



# Web based Open Source LIMS for health care laboratories



bi:ka Zulu trad: to report, from clan to clan,  
bring news of weddings, births, festivals and funerals

lemoene smit · LIMS analyst & Project manager

# Presenting

Professional Open Source

Bika Community

Bio-Informatics requirements

Bika Health functionality

Roadmap

# POSS - Professional Open Source Software

Used by FireFox, MySQL etc.

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**Enthusiastic user community**

**Sponsors** · **Fee paying clients**

**Professional service providers**

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**Participants work towards their own goals,  
benefiting all**

# POSS - Professional Open Source Software

Used by FireFox, MySQL etc.

## Enthusiastic user community

Bug reports · Feature requests · Translations · Code

## Sponsors · Fee paying clients

Major new developments · No licenses to pay

## Professional service providers

Aggregate · Merge · Develop · Maintain

All contribute to LIMS design and testing

**Participants work towards their own goals,  
benefiting all**



# 12 Years of Professional Open Source LIMS





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65,000+ Downloads

380 Subscribers in community







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**bika**lims Universal LIMS





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Branches

**bika**interlab

Inter-laboratory proficiency testing



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**bika** water Water quality management

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Branches

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**bika** water Water quality management

**bika** health Health care

# Professional Services

## Community Services

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## Implementations

- ✓ LIMS Analysis & Design
- ✓ Customisations
- ✓ Installations
- ✓ Configuration & Set-up
- ✓ Training

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## Support

- ✓ Systems administration
- ✓ User and Technical support
  - On-line issue trackers
  - Remote inspection
  - Email and telephonic

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# Community Services

Infrastructure - Code repositories · Forums  
Knowledge centres  
**User manual**



## In a Nutshell, Bika Open Source LIS/LIMS...

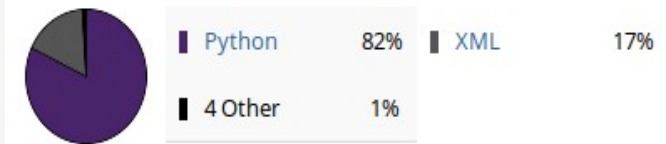
... has had 5,873 commits made by 29 contributors representing 717,534 lines of code

... is mostly written in Python with an average number of source code comments

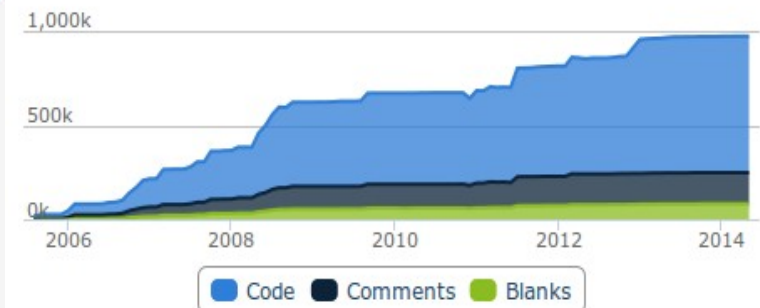
... has a well established, mature codebase maintained by a large development team with decreasing Y-O-Y commits

... took an estimated 195 years of effort (COCOMO model) starting with its first commit in August, 2005 ending with its most recent commit 8 days ago

Languages



Lines of Code



# Client Sponsors

Agriculture · Environmental  
Bio-informatics · Food and beverages  
Inter-laboratory proficiency testing  
Water quality · Health





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Your logo  
HERE



# Open Source Platform

Programming language preferred by  
Google, Yahoo, Shuttleworth, Disney



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Web application server

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Web application server



Content management framework

Used by **eBay, Nokia, Motorola,**  
many **governments and universities, NASA, NATO** and more

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Web application server



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many **governments and universities, NASA, NATO** and more

**No license fees · Big supporting communities**



# Open Source Platform



PostgreSQL



Content Mirror

# Open Source Platform



PostgreSQL



Content Mirror

Platform independent  
Ubuntu & FreeBSD preferred



**ubuntu**  
linux for human beings



FreeBSD®

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FreeBSD®



**ORACLE®**

# Open Source Platform



PostgreSQL



Content Mirror

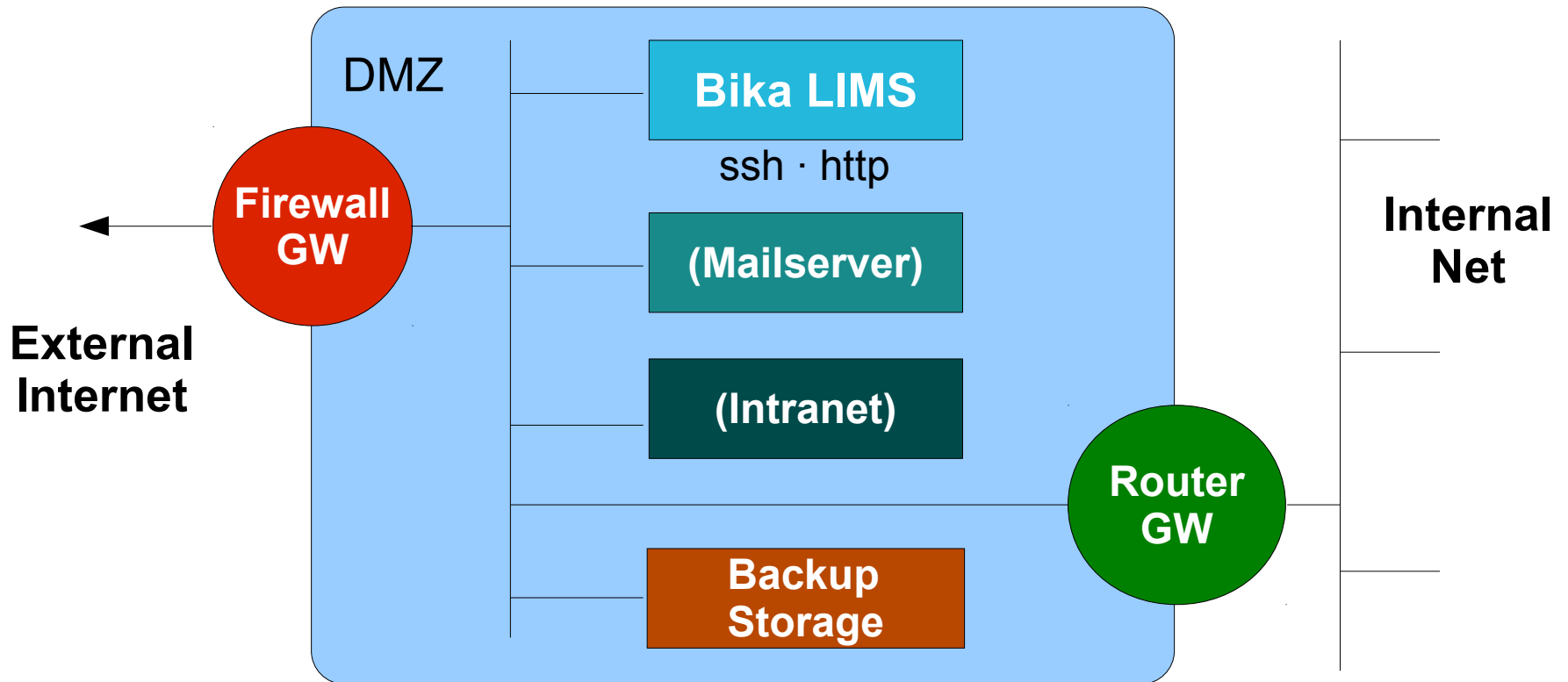
Platform independent  
Ubuntu & FreeBSD preferred



