



qbio
quantitative
biology

QBIO MASTER PROGRAM

quantitative biology in practice

$$\frac{du}{dt} = \frac{\alpha_1}{1 + v^\beta} - u$$

ORAL PRESENTATION

Lab1 Seminar series

27.01.2022

Cherine Bechara

BEFORE STARTING



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- Know your audience

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- Know your allocated time and **strictly** respect it

General rule of thumb: 1 min/slide

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- Focus on the main message

Keep some elements for the questions → Guiding the questions

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- Emphasize both the **motivation** for the work and the **outcome** of it

THE STRUCTURE

GENERAL STRUCTURE

- Cover page
Title, name, affiliation, appropriate logos, event, date
- Acknowledgments
Contributors, affiliation logos, funding logos



Molecular insights into mechanisms of GPCR hijacking by *S. aureus*

When Structural MS meets cell-based Resonance Energy Transfer

Cherine BECHARA

Associate Professor, University of Montpellier
Junior member, Institut Universitaire de France
Cherine.bechara@igf.cnrs.fr

SFB-GEM Meeting 2021
“Biophysics of Membranes and Beyond”
27th-30th September 2021, Online



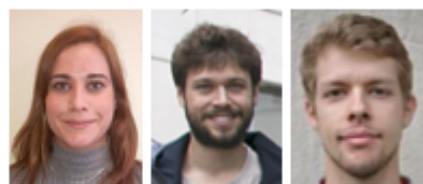
Acknowledgements

Granier-Mouillac Lab

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Alumni

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Fanny Peysson



Arpège Platform IGF

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Damien Maurel
Isabelle Bradet
Claire Vol



FPP IGF

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Oana Vigy
Mathilde Decourcelle
Khadija El Koulali
Séverine Chaumont-Dubel



IMM Marseille

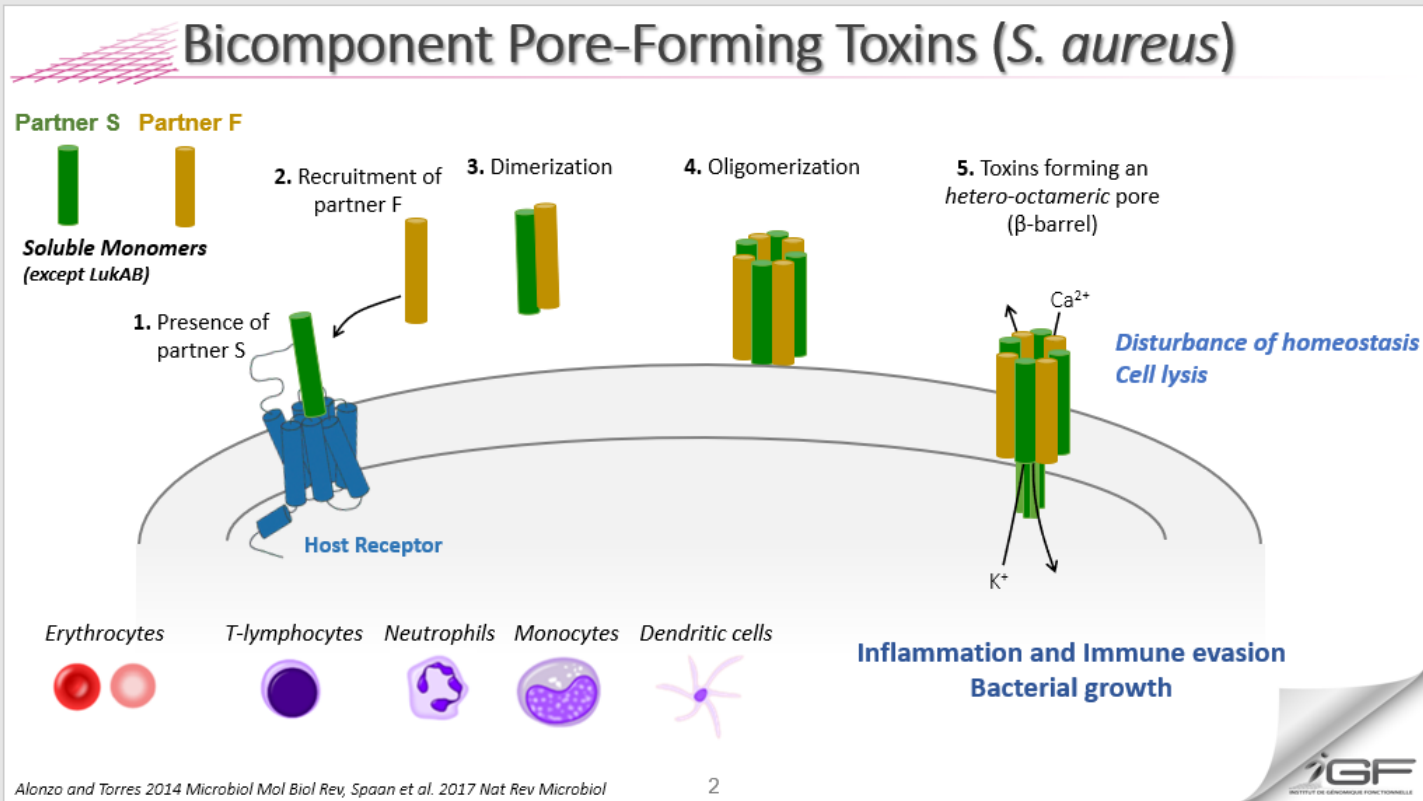
Regine Lebrun
Pascal Mansuelle
Remy Puppo



GENERAL STRUCTURE

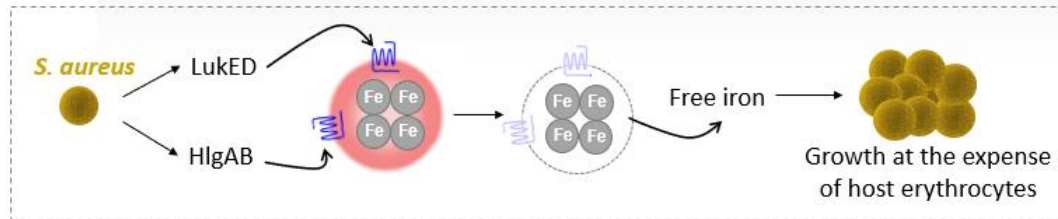
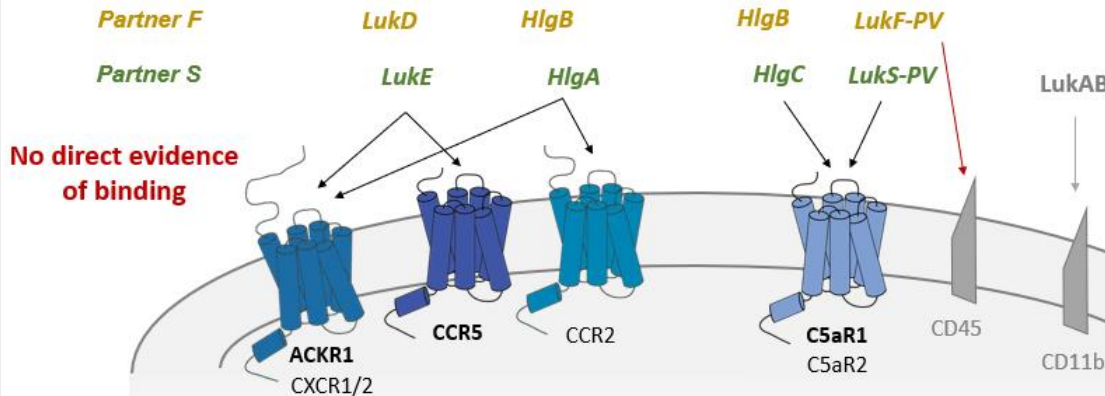
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OPENING



