

# Point-of-Care Medical Diagnostic for 3<sup>rd</sup> World Market

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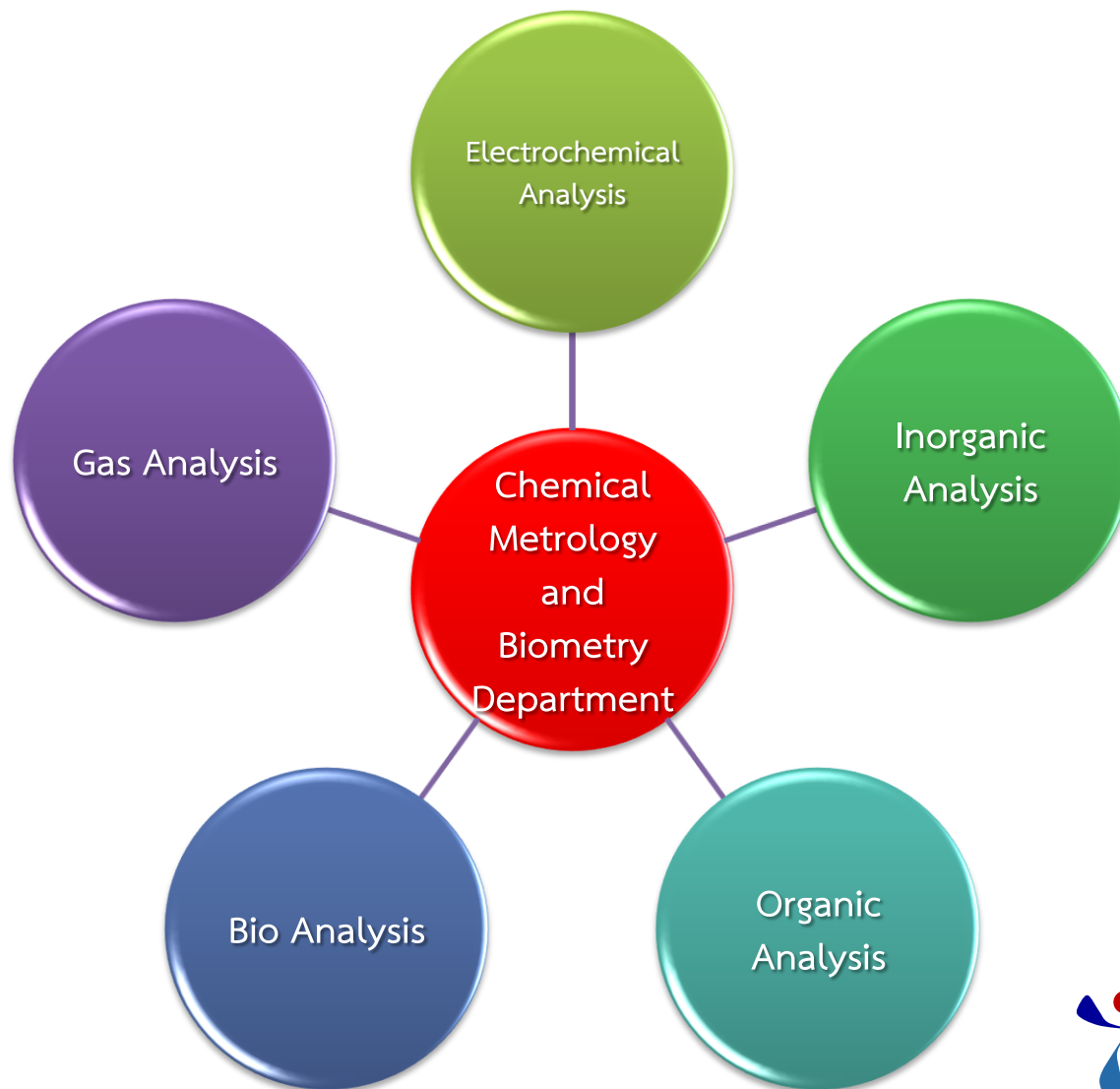
NIMT



สถาบันมาตรวิทยาแห่งชาติ

National Institute of Metrology (Thailand)