498 Of the fastest 500 super computers run Linux (Forbes)  
65% of all web servers (Netcraft.com)



# Network



Secured by state of the art industrial strength Unix firewall and DMZ

# Security

- ✓ **SSH for sys admin, housekeeping**
- ✓ **HTTP (port 80) exposed**
- ✓ **Unix firewall**
- ✓ **ftp/rsync/CIFS to network storage**

Site encryption and digital certification

if required

Password expiry

Auto log-off

# Hardware

Entry level server dedicated to LIMS  
Back-up server recommended

# Backups

Hourly incremental to network storage  
Weekly, monthly off-site per IT Dept policy

# Test LIMS instance

Acceptance testing  
On-going training

# LIMS Benefit areas

Process automation

Barcoding and labelling

Instrument integration

Interfaces with enterprise systems

Reporting and data retrieval



# LIMS Benefits

- ✓ Dramatically improved capacity
- ✓ **Improved turnaround** times (TAT)
- ✓ Higher **accuracy**
- ✓ Higher levels of certainty
- ✓ Traceability and accountability

# LIMS Benefits

Continued...

- ✓ Data at your finger tips
- ✓ Interfaces with other departments
- ✓ Track Productivity
- ✓ Enhance Quality Control
- ✓ Low cost of reporting
- ✓ Less paper

# Web-based Benefits

- ✓ Even higher capacity
- ✓ Dramatically improved TAT
- ✓ High client satisfaction
- ✓ Central Web Content Management
- ✓ **Easy installation**  
Users require browsers only
- ✓ Lower systems administration costs

# Web-based Benefits

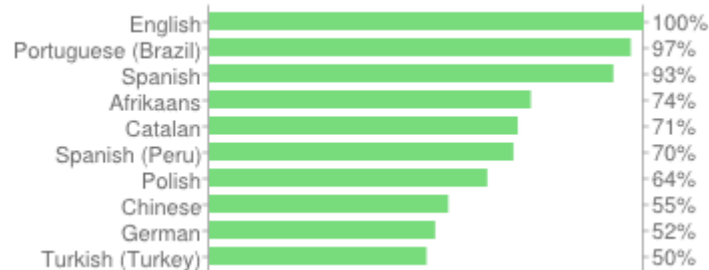
Continued...

- ✓ Lower hardware requirement
- ✓ Ease of access
- ✓ Ease of use
- ✓ Geographically distributed deployment

**Users require  
browsers only**

Multiple sites

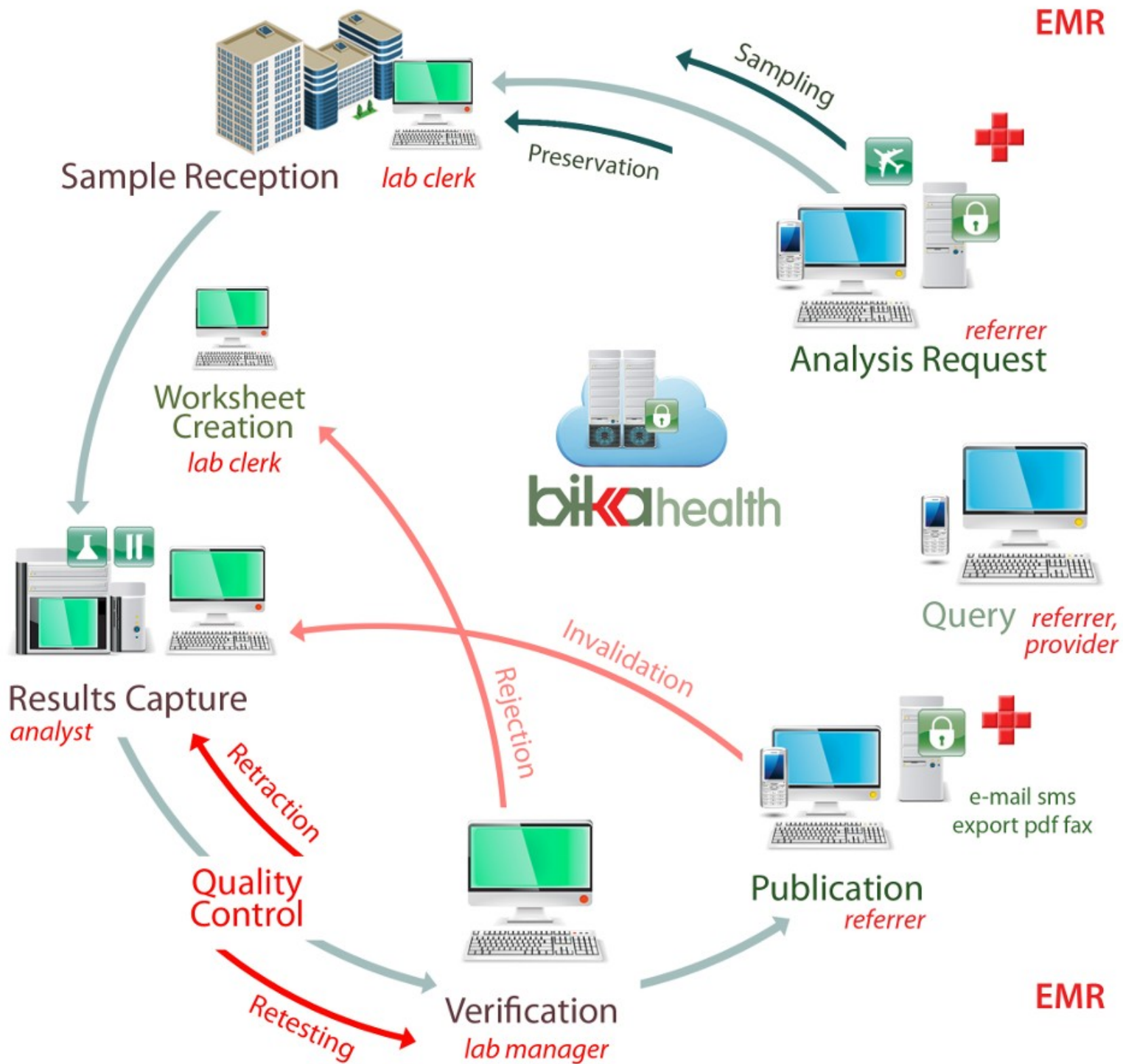
Easy translation



# Open Source Benefits

- ✓ Lower hardware and sys admin costs
- ✓ No annual license fees
- ✓ Unlimited users
- ✓ Best of Breed designs
- ✓ No vendor lock in. No fixed upgrade cycle
- ✓ Customisation

**How  
does  
it  
work?**



# BioBank Management System



HL7  
HIPAA  
...



# LIMS as BioBank Management System

## Phase I · LIMS based

Kit Assembly and Distribution

Patient MDS\*

Patient Consent

Shipping

Sample Storage

Lab management. LIMS

Document management

Invoicing



Shared Database

## Phase II

Patients. EMR

Cell Lines

Sequencing

Data mining

Accounts. HR. ERP

Others to come...

