Scientific Presentation

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Public speaking with scientific contents

OMG !

Preparing oral scientific presentation

- Know your audience
- Structure your material
- Know your stuff
- Rehearse

Know your audience

First Rule: RESPECT YOUR AUDIENCE

- Formal / Informal approaches ?
  - Graduate seminar vs International conference
  - Oral presentation or Invited lecture
  - **TIME RESTRICTION**
- Who might be attendance ?
  - Farmers vs Graduate students vs Medical doctors
- Additional concerns
  - Room size, light settings
  - Audiovisual equipment settings and requirement
  - Presentation software (version)…compatibility
  - Backup plan

Preparing oral scientific presentation

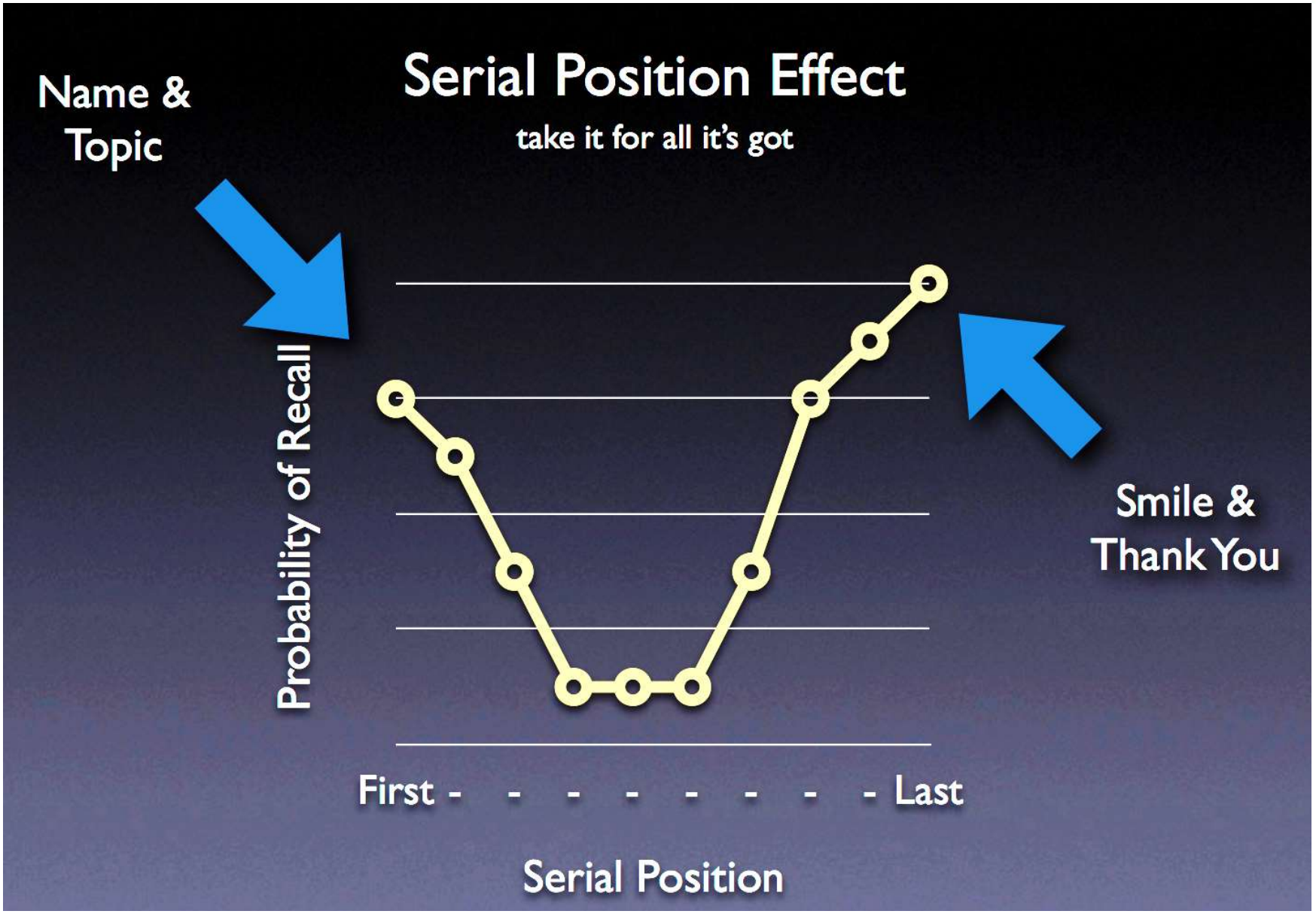
- Know your audience
- **Structure your material**
- Know your stuff
- Rehearse

Structure your material

- Don’t exceed the allotted time
  - prepare for 80% of the allotted time
  - **Rule of thumb: 1-2 min./slide**
  - **For poster: check the layout & format !!**

- **Be FOCUS**
- Tell them…
  - What you are going to tell them (outline)
  - Then tell them (context)
  - Then tell them what you have told them (summary/conclusion)

What do people care ?



Credit: http://justinlmatthews.com/posterhelp/posterguide/

General format of scientific presentation

5	Title	
	Outline/content	
	Introduction	(what's the problem?)
12	Methods	(how did I solve the problem?)
	Results & mini conclusion	(what did I find out?)
	Discussion	(what does it mean?)
3	Summary & General conclusion	(take home message)
	Acknowledgement	(who helped me out?)
20 min		

If you begin with the research question, then please ANSWER your question.

For newcomers….make the plot

- Introduction & Hypothesis/Objective
- Research question 1
  - method >> result >> summary: answer 1
- Research question 2
  - Method >> result >> summary: answer 2
- …
- Re-Summary & discussion
- General conclusion

A case report ?

- Introduction
- Content
  - History, No. of Cases, Exclusion/inclusion criteria etc.
  - Treatment approach(es) and results
  - Statistical tests, if necessary
- Re-Summary & discussion
  - Efficacy, prognosis
  - Cost benefit
- General conclusion (implication for practitioners)

Slide text and layout

Second Rule: Keep it simple

- **Keep it simple and to the point**
  - Avoid abbreviations and complicated sentences
  - One point at a time

- Spend extra time on preparing simple and clean data slides that meticulously labeled and informative.

- Less wordings, more pictures

Presentation tips

- Pay attention on uniformity of text size & color

  Use “Slide Master”
- Avoid too colorful slide background
- No cartoon please

- Get familiar with software tools/animations
- Try animations in complex slides
- Spell check

Choosing FONT matters!

- I am the most boring font in the entire 3 worlds. I am the most boring font in the entire 3 worlds. I am the most boring font in the entire 3 worlds.

