



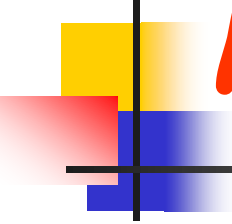
四段十步式論文寫作法

實驗方法寫作技巧

陳甫州 博士

台中榮民總醫院

醫學研究部幹細胞中心



Materials and Methods

- **Study design** is selected & the subjects (patients, animals) to be studied are defined.
- **Interventions** (treatment) are decided on in detail.
- **Measurements** and other observations to be made.
- **Statistical** procedures for assessment of data.

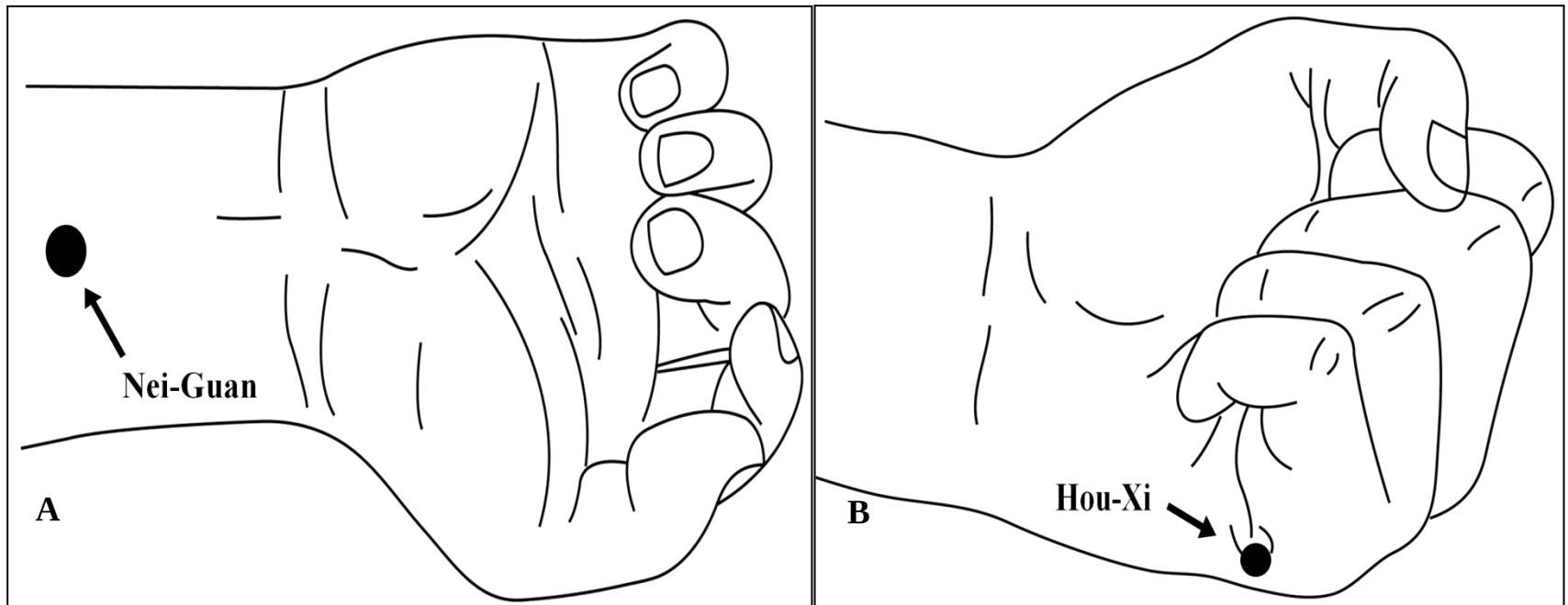


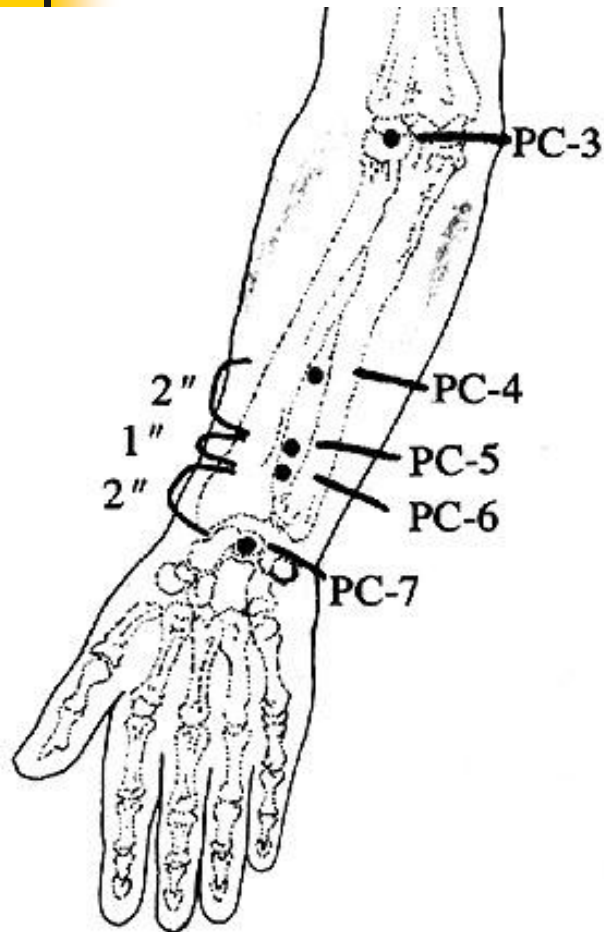
Materials and Methods

- A general overview of the entire subsections, **background**, and **procedures**
- Details about what **was done** and care **was taken in details**
- **A good choice** within existing methods
- **A limitation/possible difficulty** when compared to conventional methods

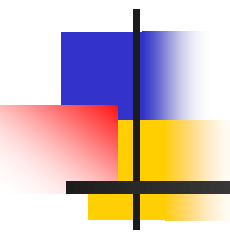
Nei-Guan: The acupuncture point nei-guan (Pericardium-6) is probably best known in the West as a treatment for nausea and vomiting.

Hou-Xi: Then a loose fist is made, at the ulnar end of the distal palmar crease proximal to the 5th metacarpal phalangeal joint at the junction of the red & white skin.



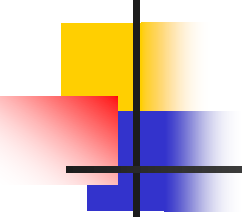


Nei-guan is one of the 365 classical acupuncture points, located on the forearm portion of the short pericardium meridian that has a total of only **nine standard points**.



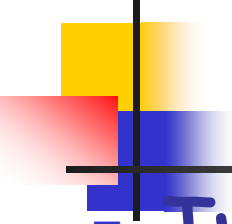
Dynamic changes of brain magnesium levels in cerebral ischemia