\*MDS - Minimum Data Set

# Gaps

## Sample storage and inventory management



The screenshot displays the FreezerPro software interface. On the left, a sidebar lists various storage units under 'Freezers And Boxes', including ROOM 23, ROOM 81, F231 (with Shelf1 and Shelf2), Freezer I, Freezer II, MHBH\_Cryo Tank, Mitt's Freezer, and New Chest Freezer, Asset# 23356. A bottom navigation bar includes 'Samples, Groups And Sources', 'Customers & Shipping', 'Reports And Audit', and 'Settings And Preferences'. The main area shows a grid of storage containers labeled X1 through H7. A context menu is open over the grid, listing actions: Delete Sample(s), Cut Sample(s), Copy Sample(s), Shipments, Add To Pick List, Import Samples, and Reload Box. On the right, a detailed view for 'RNA-01' is shown, including its barcode (1002126), custom vial ID (\_872\_2), volume (1.0 mL), creation and update dates (08/09/2012), and an auto-increment counter set to 7.0.

X	1	2	3	4	5	6	7
A	RNA	RNA	RNA	RNA	RNA	RNA	RNA
B	RNA	RNA	RNA	RNA			
C							
D							
E							
F							
G							
H							

**RNA-01**  
RNA (FreezerPro RNA)  
Barcode: **1002126**  
CustomVialID: **\_872\_2**  
Volume: **1.0 mL** (Total)  
Created: **08/09/2012**  
Updated: **08/09/2012**  
Total number of RNA-01: **7**  
Comment:  
**Notes:**  
Auto-Increment Counter: **7.0**

## Storage Containers

*Screenshot courtesy of FreezerPro*

# Gaps



Request And Ordering



Shipping And Tracking



Protocol Management



Data Retrieval And Reporting



Programmatic Access (API)

*Icons courtesy of caTissue - OpenSpecimen*

# Knowledge Centre

## CMS - LIMS Portal

The Knowledge Centre will be updated regularly with helpful information relating to the LIMS and lab information and should be contributed to by lab staff too. Not only can it be used to collect LIMS reference manuals, training videos, 'how to' documentation, FAQs - frequently asked questions, glossary of terms and helpful internet resources, but also SOPs, Safety documentation, material data sheets, accreditation information, etc.

Documentation search

in

 Feed for all documentation.

### Latest Reference Manuals

 [Bika 3 User manual](#)  
16 Oct 2011

[All 1 Reference Manuals...](#)

### Latest SOPs

 [Protocolpedia](#)  
29 Dec 2011


 [Estimation of time for bacteria growth](#)  
29 Dec 2011


### Latest Analysis

 [CFA - Continuous Flow Analysis](#)  
17 Dec 2011


[All 1 Analysis...](#)


### Latest Accreditation

 [ISO 17025 at ISO.org](#)  
16 Oct 2011


 [Interlab PT resources](#)  
16 Oct 2011

### Latest Glossary

 [ISO/IEC 17025](#)  
18 Oct 2011

 [PT - Proficiency Testing](#)  
16 Oct 2011

### Latest How-tos

 [How to get system issues attended to fast](#)  
18 Oct 2011

[All 1 How-tos...](#)

# Browser-based editing

Title ■

## Icons

### Summary

Used in item listings and search results.

Bika 3 icon set. The descriptions entered here are helpful in describing main Bika objects. Cop

**Version Controlled  
Document  
Management**

Text Format HTML



### Samples

#### Sample Points

Indicates the location where the sample is taken, described by a set of parameters, incl lat & long for field samples, or node on a production process

#### Sample Types

E.g. water, ore, blood, wine, urine – depending on the lab's discipline

#### Hazardous

Used to indicate hazardous Samples. configured per sample

### Analysis Requests

**ARs** · The collection of concurrently requested analyses for a sample. ARs are the most important building blocks in Bika. Have unique IDs and action log

#### Sample

Click this icon on AR lists and views to navigate to the request's associated Sample

#### Analysis Profiles

Collection of Analyses frequently ordered together for the same sample types. By storing the collection of analyses in a profile

### Bika Setup

#### Laboratory Information

The name of the laboratory as it will appear in browser frames, contact numbers, physical and postal address, email address and accreditation information

#### Lab Departments

#### Lab Contacts

The people that work in the lab

#### Instruments

# Case study: Caribbean Public Health Agency (CARPHA)

**CARPHA** | Caribbean Public Health Agency  
*Advancing the Wellness Revolution*



- **5 Caribbean Regional Health Institutes**

- **Provides services to 21 member countries**

- **Laboratory services**

Bacteriology, Virology, Parasitology, Molecular biology, Immunology, Serology, Mycology, Antibiotic resistance, Clinical Chemistry

- **Surveillance and health analysis**

NCDs, disease outbreaks, water quality, environmental health, ...

<http://carpha.org>

<http://lims.carpha.org>



# Clinical cases management

You are here: [Home](#) > [Cases](#) > C14-0003

[Edit](#) [View](#) [Analysis Requests](#) [Samples](#) [Log](#)

## Edit C14-0003

### Client Patient ID

STIKH140101009

### Patient

Fred Slabbert [+ Edit](#)

### Client

Stikland Hospital

### Client Case ID

SHPC1400454

### Doctor

Anabel Romero [+ Edit](#)

### Onset Date

Mar 21, 2014

### Patient Age at Case Onset Date

Years:  Months:  Days:

### Basal body temperature

Day 1  °C

Day 2  °C

Day 3  °C

### Symptoms

Decreased Erections

Heart Palpitations

Increase Facial or Body Hair

Low Blood Sugar

Numbness - Feet or Hands

Prostrate Swollen  Mild  Moderate  Severe

Sugar Craving

### Provisional diagnosis

Code	Provisional diagnosis	Description	Onset
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

[More](#)

### Case status

Outbreak

Single case

Survey

Unknown

### Case outcome

Died

Discharged

Hospitalized

### Signs and Symptoms

Aetiologic agent	Description	Subtype
<input type="text"/>	<input type="text"/>	<input type="text"/>

[More](#)

And...

- Medical history
- Immunization
- Drug history
- Travel history



# Clinical cases management

## Pop-up selectors on search boxes

### Provisional diagnosis

Code	Provisional diagnosis	Description	Onset
<input type="button" value="More"/>			
Code	Title	Description	
785.50	Shock NOS	Shock, unspecified	
785.59	Shock w/o trauma NEC	Other shock without mention of trauma	
783.43	Short stature	Short stature	
786.05	Shortness of breath	Shortness of breath	
782.0	Skin sensation disturb	Disturbance of skin sensation	
780.57	Sleep apnea NOS	Unspecified sleep apnea	
780.50	Sleep disturbance NOS	Sleep disturbance, unspecified	
780.59	Sleep disturbances NEC	Other sleep disturbances	
780.58	Sleep rel move disor NOS	Sleep related movement disorder, unspecified	
780.56	Sleep stage dysfunctions	Dysfunctions associated with sleep stages or arousal from sleep	
Page 34 of 39      10      View 331 - 340 of 381			

And compliant with the International Classification of Diseases (ICD-9)





# Patient management

Edit Analysis Requests Specimens Past Medical History **Immunization History** Drug History Travel History Log