# Chemical Metrology in NIMT

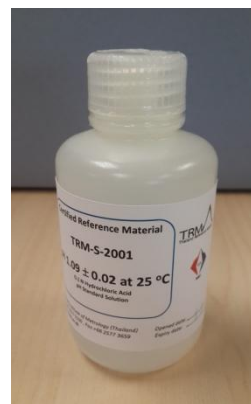


# Thailand Reference Materials

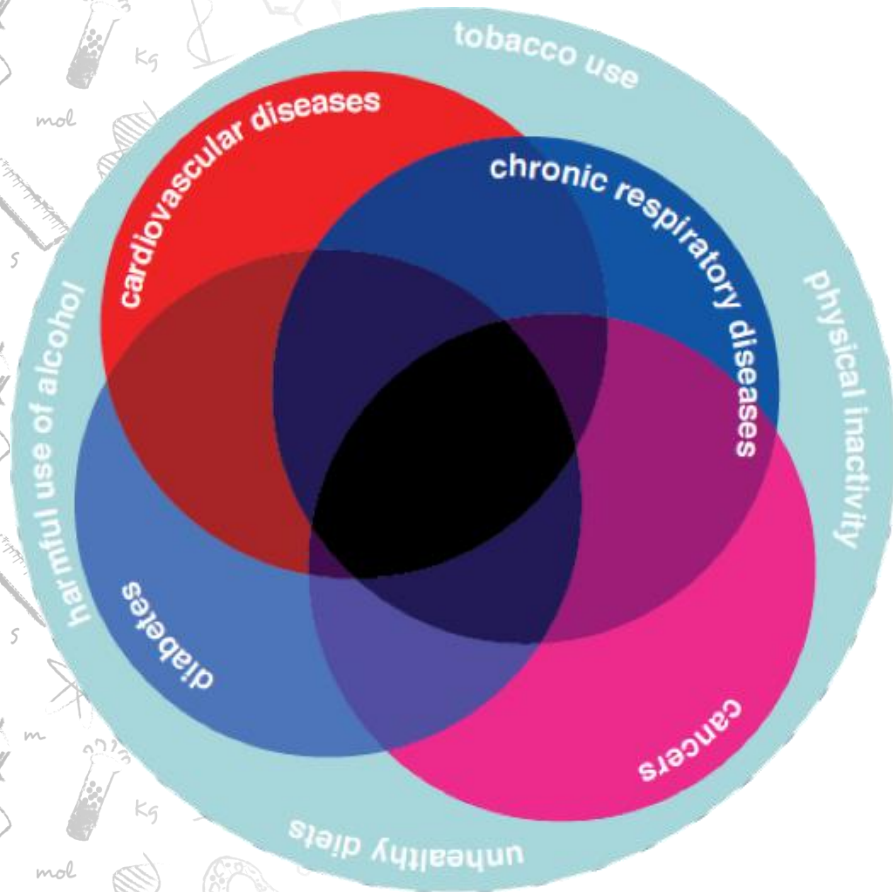


- Clinic (C, 1)
- Environmental (E, 6)
- Food (F, 5)
- Materials (M, 1)
- Standard Solutions (S, 35)