Materials and Methods



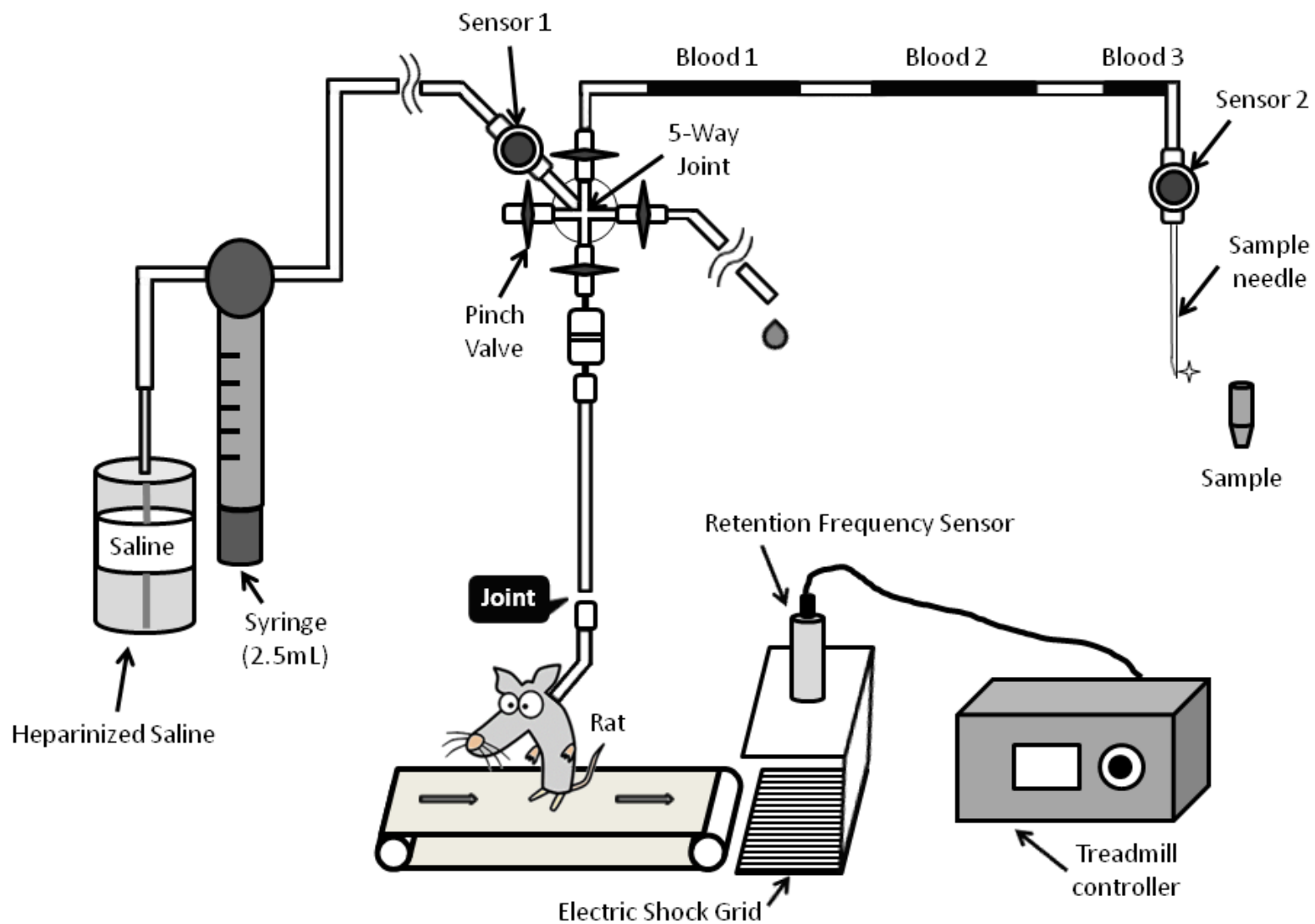
Stroke

- A focal **ischemic lesion** was induced by occlusion of the MCA. The dialysis probes were perfused with Ringer's solution at 2 $\mu\text{L}/\text{min}$ using a CMA/100 infusion pump.
- Dialysis probes were **perfused** with Ringer's solution (147 mM Na^+ ; 2.2 mM Ca^{++} ; 4 mM K^+ ; pH adjusted to 7.0) at 2 $\mu\text{L}/\text{min}$ using a CMA/100 microinfusion pump.
- Dialysates were **collected every 15 min** in a CMA/140 fraction collector (Carnegie Medicin, Stockholm, Sweden).



Sample Collection & AA

- Two microdialysis probes (CMA/20-4, and a cut-off at 20 kDa) were stereotaxically implanted into the cortex (AP 0 mm, ML₊5 mm, DV - 5.0 mm from Bregma).
- A Perkin-Elmer Model Analyst 300 atomic absorption spectrometer (Perkin-Elmer, Uberlingen, Germany) was used for analyzing extracellular Mg concentrations.
- For atomization of Mg, the temperature was controlled at 1700°C and Mg was detected at a wavelength of 285.2nm.





Three category Verbs

- **General verbs:** attempt, consider, conduct, determine, investigate,...
- **Specific verbs:** calculate, extract, isolate, formulate, modify, plot, stimulate..
- **Verbs in your own field:** transfect, clone, dissect, infuse,...



MATERIALS AND METHODS

- (the) tests
- (the) trials
- (the) samples
- Is/are commercial available
- Was/were conducted
- Was/were modified
- Was/were chosen/obtained



MATERIALS AND METHODS

- The primary tests **used** in this work were a modified version of ..
- All reactions **were performed** in a gas-tightened reactor..
- All cell lines **were incubated** as previous **described** in ...
- Both experiments **were performed** in a ...so that....



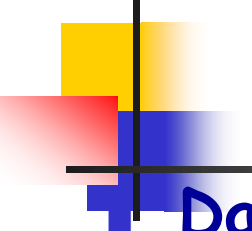
Procedures/Methods

- May include tables and figures
- An issue: level of detail in which to describe
 - Well-known methods
 - Methods previously described but not well known
 - Methods that you yourself devised
- Helpful to use papers published in the same journal as models



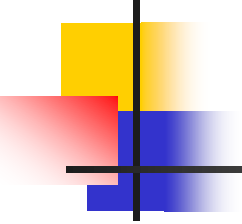
Procedures/methods

- **According to..** (as reported by ...)
 - The protein was overexpressed and purified according to ...[1]
- **A modified version of...**
 - The ... is a slightly modified (version of) commercially available model, HP-5895.
- **A novel step was..**
 - Our procedures partly based on reported by .. [2], a novel step was.. ...



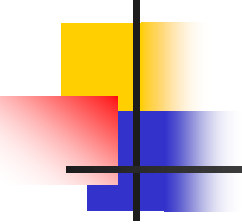
Statistical analysis

- Data are expressed as a ratio between the ipsilateral (right) hind paw and contralateral (left) hind paw where possible. The nature of data on animal weight, SSI data, and also on (the **CatWalk** derived) normal step sequence patterns (NSSP) and couplings did not allow for a ratio-presentation of the data.
- Data are expressed as mean $\pm$ standard-error-of-the-mean (S.E.M.). Statistical analysis included analysis of variance (**ANOVA**) with repeated measures over time. This ANOVA was combined with a **Bonferroni post hoc** correction to detect which times points differed from each other.
- A ***p*-value of 0.05** was regarded as the level of statistical significance.

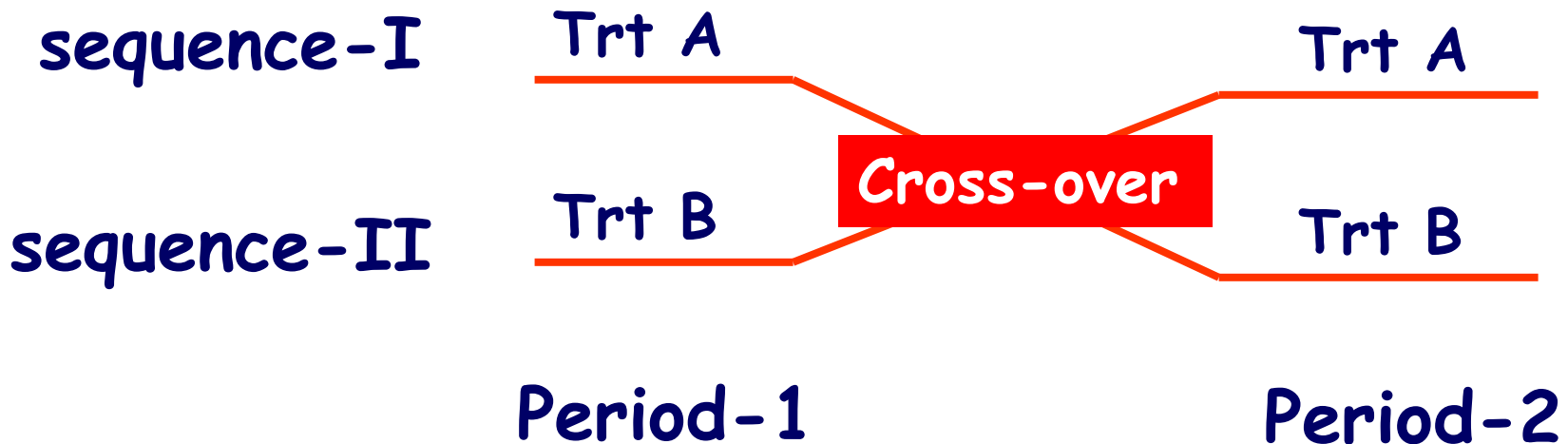


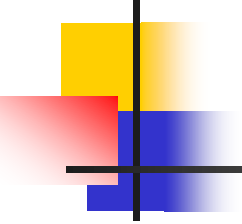
Experimental designs

- parallel design
- randomized consent design
- cross-over design
- factorial design

