The urgent need for TB point-of-care testing – *Where do we stand?*

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On behalf of
Point of Care Subgroup
NDWG Meeting
16 October 2008, Paris

Partnering for better diagnosis for all

Point-of-care testing for TB - Rationale

WHAT

- **Simple &**
- **Accurate &**
- **Robust &**
- **Rapid Test**
- **For qualitative TB case detection**

WHERE

- **At or near the site of patient care**
- **Lowest level of health system: the health posts**

WHY

- **4 M undiagnosed cases**
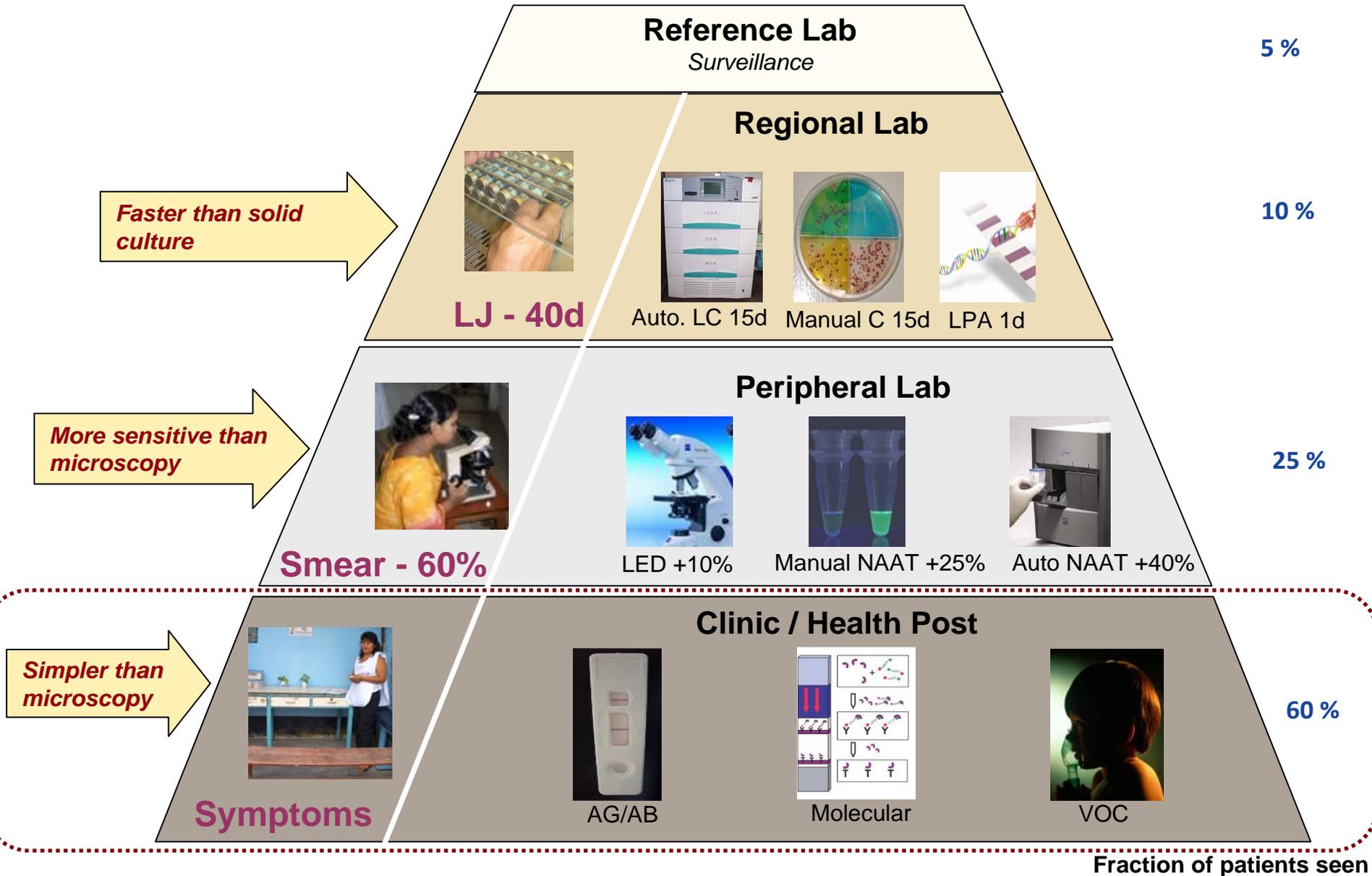 WHO Global TB Report 2008