<http://www.nimt.or.th/etrm/en>



# Chronic Diseases



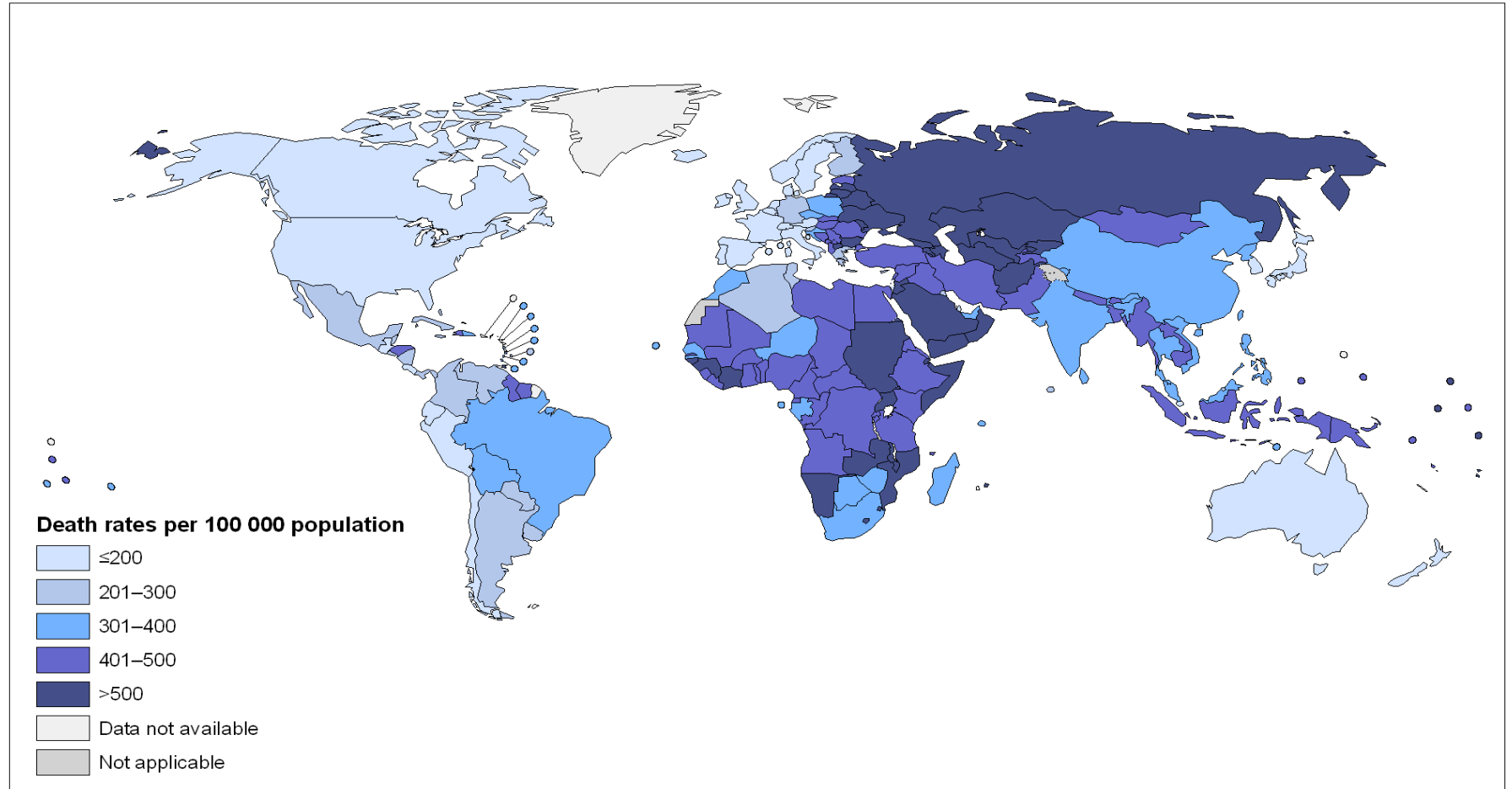
WHO Global Status Report on  
Non-communicable Diseases 2010

- **Cardiovascular Disease**
- **Kidney Failure**
- **Diabetes**
- **Cancer**
- **Deaths for men and women are 65% to 85% higher in developing countries**



# Chronic Diseases

Cardiovascular diseases and diabetes, death rates per 100 000 population, age standardized  
Males, 2008



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization  
Map Production: Public Health Information  
and Geographic Information Systems (GIS)  
World Health Organization



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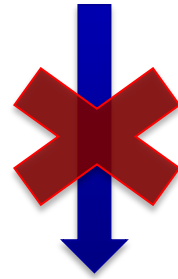
# Diagnostic Tests