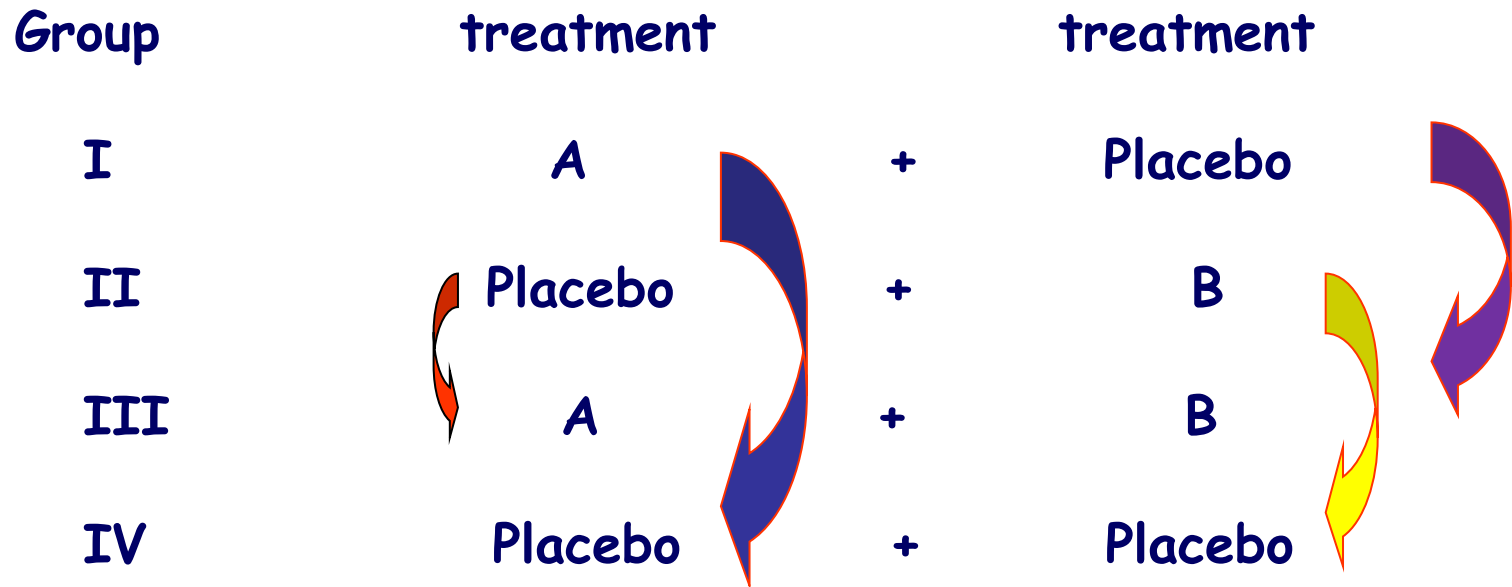


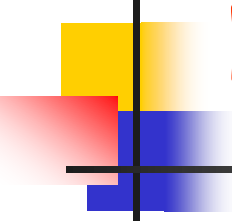
Cross-over design





Factorial design

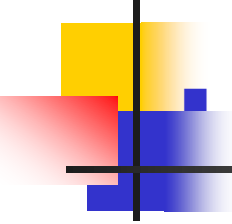


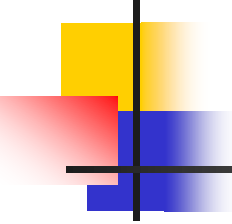


Notes for Writing a proposal

- Computer programs & Internet
- Conduct field research (**advanced**)
- Materials and methods **verification**
- Collect & analyze **Preliminary data**
- Write **a draft** of proposal
- **Apply** a grant or financial supports

Specific aims

- 
- Thus, it is proposed to clarify the role of brain metals, dopamine, serotonin and their metabolites and interactions between cerebral metabolic mediators during cerebral ischemia.
 - The specific aims for this project are: (1) establishing animal models and analytical assays, (2) establishing microdialysis and hyphenated GFAAS, clinical analyzing techniques, and (3) studying protective effects and dynamic changes of anti-ischemic agent treatments. In addition, stem cells therapy is also investigated.
 - Through these studies, the relationship between neurochemical substances might clarify the mechanism responsible for the neural damage and protection in cerebral ischemia.

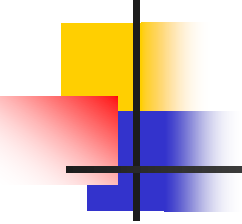


十步論文寫作法

結果寫作技巧

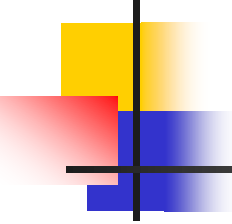
陳甫州 博士

台中榮民總醫院
醫學研究部幹細胞中心



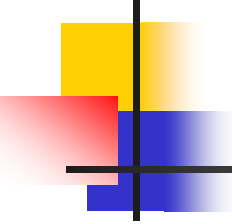
Results to be Presented

- The **core** of the paper
- Often includes tables, figures, and the text should overlap with that in the tables and figures
- Should present results **but not comment on them**



Results Section

- Maintain a balance between **brevity** and **completeness**
- Describe experimental design including treatments measured, how many **replicates**, **controls** etc
- Present the results in an **orderly sequence**



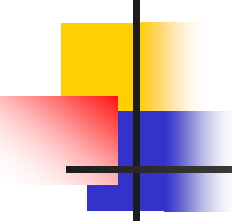
Results

- Overview of results
- Viewing results
- Key results in detail
- Problems with results



Results Section

- If your research has been concerned with a **new question** or has used a **new** approach to an old question, most of your evidence will be your **own observations and data**. This **new evidence** is what should be reported in the Results section.
- The Results section should give **as clear an answer** to the question to be answered by the research as your data will permit.
- Present the **key results**, in orderly sequence, **without** interpreting their meaning



Tables: A Few Suggestions

- Use tables **only if text will not suffice**.
- Design tables to be understandable without the text.
- If a paper includes a series of tables, use **the same format** for each.
- Be sure to follow **the instructions** to authors of the Journal.

Table 2. The relationship between gradient, speed, and enduring time of treadmill for exhaustive exercise

Gradient (°)	Speed (mph)	Enduring time (min)
0	8.2	3
5	15.2	3
10	19.3	3
10	26.8	3
12.5	26.8	3
12.5	30.3	3
15	30.3	3
15	35.4	3
15	40.0	3
15	43.8	3

Table 1. Clinical Features, Echocardiographic Measurements, and Biochemical Values During Acute Hepatitis

	1st Day	7th Day
Systolic arterial pressure (mm Hg)	121.6 $\pm$ 5.6	117.5 $\pm$ 2.9
Diastolic arterial pressure (mm Hg)	73.7 $\pm$ 2.5	72.7 $\pm$ 2.1
Heart rates (beats/min)	76.0 $\pm$ 3.9	77.3 $\pm$ 3.3
AST (IU/L)	663.7 $\pm$ 168.5	397.9 $\pm$ 166.4
ALT (IU/L)	1025.8 $\pm$ 182.3	559.4 $\pm$ 156.8*
Total bilirubin (mg/dL)	6.1 $\pm$ 1.2	4.3 $\pm$ 1.0
ALB (g/dL)	3.7 $\pm$ 0.1	3.3 $\pm$ 0.2
Prothrombin time (second)	13.0 $\pm$ 1.0	12.4 $\pm$ 0.3
Respiration rate (times/min)	18.2 $\pm$ 0.8	18.7 $\pm$ 0.7

ALB, albumin; ALT, alanine aminotransferase; AST, aspartate aminotransferase.