Bicomponent Pore-Forming Toxins (*S. aureus*)

Targeted Host Receptors

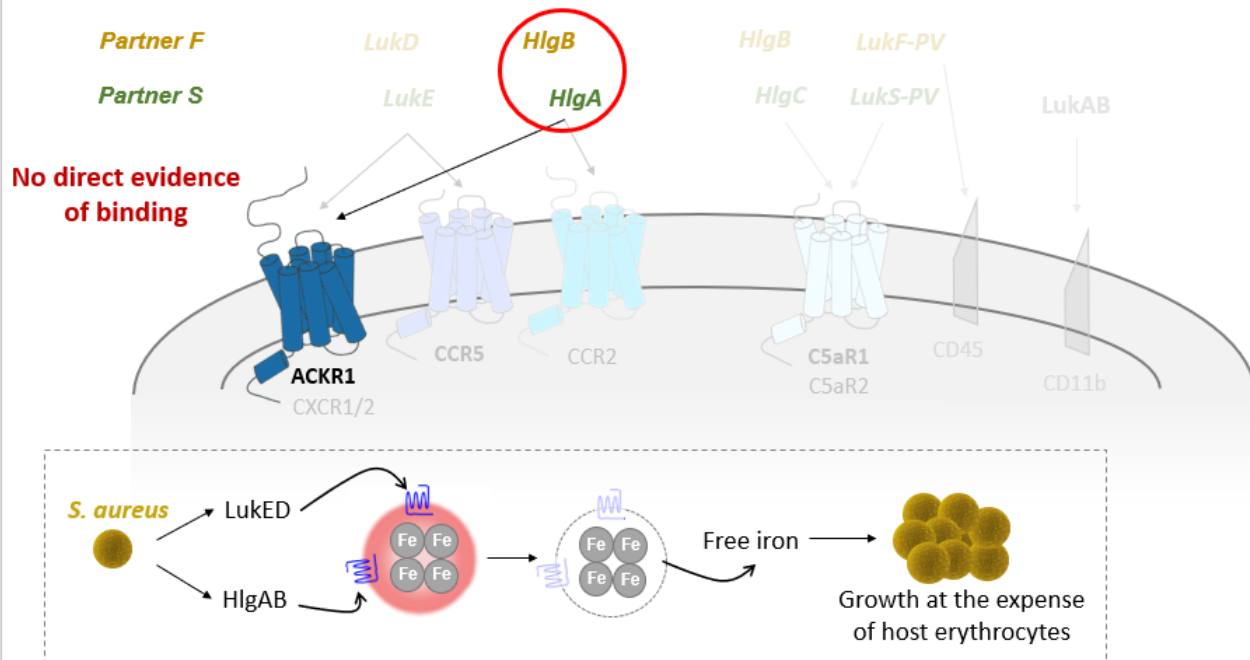


Alonzo and Torres 2014 Microbiol Mol Biol Rev, Spaan et al. 2017 Nat Rev Microbiol

Bicomponent Pore-Forming Toxins (*S. aureus*)

Targeted Host Receptors

Targeted Host Receptors



Spaan 2015 Cell Host Microbes

3

IGF
INSTITUT DE GÉNOMIQUE FONCTIONNELLE

Bicomponent Pore-Forming Toxins (*S. aureus*)

Targeted Host Receptors

Targeted Host Receptors

Leukocidin/ACKR1 Interactions

Atypical Chemokine Receptor 1

Binding a broad
range of chemokines
(CC and CX3C)

**Direct evidence of binding?
Structural determinants?**

**Signalling
pathways**

G proteins

β -arrestins

Internalisation

Mechanism?

Chemokine

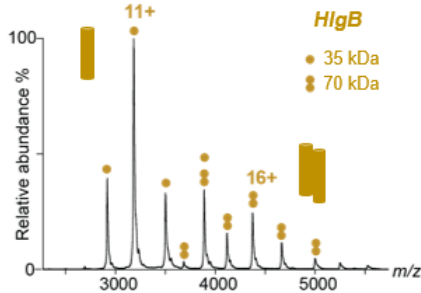
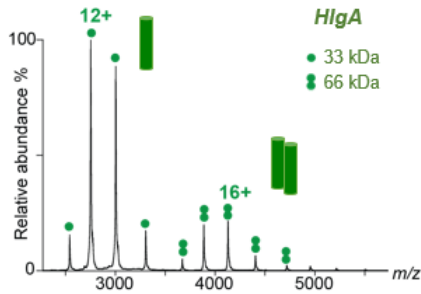
**Partner S
HlgA**

**Partner F
HlgB**

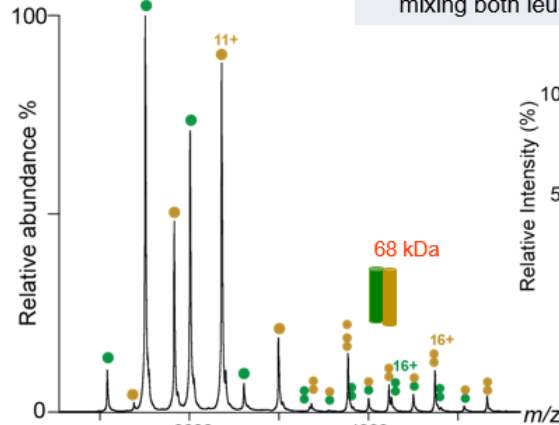
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Subpoints: 2-5 statements to support each main point
Organize main points and subpoints in a logical sequence
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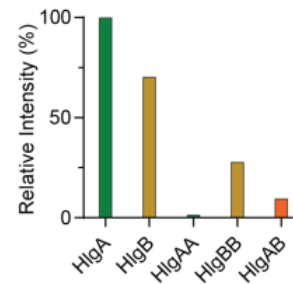
Recombinant Leukocidins: Stoichiometry



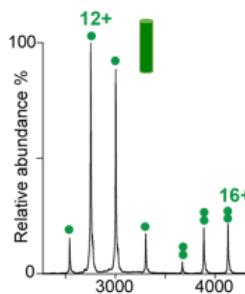
Equimolar Mixture
HlgA + HlgB



- Leukocidins dimerise in solution
- HlgB more prone to dimerization compared to HlgA
- Heterodimers are visible when mixing both leukocidins



Recombinant Leukocidins: Stoichiometry



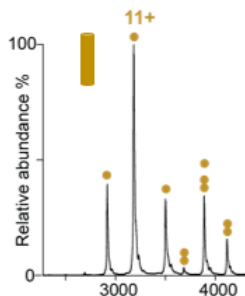
HlgA

• 33 kDa

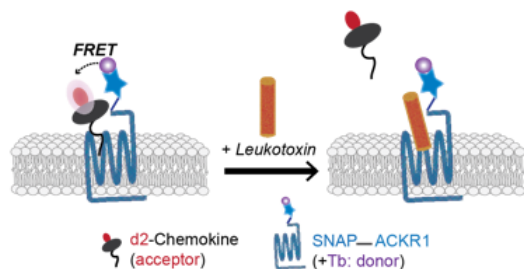
• 66 kDa

Equimolar Mixture
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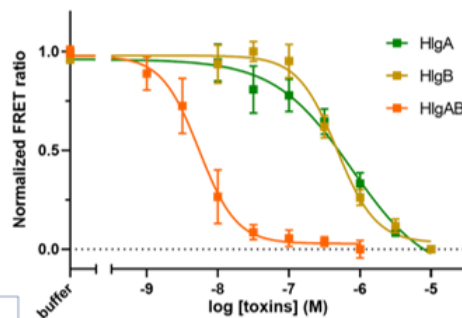
- Leukocidins dimerise in solution
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Competition with natural ligand?



