



TransMedcon2016

सुरक्षित रक्त - हर जीवनदायिनी बूँद से स्वस्थ भारत

Safe Blood - Making every blood drop count for healthy India.

Study of ChLIA and ELISA for TTI Markers in Blood Donors

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Life Blood Centre

(Formerly known as Rajkot Voluntary Blood Bank & Research Centre)

Rajkot, Gujarat, INDIA

BACKGROUND

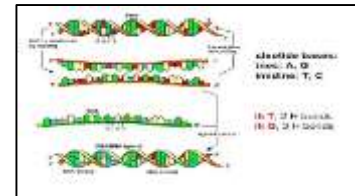
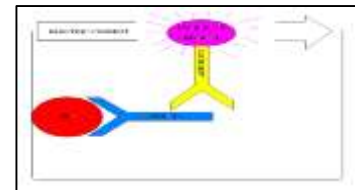
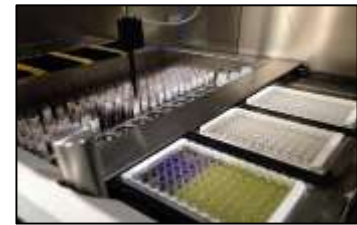
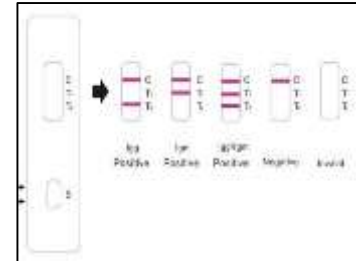
- Blood can save lives, however, blood transfusion may lead to many complications in the recipients.
- It is mandatory to screen all donated blood units for five transfusion transmitted diseases – HIV, Hepatitis B and C, Malaria and Syphilis.
- Detection of the serum markers of these diseases demands highly sensitive and specific immunoassays.

BACKGROUND

- Enzyme Linked Immuno Sorbent Assays (ELISA) are simple to perform and requires little specialized instruments, hence widely used and preferred in many blood banks.
- In Chemiluminescence Immunoassay (ChLIA), an enzyme converts a substance to a reaction product that emits photons of light instead of developing a visible color.

BACKGROUND

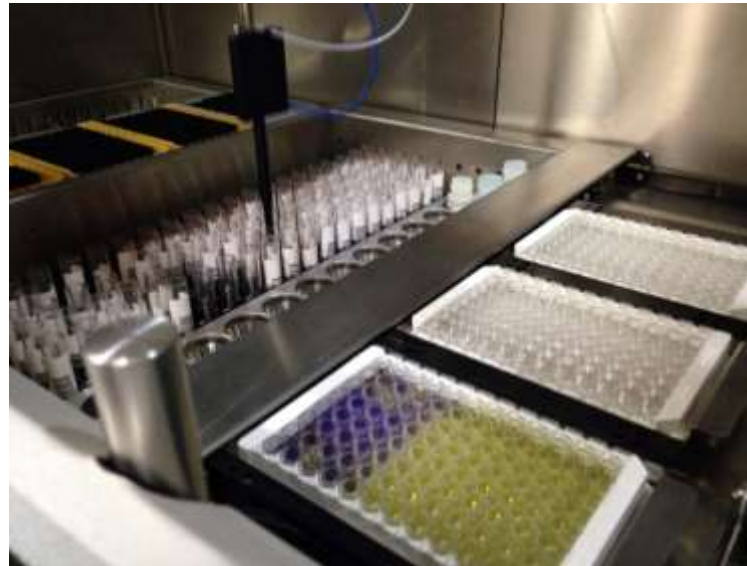
- **Rapid card**
(Immunochromatographic Assay)
- **ELISA**
(Enzyme Linked Immuno Sorbent Assay)
- **ChLIA**
(Chemiluminescence Immuno Assay)
- **NAT**
(Nucleic acid Amplification Technique)
- **Pathogen Inactivation**