** $P < 0.05$, upon admission vs. the 7th day. Results are expressed as mean $\pm$ SEM.*

Table 1
Clinical features of patients with frontal lobe epilepsy

Patients (no.)	Age (years)/gender	Duration of epilepsy (years)	Type of seizures	Interictal EEG findings, location	Therapy at enrollment
1	7/F	7	Tonic, tonic-clonic	Spikes, sharp waves, spike-wave complexes, left F	CZP, LTG, PB
2	7/F	4	Tonic, tonic-clonic	Spike/polyspike-wave complexes, right F	LTG, VPA
3	8/F	2	Tonic	Spikes, spike-wave complexes, left lateral frontal region	TPM, VPA
4	9/F	3	Tonic	Repeated or isolated spikes, spike-waves, left F	TPM, VPA
5	13/F	8	CPS, sec. GTC	Polyspikes and spike-wave complexes, left F	OXC, VPA
6	14/F	13.5	Tonic-clonic	Paroxysms of sharp-wave complexes, left F	VPA
7	15/F	10	Tonic-clonic	Polymorphic alpha/theta activity, left F	LTG, VPA
8	16/F	15	Tonic, tonic-clonic	Spikes, right frontocentral region	PB, PHT, TPM
9	5/M	2	Tonic-clonic	Trains of sharply contoured 10–11 Hz activity, bilateral F	OXC
10	8/M	2	PS	Sharp wave with following rhythmic theta activity, left F	CZP
11	10/M	4	Tonic-clonic	Slow waves, right frontocentral region	VPA
12	15/M	10	Tonic-clonic	Spikes with phase reversal, left frontocentral region	VPA
13	19/M	15	CPS, sec. GTC	Repeated spikes and polyspikes with phase reversal, right F	CLB, VPA
14	25/M	10	Tonic-clonic	Sharp-contoured alpha and semirhythmic theta activity, left F	OXC
15	27/M	24	CPS, sec. GTC	Isolated spikes, left lateral frontal region	CZP, LTG, VPA
16	31/M	28	Tonic-clonic	Spike-wave complexes and repetitive spikes, left F	VPA
17	32/M	14	CPS	Isolated spikes, left F	OXC
18	8/F	5	Tonic-clonic, absence	Spikes, bilateral F	CBZ, VPA
19	16/F	7	Tonic-clonic	Spike/polyspike with phase reversal, left F	CBZ, TPM
20	23/F	2	CPS	Spikes with phase reversal, left F	CBZ
21	12/M	6	CPS, sec. GTC	Spikes with phase reversal, bilateral frontocentral regions	CBZ
22	16/M	8	Tonic	Sharp waves with phase reversal, right F	CBZ, VGB
23	16/M	10	CPS	Transients of fast alpha activity or sharp waves, left F	CBZ, VGB
24	18/M	8	CPS, sec. GTC	Polyspikes, repeated spikes, spike-wave complexes, right F	CBZ
25	34/M	31	CPS, sec. GTC	Spikes with phase reversal, left F	CBZ, LTG, VPA

EEG, electroencephalography; CPS, complex partial seizure; sec. GTC, secondarily generalized tonic-clonic; PS, partial seizure; F, frontal location; OXC, oxcarbazepine; VPA, sodium valproate; LTG, lamotrigine; PB, phenobarbital; PHT, phenytoin; TPM, topiramate; CZP, clonazepam; CLB, clobazam; CBZ, carbamazepine; VGB, vigabatrin. Patient no. 9 and no. 21 had intracranial arachnoid cysts which did not correlate with their seizure foci. All the patients were categorized as idiopathic or cryptogenic epilepsy.

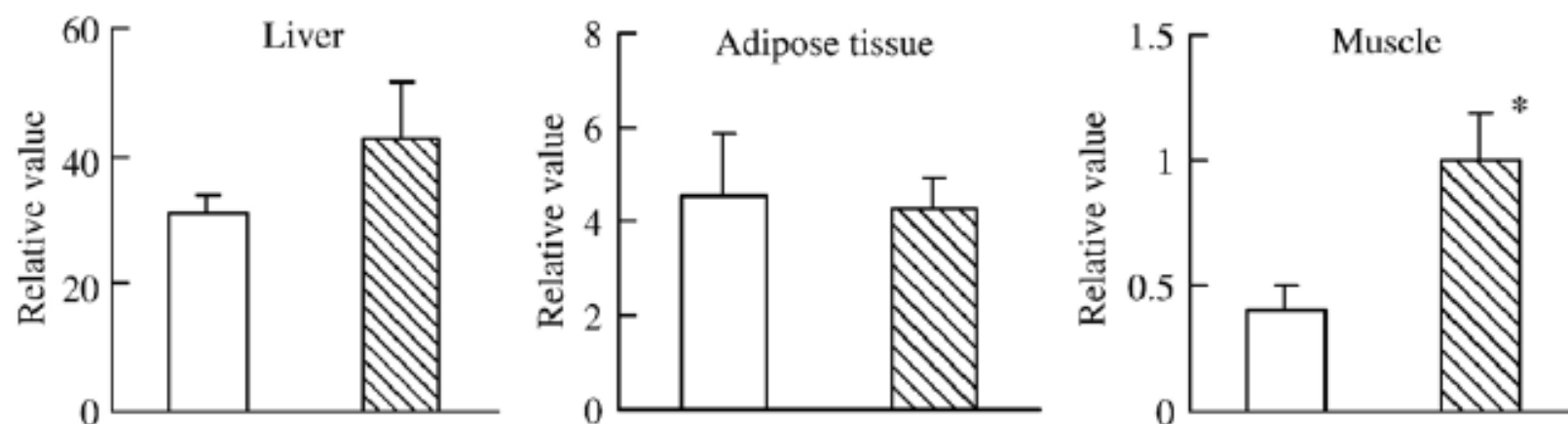
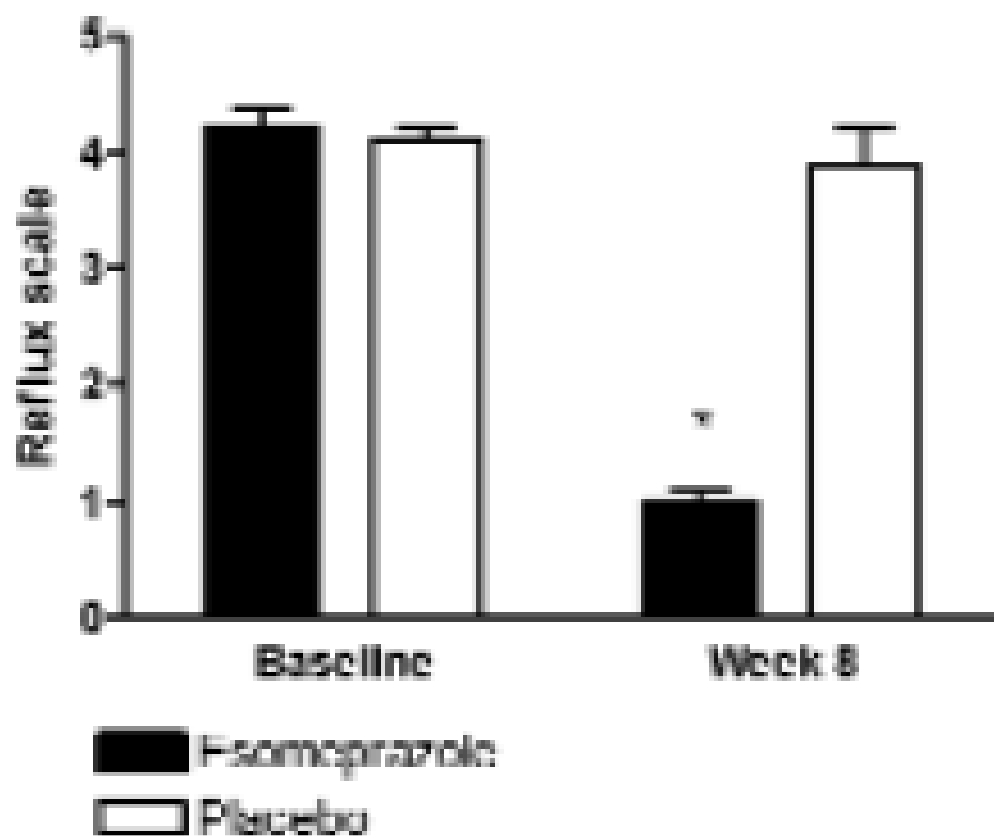
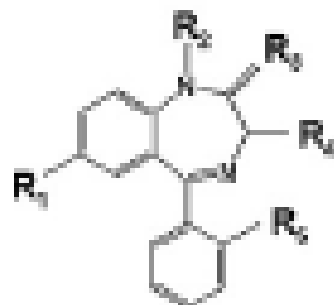
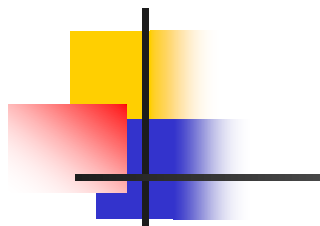


Fig. 1. Expression of tumor necrosis factor- α mRNA in liver, adipose tissue, and skeletal muscle of magnesium-deficient rats (▨) or control rats (□). The copy number of TNF- α was multiplied by 1000 and was expressed as the ratio to that of GAPDH for each sample. Data are expressed as means $\pm$ SEM for 6 rats. *Significantly different from control rats ($P < .01$).