Dose-response: toxins displacement of CCL5

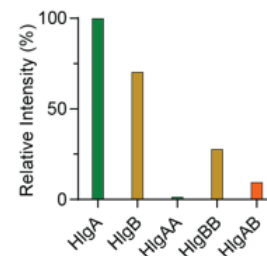


In HEK293T cells

	HlgA	HlgB	HlgA/B
IC ₅₀ (nM)	376 ± 105	577 ± 93	6.2 ± 2.7
Hill Slope	-1.14 ± 0.08	-1.96 ± 0.34	-2.06 ± 0.29

Cooperative binding:

- X HlgA
- ✓ HlgB
- ✓ HlgAB

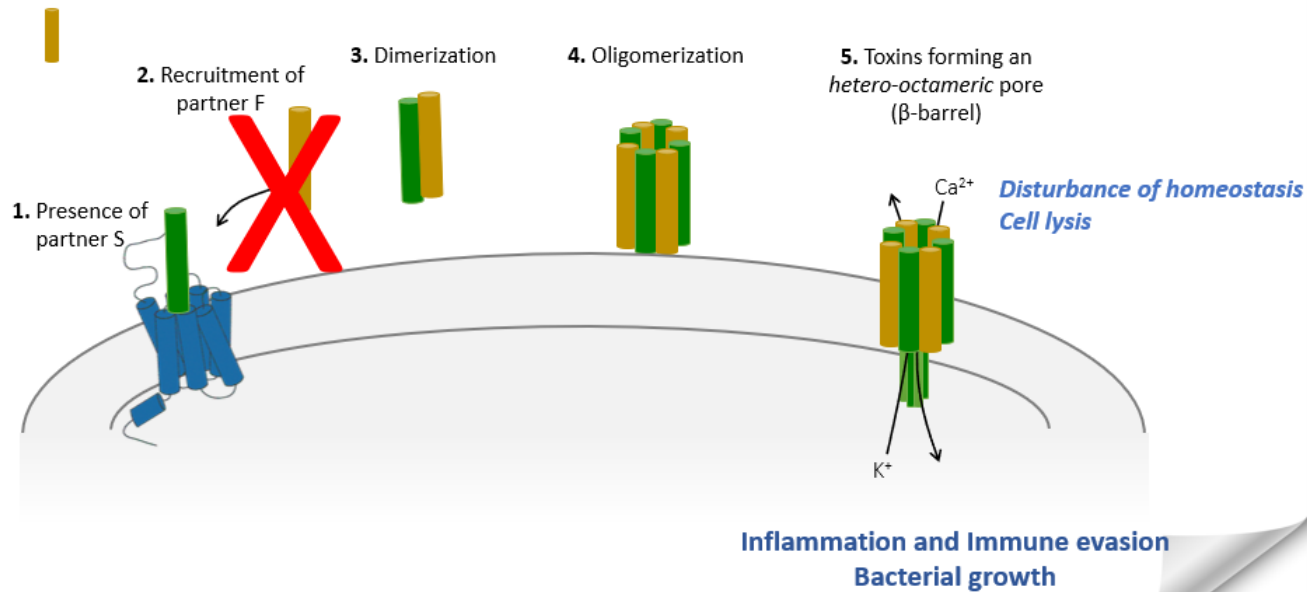


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- **Closing**
Review: main points
Conclusion
- Acknowledgments
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Revisited Mechanism – part 1

Partner S *Soluble Monomers*
Partner F (except LukAB)



Revisited Mechanism – part 1

Partner S Soluble **Monomers**
Partner F (except LukAB)



2.

3. Dimerization

4. Oligomerization

5. Toxins forming an

1. Presence of partner S

Revisited Mechanism – part 1

Partner S
Partner F



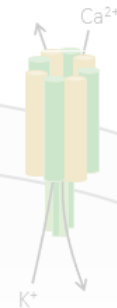
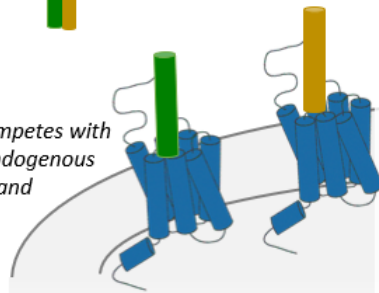
Binding of **both** toxins to ACKR1 **independently**

