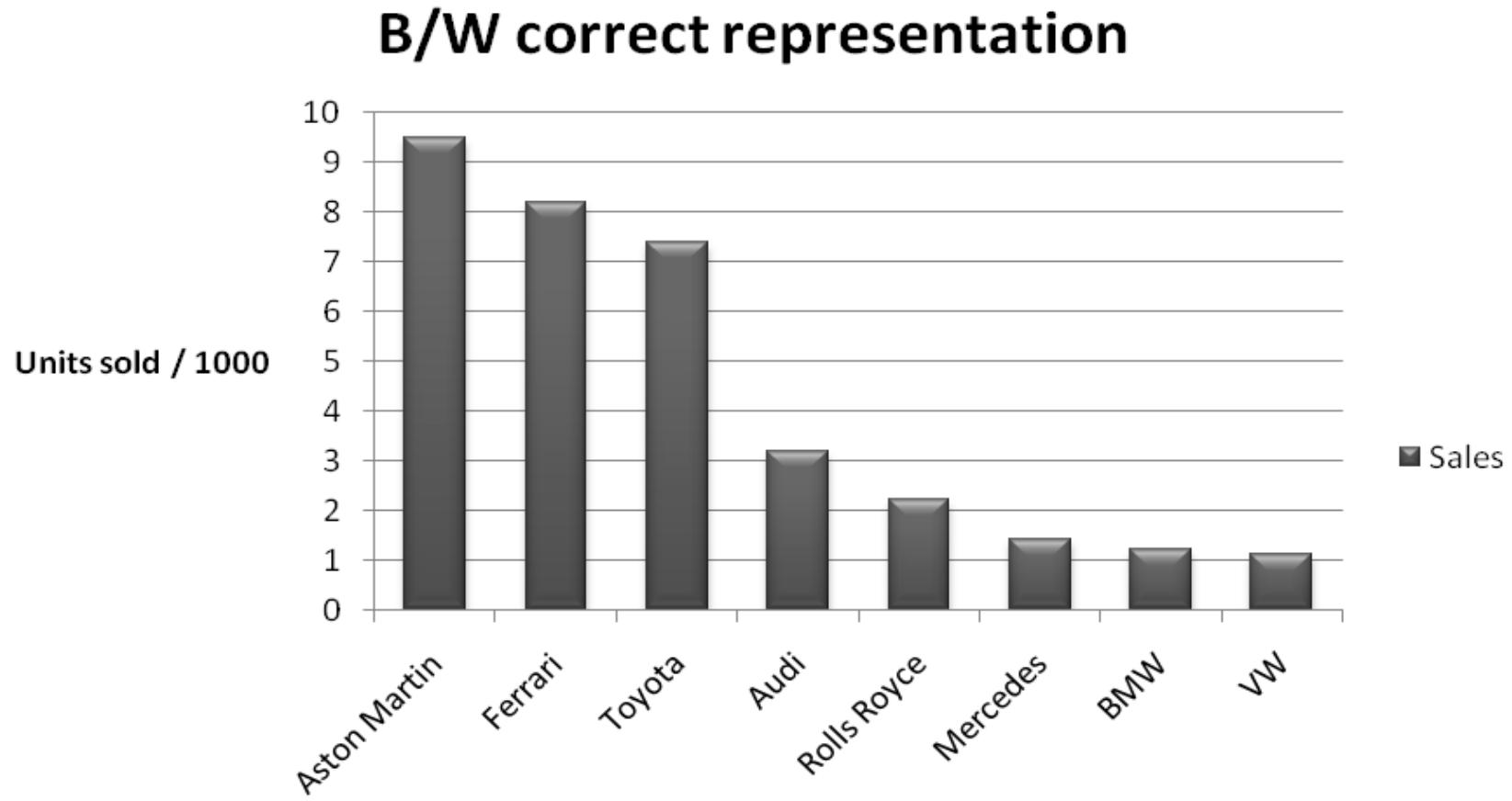
SOLUTION: Depending on the number of categories it might be better to use a different graph type, or re-organize the data.