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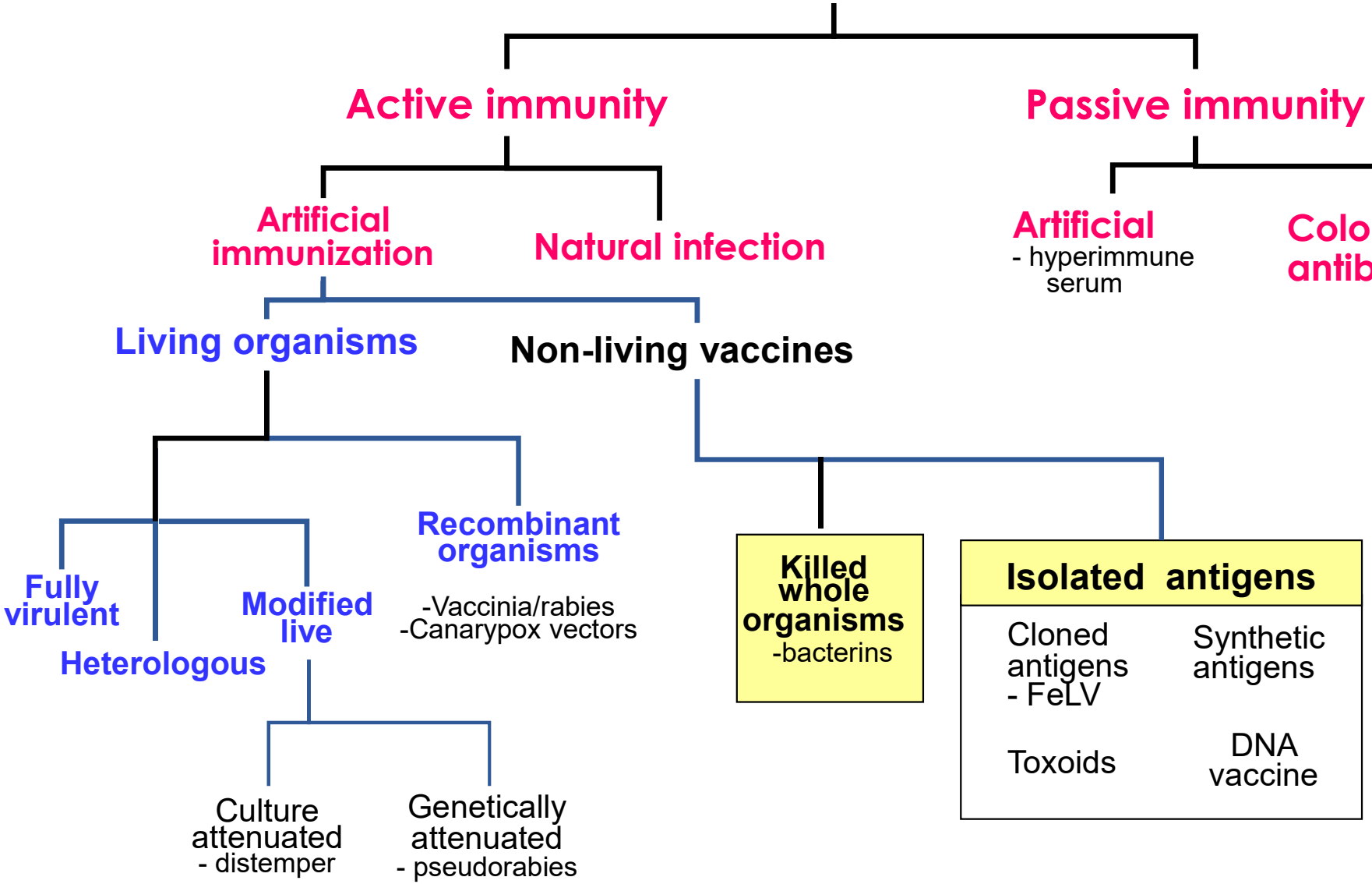
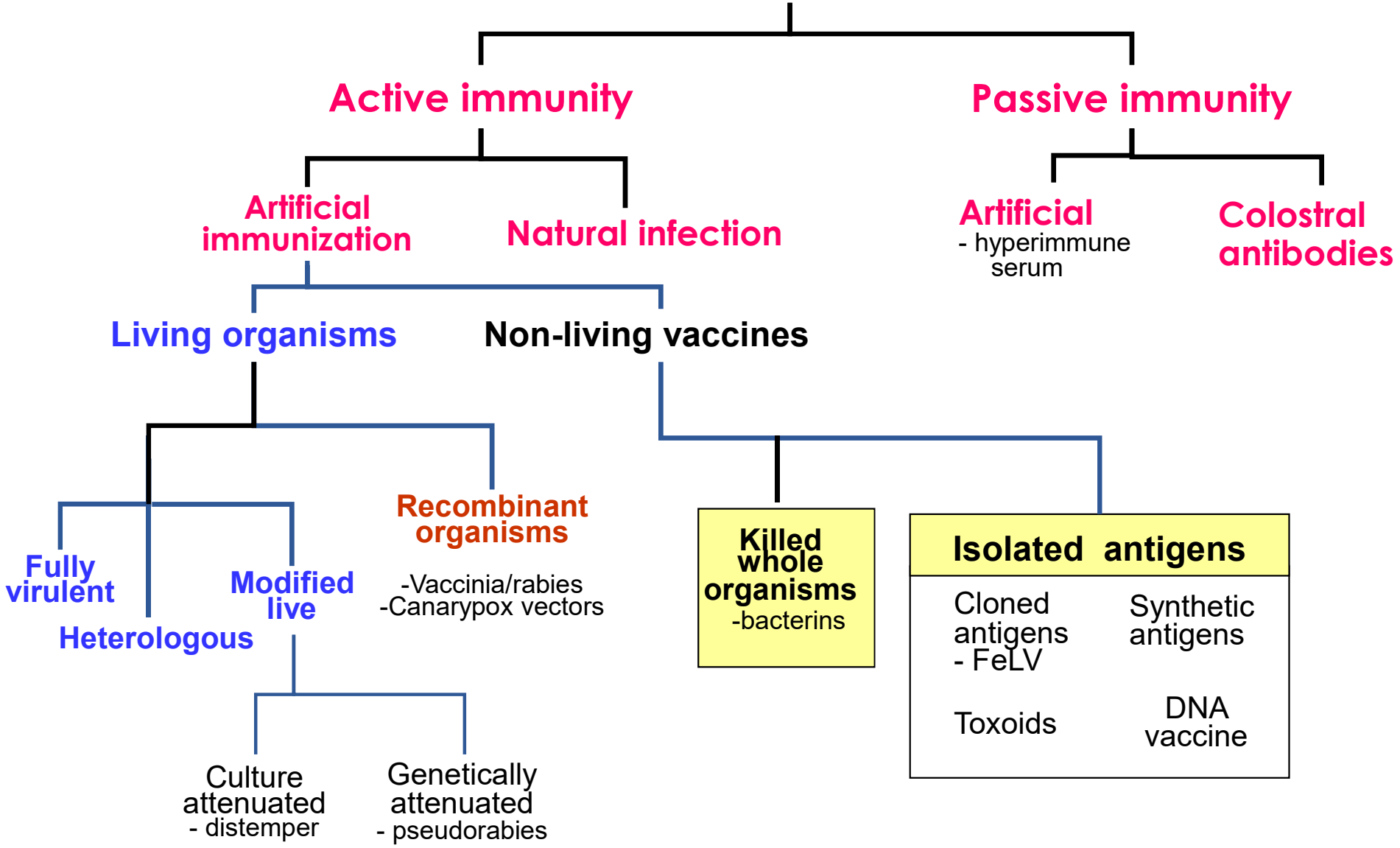
Type of immunization procedures