Info Changes saved

## C13-00001 (Malcolm Edison)

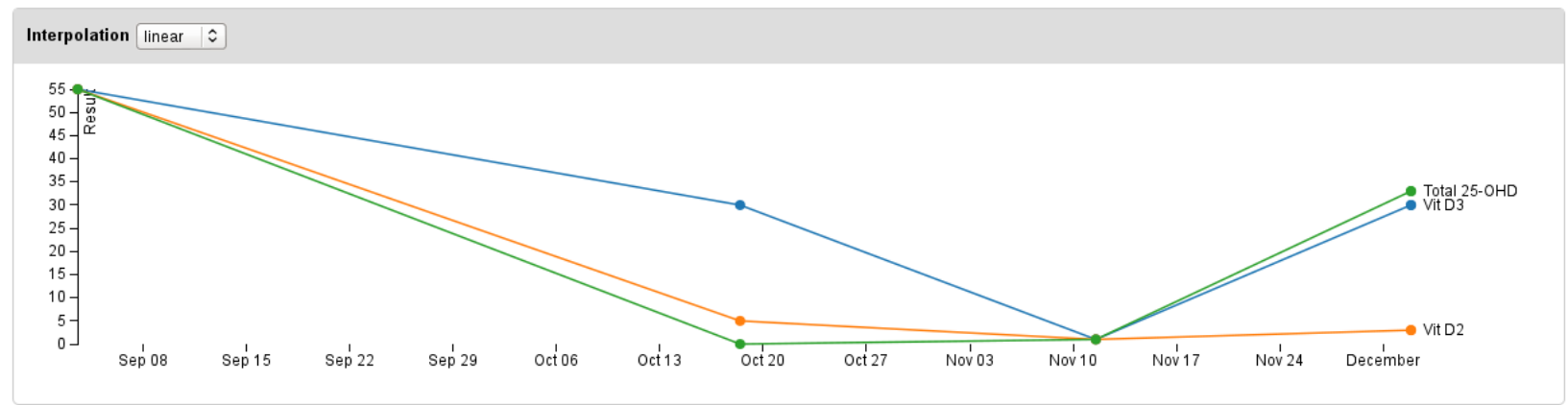
EPI Number

Immunization	Vaccination Center	Date
<input type="checkbox"/> 13vPVC	Josephine Thomas Health Center	1997-09-12
<input type="checkbox"/> Hepatitis A	Western Sea Hospital (Cape Town)	2005-05-13
<input type="checkbox"/> hepB	Western Sea Hospital (Cape Town)	2005-07-23

Add Delete selected Delete all

Save immunization history

## Historic Results



Test	2013-09-03 01:19 PM	2013-10-18 11:01 AM	2013-11-11 12:43 PM	2013-12-02 09:14 PM	2013-12-02 09:39 PM	Units	Range
<b>Dried Bloodspot</b>							
Total 25-OHD (TOHD)	55.00	< 2	< 2	33.00	33.00	ng/ml	32 - 100
Vit D3 (25HVD3_MAPTAD)	55.00	30.00	< 2	30.00	30.00	ng/ml	
Vit D2 (25HVD2_MAPTAD)	55.00	5.00	< 2	3.00	3.00	ng/ml	

Can also be used with anonymous patients

- Query clinic, doctor
- EMR Analysis Request
- Reception lab clerk
- worksheets
- Workflow Creation lab clerk
- Results Capture analyst
- Verification lab manager
- e-mail sms export pdf fax
- Publication

# Doctors

You are here: [Home](#) > [Doctors](#)

 **Doctors**  Add

<input type="checkbox"/>	Doctor ID	Full Name	Email Address	Business Phone	Mobile Phone
<input type="checkbox"/>	D013	Anabel Romero	anabel@example.com	+27-21-5429321	+27-82-4245178
<input type="checkbox"/>	D001	Antonio Díaz	antonio@example.com	+27-21-6512024	+27-82-5954193
<input type="checkbox"/>	D002	Armando Castro	armando@example.com	+27-21-6196808	+27-82-6276642
<input type="checkbox"/>	D011	Efua Tshabala	efua@example.com	+27-21-4667785	+27-82-4503448
<input type="checkbox"/>	D015	Flavia Silva	flavia@example.com	+27-21-4604522	+27-82-6494721
<input type="checkbox"/>	D003	Gobind Bargal	gobind@example.com	+27-21-6467713	+27-82-6543885
<input type="checkbox"/>	D004	Ishvara Dwivedi	ishvara@example.com	+27-21-4050354	+27-82-4269073
<input type="checkbox"/>	D018	Jarita Dang	jarita@example.com	+27-21-6222809	+27-82-4575134
<input type="checkbox"/>	D016	Joy James	joy@example.com	+27-21-4067382	+27-82-6699524
<input type="checkbox"/>	D009	Kunal Osman	kunal@example.com	+27-21-4332611	+27-82-6678193
<input type="checkbox"/>	D010	Marcelino Domínguez	marcelino@example.com	+27-21-5033447	+27-82-6735871
<input type="checkbox"/>	D005	Pablo Méndez	pablo@example.com	+27-21-4501617	+27-82-4319976
<input type="checkbox"/>	D006	Paki Sibiya	paki@example.com	+27-21-5894776	+27-82-5566742
<input type="checkbox"/>	D019	Rosamaria Riffle	rosamaria@example.com	+27-21-6972168	+27-82-6098389
<input type="checkbox"/>	D007	Shasty Inamdar	shasty@example.com	+27-21-5941559	+27-82-4892456
<input type="checkbox"/>	D014	Thandiwe Mahlangu	thandiwe@example.com	+27-21-6899933	+27-82-5023193
<input type="checkbox"/>	D008	Themba Skweyiya	themba@example.com	+27-21-5220306	+27-82-4424438
<input type="checkbox"/>	D012	Ushas Parab	ushas@example.com	+27-21-5503845	+27-82-5687958
<input type="checkbox"/>	D020	Valentina Núñez	valentina@example.com	+27-21-6532166	+27-82-6248444
<input type="checkbox"/>	D021	Vliet Snyman	VlietSny@example.com	+27-21-5944449	+27-82-6444721
<input type="checkbox"/>	D017	Zola Malahlela	zola@example.com	+27-21-5670380	+27-82-5619843

Active  Dormant  All



# Analysis Requests

## Request new analyses

Contact Person ■ Carol Collie CC

CC Emails

Template » »

Profile » Lab: AST - K » Lab: AST - M

Secondary AR » Select Specimen » Select Specimen

Referring Institution SID » »

Sampling Date ■ » 2013-01-14 » 2013-01-14

Sample Point » Lab: Human » Lab: Human

Specimen Type ■ » Whole Blood » Blood

Sampling Deviation » »

### Lab Analyses

Bacteriology - Identification				
Bacteriology - Molecular Methods				
Bacteriology - Sensitivity Testing				
KB Testing: Acinetobacter spp. - Amikacin	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Ceftazidime	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Ciprofloxacin	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Co-trimoxazole	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Gentamycin	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Imipenem	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Piperacillin	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>
KB Testing: Acinetobacter spp. - Tetracycline	US\$ 0.00	<span style="border: 1px solid gray; padding: 2px;">»</span>	<input type="checkbox"/>	<input type="checkbox"/>

- Sputum
- Stool
- Swab Faecal
- Swab Nasopharyngeal
- Swab Throat
- Swab Vesicle
- Viral Isolate
- Whole Blood
- Bacterial Isolate
- Plasma
- Serum
- Solid Tissue

**VB13-0001-P1** ▲   
 Whole Blood  
 Sampling Date 2013/01/14 Human

**VB13-0002-P1** ▲   
 Whole Blood  
 Sampling Date 2013/01/14 Human

- Automatic labelling

- Custom IDs for samples, requests, worksheets, patients, ref. samples, etc.