BACKGROUND

ELISA

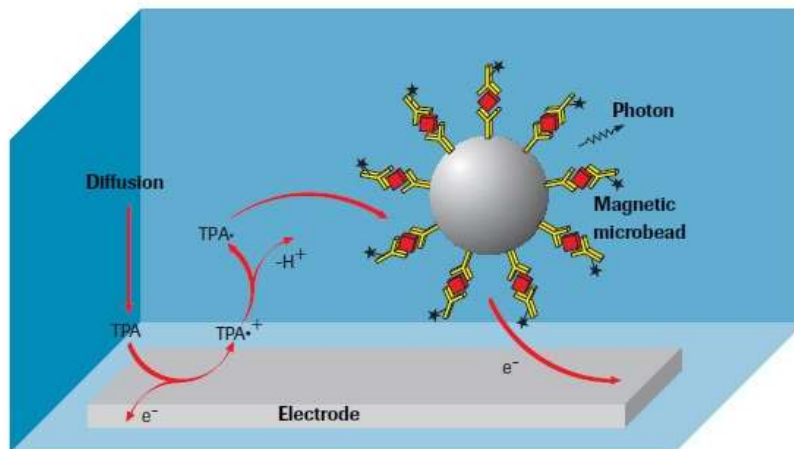
- Developed in 1970 by Eva Engvall in Sweden.
- Upgradation – 1st, 2nd, 3rd and 4th generation.
- Quantitative measurement of antigen / antibody.



BACKGROUND

ChLIA

- A highly sensitive and selective method.
- The antigen or antibody is labelled with a molecule capable of emitting light during a chemical reaction; this light is used to measure the formation of the antigen-antibody complex.
- Luminescence produced during electrochemical reactions in solutions.



**To compare technical performance of the
ChLIA and ELISA for detection of the
HBsAg, HIV and HCV.**

METHODS

- Total 556 samples were tested.
 - 532 donors' random samples
 - 24 EQAS samples
- Two different immunoassays – ChLIA and ELISA were evaluated on a fully automated analyzer.

METHODS

- All tests including calibrations and control were performed and interpreted in accordance with the manufacturers' recommendations.

	ChLIA	ELISA
HIV	4 th Generation	4 th Generation
HBV	3 rd Generation	3 rd Generation
HCV	3 rd Generation	3 rd Generation

- In any discrepant results between the two methods, serum samples were tested by confirmatory tests for HIV, HBV & HCV.

RESULTS

- Total 556 paired sample testing carried out on ELISA and ChLIA for each assay – HIV, HBsAg and HCV.
- Some interesting results were found in the case of HIV & HBsAg assay.

RESULTS

HIV				
ELISA	Reactive	Nonreactive	Reactive	Nonreactive
ChLIA	Reactive	Reactive	Nonreactive	Nonreactive
Result	05	02	00	549

RESULTS

HBsAg				
ELISA	Reactive	Nonreactive	Reactive	Nonreactive
ChLIA	Reactive	Reactive	Nonreactive	Nonreactive
Result	00	03	00	553

RESULTS

HCV				
ELISA	Reactive	Nonreactive	Reactive	Nonreactive
ChLIA	Reactive	Reactive	Nonreactive	Nonreactive
Result	00	00	00	556

RESULTS

- There was a significant correlation between the assay results of the ELISA and ChLIA methods.
- The results of the correlation analysis between the two methods were **99.10%**.
- **0.90% ChLIA** is given **better** sensitivity and specificity compared to **ELISA**.

CONCLUSION

- We found that ChLIA is having better sensitivity and specificity.
- ChLIA method has some value added advantages over ELISA method.

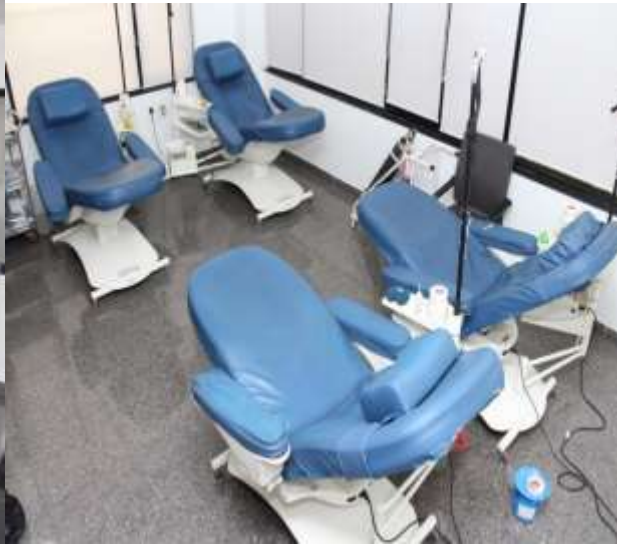
CONCLUSION

Advantages of ChLIA over ELISA...

- Full automation
 - Random sampling
 - Increased sensitivity and specificity
 - Less sample quantity
 - Rapid turnaround
 - Less manual handling
 - Excellent reproducibility

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South East
Asia**

**First in
Gujarat**

Thanks



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X-Ray Irradiator

Panther (ID-NAT)