3. Dimerization

4. Oligomerization

5. Toxins forming an hetero-octameric pore (β-barrel)

Binding competes with ACKR1 endogenous ligand



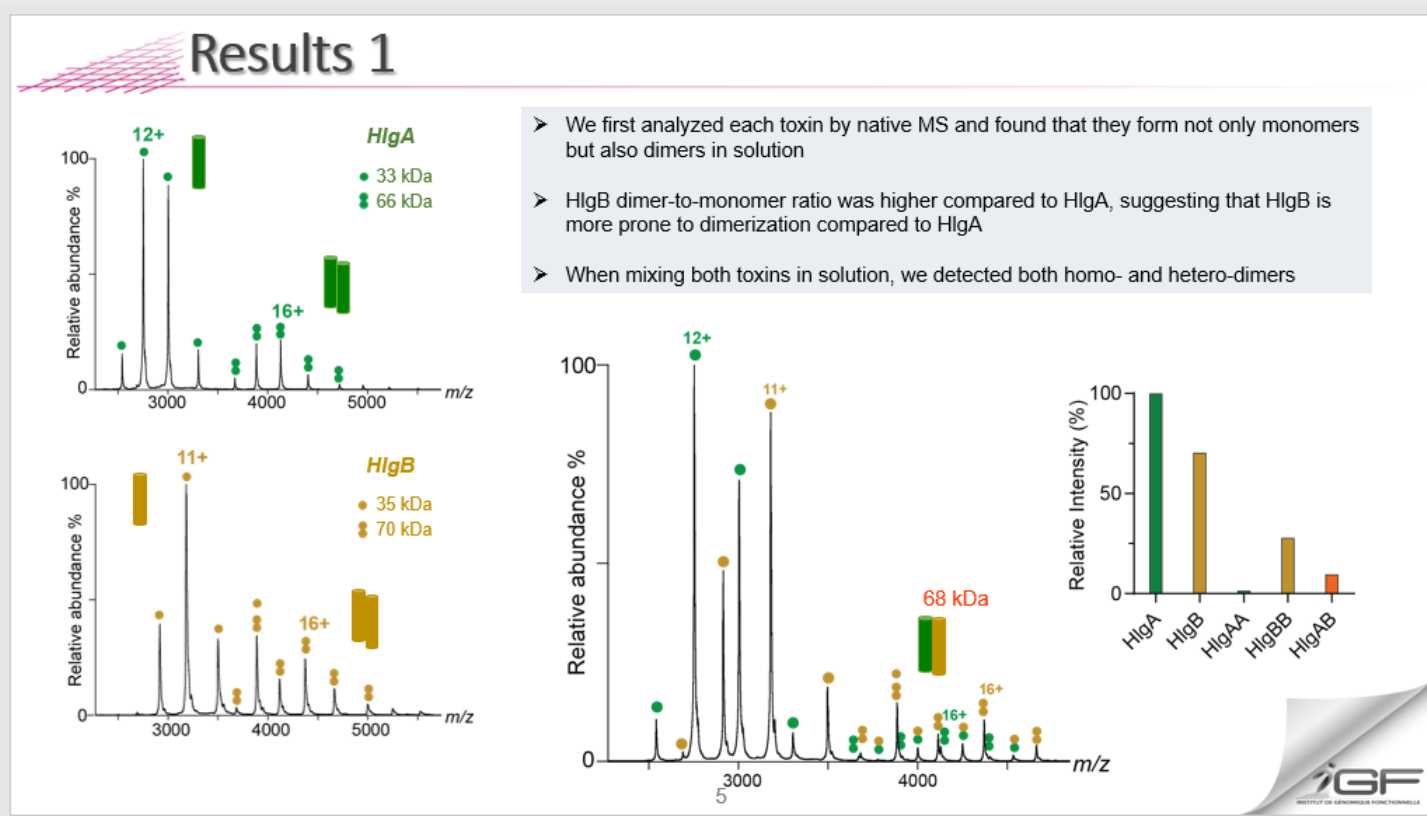
Disturbance of homeostasis
Cell lysis

Inflammation and Immune evasion
Bacterial growth

10

THE FORM

TIPS FOR PREPARING YOUR SLIDES

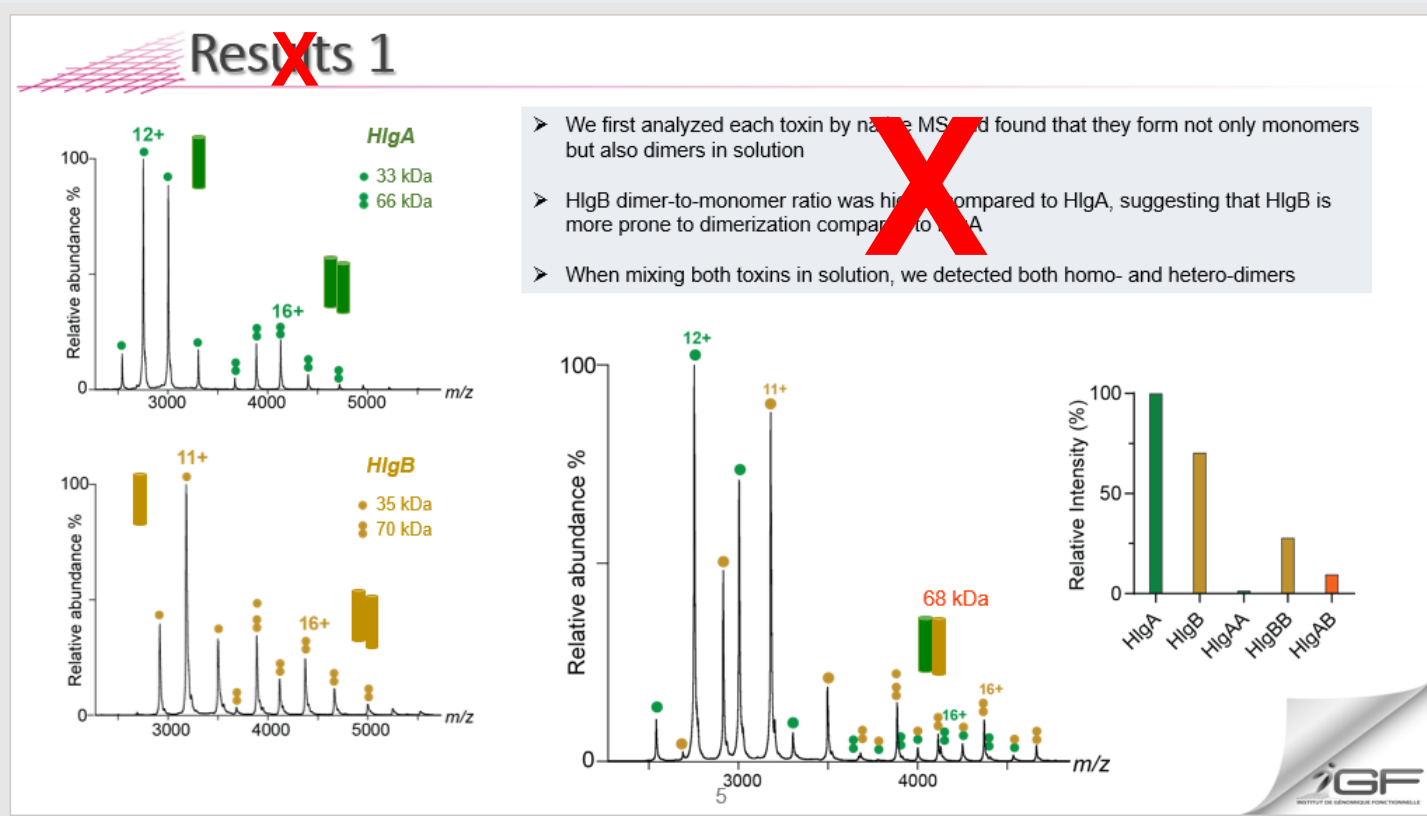