Large instrumentation  
>\$100,000



Extensive Libraries  
\$ 1 - \$10 per test



3<sup>rd</sup> World Health Market





# Diabetic Monitoring Systems



2,000 THB



4,250 THB



1,850 THB



2,930 THB



3,490 THB

TAI AM NIMT

# Dry Chemistry Diagnostics

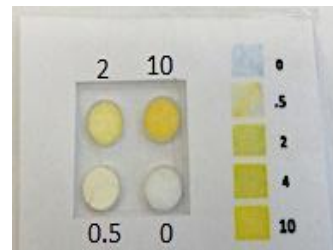


Low Cost \$0.10

Portable

Accurate & Sensitive

Suitable for Remote Locations



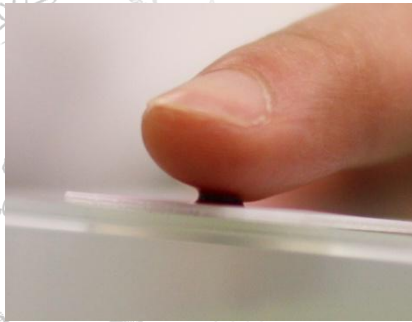
Multiple assays



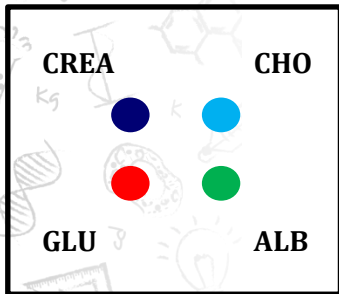




**Prick Finger**



**Apply Sample**



**Color Develop**

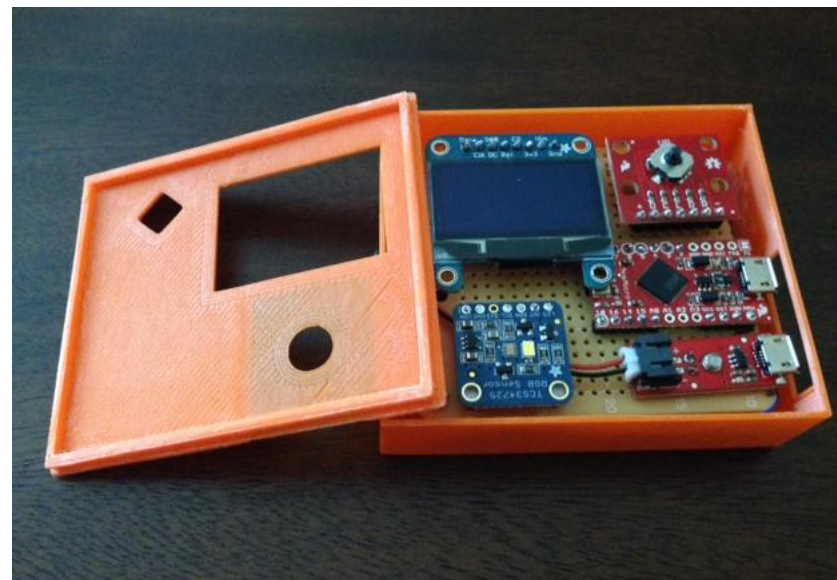
## Quantification



*ColorAssist FTLapps*