Query *clinic, doctor*

EMR + *clinic*

Analysis Request

Reception *lab clerk*

worksheets 

Workflow Creation *lab clerk*

Results Capture *analyst*

Verification *lab manager*

e-mail sms export pdf fax + *clinic*

Publication

# Analysis Services

You are here: [Home](#) › [Bika Setup](#) › Analysis Services

## Analysis Services + Add

Active Dormant All

Service	Category	Keyword	Instrument	Unit	Price	Calculation
<input type="checkbox"/> Bacteriology - Identification						
<input type="checkbox"/> Bacteriology - Molecular Methods						
<input type="checkbox"/> Bacteriology - Sensitivity Testing						
<input type="checkbox"/> Bacteriology - Serology						
<input type="checkbox"/> E. coli - Serotyping	Bacteriology - Serology	S168			0.00	
<input type="checkbox"/> H. influenzae - Biotyping	Bacteriology - Serology	S169			0.00	
<input type="checkbox"/> H. influenzae - Serotyping	Bacteriology - Serology	S170			0.00	
<input type="checkbox"/> Leptospira - IgM	Bacteriology - Serology	S105	iMark Microplate Absorbance Reader		0.00	
<input type="checkbox"/> N. meningitidis - Serotyping	Bacteriology - Serology	S171			0.00	
<input type="checkbox"/> S.pneumoniae - Serotyping	Bacteriology - Serology	S172			0.00	
<input type="checkbox"/> Salmonella - Phage Typing	Bacteriology - Serology	S148			0.00	
<input type="checkbox"/> Salmonella - Serotyping	Bacteriology - Serology	S173			0.00	
<input type="checkbox"/> Shigella - Serotyping	Bacteriology - Serology	S174			0.00	
<input type="checkbox"/> V. cholerae - Serotyping	Bacteriology - Serology	S175			0.00	
<input type="checkbox"/> Entomology - Resistance Testing						
<input type="checkbox"/> Entomology - Species Identification						
<input type="checkbox"/> Mycology - Identification						
<input type="checkbox"/> Not Tested						
<input type="checkbox"/> Parasitology - Identification						
<input type="checkbox"/> Referred						
<input type="checkbox"/> Virology - Identification						
<input type="checkbox"/> Virology - Molecular Methods						
<input type="checkbox"/> Virology - Serology						

Deactivate Duplicate

- Different Analysis Specifications for each Analysis

- Different results type for each analysis: text, numeric, choice, attachment, etc.

# Calculations



## Edit AST - Disk Diffusion (v1)

Description ■ Calculation

### Calculation Interim Fields

Define interim fields such as vessel mass, dilution factors, should your calculation require them. The field title specified here will be used as column headers and field descriptors where the interim fields are displayed

Keyword	Field Title	Default value	Unit	Hidden Field	delete
<input type="text" value="LOWER_LIMIT"/>	<input type="text" value="LOWER LIMIT"/>	<input type="text" value="0"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="text" value="UPPER_LIMIT"/>	<input type="text" value="UPPER LIMIT"/>	<input type="text" value="100"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="text" value="DIAMETER"/>	<input type="text" value="Diameter"/>	<input type="text" value="0"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

More

### Calculation Formula

The formula you type here will be dynamically calculated when an analysis using this calculation is displayed.

To enter a Calculation, use standard maths operators, + - \* / ( ), and all keywords available, both from other Analysis Services and the Interim Fields specified here, as variables. Enclose them in square brackets [ ].

E.g, the calculation for Total Hardness, the total of Calcium (ppm) and Magnesium (ppm) ions in water, is entered as [Ca] + [Mg], where Ca and MG are the keywords for those two Analysis Services.

```
[DIAMETER] <= [LOWER_LIMIT] and "Resistant" or ([DIAMETER] > [LOWER_LIMIT] and [DIAMETER] < [UPPER_LIMIT]) and "Intermediate" or [DIAMETER] >= [UPPER_LIMIT] and "Sensitive"
```

- Interim fields and results from other analyses as input calculation sources

- Automatic calculations

# Preservations

You are here: [Home](#) › [Bika Setup](#) › Preservations

## Preservations + Add

Active Dormant All

<input type="checkbox"/> Preservation	Description
<input type="checkbox"/> Ambient	Room Temperature
<input type="checkbox"/> Frozen -20 °C	-20° C
<input type="checkbox"/> Frozen -70 °C	-70° C
<input type="checkbox"/> Incubation	
<input type="checkbox"/> Incubation with CO <sub>2</sub>	
<input type="checkbox"/> Refrigerated	

### Edit Frozen -70 °C

**Title** ■

**Frozen -70 °C**

**Description**  
Used in item listings and search results.

-70°C

**Preservation Category**

Field Preservation

Lab Preservation

**Retention Period**  
Once preserved, the specimen must be disposed of within this time period. If not specified, the specimen type retention period will be used.

Days  Hours  Minutes

- Allows to activate or deactivate a sample preservations workflow

- In-lab or out-lab sampling workflow

# Containers

You are here: [Home](#) > [Bika Setup](#) > [Containers](#)



## Containers

[+](#) Add

Active Dormant All

<input type="checkbox"/>	Container	Description	Container Type	Capacity	Pre-preserved
<input type="checkbox"/>	Biopsy Specimen Container		Biopsy Specimen Container		
<input type="checkbox"/>	Centrifuge tube 15 ml	Sterile, polypropylene	Centrifuge Tube	15 ml	
<input type="checkbox"/>	Centrifuge tube 50 ml	Sterile, polypropylene	Centrifuge Tube	50 ml	
<input type="checkbox"/>	Cryogenic vial 2ml (-20°C)	Sterile, polypropylene	Cryogenic Vial	2.0 ml	
<input type="checkbox"/>	Cryogenic vial 2ml (-70°C)	Sterile, polypropylene			
<input type="checkbox"/>	Cryogenic vial 2ml (-8°C)	Sterile, polypropylene			
<input type="checkbox"/>	Entomology Specimen Container				
<input type="checkbox"/>	Faecal Swab	Sterile in Cary-Blair tra			
<input type="checkbox"/>	Microscopic Slide	Clean, glass			
<input type="checkbox"/>	Nasopharyngeal Swab (Bacterial)	Sterile in Regan-Lowe			
<input type="checkbox"/>	Nasopharyngeal Swab (Viral)	Sterile, in viral transpo			
<input type="checkbox"/>	Petri Dish	Sterile, polystyrene			
<input type="checkbox"/>	Petri Dish (CO2)	Sterile, polystyrene			
<input type="checkbox"/>	Seed Germination Paper				
<input type="checkbox"/>	Sputum 60 ml	Sterile, polypropylene			
<input type="checkbox"/>	Stool 60 ml	Sterile, polypropylene			
<input type="checkbox"/>	Transport tube 15 ml	Sterile, polypropylene			
<input type="checkbox"/>	Urine cup 60 ml	Sterile, polypropylene			

[Deactivate](#)

You are here: [Home](#) > [Bika Setup](#) > [Containers](#) > [Cryogenic vial 2ml \(-70°C\)](#)



## Edit Cryogenic vial 2ml (-70°C)

Title

**Cryogenic vial 2ml (-70°C)**

### Description

Used in item listings and search results.