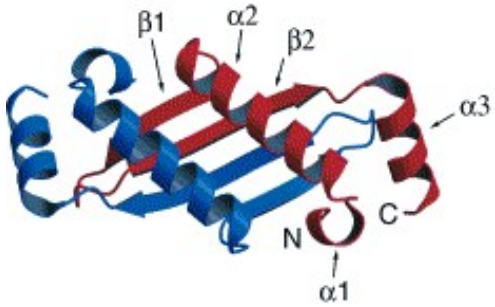
Adapted from Tizards, 2004

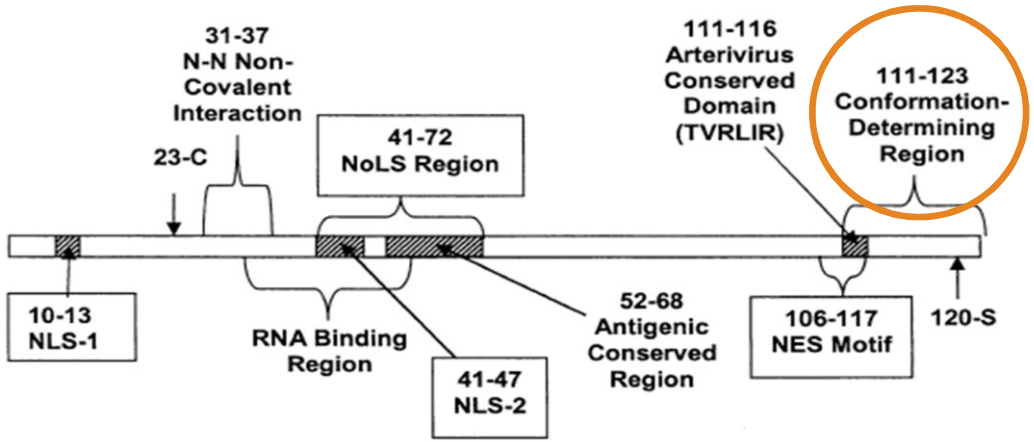
Type of immunization procedures



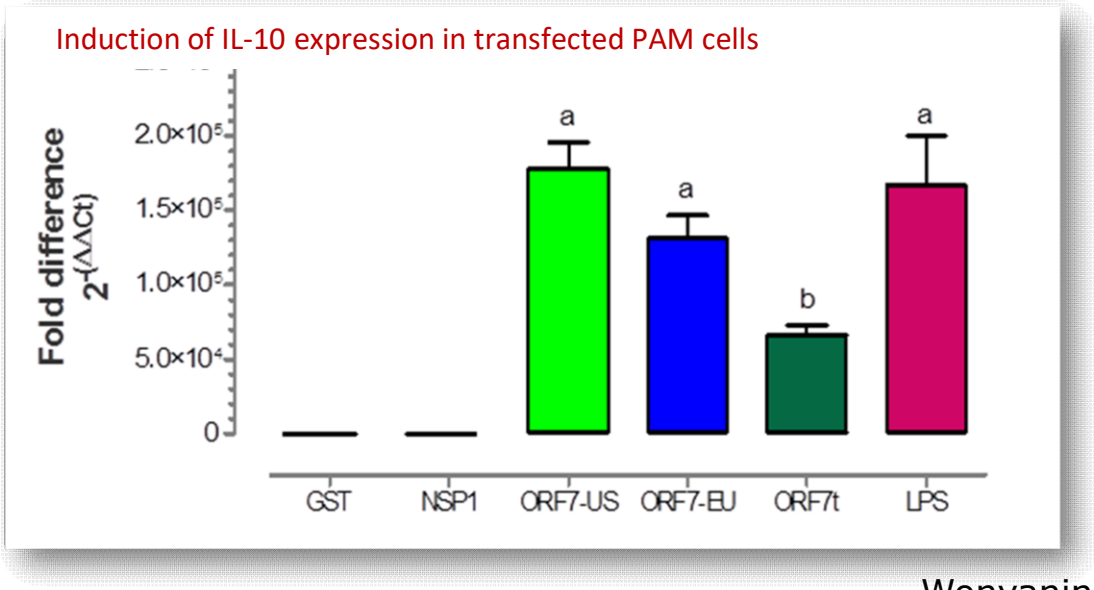
Adapted from Tizards, 2004

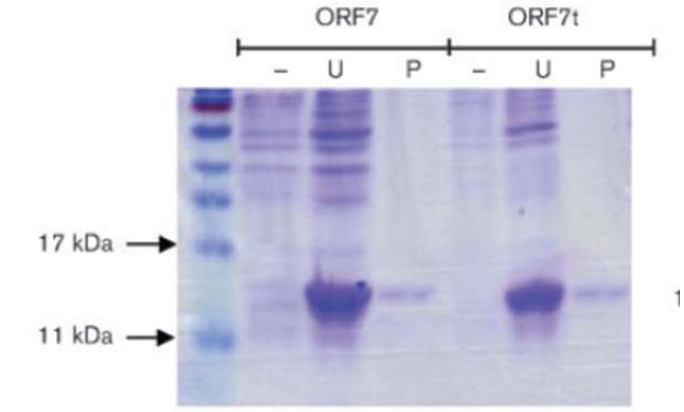
PRRSV-N protein

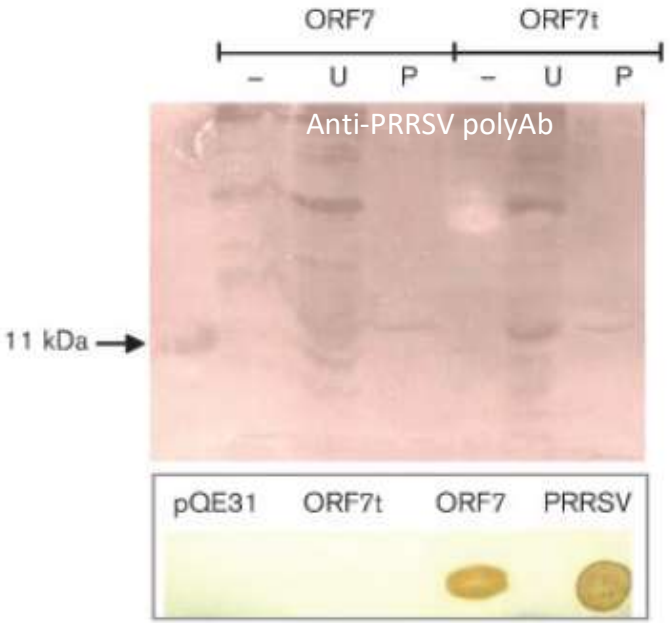




Rowland and Yoo. 2003.Virus Res. 95: 23-33.





