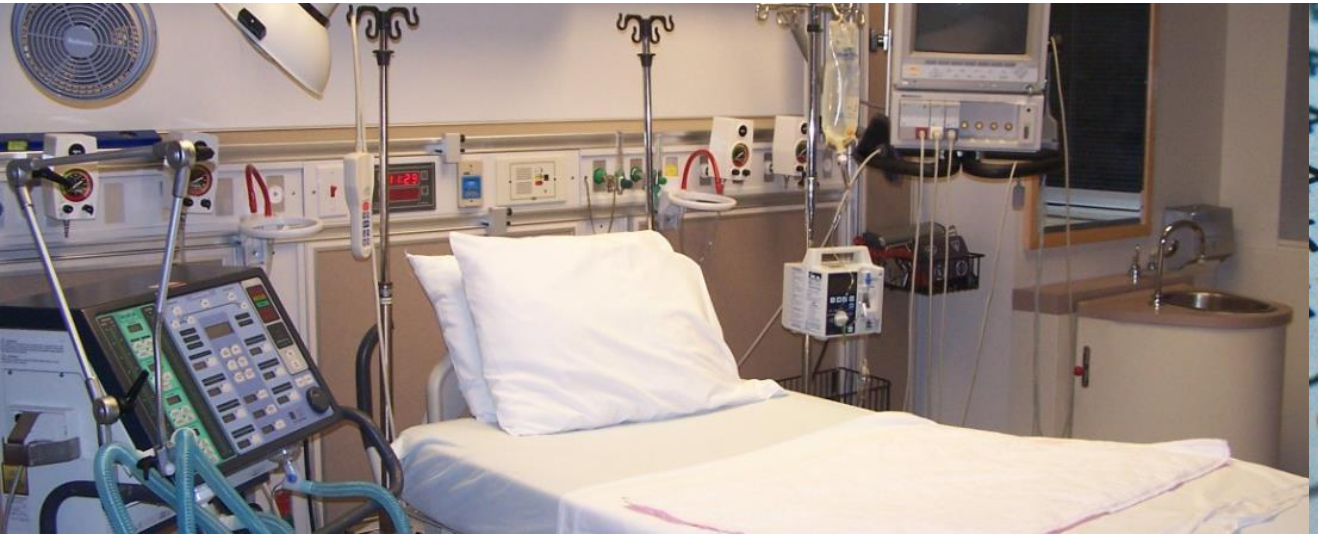
THE PARIS-GENEVE CLINICAL METAGENOMIC GROUP



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Geneva October 18, 2019

Université de Paris

HÔPITAUX UNIVERSITAIRES PARIS NORD VAL DE SEINE
Adélaïde-Hautval | Beaujon | Bichat - Claude-Bernard | Bretonneau | Louis-Mourier

iame UMR 1137
Infection • Antimicrobials • Modelling • Evolution

KUDOS TO MAUD SALMONA (PARIS, FRANCE)

(if you like the slides, she’s the one to credit)

CURRENT SITUATION INOUR HOSPITALS

Significant decrease of sequencing cost

Implementation of NGS sequencers in care facilities

CMg in the hospital as complementary care tool

Heterogeneity between the teams → **Need to harmonize practices**

OBJECTIVES OF THE GROUP

Establish consensus guidelines for CMg implementation at APHP

- ✓ *Shotgun Clinical Metagenomic*
- ✗ *Targeted Metagenomic (16S,..)*
  Microbiome analysis

COMPOSITION OF THE GROUP

18 lab experts

Biologists, Engineers and Bioinformaticists

7 Hospitals

6 meetings

PRE-ANALYTICAL

- **All samples** are relevant
- **DNA** and **RNA** must be extracted (RNA virus)
- **No minimum** of acid nucleic quantity
- **Internal control** (DNA and RNA) necessary
- **Negative and Positive control**s necessary
- **Dedicated workflow**

- Samples pre-treatment **by bead-beating?**
- **Host nucleic acid depletion?**

SEQUENCING

- **Illumina Sequencers**

Nanopore too experimental

- **Minimum depth** : 2x5 M reads / sample

Or more (Virus++)

- **Reads size** : 150nt sufficient

INFORMATICS AND BIOINFORMATICS

- **Curated Database** is necessary
  No curated database to date
  RefSeq curation ongoing (Bichat)
- Use of **MOABI** (AP-HP) for patients' data

- **Analysis Strategy**
  (Cleaning, Mapping, Metrics and cut-off)