Primer 6 – uporaba barv



EVEN BETTER: Arrange the categories so that values are in order

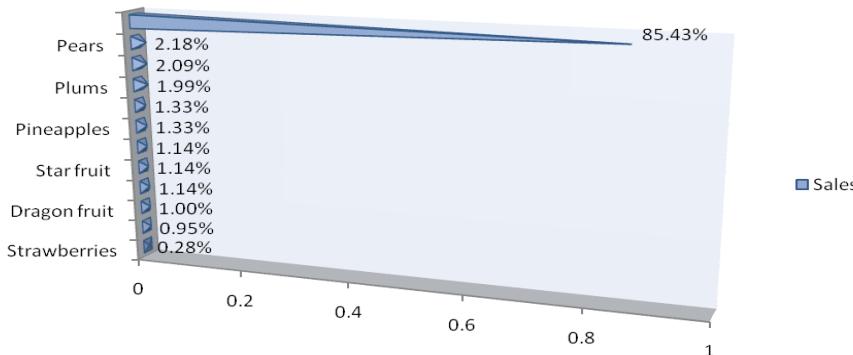
Primer 6 – uporaba barv



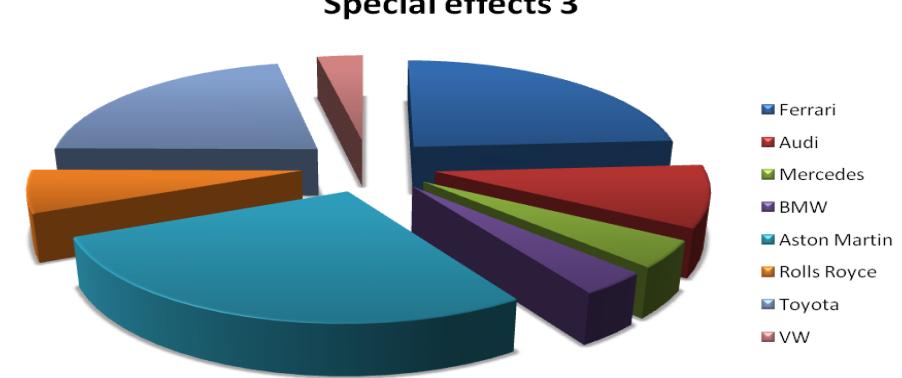
BEST: Make the order of values DESCENDING (rather than ascending)

Barve in posebni učinki

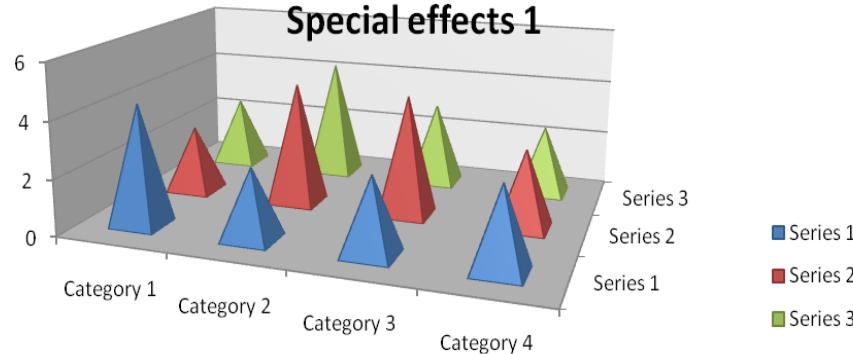
Special effects 3



Special effects 3

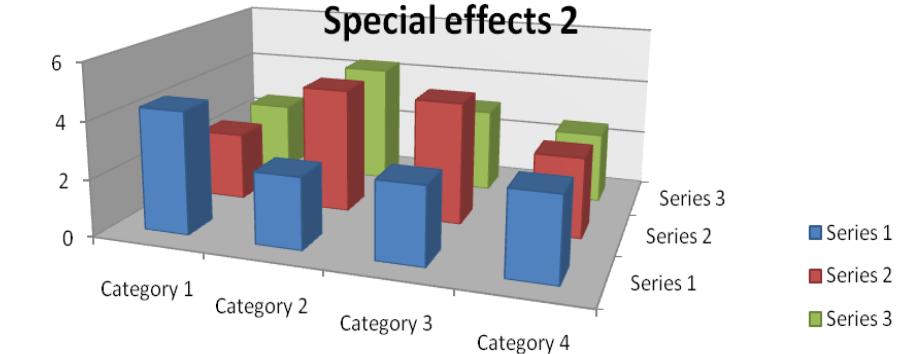


Special effects 1



	Category 1	Category 2	Category 3	Category 4
Series 1	4.3	2.5	2.7	2.9
Series 2	2.4	4.4	4.3	2.8
Series 3	2.5	4.3	3	2.5

Special effects 2



	Category 1	Category 2	Category 3	Category 4
Series 1	4.3	2.5	2.7	2.9
Series 2	2.4	4.4	4.3	2.8
Series 3	2.5	4.3	3	2.5

Vizualni pripomočki - vrste

- Vzorci, modeli, makete, demonstracije
- Izročki (handouts)
- Kreda in tabla/flomastri in flip-chart
- Video in audio posnetki
- Računalniške projekcije/diapositivi