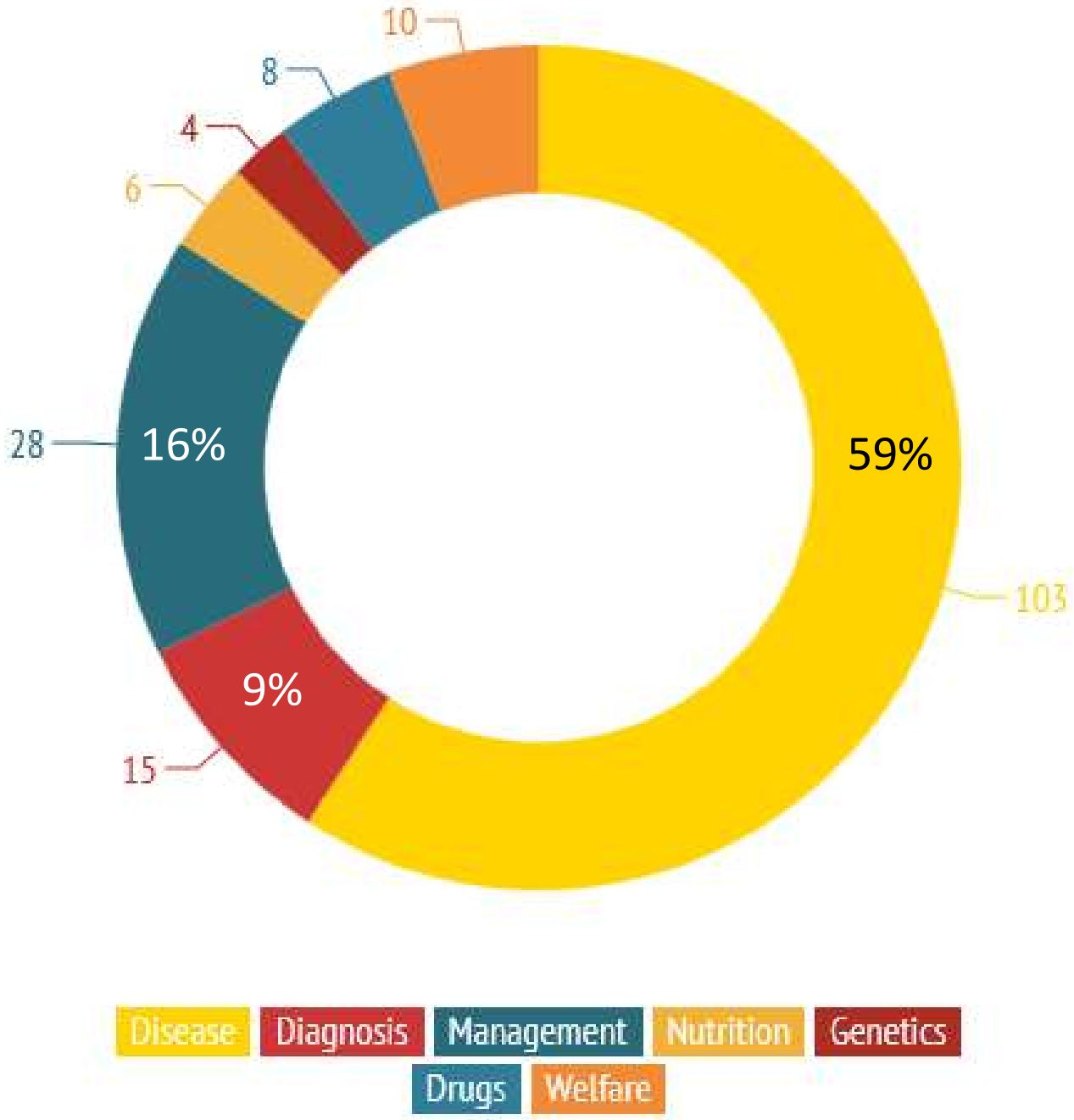


mAb SDOW17

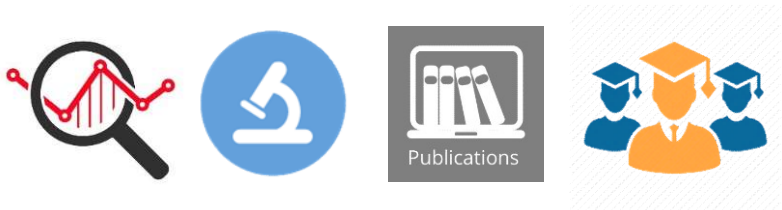
Wonyanin et al., 2012. J. Gen. Virol. 93:1236-1246.

AASV 2014

Disease	103
Diagnosis	15
Management	28
Nutrition	6
Genetics	4
Drugs	8
Welfare	10
Total	**174**



Outputs / Outcomes



Output

- Broaden veterinary pathogen collection and database
- Diagnostic protocols and services
- Research /publications
- Training

Outcome

- National/Regional references
- Efficient veterinary diagnostic services
- Academic/Research resources
- Networking: TNCC, TBRC etc.

TNCC: Thailand Network on Culture Collection
TBRC: Thailand Bioresource Research Center

Commercially available WNV vaccines

Table 1
West Nile virus vaccines and candidate vaccines [137]