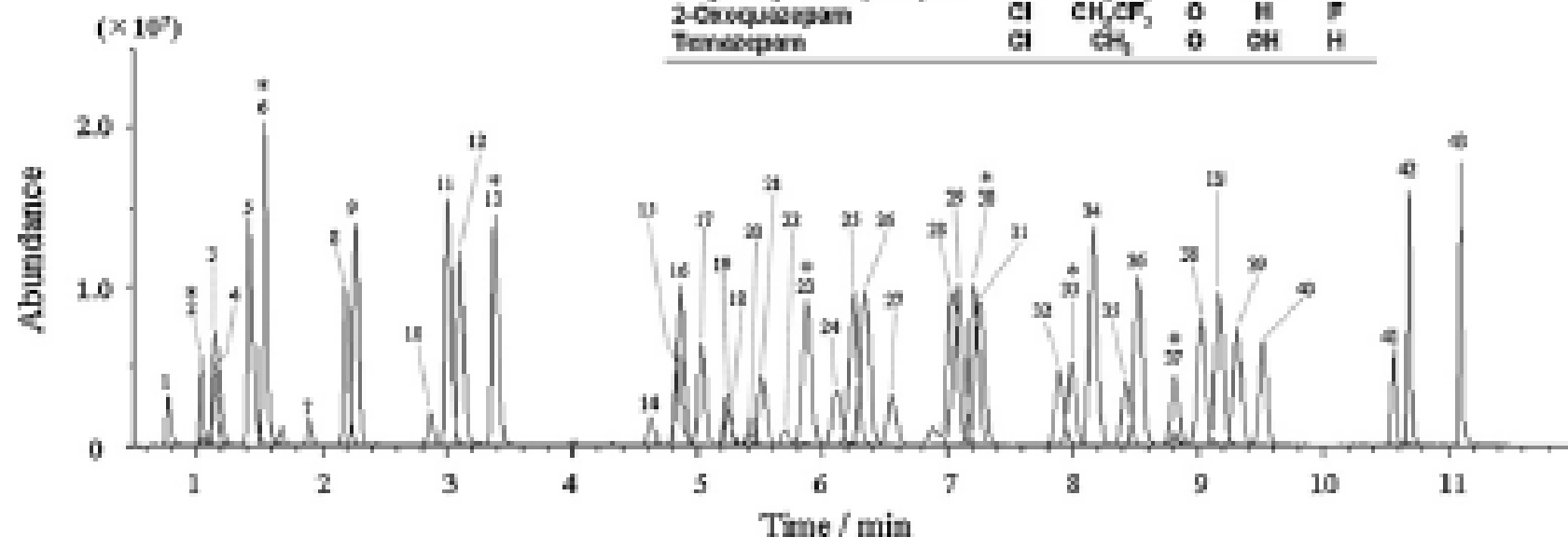
FIGURE 1

Reflux symptom scale using the Gastrointestinal Rating Scale. The reflux symptom decreased significantly from 4.2 at baseline to 1.0 in week 8 in the esomeprazole group ($*P < 0.001$).

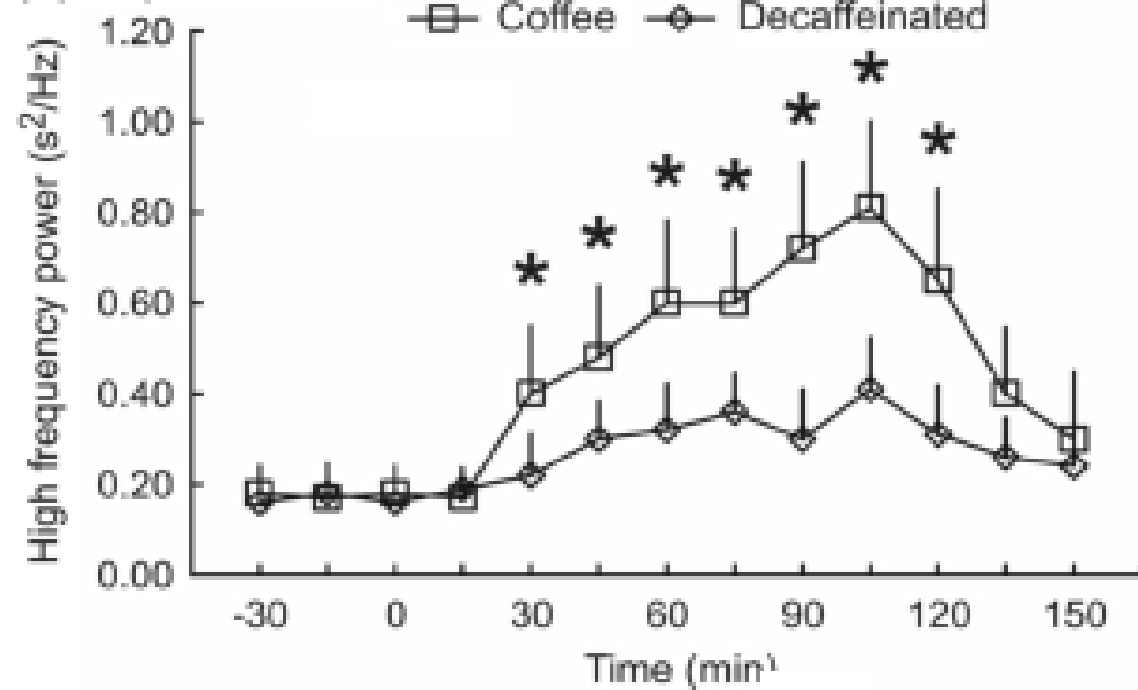




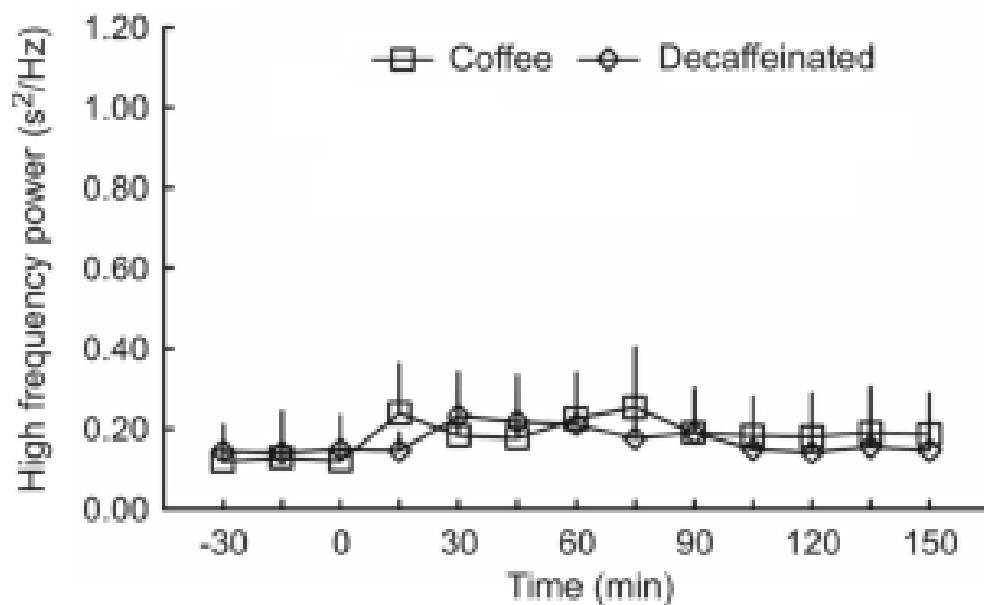
	R ₁	R ₂	R ₃	R ₄	R ₅
Clonazepam	NO ₂	H	O	H	Cl
Diazepam	Cl	CH ₃	O	H	H
Delorazepam	Cl	H	O	H	Cl
Ethyl loflazepate	Cl	H	O	COOC ₂ H ₅	F
Fludiazepam	Cl	CH ₃	O	H	F
Flurazepam	NO ₂	CH ₃	O	H	F
Flurazepam	Cl	C ₂ H ₅ NO ₂ C ₂ H ₅	O	H	F
Lorazepam	Cl	H	O	OH	Cl
Lormetazepam	Cl	CH ₃	O	OH	Cl
Medazepam	Cl	CH ₃	H	H	H
Nimetazepam	NO ₂	CH ₃	O	H	H
Nitrazepam	NO ₂	H	O	H	H
7-Aminoclonazepam	NH ₂	H	O	H	Cl
N-Desmethylnitrazepam	Cl	H	O	H	H
7-Aminoflurazepam	NH ₂	CH ₃	O	H	F
N-Desmethylnitrazepam	NO ₂	H	O	H	F
2-Hydroxyethylflurazepam	Cl	C ₂ H ₅ OH	O	H	F
Desalkylflurazepam	Cl	H	O	H	F
7-Aminonitrazepam	NH ₂	H	O	H	H
Oxazepam	Cl	H	O	OH	H
3-Hydroxy-5-oxazepam	Cl	CH ₂ CF ₃	O	OH	F
2-Oxazepam	Cl	CH ₂ CF ₃	O	H	F
Tenazepam	Cl	CH ₃	O	OH	H