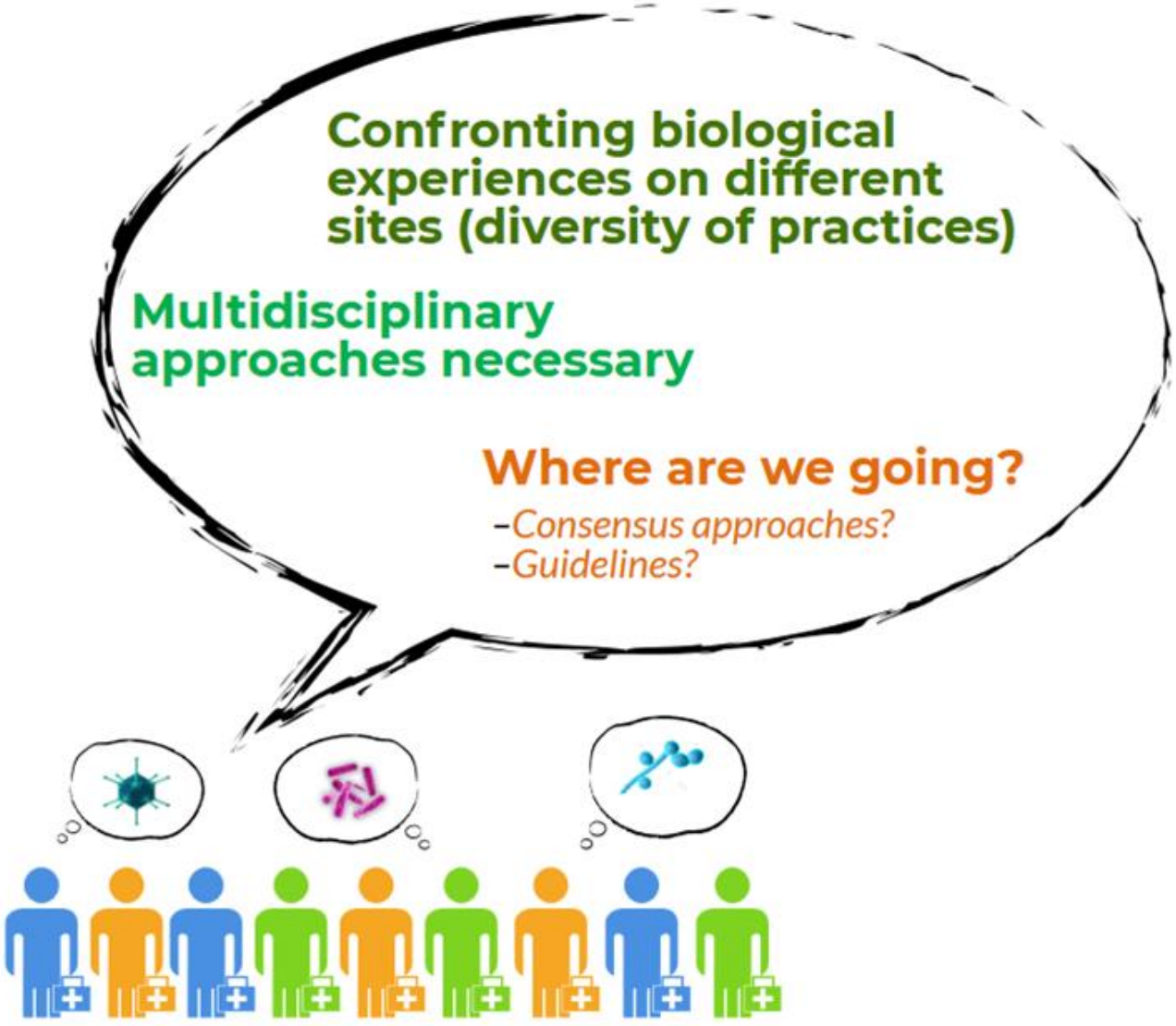
➜Differents pipeline available in each site

OUTPUT

- First technical report interpreted by a **microbiologist trained in metagenomic** sequencing
  Includes **various bioinformatics parameters**
- Second report **clinician friendly**

- **What should be reported to the clinician?**
  So far quite dependant on the interpretation of the biologist

CONCLUSION


Confronting biological experiences on different sites (diversity of practices)
Multidisciplinary approaches necessary
Where are we going?
-Consensus approaches?
-Guidelines?

ACKNOWLEDGEMENTS