Sterile, polypropylene

### Container Type

Cryogenic Vial

### Capacity

Maximum possible size or volume of specimens.

2.0 ml

### Pre-preserved

Check this box if this container is already preserved. Setting this will short-circuit the preservation workflow for specimen aliquots stored in this container.

### Preservation

If this container is pre-preserved, then the preservation method could be selected here.

Frozen -70 °C

[Save](#)

[Cancel](#)

- Specific containers for each Sample Type and analysis

- Integration with the samples preservation workflow

# Worksheets

Manage Results **Add Analyses** Add Blank Reference Add Control Reference Add Duplicate Export Log State: Open

## Add Analyses

Select template  Apply template

Category  Service  Client  Search

<input type="checkbox"/>	Client	Order	Request ID	Category	Analysis	Date Received	Due Date
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Amikacin	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Identification	Bacterial Identification	2014-03-19	2014-04-02
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Molecular Methods	M. tuberculosis - RT-PCR	2014-03-19	2014-03-23
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Imipenem	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Haemophilus spp. - Chloramphenicol	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: S. pneumoniae - Chloramphenicol	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: S. pneumoniae - Co-trimoxazole	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: S. pneumoniae - Erythromycin	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: S. pneumoniae - Oxacillin	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: S. pneumoniae - Tetracycline	2014-03-19	2014-04-09
<input type="checkbox"/>	Zola Budd Chest Clinic	ZBCC-1001	ISB14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: S. pneumoniae - Vancomycin	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Amikacin	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Ceftazidime	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Ciprofloxacin	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Co-trimoxazole	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Gentamycin	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Imipenem	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Piperacillin	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Tetracycline	2014-03-19	2014-04-09
<input type="checkbox"/>	MediClinic Pinelands		AA14-0001-R01	Bacteriology - Sensitivity Testing	KB Testing: Acinetobacter spp. - Tobramycin	2014-03-19	2014-04-09
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Virology - Identification	Influenza A - VI	2014-03-19	2014-04-16
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Virology - Identification	Influenza B - VI	2014-03-19	2014-04-16
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Virology - Identification	Dengue - IFA	2014-03-19	2014-03-26
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Virology - Identification	Dengue - VI	2014-03-19	2014-04-16
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Bacteriology - Identification	Bacterial Identification	2014-03-19	2014-04-02
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Mycology - Identification	C. neoformans - Microscopy	2014-03-19	2014-03-21
<input type="checkbox"/>	Stikland Hospital	SHAR14234	SE14-0003-R01	Parasitology - Identification	Malaria - Microscopy	2014-03-19	2014-03-21
<input type="checkbox"/>	Stikland Hospital		SO14-0001-R01	Entomology - Species Identification	Arthropod Identification - Microscopy	2014-03-20	2014-03-27

Assign



Query clinic, doctor



Analysis Request



Reception lab clerk



Workflow Creation lab clerk



Results Capture analyst



Verification lab manager



Publication



# Results capture

Autofill  Field  Value   Only to empty or zero fields

<input type="checkbox"/>	Position	Analysis	Method	Final Conc	Factor	Result	+/-	<input checked="" type="checkbox"/>	Due Date	State	Attachments
<input checked="" type="checkbox"/>	1 ACT DBS13345-026-R1 Dried Bloodspot	Total 25-OHD	LC MS			66.00 ng/ml			2013-12-16	Published	
		Remarks: recalculated because of D2 retesting									
<input type="checkbox"/>		Total 25-OHD	LC MS			55.00 ng/ml			2013-12-16		
<input type="checkbox"/>		Vit D2	LC MS	22	1	22.00 ng/ml			2013-12-16 10:11 PM		
<input type="checkbox"/>		Vit D3	LC MS	33	1	33.00 ng/ml			2013-12-16 10:11 PM		
<input type="checkbox"/>		Vit D3	LC MS	44	1	44.00 ng/ml		<input checked="" type="checkbox"/>	2013-12-16 10:11 PM		
		Remarks: retested									
<input checked="" type="checkbox"/>	2 ACT DBS13345-025-R1 Dried Bloodspot	Total 25-OHD	LC MS			56.33 ng/ml		<input checked="" type="checkbox"/>	2013-12-16		
		Remarks:									
<input type="checkbox"/>		Total 25-OHD	LC MS			66.00 ng/ml			2013-12-16		
<input type="checkbox"/>		Total 25-OHD	LC MS			56.33 ng/ml			2013-12-16		
<input type="checkbox"/>		Vit D2	LC MS	29	1	29.00 ng/ml			2013-12-16 10:11 PM		
<input type="checkbox"/>		Vit D2	LC MS	29	1.5	19.33 ng/ml		<input checked="" type="checkbox"/>	2013-12-16 10:11 PM		
		Remarks: retested									
<input type="checkbox"/>		Vit D3	LC MS	37	1	37.00 ng/ml			2013-12-16 10:11 PM		
<input type="checkbox"/>		Vit D3	LC MS	<input type="text" value="37"/>	<input type="text" value="1"/>	37.00 ng/ml		<input checked="" type="checkbox"/>	2013-12-16 10:11 PM	Received	
		Remarks:									
<input checked="" type="checkbox"/>	3 QC13-0001-014 Blank DS July	Vit D2	LC MS	<input type="text" value="1"/>	<input type="text" value="1.2"/>	ng/ml		<input type="checkbox"/>	2014-07-01 12:00 AM	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="2.3"/>	<input type="text" value="1.5"/>	ng/ml		<input type="checkbox"/>	2014-07-01 12:00 AM	Assigned	
<input checked="" type="checkbox"/>	4 QC13-0006-002 UTAK 100 July	Vit D2	LC MS	<input type="text" value="123"/>	<input type="text" value="2"/>	ng/ml		<input type="checkbox"/>	2014-07-31 12:00 AM	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="0.1"/>	<input type="text" value="1"/>	ng/ml		<input type="checkbox"/>	2014-07-31 12:00 AM	Assigned	
<input checked="" type="checkbox"/>	5 ACT DBS13345-026-P1-D01 Dried Bloodspot	Vit D2	LC MS	<input type="text" value="0.23"/>	<input type="text" value="2.3"/>	< 2 ng/ml		<input type="checkbox"/>	2013-12-16	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="12"/>	<input type="text" value="12"/>	< 2 ng/ml		<input type="checkbox"/>	2013-12-16	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="1"/>	<input type="text" value="12"/>	< 2 ng/ml		<input type="checkbox"/>	2013-12-16	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="2"/>	<input type="text" value="1"/>	2.00 ng/ml		<input type="checkbox"/>	2013-12-16	Assigned	