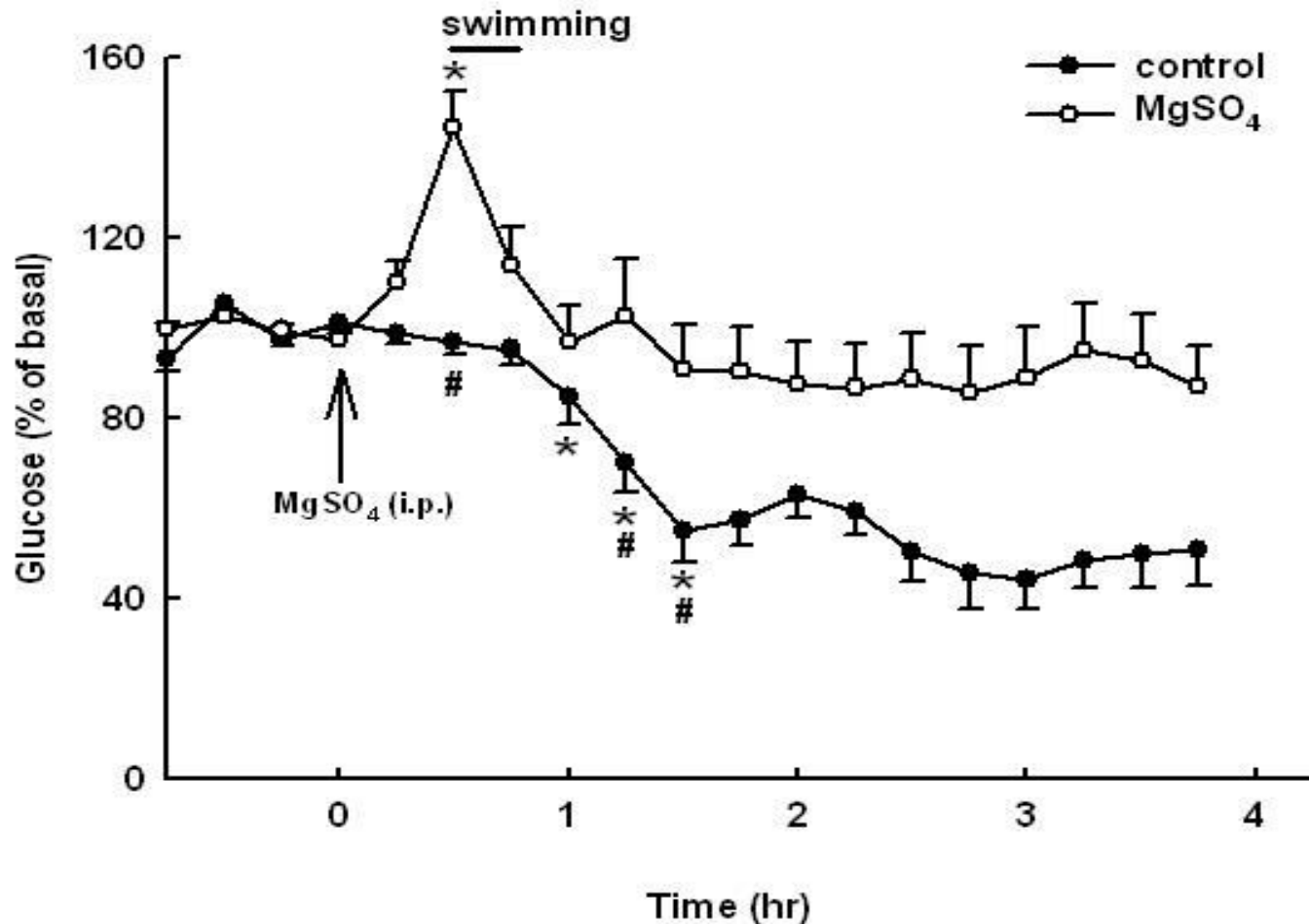
(A) Supine

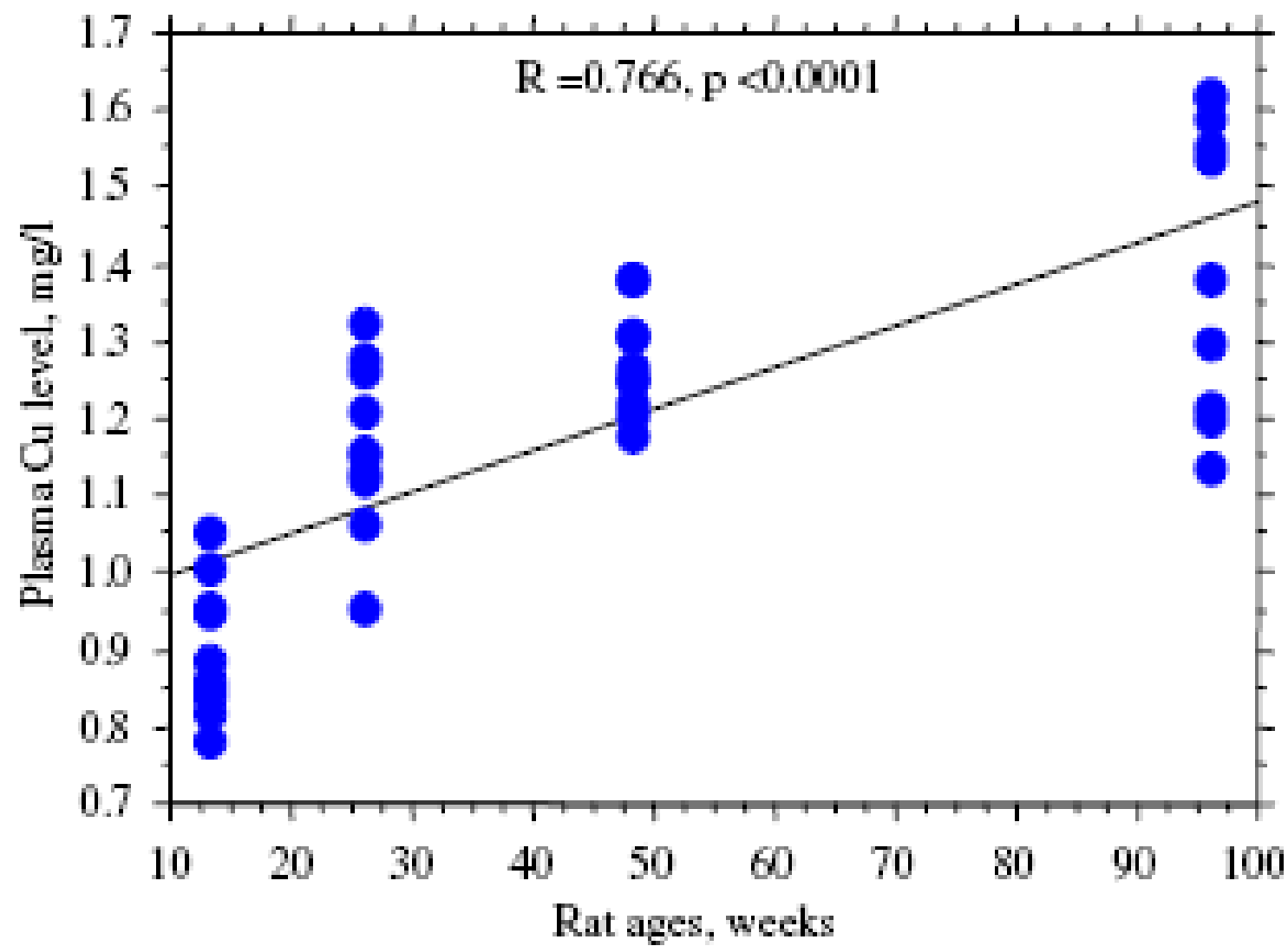


(B) Seated

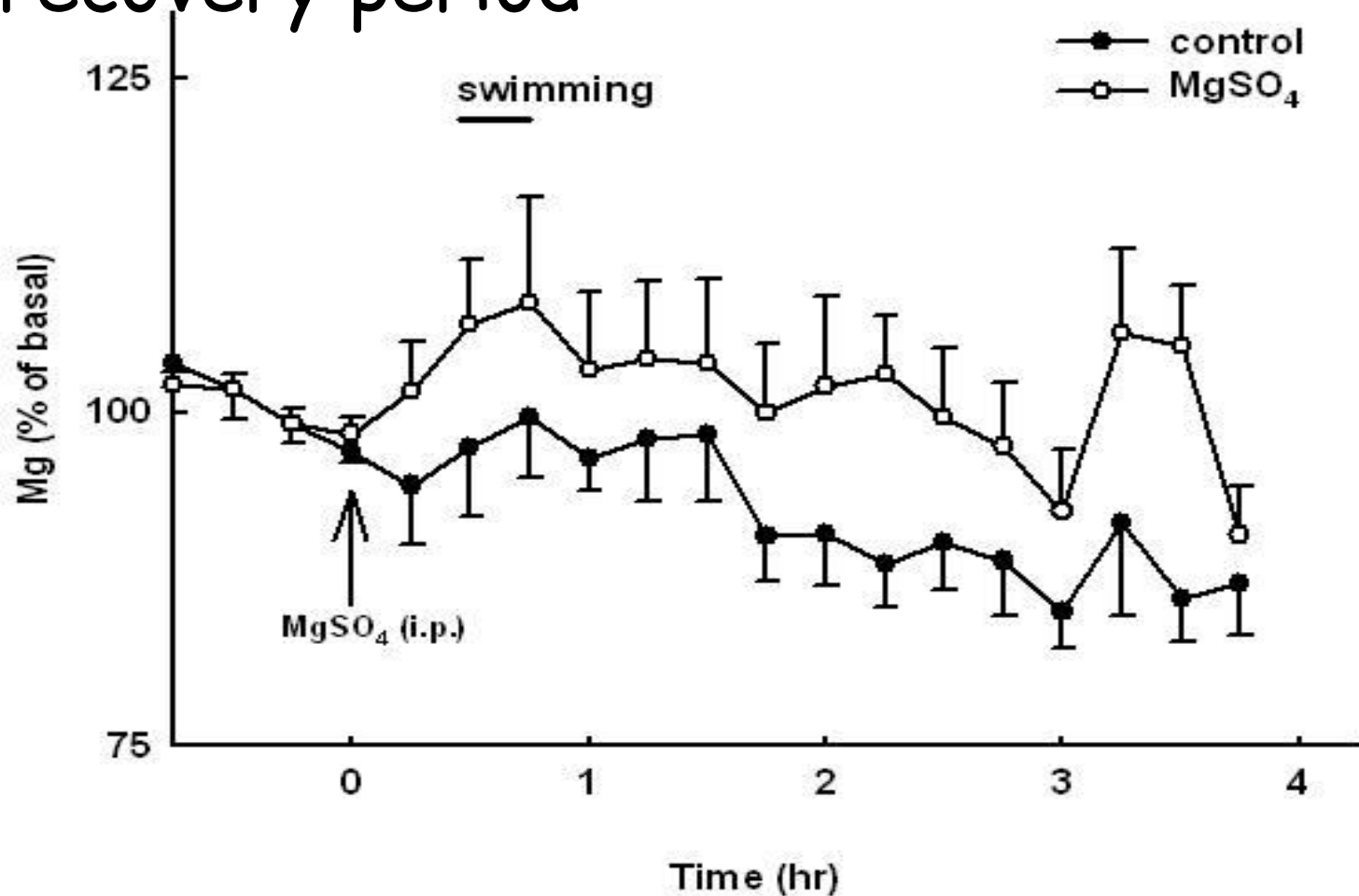


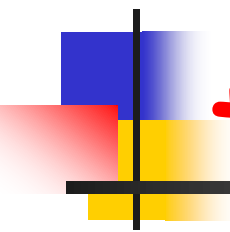
Time profiles of the effect of magnesium sulfate on the changes in glucose levels at rest, during swimming and in the recovery period.



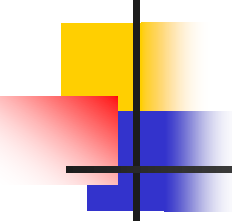


Time profiles of the effect of magnesium sulfate on the changes in magnesium levels at rest, during swimming and in the recovery period





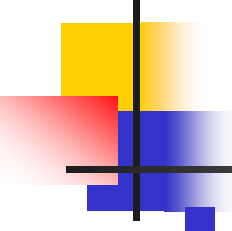
A modelling approach to
traffic management and CO
exposure during peak hour



A modelling approach to traffic management and CO exposure during peak hour

- Data obtained in previous studies using a fixed on-site monitor indicated that travel **by car** resulted in low **CO** exposure than travel **on foot**.
- According to Figo (12), the median exposure of car passengers was **11%** lower than for those walking.

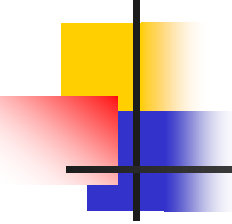
1. Overview of results



A modelling approach to traffic management and CO exposure during peak hour

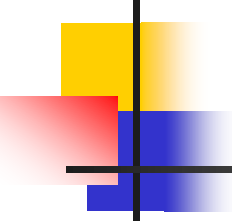
- In our study, modelled emission rates were obtained using **Traffic Emission Model (TEM)**, a CO-exposure modelling framework developed by Ka (10).
- Modelled results were compared with actual roadside CO concentrations **measured hourly at a fixed monitor**.

1. Overview of results



Overview of results

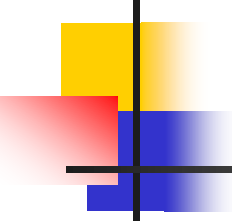
- In our studies attempts were made to establish degradation rate constant by..