Vaccine designation	Type	Viral antigen(s)	State of development	Immunization (% seroconversion or protection)	Reference	Result in other species
Innovator™	Formalin inactived vaccine + adjuvant	Whole virus	Commercialized in the USA for horses	- 2 injections + annual boosts = 94% protection	Ng et al. [111] www.equinewestnile.com	No immunogenicity in certain bird species tested [123]
WNV-isr98	Formaldehyde-inactivated + adjuvant	Whole virus	Used in Israel to protect geese since 2000	- 2 doses = 80–90% protection (for 3 months)	Samina et al. [120] Malkinson et al. [119]	Not tested
WNV-25 (25A)	Attenuated live WNV variants	Whole virus	Used in Israel to protect geese	- 1 injection = protection of geese	Lustig et al. [118]	Not tested
WNV-1415	Attenuated WNV isolate (lineage 2)	Whole virus	Evaluated in mice	- 1 injection low dose = protection - 1 injection high dose = mortality	Yamshchikof et al. [138]	Not tested
rE-WNV	Recombinant E protein + adjuvant (recombinant sub-unit vaccine)	Truncated E (drosophila cells)	Evaluated in mice and horses	- 2 injections = 100% protection in mice - 2 injections = 100% seroconversion in horses	Ledizet et al. [127]	Not tested
VLP (Virus-like particles)	Recombinant proteins + adjuvant	prM/E (insect cells)	Evaluated in mice	- 4 injections = 100% protection in mice	Qiao et al. [129]	Not tested
ADN-prM-E	Recombinant plasmidic DNA	prM/E	- Licenced in the USA for horses (July 2005) - Clinical trials in humans	- 1 injection = 100% protection in mice and horses	Davis et al. [61]	Fish crows (mortality but not viremia) [124]
Chimerivax-WNV	Live attenuated recombinant 17D-Yellow Fever vaccine strain	WN-prM/E substituted to YF-prM/E genes	- Preclinical tests in monkeys achieved - Clinical trials undergoing (phase I human clinical trials achieved)	- 21 days after a single dose = high titers in all humans subjects + induction of CD4+ and CD8+ T cells response after 14–28 days	Arroyo et al. [133] Monath et al. [134] www.acambis.com	No protection of fish crows and chickens [125]
WN-DEN4	Live-attenuated WN-DEN4 chimeric vaccine	WNV-prM/E in dengue- 4 virus backbone	- Preclinical tests in monkeys achieved - Clinical trials (phase I started in 2006)	- 1 injection = moderate to high titer of NAbs in rhesus monkey	Pletnev et al. [136] www.clinicaltrials.gov	Not tested
RecombiTEK	Recombinant replicative canarypox + adjuvant	WN-prM-E	Commercialized in the USA for horses	- 2 injections + annual boosts = 100% seroconversion but <100% protection against viraemia	Minke et al. [114] Siger et al. [110]	Cats and dogs protection [116]
MVSchw-sE_{WNV}	Recombinant live attenuated measle vaccine	WN-prM/E	Evaluated in mice	- 1 injection = high levels of NAbs - 2 injections = 100% protection	Despres et al. [131]	Not tested
TRIP/sE_{WNV}	Recombinant lentivirus	WN-prM/E	Evaluated in mice	- 7 days after single immunization of mice = high NAbs titers + early and long lasting protection	Iglesias et al. [130]	Not tested

prM/E gene: premembrane/envelope gene; NAbs: neutralizing antibodies; =: induced.

G. Dauphin, S. Zientara / Vaccine 25 (2007) 5563–5576

Commercially available WNV vaccines

Dauphin and Zientara, 2007. Vaccine. 25: 5563-76.

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VLP (Virus-like particles)	Recombinant proteins + adjuvant	prM/E (insect cells)	Evaluated in mice
ADN-prM-E	Recombinant plasmidic DNA	prM/E (VLPs)	-Licenced in the USA for horses (July 2005) - Clinical trial in humans
Chimerivax-WNV	Live attenuated recombinant 17D-Yellow Fever vaccine strain	WN-prM/E substituted to YF-prM/E genes	- Priclinical trial in monkeys achieved - Clinical trials undergoing (phase I human clinical trials achieved)
WN-DEN4	Live-attenuated WN-DEN4 chimeric vaccine	WNV-prM/E in dengue-4 virus backbone	- Priclinical trial in monkeys achieved - Clinical trials (phase I started in 2006)
RecombiTEK	Recombinant replicative canarypox + adjuvant	WN-prM-E	Commercialized in the USA for horses
MVSchw-sEWNV	Recombinant live attenuated measle vaccine	WN-prM/E	Evaluated in mice
TRIP/sEWNV	Recombinant lentivirus	WN-prM/E	Evaluated in mice

prM/E gene: premembrane/envelope gene; NAbs: neutralizing antibodies; =: induced.

Commercially available WNV vaccines

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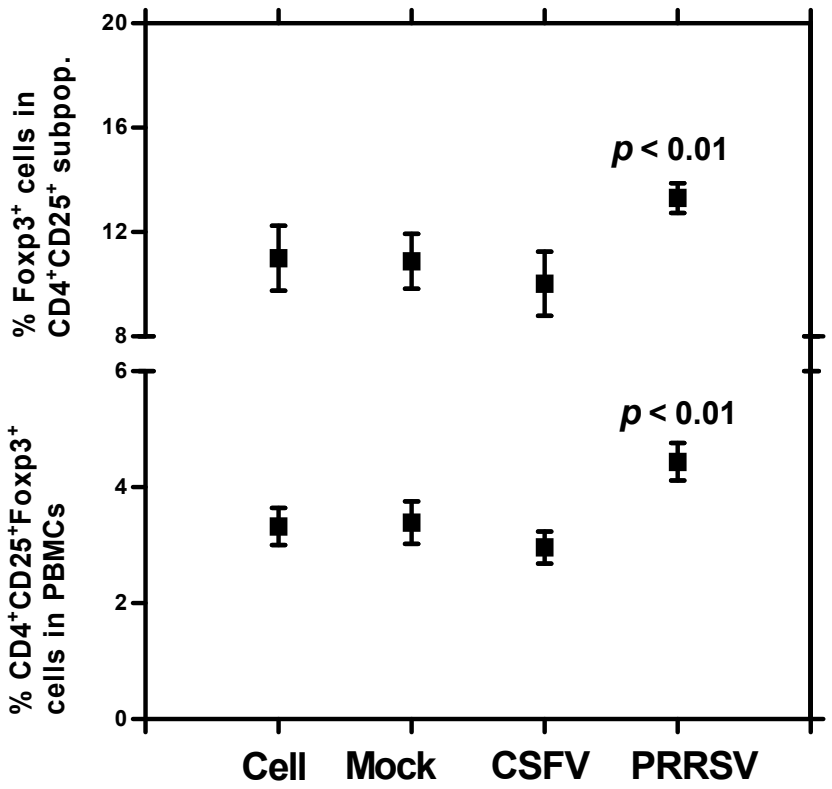
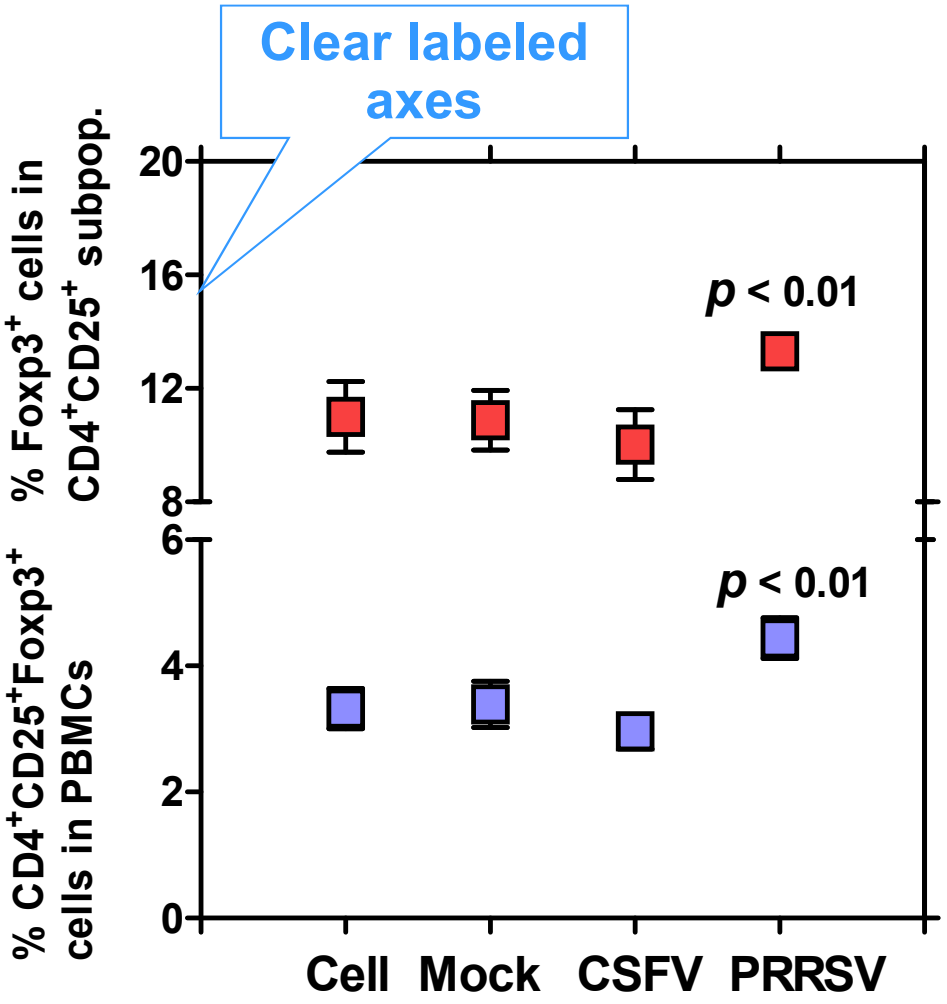
Dauphin and Zientara, 2007. Vaccine. 25: 5563-76.