- **Diagnostic delays fuel transmission & severity**
  Liam, 1997, Int J Tub & Lung Dis

- **Widely deployed rapid test could save 0.5 M lives/ year**
  Keeler, 2006, Nature
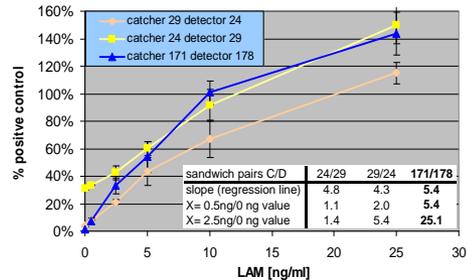
Technology needs for patient-centered approach

Point-of-care approaches for TB (1)

Antigen detection

Improved LAM AB	Novel targets	Better detection technology

Sandwich catcher 171 detector 178

Legend:
- catcher 29 detector 24
- catcher 24 detector 29
- catcher 171 detector 178

Y-axis: % positive control (0% – 160%)
X-axis: LAM [ng/ml] (0 – 30)

sandwich pairs C/D	24/29	29/24	171/178
slope (regression line)	4.8	4.3	5.4
X= 0.5ng/0 ng value	1.1	2.0	5.4
X= 2.5ng/0 ng value	1.4	5.4	25.1

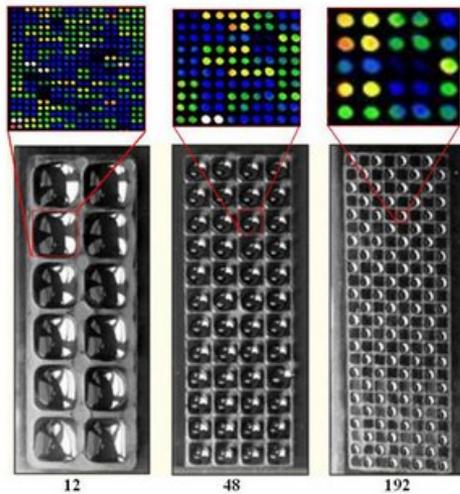| **Feasibility study to start Nov 08**	**Apply new tools for AG discovery**	**Fluorescence labeled LFI with reader**

Point-of-care approaches for TB (2)

Antibody detection

Strategic approach

Identify diagnostic AB pattern

Microarray-based screening using high-throughput expression systems

Suitable detection technology

Multiplexing in point-of-care format

Point-of-care approaches for TB (3)

Volatile Organic Compound detection

MTB-specific VOC	Field-applicable detection technology

Use of high end MS devices

Miniaturization of sensitive MS

VOC in	Author/Year
Breath	Phillips, 2007
HS of culture	Trevejo, 2007
HS of culture	Syhre, 2008

Point-of-care approaches for TB (4)

Molecular detection

Strategic approach

| 3rd generation microscopy level NAAT platforms | Lab-on-a-chip |

From macrofluidics to microfluidics
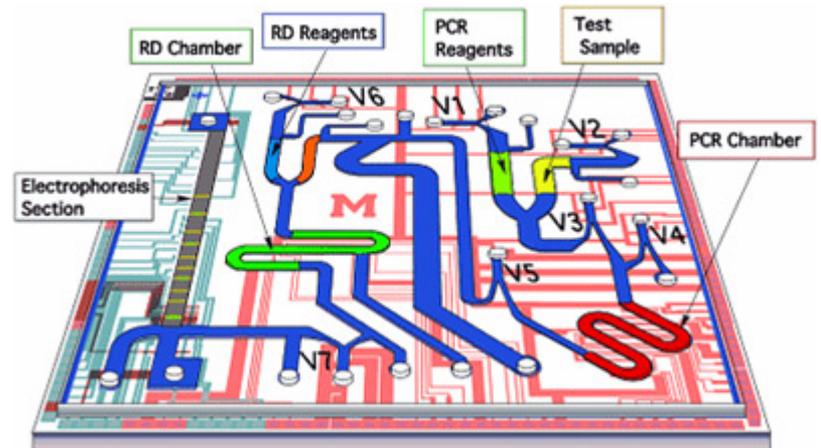
With most efficient isothermal amplification
! Sample volume