Najpogosteje uporabljamo

- Kreda, tabla (traja več časa, lahko pripravimo vnaprej)
- Flip chart (pripravljeni vnaprej dobro predvsem za majhen avditorij)
- Prosojnice/grafoskop (svetla soba, popolna kontrola nad potekom projekcije, možno dorisovanje)
- Diapositivi (zatemnитеv sobe, napačna vstavitev)
- Računalniška projekcija

Namen vizualnih pripomočkov

- Da pojasnijo,
- poudarijo,
- ponazorijo,
- pomagajo, da si publika vaše ideje lažje zapomni.
- To clarify
- To enhance
- To illustrate your ideas
- To make your key points more memorable

Kaj prikazati na diapositivih?

- Sezname
- Gafe
- Risbe
- Fotografije
- ...

Seznam

- Visual aids help audiences recall more information
- Visual aids help explain and clarify information
- Visual aids can enhance speaker's persuasiveness
- Visual aids can enhance speaker's credibility
- Visual aids can reduce speaker's nervousness

Visual aids

- help audiences recall more information
- help explain and clarify information
- can enhance speaker's persuasiveness
- can enhance speaker's credibility
- can reduce speaker's nervousness

The importance of visual aids

- Recall
- Explain
- Persuade
- Enhance credibility
- Reduce nervousness

Velikost in oblika črk

Serif

- Times New Roman
- Bookman
- Palatino

Sans serif

- Lucida Sans
- Ariel
- Calibri

Elaborate styles:

- *Mistral*
- **Playbill**
- *Freestyle script*

PRIMER UPORABE SEZNAMA

- TO JE PRVA VRSTICA
- TO JE DRUGA VRSTICA
- TO JE TRETJA VRSTICA
- TO JE ČETRTA VRSTICA
- TO JE PETA VRSTICA
- TO JE ŠESTA VRSTICA
- TO JE SEDMA VRSTICA

Primer uporabe seznama

- to je prva vrstica
- to je druga vrstica
- to je tretja vrstica
- to je četrta vrstica
- to je peta vrstica
- to je šesta vrstica
- to je sedma vrstica

Vizualni pripomočki (1/4)

- Slike morajo biti dugačne kot za članek ali poster
- velikost in oblika črk (sans serif) in debelina črt
- format (portrait vs. landscape)
- orientacija napisov
- ne uporabljajte barv, »podlag« in animacij samo zato, ker jih imate na razpolago

VIZUALNI PRIPOMOČKI (2/4)

- SLIKE MORAJO BITI DRUGAČNE KOT ZA ČLANEK ALI POSTER
- **velikost in oblika črk (sans serif) in debelina črk in črt**
- **velikost naslova: 44 točk**
- **velikost besedila: 32 točk**
- najmanjša priporočena velikost besedila: 25 točk
- ne uporablajte barv/podlag, ki se slabo projicirajo (rdeča, rumena na sv.modri, ...)

Vizualni pripomočki (3/4)

- slike morajo biti dugačne kot za članek ali poster
- velikost in oblika črk (sans serif) in debelina črt
- format (portrait vs. landscape)
- orientacija napisov
- ne uporabljajte barv, »podlag« in animacij samo zato, ker jih imate na razpolago

Vizualni pripomočki (4)

- morajo biti dugačni kot za članek ali poster
- velikost in oblika črk (sans serif) in debelina črt
- format (portrait vs. landscape)
- orientacija napisov
- ne uporabljajte barv, »podlag« in animacij samo zato, ker jih imate na razpolago