TIPS FOR PREPARING YOUR SLIDES

- Never use long sentences/never read-out from your slides

Write simple message/bullet points to consolidate the main information

- Slide title = conclusion/aim of the presented data

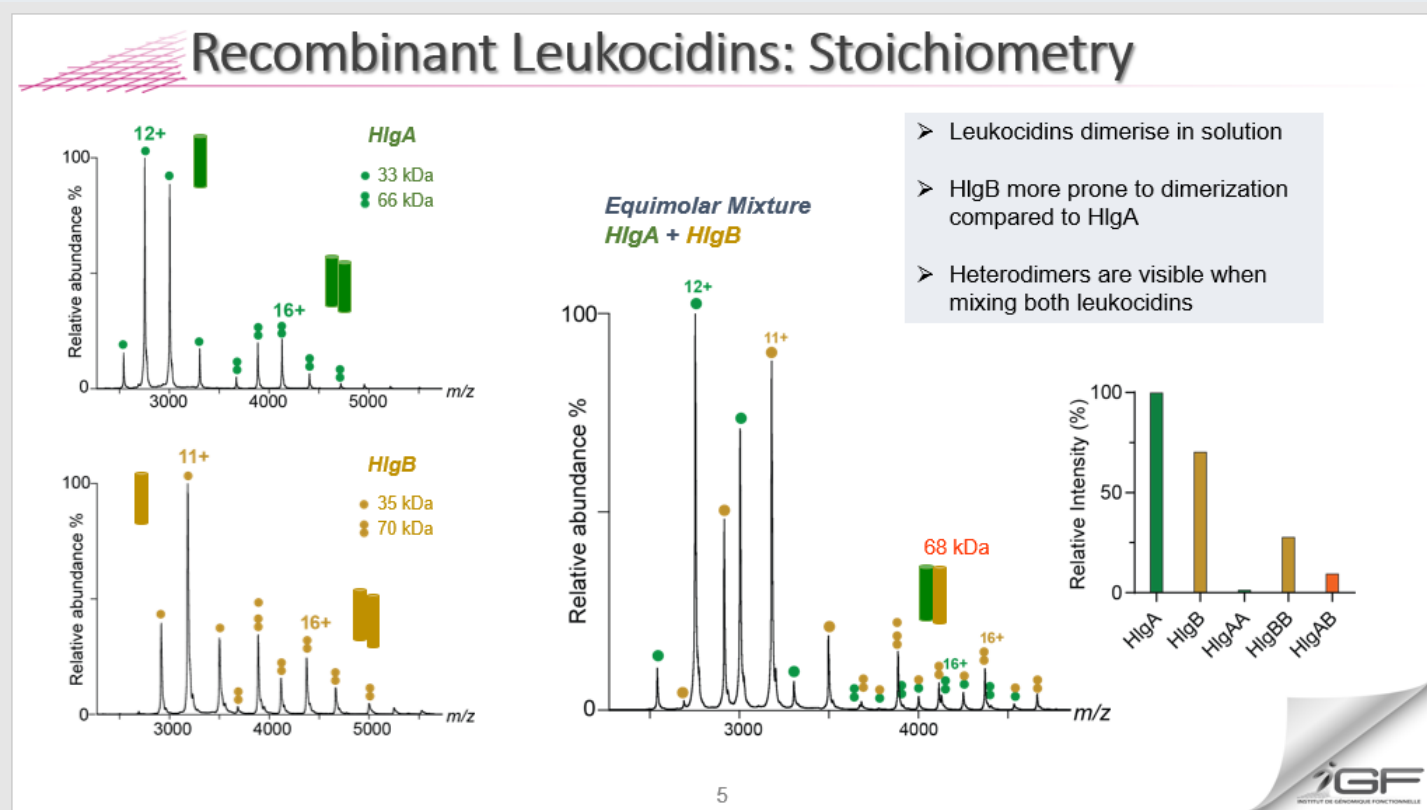


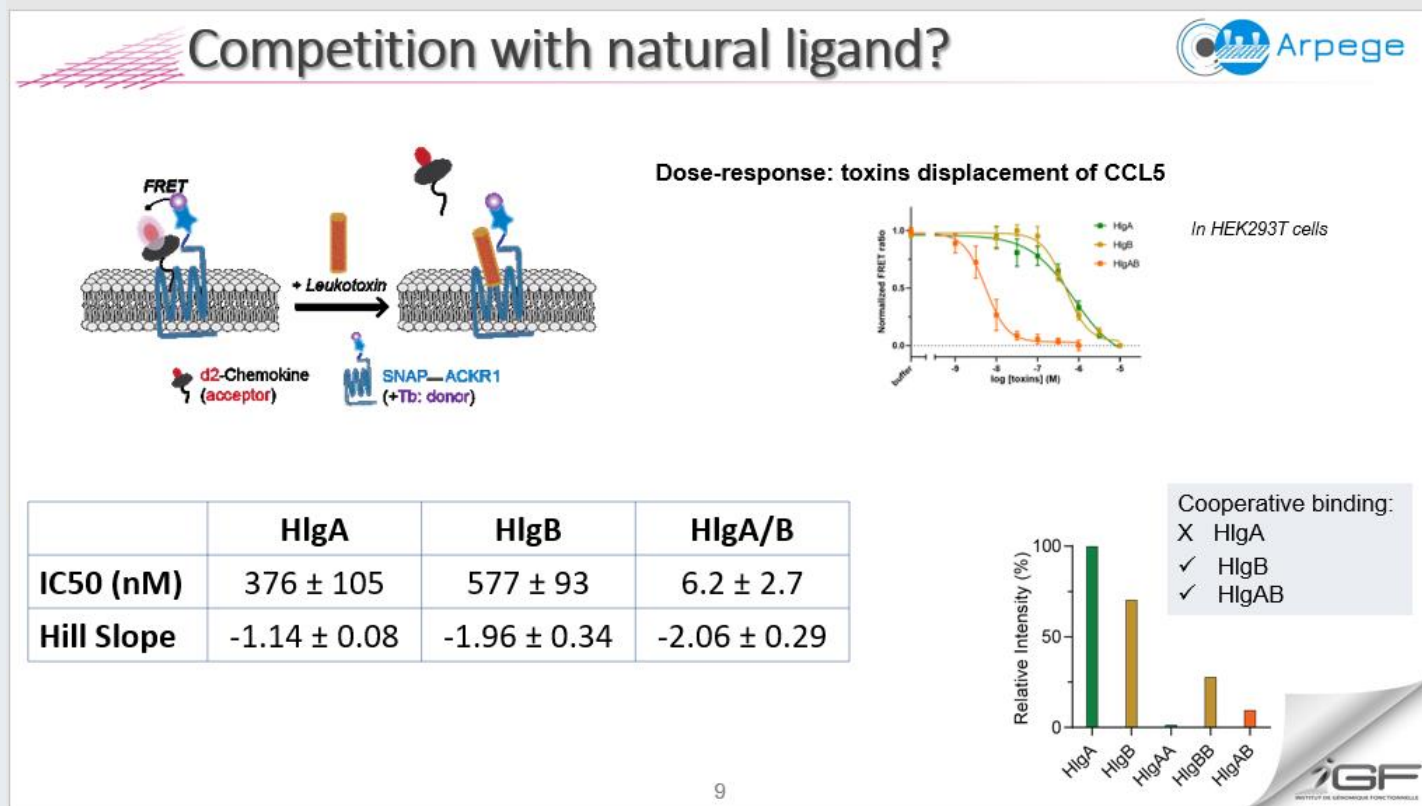
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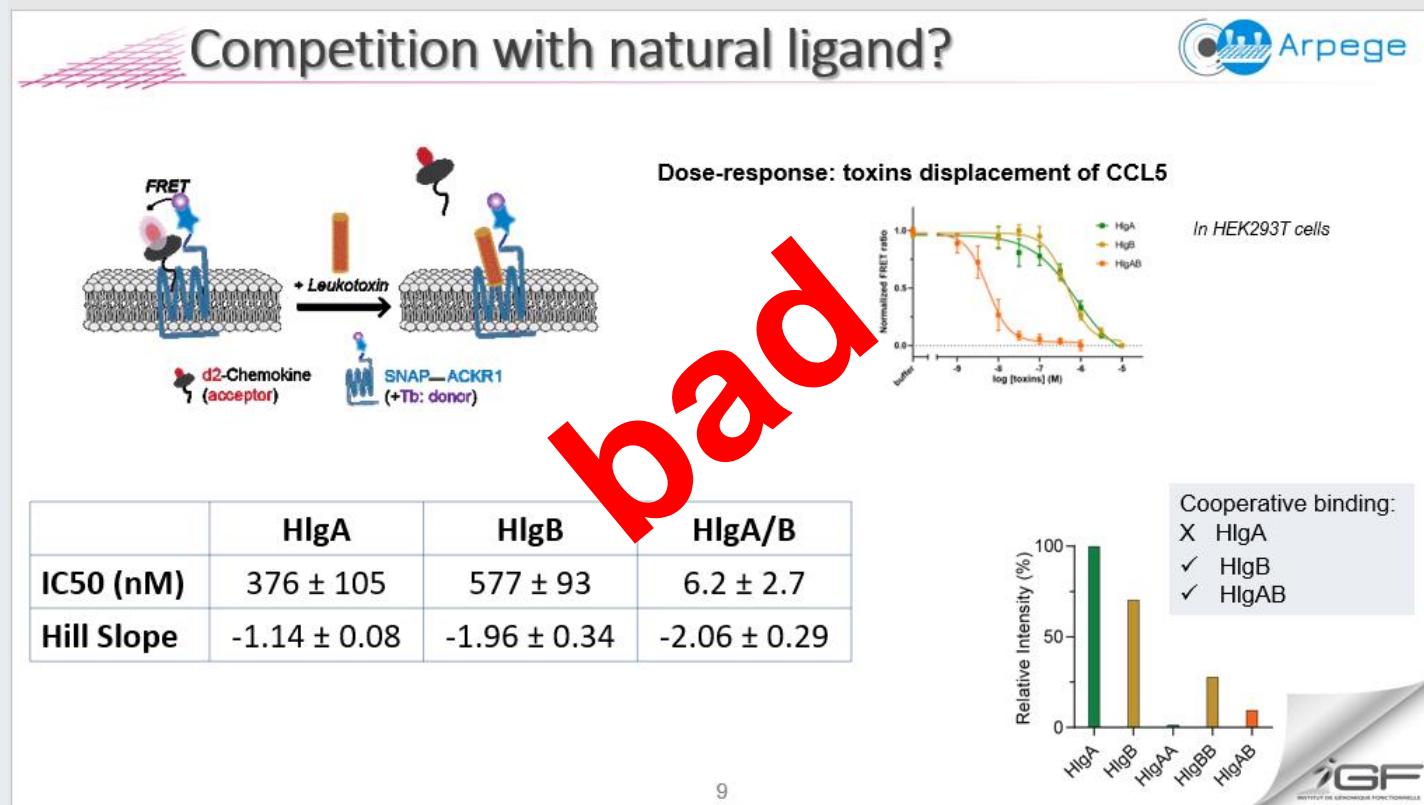