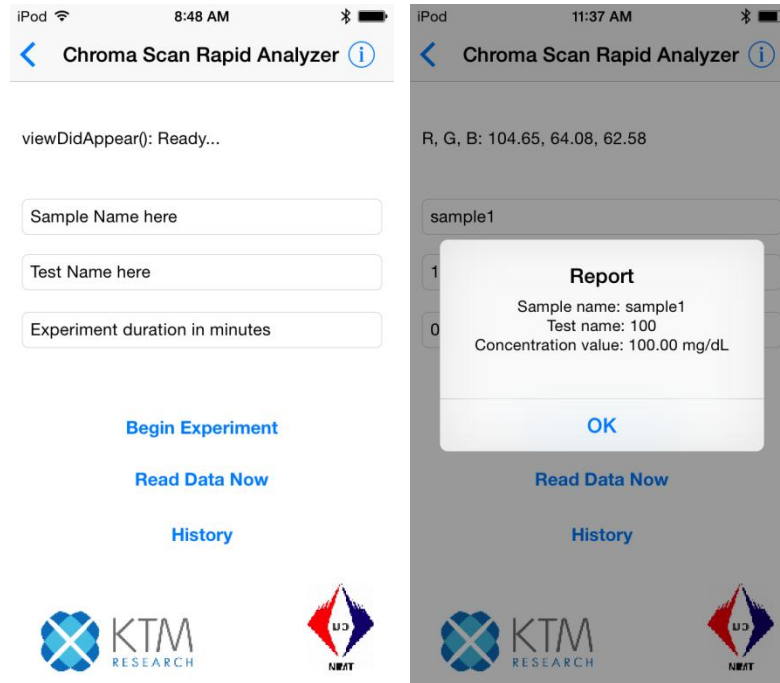
# Prototype-I: Multi-assay POC



Cost-effective in-house color sensor using off the shelf components



# Prototype-II: Mobile-based POC



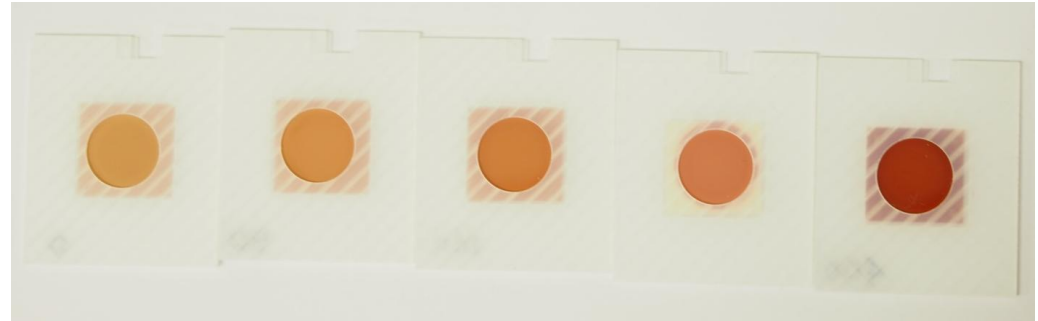
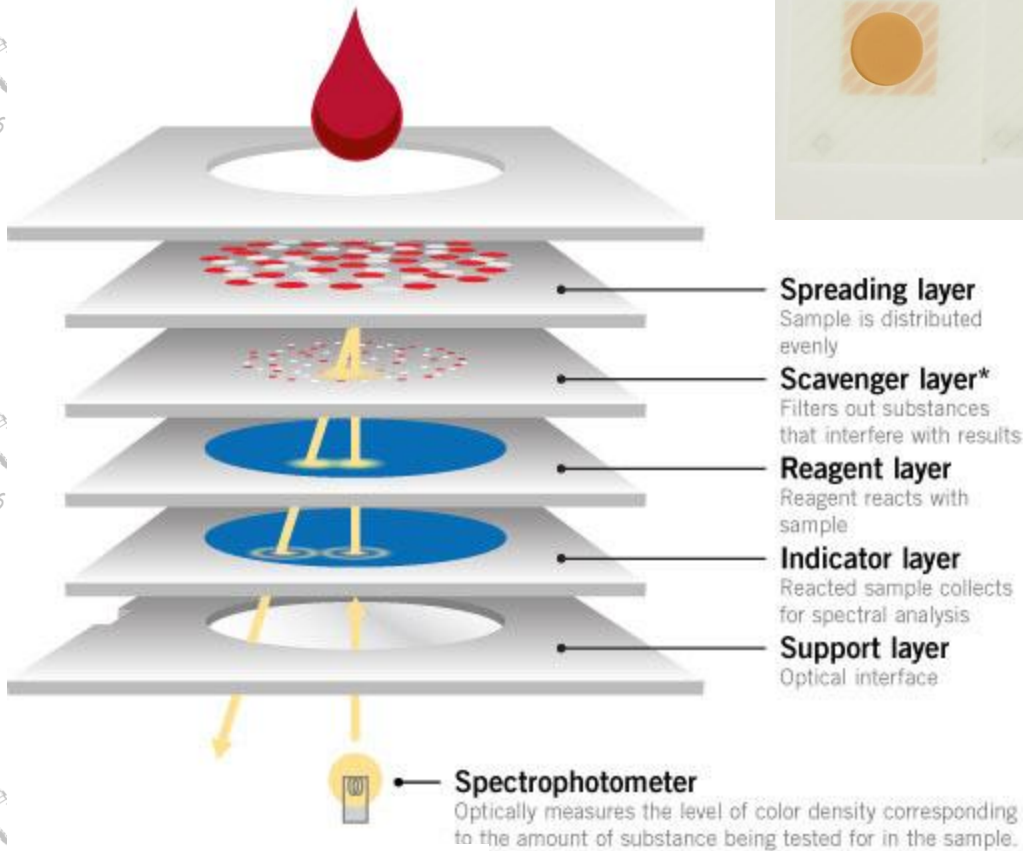
NODE color sensor Application for iOS device to measure assay concentration



# Color Development of Dry Slide

## Dry slide technology

Colormetric/Rate Slide



Series of serum glucose concentration ranging from 50 mg/mL to 400 mg/mL tested on Vitros dry chemistry assay slides, an image was taken after 5 mins of incubation time