- As mentioned previously, the aim of the tests was to construct
- It was suggested that the effective stress paths may be ...



A modelling approach to traffic management and CO exposure during peak hour

- Figure 1 shows the results obtained using TEM.
- As can be seen, during morning peak-time journeys the CO concentrations for car passengers were significantly lower than for pedestrians, which is consistent with results obtained in previous studies.

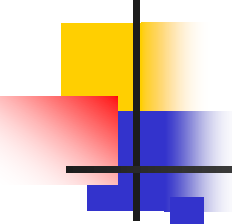
2. Viewing results



A modelling approach to traffic management and CO exposure during peak hour

- However, the modelled data were not consistent with these results for afternoon journeys.
- Although the **mean CO concentrations..were in line** with..
- Although levels for journeys on foot general exceeded...

2. Viewing results

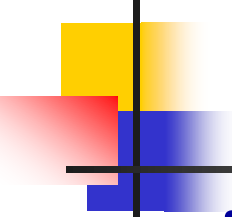


Viewing results

- ..as indicated (shown) in Fig. 1.
- ..as shown in Figure 2.
- .. can be seen from Figure 3.
- ..can be found in Figure 1.
- ..is given in Figure 2.
- In Figure 3 we compare/present
- Comparing Fig. 1 and Fig. 3 shows that..

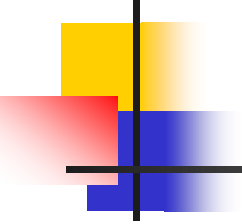
- 
- A quantitative analysis to determine modelling uncertainties was applied, based on the maximum deviation of the **measured and calculated levels** within the considered period.
 - Nevertheless, these results suggest that **data obtained using TEM to simulate CO exposures may provide more sensitive** information for assessing the impact of traffic management strategies than traditional **on-site** measurement...