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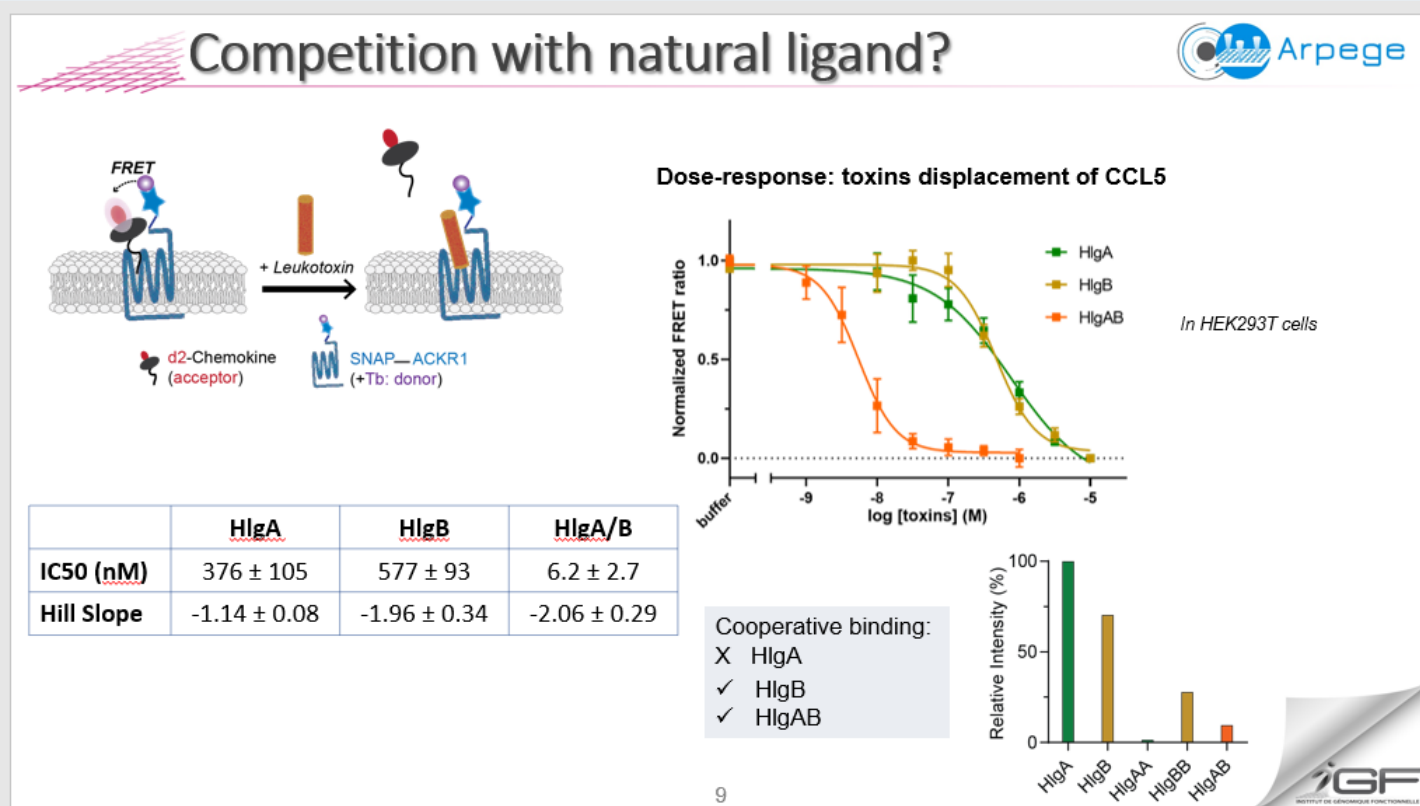
TIPS FOR PREPARING YOUR SLIDES

- Use a good resolution figure/scheme
- Use a visible figure/scheme size
- Use a proper and visible font for text and figures
- Always maintain the symmetry
- Simple, consistent and high-contrast color schemes