In vitro effect of PRRSV on porcine Foxp3^{+} cells



Porcine PBMCs were cultured in the presence of indicated antigen for 48 hr, prior to fluorescent labeling.

In vitro effect of PRRSV on porcine Foxp3$^+$ cells



Porcine PBMCs were cultured in the presence of indicated antigen for 48 hr, prior to fluorescent labeling.

PRRSV, but not CSFV, significantly increased the number of Foxp3$^+$CD4$^+$CD25$^+$ subpopulation.

Concise conclusion to be drawn from the figure

Chokeshai-usaha et al., IPVS. 2008.

For Poster

- Check the format (portrait or landscape)/size
- Avoid crowded information, be creative, …not a newspaper !
- Beware of font size !!
- Attractive figures helps
- Prepare for a short summary for the interested audience (not too long please)
  - Why – How – Result - Implication

Discovering protein functional sites with unsupervised techniques

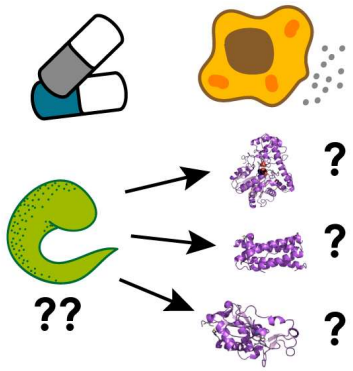
Shirley Wu[1], Russ B. Altman[2]

1 Program in Biomedical Informatics, 2 Department of Bioengineering

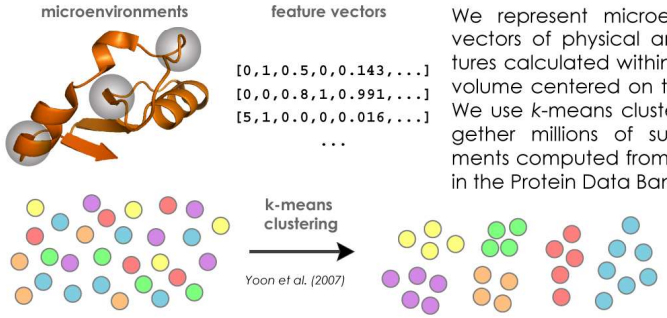
Motivation

Characterizing protein function - for example, what molecules they bind and interact with - is important for understanding biological processes. We can use this knowledge to engineer therapeutics and other beneficial biology.

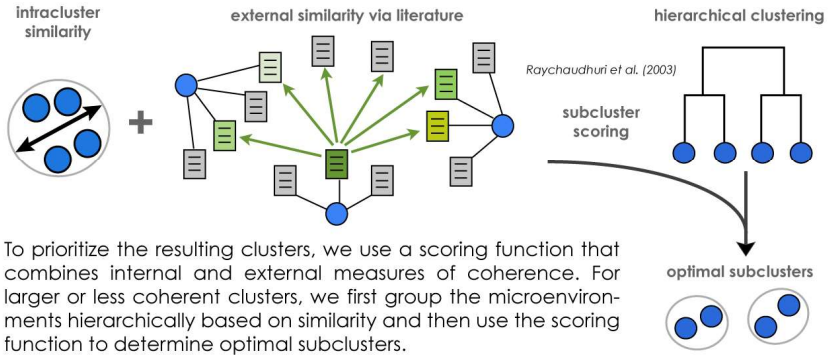
Computational methods are fast and inexpensive, allowing high-throughput prediction of protein function. Most methods are supervised approaches, i.e. they use available data about known proteins and functions to make predictions. Thanks to genomics, researchers are now discovering novel proteins at a tremendous rate. We therefore need methods to identify new functions in proteins as opposed to methods that only recognize known functions.



Methods



We represent microenvironments with vectors of physical and chemical features calculated within a small spherical volume centered on the site of interest. We use *k*-means clustering to group together millions of such microenvironments computed from protein structures in the Protein Data Bank (PDB).



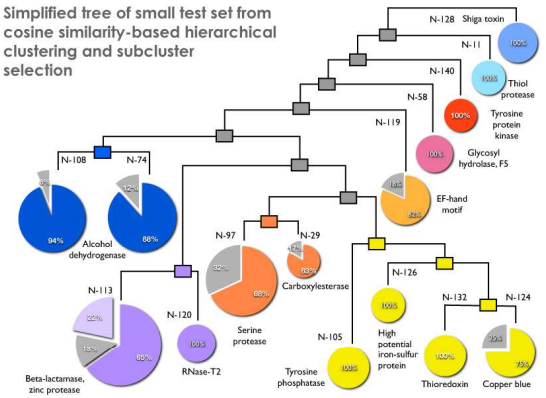
To prioritize the resulting clusters, we use a scoring function that combines internal and external measures of coherence. For larger or less coherent clusters, we first group the microenvironments hierarchically based on similarity and then use the scoring function to determine optimal subclusters.