3. Key results in detailed



Key results in detailed

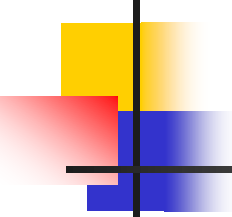
- In the majority of cases, SEM analysis revealed a considerably..
- As can be seen in Figure 1, the higher injection rate gave satisfactory results from all...
- A striking illustration of this can be seen in Figure 1.



A modelling approach to traffic management and CO exposure during peak hour

- Using this approach, the average uncertainty of the model prediction for this study slightly **exceeds the 50% acceptability** limit defined by Jiang (5).

4. Problems with results



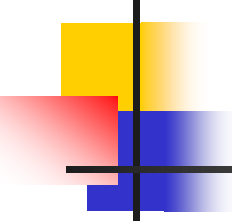
Problems with results

- It could be inferred therefore that may have reacted with..
- The results seems to indicated that...
- It is apparent that this type of errors may be contributed by...
- In future, care should be taken in... (further work is planned..)

Discussion



- Revisiting previous sections summarising **key results**
- **Mapping** (relationship to existing research)
- Achievement/Contribution refining the **implications**
- **Limitations**/current and future work/**applications**



Take home messages

- Introduction (Problems)
- Materials & Methods (Design)
- Results (Core)
- Discussion (Heart)

No short cut!

- Read More?!
- Learn More?!
- Think More!?
- Write More!?

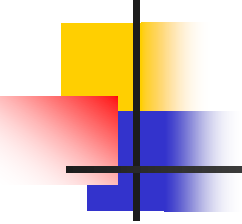




當將你的事交託耶和華，
並倚靠他，他就必成全。

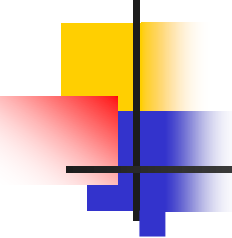
After service
fucheng@vghtc.gov.tw





Conclusion

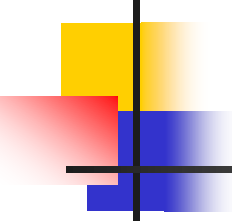
- A default approach is to treat it as **an extended abstract**. But this is also an opportunity to be reflective about what you learned, the uncertainties remaining, the links to other problems, etc.
 - **First paragraph:** focus on what you did. Begin with “We have used...”, “We have investigated...”
 - **Following paragraphs:** one major finding per paragraph. First sentence states the finding, following sentences elaborate.
 - **Final paragraph:** should have some forward-looking perspective. Don't let paper finish on a whimper!



Conclusion

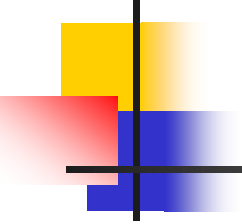
GDNF gene-modified hAFMSCs transplantation to TBI and SNI rats improve motor function.

- These preliminary data suggest that hAFMSCs transfected with the GDNF gene may provide an alternative therapy for the nerve injury.
- Computer aided CatWalk provides static, dynamic and coordination gait analysis.
- The investigation of GDNF protein expression needs to clarify and confirm the optimal GDNF expression time profile and motor function recovery.



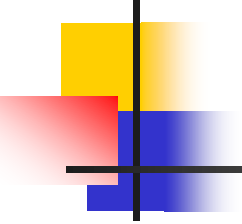
Abstract

- The first section read and sets the tone of the paper for the editor & reviewers
- A condensed version of the manuscript
 - Objective, method and materials
 - Major observations, Result
 - Conclusion
- Conveys only the essential information & Remove extra words and phrases (<160-300 words)



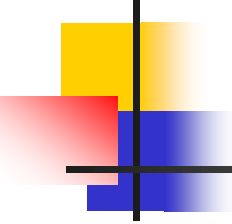
Abstract

- Abstract is of course **the most important part** of the paper - many readers will read **just that**.
- Focus on what is new - **essential ideas**, essential numbers.
- **One fact/idea per sentence**.
Everything that you would like the casual reader to remember should be there.



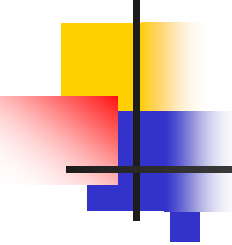
Acknowledgments

- A place to **thank** people who helped with the work but **did not** make **contributions** deserving authorship
- **Permission** should be obtained from people you wish to list
- Sometimes the place where sources of **financial support** are stated



Acknowledgements

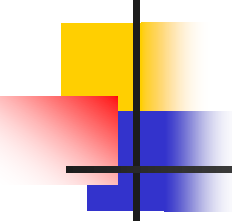
- We **thank** ...(kind supporting or..)
- The study was supported by National Research Council, Taiwan (**NSC-99**-..) and Taichung Veterans General Hospital and Providence University (**TCVGH-PU-99**.....).
- The authors thank Dr. ... and Dr. ... for...



References

■ Functions:

- To give credit
- To add credibility
- To help readers find further information
- Importance of accuracy
- Existence of various reference formats
- Availability of citation management software (EndNote XIV)



References

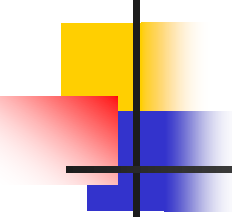
- Extensive literature **review & updated**
- Read **recent** research articles & reviews
- Regarding the **methodologies**, cite original papers
- Match the content **mentioned & discussed** in the text
- Avoid citation of **too many your owns**

Results section



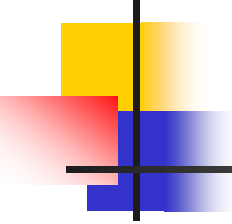
Use section headers descriptive of the science: “Results and discussion” is generally not good. Progress **from general to specific**

- **Start by presenting your results** (Figure X shows...) and then explain what they mean
- Logical – you’ve thought a lot about your results and what they mean, share this progression with reader,
- **Sequence, Frequency, Quantity, Causality**



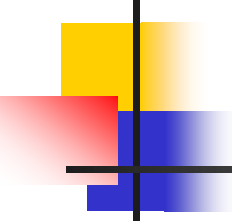
Sequence

- It was apparent that a reduction in temperature would be a desirable outcome.
- **At the beginning** the temperature was stable, as predicted.
- The temperature increased to 49°C and then dropped (**but soon, later**) to 30°C .
- The temperature **dropped sharply when** we reduced the pressure.



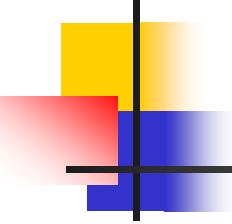
Frequency

- Without exception/Always
- Generally/Normally/Usually
- Frequently/Often/Commonly
- Sometimes/On some occasions
- Rarely/Seldom
- Barely ever/Almost never
- Never/On no occasion



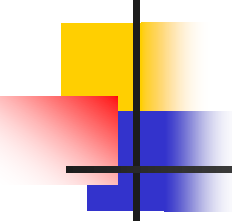
Quantity

- A considerable amount of residue remained in the pipe. (frequently--high)
- Barely 25 % of the residue remained in the pipe. (occasionally--low)
- Almost all/Almost half of the residue remained in the pipe.



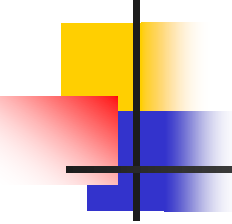
Quantity words

- A great deal, a few, a little,
- Almost, approximately, below,
- Barely, close to, easily, even (higher),
- Far, fewer, hardly, less, marked,
- Most, much, noticeable, over, quite,
- Relatively, Significantly, slight, under,



Size/Quantity

- Increase: Significant, marked, plenty
- Reduce: A few, a little, hardly, only
- Emphasize: Extremely, well, far above
- Similar: Approximately, nearly
- A reluctance to commit oneself: Some, Reasonably, Somewhat, Quite, Moderate



Causality

- It appears that...
- It can be inferred that...
- It may be assumed that...
- There is evidence to indicate that...
- Apparently, there seems to be a tendency to ..
- The evidence suggest that...