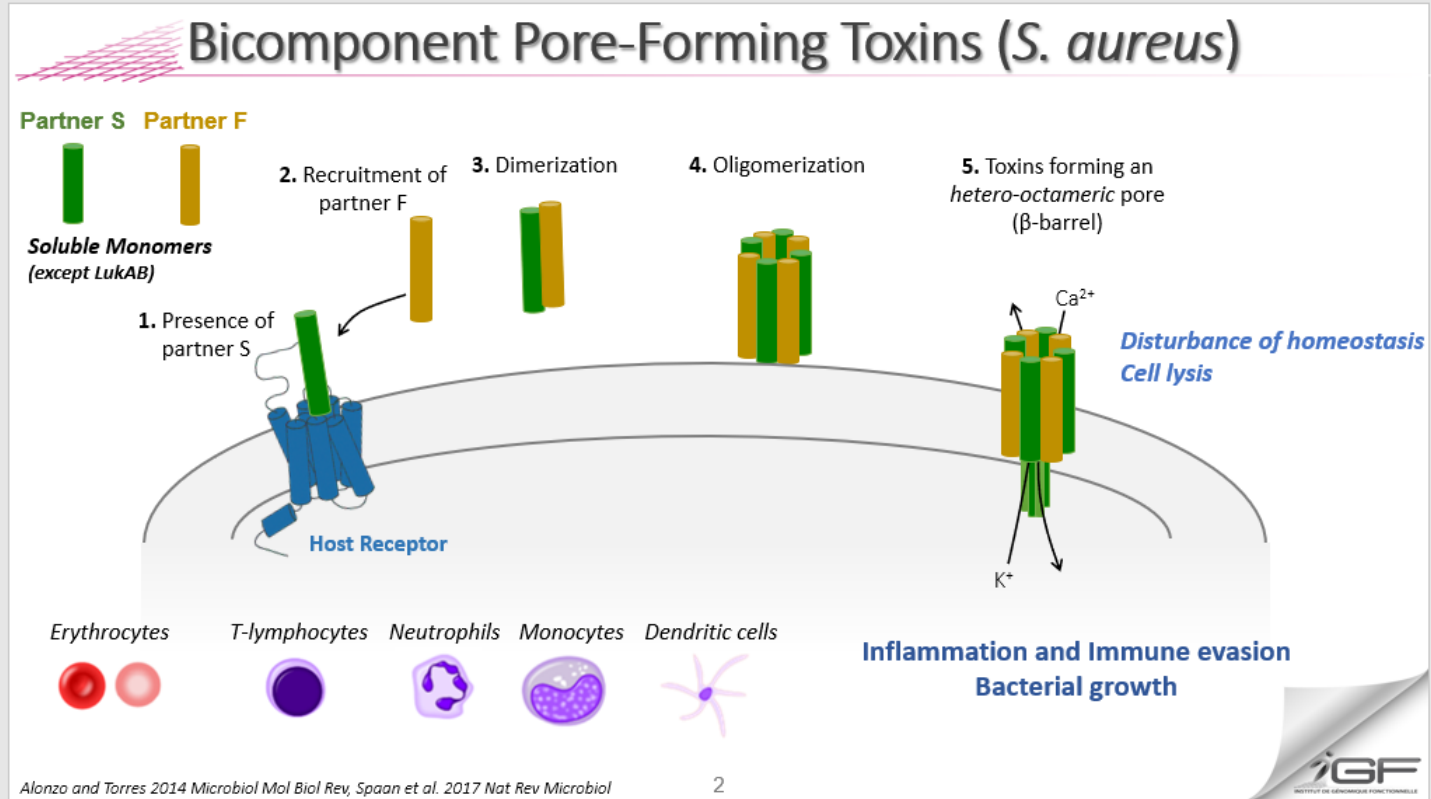
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TIPS FOR PREPARING YOUR SLIDES

- Add all references
- Add page numbers
- Check grammar and spelling
- Check file format and conversion



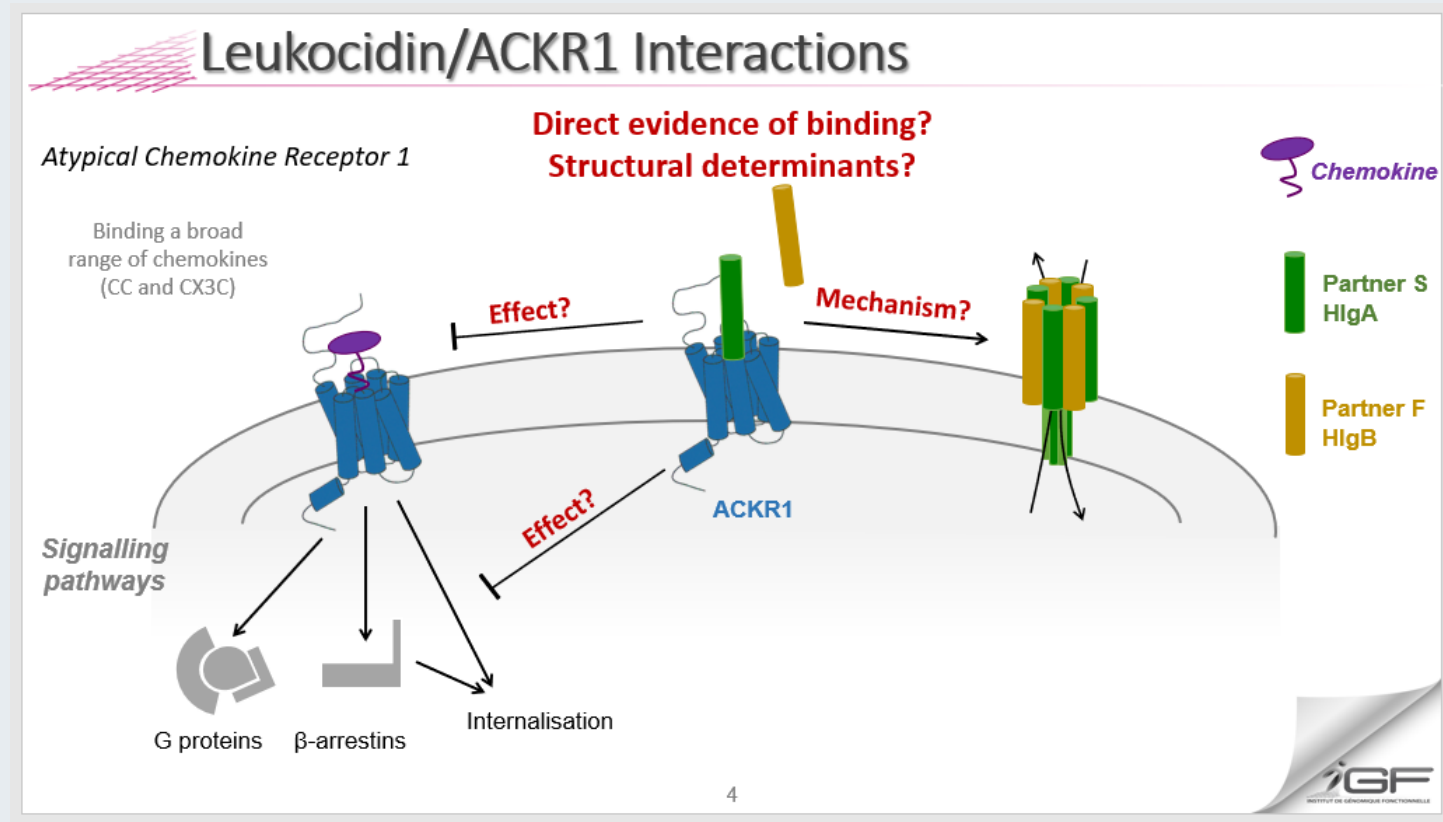
THE PERFORMANCE

DELIVERING A GOOD PRESENTATION

- Do not show all the slide in one go: guide your audience otherwise you'll lose them
- Keep the animation to the strict minimum (use a simple “appear” function)