Evaluation

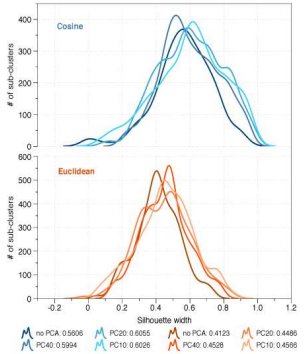
Results from the subcluster selection approach on the small test set seem reasonable. We then evaluated different distance metrics on a larger test set. Cosine similarity produced subclusters with better purity (external coherence) and silhouette values (internal coherence).

Small test set	**Large test set**
~150 vectors	~1400 vectors
15 functions	168 functions

Simplified tree of small test set from cosine similarity-based hierarchical clustering and subcluster selection



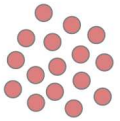
Distribution of silhouette values for large test set



Application

We are currently applying the subcluster selection approach to the whole-PDB *k*-means clustering. We then use a number of term enrichment methods to gain insight into the possible biological role of the microenvironment represented by each candidate subcluster.

Cluster 257: 30 proteins



MeSH terms	**Raw text terms**	*Boyle et al. (2004)* **Gene Ontology terms**
Insulin	structur monomer	hormone activity
Hydrogen Bonding	sequenc c-peptid	glucose metabolic process
Ribosomal Proteins	monomer insulin	receptor binding
Peptides	conform insulin	hexose metabolic process
Pancreas	hexam crystal	insulin receptor binding
Amino Acids	2zn insulin	monosaccharide metabolic process
Chymotrypsin	protein-protein	negative regulation of catabolic process
Electrophoresis	coordin zn	positive regulation of cytokine secretion
Protein Folding	zn atom	insulin-like growth factor binding

Conclusion

We use unsupervised, automated techniques to identify biologically interesting groups of protein microenvironments, creating a potential pipeline for discovering novel functions.

References

Yoon S, Ebert JC, Chung EY, De Micheli G, Altman RB. (2007) BMC Bioinformatics, 8:Suppl 4:S10.
Raychaudhuri S, Chang J, Imam F, Altman RB. (2003) Nucleic Acids Res 31(15):4553-60.
Boyle EI, Weng S, Gollub J, Jin H, Botstein D, Cherry JM, Sherlock G. (2004) Bioinformatics 20(18):3710-5.

Kinetics and mechanisms of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) infection induced Interleukin-1 Receptor Antagonist (IL-1RA) gene expression

Nedumpun, T.[1], Wongyanin, P.[2], Ritprajak, P.[3], Palaga, T.[4] and Suradhat, S.[5*]

[1]Interdisciplinary Program of Medical Microbiology, Graduate School, Chulalongkorn University, Bangkok, Thailand
[2]Department of Medical Technology, Faculty of science and Technology, Bansomdejchaopraya Rajabhat University, Bangkok, Thailand
[3]Department of Microbiology, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand
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*Corresponding author: sanipa.S@chula.ac.th

Introduction

Porcine reproductive and respiratory syndrome virus (PRRSV) causes significant health impact in pigs worldwide. The unique characteristics of PRRSV infection is induction of immunosuppression in both innate and adaptive immune responses (1). Interestingly, PRRSV infection poorly induces pro-inflammatory cytokines such as IL-1 and TNF-α during an early stage of infection (2). In microarray analysis, PRRSV infected porcine monocyte derived dendritic cell (MoDC) drastically upregulated IL-1RA gene expression (unpublished observation). The finding was further confirmed by real-time PCR (3). Interleukin-1 receptor antagonist (IL-1Ra) is known as early anti-inflammatory cytokine that inhibits host immune response mediated via IL-1 receptor (4). This study further explored the kinetics and mechanism of PRRSV-induced IL-1RA gene expression.

Materials and methods

Porcine peripheral blood mononuclear cells (PBMCs) were isolated from PRRSV-seronegative pigs by density gradient centrifugation. Fast monocyte derived dendritic cells (MoDCs) (5) and conventional MoDC (6) were generated by incubation with porcine recombinant IL-4 and GM-CSF (R&D system, Minneapolis, MN, USA) from PBMCs. PBMCs, PBLs, fast MoDCs and conventional MoDCs were used in culture system. PRRSV (strain 01NP1) 0.01 m.o.i., CSFV 0.01 m.o.i., HP-PRRSV (strain 10PL01), swine influenza H1N1 and H3N2 0.01 m.o.i. were used for in vitro activation. Control groups included the cultured with mock or 0.1 μg/ml LPS (SIGMA). Total mRNA was extracted from the cultured cells. The expressions of IL-1RA gene were analyzed by real-time PCR.

Result

In the cultured PBMC, upregulation of IL-1RA gene expression was observed from 3 hrs post-inoculation (PI) (Fig. 1A) and peaked at 12 hrs PI (Fig. 1C). In addition, in vitro culture with PRRSV, but not CSFV or other controls, resulted in prolonged expression of IL-1RA gene up to 24 hrs PI (Fig. 1D).

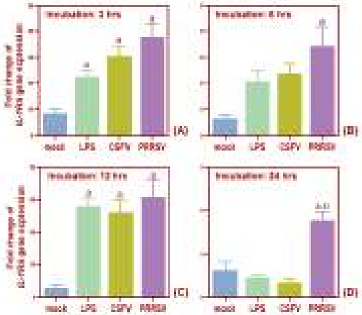


Figure 1 [illegible]

In the MoDC culture system, only PRRSV (01NP1) could enhance IL-1RA gene expression. Interestingly, HP-PRRSV (strain 10PL01) did not upregulate IL-1RA gene expression (Fig. 2).

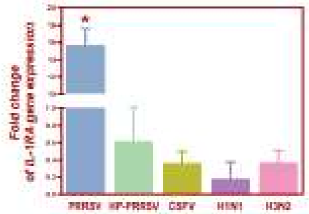


Figure 2 [illegible]

PRRSV-induced upregulation of IL-1RA gene expression was observed in the cultured fast MoDC, conventional MoDC, and PBMC, but not in the PBL population (Fig. 3).

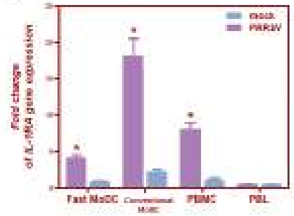


Figure 3 [illegible]

Discussion

IL-1Ra is known as early anti-inflammatory cytokine that inhibit host immune response, mediated through IL-1 receptor (7). IL-1Ra can suppress productions of pro-inflammatory cytokine such as IL-1 and TNF-α from monocytes (8). Therefore, IL-1Ra might play a role in early PRRSV infection, by suppressing production of pro-inflammatory cytokines (IL-1 and TNF-α). This study demonstrated that upregulation of IL-1RA gene expression is unique to PRRSV. Interestingly, the highly virulent HP-PRRSV (strain 10PL01) did not upregulate IL-1RA gene expression. HP-PRRSV causes severe clinical manifestation related to induction of high pro-inflammatory cytokines, including IL-1, IL-6 and TNF-α (9). The severe clinical outcome following HP-PRRSV infection might be related to low level of IL-1RA gene expression during the early stage of infection.