Combine most accurate markers with best performing POC technology

Biomarkers

- Antigen
- Antibody
- VOCs
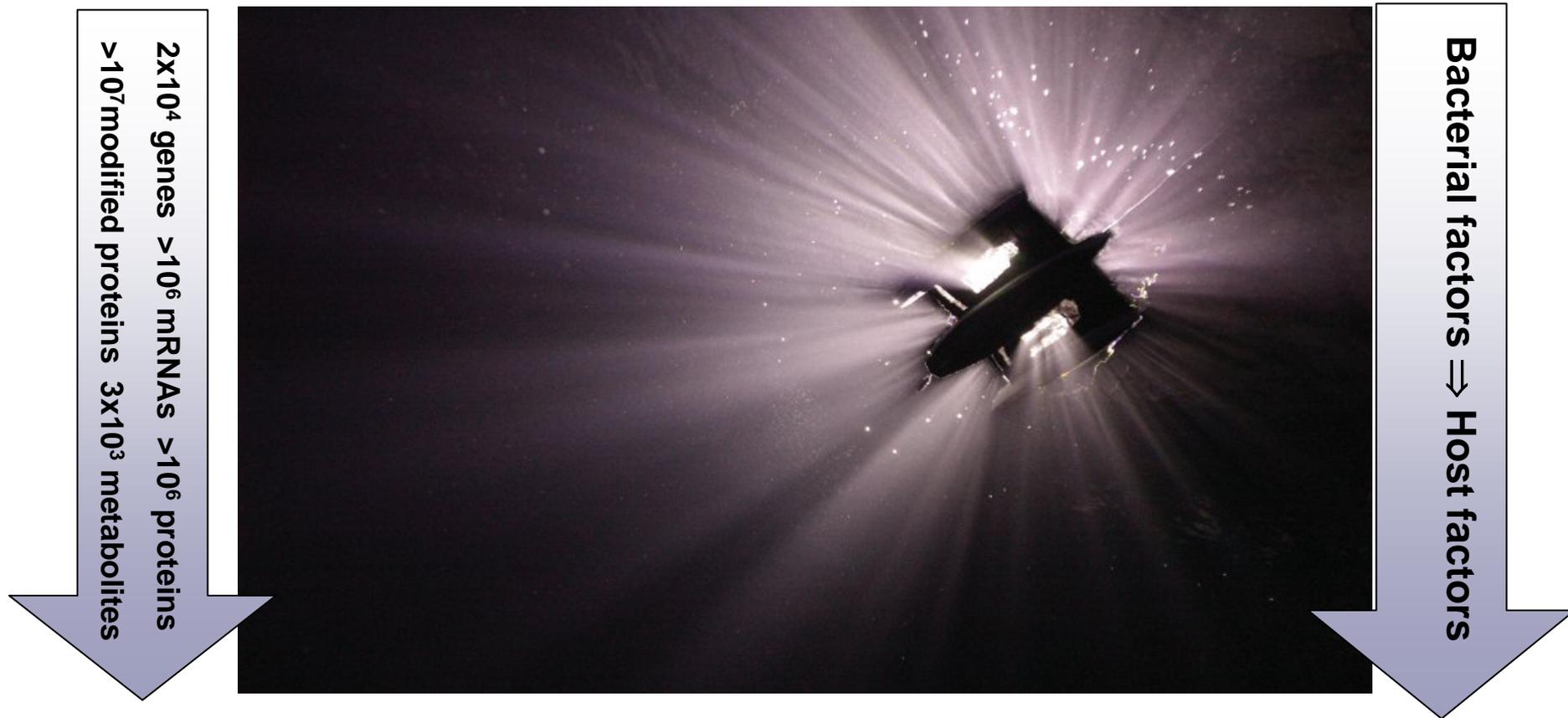- DNA / RNA
- The "omics"
- Host markers

Technologies

- LFI with new labeling technologies & handheld readers
- Label-free platforms
- Spectrometric methods
- Microfluidics

TB biomarker research -
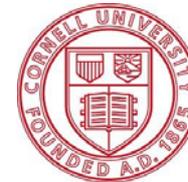## *Leaving the shallow end of the biomarker pool*

2x10⁴ genes >10⁶ mRNAs >10⁶ proteins >10⁷ modified proteins 3x10³ metabolites

Bacterial factors ⇒ Host factors

➢ **Systematic approaches**
➢ **Large sample repositories**
➢ **Much more resources**

The new face of TB biomarker discovery

Point-of-care subgroup

- ➢ **31 registered subgroup members**

- ➢ **14 from academia, 10 from MOH/agencies, 7 from industry**

- ➢ **Web forum: share point for members of the subgroup**

- ➢ **Public website: www.tbdiagnostics.org**

- ➢ **Workplan / activities**

Thank you for any input & feedback