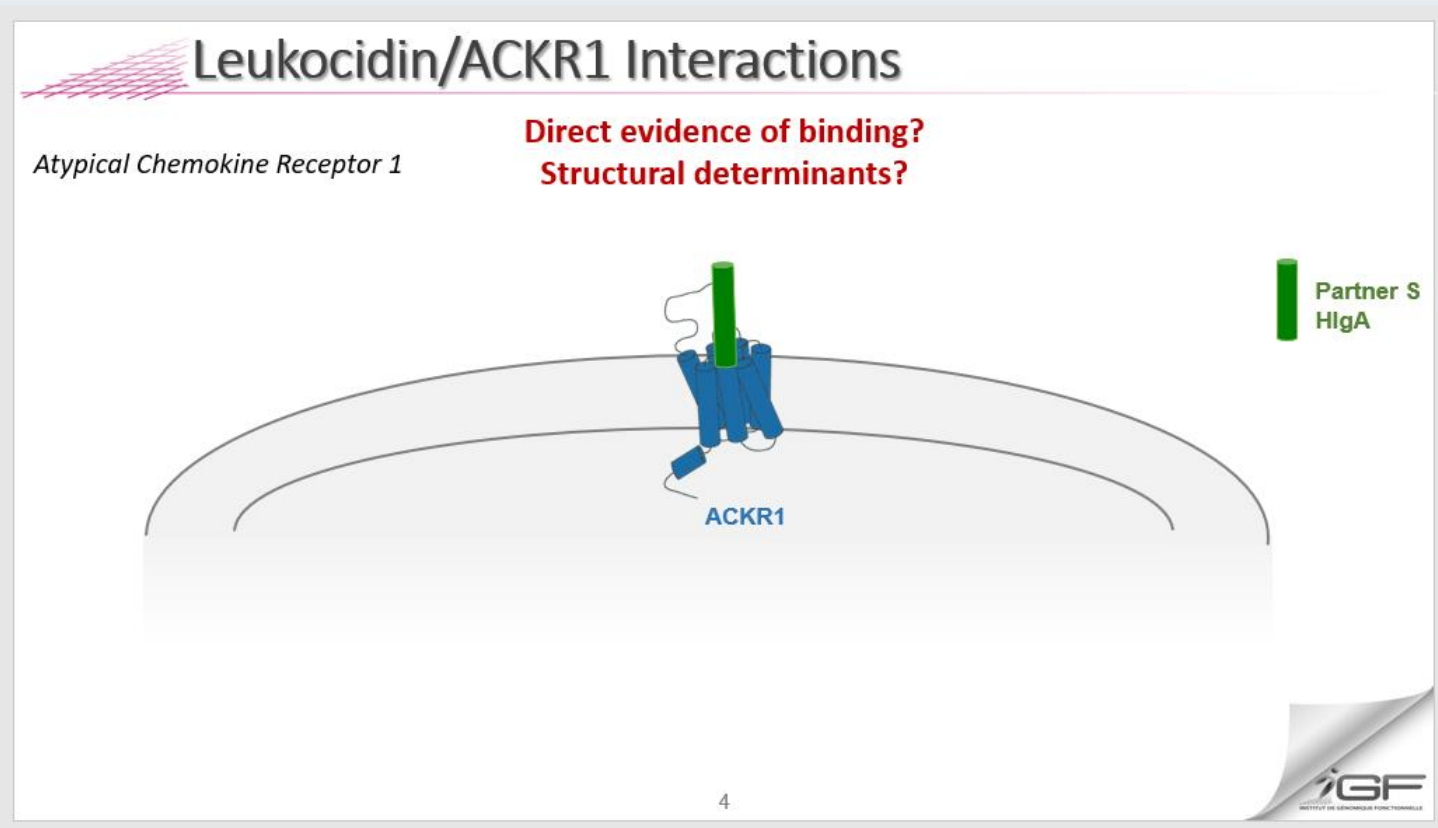
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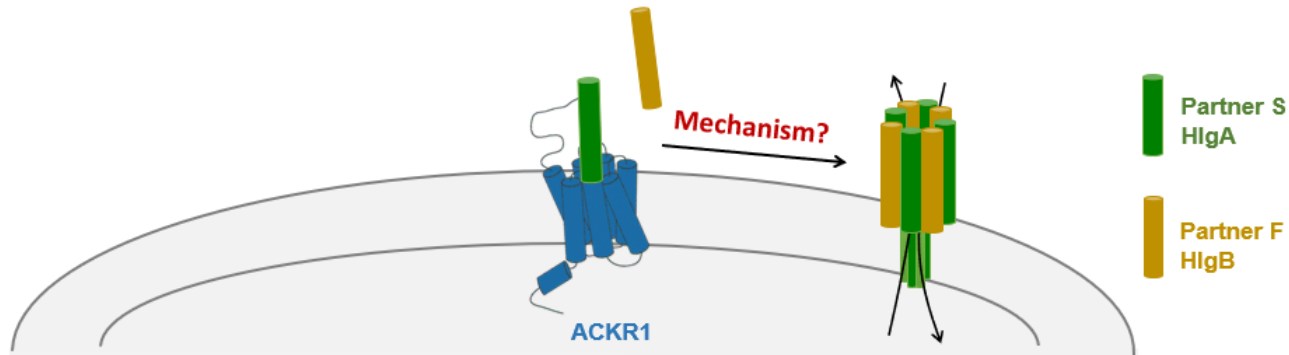
Leukocidin/ACKR1 Interactions

Atypical c

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Atypical Chemokine Receptor 1

Direct evidence of binding?
Structural determinants?



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Leukocidin/ACKR1 Interactions

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Effect?

Mechanism?

Chemokine

Partner S
HlgA

Partner F
HlgB

Signalling
pathways



G proteins



β -arrestins

Internalisation

ACKR1

DELIVERING A GOOD PRESENTATION

- Practice, Practice and ... Practice
- Re-adjust slides/speech according to the time
- Do now speak fast! Breath in between sentences
- Explain graphs/charts before giving your point
- Thank the attendees and let them know you're ready for questions
- It is OK to say "I don't know" if you do not know the answer to a question

ASSIGNMENT

3 groups (2/2/3) OR 4 groups (2/2/2/1)

Re-do one of your presentations of S1 while taking into account the tips given today + the following info:

Audience = Me

Total time of presentation = 10 min

REFERENCES

- [Designing Science Presentations: A Visual Guide to Figures, Papers, Slides, Posters, and More](#)
Matt Carter, Elsevier, 2013
- [Oral Presentation Structure](#)
Scitable, by Nature Education
From the eBook “English Communication for Scientists, Unit 4.1”
- [Creating a 10-15 minute scientific presentation](#)
CLIMB, Northwestern University
- [How to give a great scientific talk](#)
Nic Fleming, Nature, Career Guide, 2018
- [How to give a dynamic scientific presentation](#)
Marilynn Larkin, Elsevier Connect, 2015