- Additional remarks field for each analysis

- QC Samples: duplicates, control samples and blank samples

Query *clinic, doctor*

EMR Analysis Request

Reception *lab clerk*

worksheets Workflow Creation *lab clerk*

Results Capture *analyst*

Verification *lab manager*

e-mail sms export pdf fax Publication

# Results capture - Gap

Autofill  Field  Value   Only to empty or zero fields

<input type="checkbox"/>	Position	Analysis	Method	Final Conc	Factor	Result	+ - ✓ Due Date	State	Attachments
<input checked="" type="checkbox"/>	1 ACT DBS13345-026-R1 Dried Bloodspot	Total 25-OHD Remarks: recalculated because	LC MS						
<input type="checkbox"/>		Total 25-OHD	LC MS						
<input type="checkbox"/>		Vit D2	LC MS						
<input type="checkbox"/>		Vit D3	LC MS						
<input type="checkbox"/>		Vit D3	LC MS						
		Remarks: retested							
<input checked="" type="checkbox"/>	2 ACT DBS13345-025-R1 Dried Bloodspot	Total 25-OHD Remarks:	LC MS						
<input type="checkbox"/>		Total 25-OHD	LC MS						
<input type="checkbox"/>		Total 25-OHD	LC MS						
<input type="checkbox"/>		Vit D2	LC MS						
<input type="checkbox"/>		Vit D2	LC MS						
		Remarks: retested							
<input type="checkbox"/>		Vit D3	LC MS	37	1	37.00 ng/ml	2013-12-16 10:11 PM	Retracted	
<input type="checkbox"/>		Vit D3	LC MS	<input type="text" value="37"/>	<input type="text" value="1"/>	37.00 ng/ml	<input checked="" type="checkbox"/> 2013-12-16 10:11 PM	Received	
		Remarks:							
<input checked="" type="checkbox"/>	3 QC13-0001-014 Blank DS July	Vit D2 Remarks: retested	LC MS	<input type="text" value="1"/>	<input type="text" value="1.2"/>	ng/ml	<input type="checkbox"/> 2014-07-01 12:00 AM	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="2.3"/>	<input type="text" value="1.5"/>	ng/ml	<input type="checkbox"/> 2014-07-01 12:00 AM	Assigned	
<input checked="" type="checkbox"/>	4 QC13-0006-002 UTAK 100 July	Vit D2	LC MS	<input type="text" value="123"/>	<input type="text" value="2"/>	ng/ml	<input type="checkbox"/> 2014-07-31 12:00 AM	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="0.1"/>	<input type="text" value="1"/>	ng/ml	<input type="checkbox"/> 2014-07-31 12:00 AM	Assigned	
<input checked="" type="checkbox"/>	5 ACT DBS13345-026-P1-D01 Dried Bloodspot	Vit D2	LC MS	<input type="text" value="0.23"/>	<input type="text" value="2.3"/>	< 2 ng/ml	<input type="checkbox"/> 2013-12-16	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="12"/>	<input type="text" value="12"/>	< 2 ng/ml	<input type="checkbox"/> 2013-12-16	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="1"/>	<input type="text" value="12"/>	< 2 ng/ml	<input type="checkbox"/> 2013-12-16	Assigned	
<input checked="" type="checkbox"/>		Vit D3	LC MS	<input type="text" value="2"/>	<input type="text" value="1"/>	2.00 ng/ml	<input type="checkbox"/> 2013-12-16	Assigned	

**Pre-analysis workflow steps:**

1. Sample Separation
2. Nucleic Acid Extraction
3. Amplification (PCR)



# Micro-Biology

Microbiology			
<input type="checkbox"/>	Bacterial Identification	LEAF14-001-P1	
<input type="checkbox"/>	Clostridium perfringens	LEAF14-001-P1	
<input type="checkbox"/>	Enterococcus - Penicillin sensitivity	LEAF14-001-P1	0.0
<input checked="" type="checkbox"/>	Cannabanoids		
<input checked="" type="checkbox"/>	Pesticides		

Submit for verification

Remarks

- Aeromonas hydrophilia
- Bacillus cereus
- Campylobacter coli
- Candida parapsilosis
- Clostridium perfringens
- Enterobacter asburiae
- Erwinia spp.
- Flavimonas oryzae
- Klebsiella pneumoniae
- Morganella morganii
- Neisseria subflava
- Pasteurella multocida
- Salmonella spp.
- Shigella sonnei
- Yersinia enterocolitica


## Bacterial Identification

## Sensitivity and Susceptibility Testing

Microbiology			
<input checked="" type="checkbox"/>	Enterococcus - Penicillin sensitivity	AP14-005-P1	12.2 mm 12 mm - Resistant ( Resistant: <= 14.0 )

AST Disk Diffusion Manual

# Export and Import to and from Instrument



Results Capture  
analyst

Analyst LAD Analyst 1 Instrument Blott Titrator

Export

Select an output form

- Data-Collector
- Data-Collector
- FIAStar
- Winescan FT120
- Winescan Auto

Position	Analysis	Titr Vol	Titr Fact	Result	Dry	+	-	ents
<input type="checkbox"/> 1 Blank Reference Everything blank	<span>B</span> Calcium	0	0	mg/l	<input type="checkbox"/>			Assigned
<input type="checkbox"/> 2 Trace Metals Dry African's Metals	<span>C</span> Calcium	0	0	mg/l	<input type="checkbox"/>			

Import instrument data

Import

Select an input format

Data-Collector

Select instrument data file

# Results attachments

## Attachments

\\bGeneral\Microscopic\redblood.jpg

Browse...

Attach to Analysis

All analyses of type

Attachment Type Microscope

Keywords Blood cells

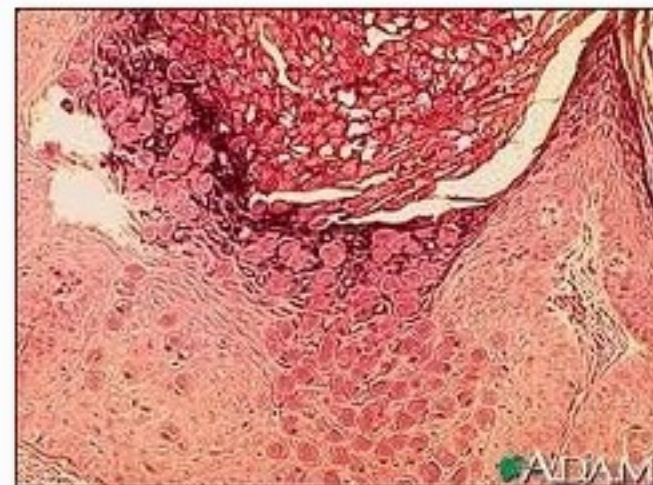
## Documents library

Microscopic

Arrange by: Folder



redblood.jpg



lesion.jpg

name: redblood.jpg

All Files

Open

Cancel

# Results verification

You are here: [Home](#) > [Worksheets](#) > WS13-0052

**Manage Results**

[Log](#)




State: Verified

**Warning** Some results exceeded the panic levels that may indicate an imminent life-threatening condition.

## WS13-0052

 [Attachments](#)

**Analyst** ■ Jean Martin **Instrument** LC MS Triple Quad

<input type="checkbox"/>	Position	Analysis	Method	Final Conc	Factor	Result	+ - ✓	Due Date	State	Attachments
<input type="checkbox"/>	1 KT Clinic	 Total 25-OHD	LC MS			10.34 ng/ml  		2013-12-17	Published	
<input type="checkbox"/>	DBS13346-005-R1	Vit D2	LC MS	1.023	1.22	< 2 ng/ml		2013-12-17 10:19 PM	Published	
<input type="checkbox"/>	Dried Bloodspot	Vit D3	LC MS	15	1.45	10.34 ng/ml		2013-12-17 10:19 PM	Published	
<input type="checkbox"/>	2 NW Health	 Total 25-OHD	LC MS			40.00 ng/ml		2013-12-15	Published	
<input type="checkbox"/>	DBS13343-010-R1	Vit D2	LC MS	1.84	1.22	< 2 ng/ml		2013-12-15 03:16 AM	Published	
<input type="checkbox"/>	Dried Bloodspot	Vit D3	LC MS	58	1.45	40.00 ng/ml		2013-12-15 03:16 AM	Published	