<http://www.orthoclinical.com>





# Device Calibration

- **Accuracy and Precision**

- NIMT TRMs e.g. TRM-C-5001 Total Cholesterol in Frozen Human Serum
- NIST SRMs
- Control Standards

- **Target Biomarkers**

- Glucose (diabetes)
- Creatinine (kidney function)
- Blood Urea Nitrogen (BUN) for kidney and liver function

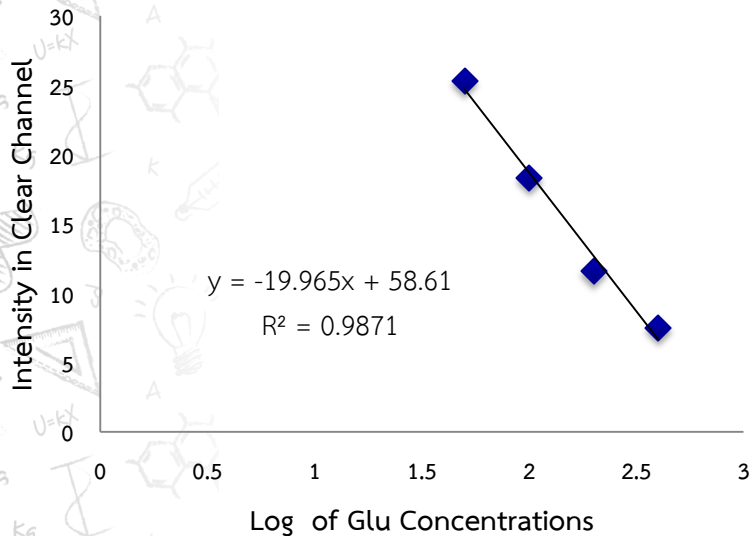
## Lipid Profile

- Cholesterol
- LDL (bad cholesterol)
- HDL (good cholesterol)
- Triglycerides (fat carried in the blood)

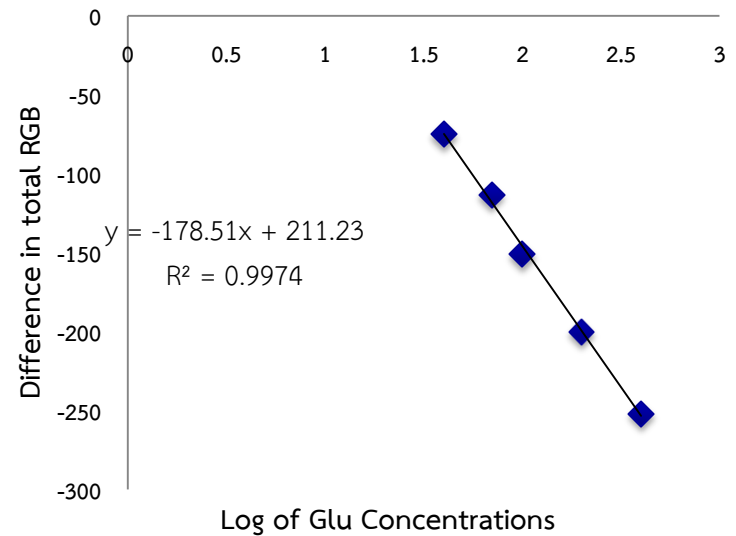


# Glucose Measurement

Glucose Vitros Measurements on Color Sensor Prototype I



Glucose Vitros Measurement with NODE Color Sensor (Prototype II)

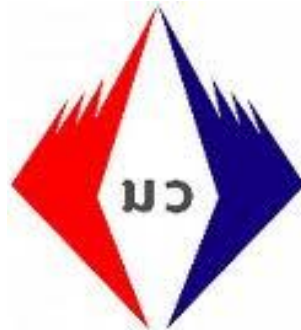




# Evaluation



Healthcare Organization



NIMT



Local Clinics



Universities

# Thank You



KTM  
RESEARCH

OSU  
Oregon State  
UNIVERSITY



TRM  
Thailand Reference Material



Project supported by:

Grand Challenges Canada<sup>®</sup>  
Grands Défis Canada

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Chemical Metrology and Biometry Department  
National Institute of Metrology (Thailand)