In addition, upregulation of IL-1RA gene was only observed in PRRSV infected MoDC and PBMC, but not in the PBL populations. Our result indicated that dendritic cells and monocyte populations were the major IL-1Ra producers in the culture system. The finding is supported by the fact that dendritic cells and monocyte are known as the major target population of PRRSV (11).

Conclusion

Our findings indicated that PRRSV infection resulted in prolonged upregulation of IL-1RA gene expression in PBMCs. Monocyte/dendritic cell population were the major IL-1Ra producer cells in PRRSV infection. The ability to induce IL-1RA gene expression is unique to PRRSV and may be related to PRRSV pathogenesis and clinical outcomes. Further investigation on the role of IL-1Ra on porcine immune system is currently under investigation.

Reference

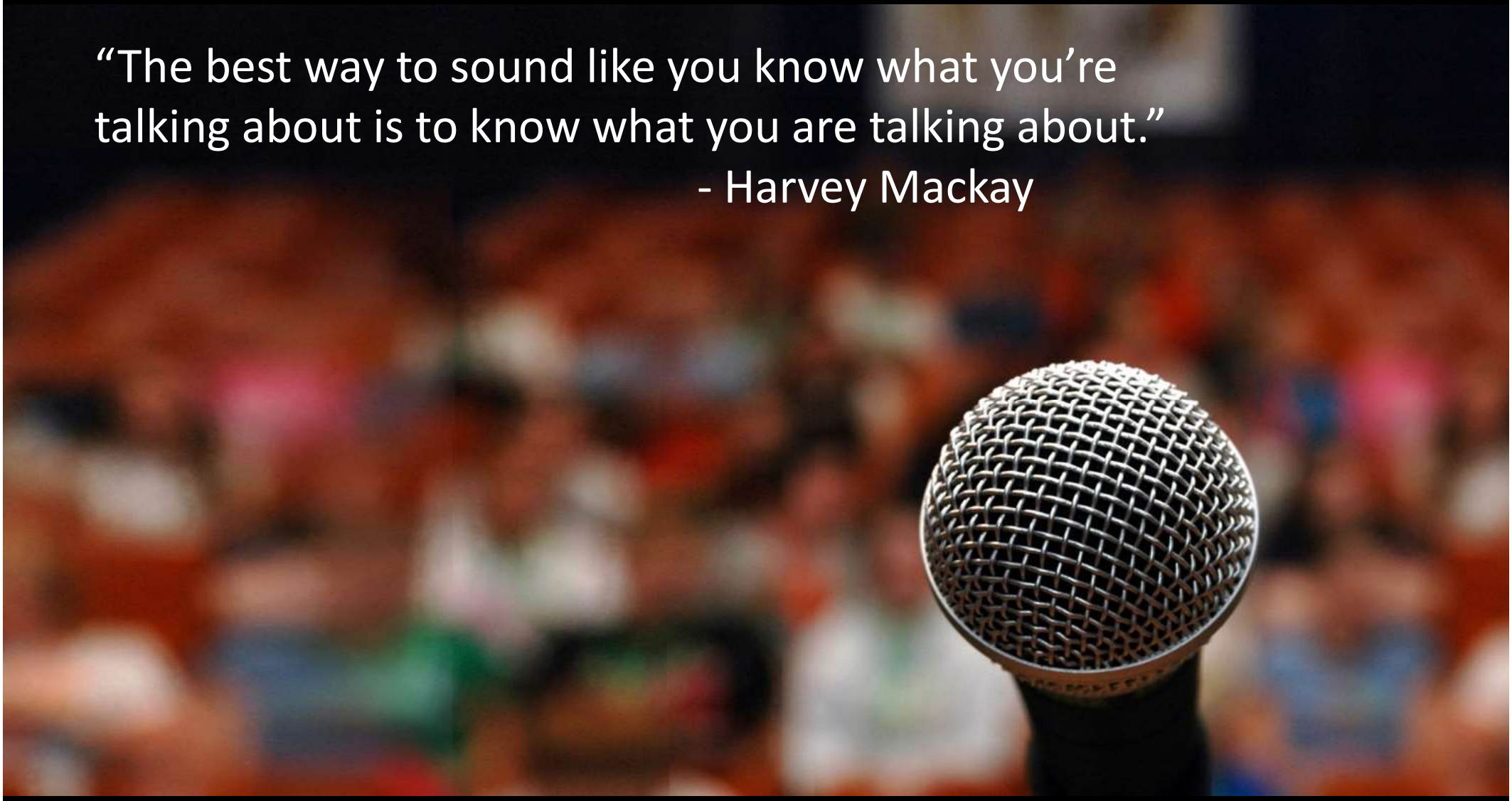
[illegible]

Acknowledgement

This work is supported by World Class University (WCU) project from Office of the Higher Education Commission (OHEC) and Thailand Research Fund ([illegible]). TN is supported by grant Chulalongkorn University Graduate Scholarship to commemorate the 72nd anniversary of His Majesty King Bhumibol Adulyadej.

Preparing oral scientific presentation

- Know your audience
- Structure your material
- **Know your stuff**
- Rehearse


“The best way to sound like you know what you’re talking about is to know what you are talking about.”
- Harvey Mackay

Know your stuff

- Decision to speak or not to speak
- Accurate, complete, well-phrased descriptions of scientific information makes you look good.
- Control your nerves
  - voice control (sound/ speed/ volume/ rhythm)
  - eye contact, postures…don't freeze yourself
- Genuine enthusiasm accounts for 90% of a speaker's success.

Preparing oral scientific presentation

- Know your audience
- Structure your material
- Know your stuff
- **Rehearse**

Rehearse

Third Rule: Practice Practice Practice

- Always rehearse presentation
- Prepare speaker note, use it for practice, but **never read it in your presentation**
- Memorize the first few lines of the talk

- Prepare…then relax
  - Don’t speak too fast
  - Watch your pointer

- Neat & Clean, Dress up please

Answering question

- Be calm…you know the best on your topic

- Wait until the person finishes the sentence
- Repeat the question …think
- Answer briefly and to the point
- Be polite and gracious

Most frequent mistakes in scientific presentations.

- Ugly slides.
- Presentation pace too fast. (Rule: 1-2 minutes per slide)
- Disconnect between Introduction (too general) and data slides (too specific).
- Data slides labeled too sparingly. Data slides overloaded.
- **Does not have a well polished finish slides**.

Preparing scientific presentation

THE 3 RULES

Respect your audience

Keep it simple (and clean)

Practice Practice Practice

- Know your audience
- Structure your material
- Know your stuff
- Rehearse

“Everything should be made as simple as possible, but not simpler.”

Albert Einstein