**Life-threatening conditions alert and automatic email notification to labmanager, doctor**

**Minimum Detection Levels, out-of-range values, % error**



Publication

# Quality Control

You are here: Home > Bika Setup > Instruments > AA 1

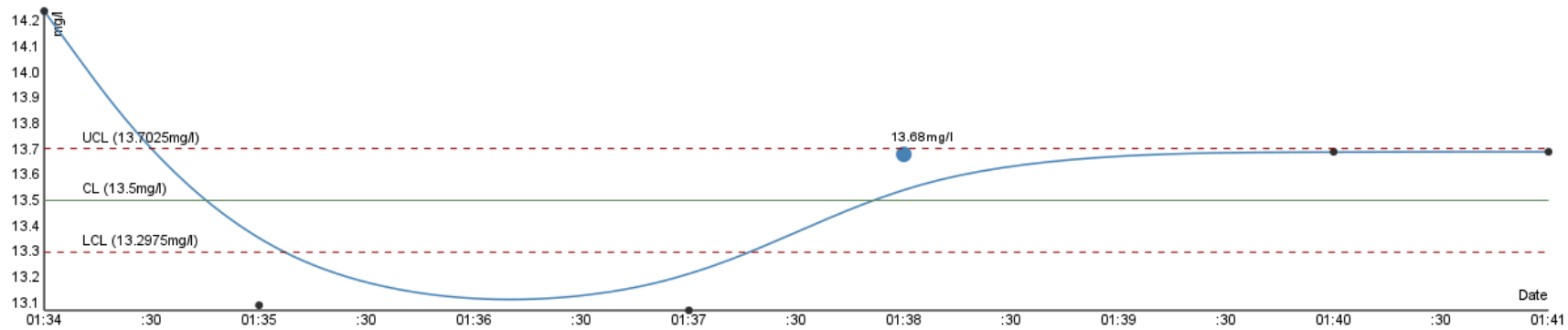
Edit Certifications Internal Calibration Tests Certificates

State: Active ▾



## Internal Calibration Tests

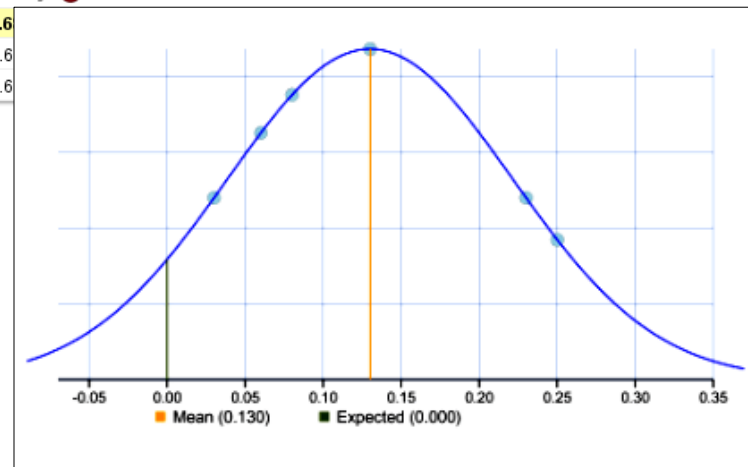
Analysis Ethanol (Ethanol) Reference Sample QC-001 Interpolation Basis



6 results found

Analysis	QC Sample ID	Reference Sample	Result	+-	Captured
Ethanol	IQC-001-001	QC-001	14.24 mg/l	🚩	2005-11-02 01:34 PM
Ethanol	IQC-001-002	QC-001	13.09 mg/l	🚩	2005-11-02 01:35 PM
Ethanol	IQC-001-003	QC-001	13.07 mg/l	🚩	2005-11-02 01:37 PM
Ethanol	IQC-001-004	QC-001	13.6		
Ethanol	IQC-001-005	QC-001	13.6		
Ethanol	IQC-001-006	QC-001	13.6		

## Reference standard graphs



# 4 Bika Health Overview - Results reports publication

Info VB13-0002-R01 published.

## Analysis Requests

Active Due Received To be verified Verified

Request ID	Patient	Doctor
<input type="checkbox"/> VB13-0002-R01	P13-00001	Nicholle Hos
<input type="checkbox"/> VB13-0001-R01	P13-00001	Nicholle Ho

Retract Verify Republish Cancel

**bikalims**  
 Carol Collie  
 Cape Town University Hospital  
 Created by: admin Laboratory

Request ID	VB13-0002-R01
Case ID	C13-00001
Patient	P13-00001
Specimen ID	VB13-0002
Referring Institution SID	Cape Town University Hospital
Referring Institution	Whole Blood
Specimen Type	Human
Sample Point	2013-01-18 09:57 AM
Date Received	2013-01-22 07:56 PM
Date Published	admin
Sampling Deviation	Result
Verified by	Sensitive
Lab Analyses - Bacteriology - Sensitivity Testing	Intermediate
MIC-E Testing: S. pneumoniae - Ceftriaxone	
MIC-E Testing: S. pneumoniae - Penicillin	

Remarks

Attachments

Candace Hlgefort +27-21-4569100 ext 40251 [candace.hlgefort@example.com](mailto:candace.hlgefort@example.com)

**!** Result out of client specified range

1. Analysis results relate only to the specimens tested
2. This document shall not be reproduced except in full, without the written approval of Laboratory
3. Test results are at a 95 % confidence level
4. Methods of analysis available by clicking on the 'Request' link

Sampled	Sampler	State
3-01-22		Published
3-01-22		To be verified

Email  
 PDF  
 SMS

- Query *clinic, doctor*
- EMR *clinic*
- Analysis Request
- Reception *lab clerk*
- worksheets
- Workflow Creation *lab clerk*
- Results Capture *analyst*
- Verification *lab manager*
- Publication *e-mail sms export pdf fax EMR clinic*



# Other features

Logs · CLIA compliance

Reference Standards

Specifications · Aliquots

Invoices · Exports to financial systems

Price lists

Android Tablet Interface

Queries · Quick search

ERP Interface

Management reports

Sampling Rounds

Results invalidation workflow Bulk AR Creation

## SON-0002-01 Log

Version	Date	User	Action
0	13 Jan 2012 11:02 am	labman1	attach
0	13 Jan 2012 11:02 am	labman1	submit
0	13 Jan 2012 10:56 am	labman1	retract
0	13 Jan 2012 10:56 am	labman1	attach
0	13 Jan 2012 10:56 am	labman1	submit
0	11 Jan 2012 12:30 pm	labman1	receive
0	11 Jan 2012 10:49 am	labman1	Create

# Road map

How deep are your pockets?

Gaob LIMS 3.2 · Health 3.2 · Interlab 2.1

## Planned new modules

Inventory and supply chain management

Instrument Server

Sample Storage

Surveys

Work Picklists

Universal Data Bus

# Thank you for the opportunity to present Bika Health

Professional Open Source

Bika Community

Web-based · CMS

Functionality and Bioinformatics

Roadmap