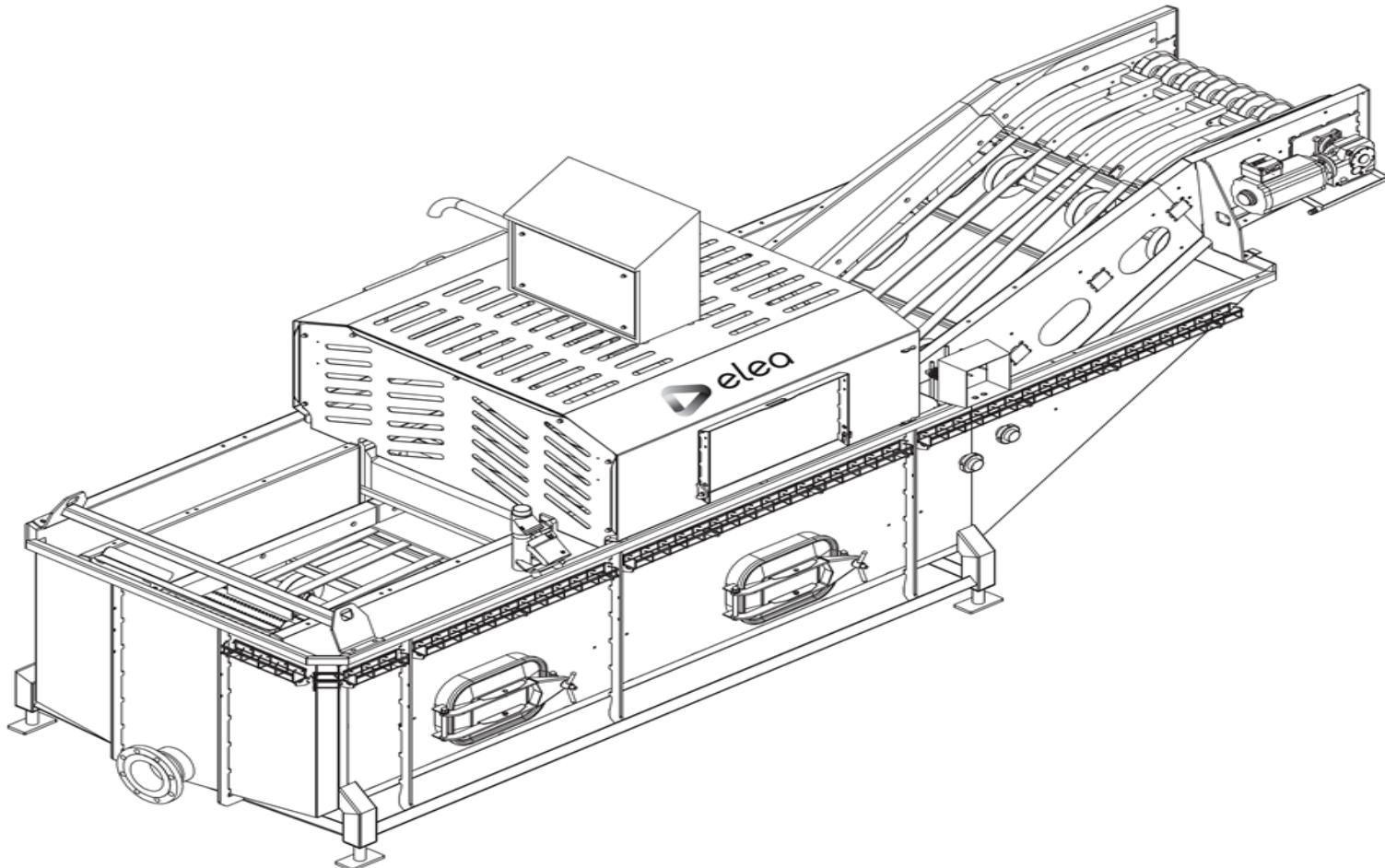


Vizualni pripomočki (4)

- morajo biti dugačni kot za članek ali poster
- velikost in oblika črk (sans serif) in debelina črt
- format (portrait vs. landscape)
- orientacija napisov
- ne uporabljajte barv, »podlag« in animacij samo zato, ker jih imate na razpolago



Industrial PEF systems



PEF belt system for treatment of fruit and vegetables (800 mm belt width, 50 t/h capacity).

The systems are used for pretreatment of potatoes prior to French Fries processing.

(Courtesy of S. Toepfl, DIL, Quakenbrueck, Germany)

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Priporočila za učinkovito rabo vizualnih pripomočkov

- Pripravi slide vnaprej
- Vadi nastop z vizualnimi pripomočki
- Uporabi/prikazuj slide samo dokler o temi govoriš/razлагаš
- Razloži vse, kar je na slideu
- Govori obrnjen proti publiki (ne proti platnu)

Priporočila za učinkovito rabo vizualnih priporočkov

Menjanje/nekonsistentna raba

- barvnih schem
- vrst in velikost črk
- oblikovne podobe

ne priomore k lažjemu spremljjanju in razumevanju digitalnih rposojnic.

Barve in posebni učinki

- The color choice should emphasize the data and the point of the chart, not make the chart a standalone ornament
- Data comparison is compromised due to 3D form of objects and the tilt
- **For scientific purposes, it is always better to keep graphs clean and simple**

Uporabljena literatura in nadaljnje branje

E.R. Tufte. The visual display of quantitative information. Graphics Press, Cheshire, Connecticut, 1983.

M.H. Briscoe. Preparing scientific illustrations – a guide to better posters, presentations, and publications. Springer, New York, 1996.

C.L. Griffin. Invitation to public speaking. Wadsworth Cengage Learning, USA, 2009.