



APFCB News

The Newsletter of the Asia-Pacific Federation for Clinical Biochemistry
and Laboratory Medicine for circulation among APFCB and IFCC members only



2011

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APFCB Membership

Members

Australasian Association of Clinical Biochemists (AACB)
Chinese Society of Laboratory Medicine (CSLM)
Hong Kong Society of Clinical Chemistry (HKSCC)
Association of Clinical Biochemists of India (ACBI)
Indonesian Association for Clinical Chemistry (IACC)
Japan Society of Clinical Chemistry (JSCC)
Korean Society of Clinical Chemistry (KSCC)
Malaysian Association of Clinical Biochemistry (MACB)
Nepal Association for Medical Laboratory Sciences (NAMLS)
Pakistan Society of Chemical Pathologists (PSCP)
Philippine Association of Medical Technologists (PAMET)
Singapore Association of Clinical Biochemistry (SACB)
Association for Clinical Biochemistry, Sri Lanka (ACBSL)
Chinese Association for Clinical Biochemistry, Taiwan (CACB)
Thailand Association of Clinical Biochemists (TACB)
Vietnamese Association of Clinical Biochemistry (VACB)

Corporate Members

Abbott Diagnostics
Agappe Diagnostic (India)
BD Diagnostics
Beckman Coulter
Beijing Wantai (China)
Bio-Rad
Ortho-Clinical Diagnostics
Osmetech
PM Separations (Australia)
Randox Laboratories
Roche Diagnostics
Sekisui Chemical Co (Japan)
Siemens
Sysmex

Affiliate Members

Chinese Association of Clinical Laboratory Management (CACLM)
Macau Laboratory Medicine Association (MLMA)

Submissions

The APFCB News welcomes suitable contributions for publication. These should be sent electronically to the Chief Editor. Statements of opinions are those of the contributors and are not to be construed as official statements, evaluations or endorsements by the APFCB or its official bodies.

Cover - Painting of Dr Tan It Koon, Founding Past President of APFCB

APFCB Executive Board and Chairmen of Committees, Elected October, 2010

Executive Board

President	Dr Leslie C Lai Consultant Chemical Pathologist, Kuala Lumpur, Malaysia lesliecharleslai@gmail.com
Immediate Past President	Mr Joseph B Lopez MAHSA University College, Kuala Lumpur, Malaysia jblopez@streamyx.com
Vice-President	Dr Sunil K Sethi National University Hospital, Singapore patsks@nus.edu.sg
Secretary	Dra Endang Hoyaranda Prodia, Jakarta, Indonesia ehoya@prodia.co.id
Treasurer	Dr Elizabeth Frank BioChem Diagnostic Laboratory, Mysore, India anet21frank@yahoo.com
Corporate Representative	Mr Martin Fuhrer Siemens Healthcare Diagnostics Holding GmbH, Germany martin.fuhrer@siemens.com

Chairman of Committees

Communications	Prof. Praveen Sharma Jaipur, India praveensharma55@gmail.com
Education	Dr Samuel Vasikaran Royal Perth Hospital Perth, Australia samuel.vasikaran@health.wa.gov.au
Laboratory Management	Dr Tony Badrick Brisbane, Australia tony_badrick@snp.com.au
Scientific	Prof. Kiyoshi Ichihara Yamaguchi University, Japan ichihara@yamaguchi-u.ac.jp
Congress and Conference	Mr Joseph B Lopez MAHSA University College Kuala Lumpur, Malaysia jblopez@streamyx.com
Hon. Auditors	Prof. Leslie Burnett Pacific Laboratory Medicine Services ("PaLMS"), Sydney, Australia
	Prof. Jap Tjin-Shing Veterans General Hospital Taipei, Taiwan

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From the desk of Chief Editor...

Dear Colleagues,

Greetings! It is with a deep sense of satisfaction and fulfilment that I am before you with this annual issue of APFCB News. In the same breath let me add that APFCB now has a fully functional website, providing comprehensive information covering its member societies, corporate members, executive council, committees & working groups, congresses, meetings, symposia, travel lectures, webinars & APFCB News including the archives. The active contributions from executive council and several other members of APFCB family have been the source of inspiration to the Communications committee to fulfil this responsibility.

However as we are all aware, the world does not stand still and we very much look forward to your sustained support in future to maintain this site as a very interactive and well updated representing the active picture of APFCB and reflecting its activities. So friends, please use this forum effectively to share your progress, achievements and your thoughts and contributions on different issues related to the clinical biochemistry and laboratory medicine disciplines.

Knowledge gains value through use and a well-cited article is very valuable in scientific progress. It gives me great pleasure to share with you that the US journal of Clinical Immunology has presented commendation certificate to Prof CWK Lam, Past President of APFCB for his publication of 2008 on "Hyperproduction of IL-23 and IL-17 in patients with systemic lupus erythematosus: implications for Th17-mediated inflammation in auto-immunity" has been credited as one of the top-5 most cited papers during the 2006 to 2010. The APFCB is proud of Dr Lam's achievement.

The attractive painting on the cover pages of the current issue of APFCB News is the art work of Tan It Koon, who has been the past president of APFCB and active contributor to the progress and development of APFCB. His art work, well appreciated by scientific world has often been used to decor scientific journals including the front cover of March 2012 issue of Clinical chemistry. It is truly inspiring to see the insightful contribution from Dr Koon where the creative spirit gets blended with science.

With best compliments

Praveen Sharma
Chief Editor
Chair, APFCB Communication Division





Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB)

Annual Report for 2011

Happy New Year.

I present here the annual report of the APFCB for the Year 2011

I. APFCB MATTERS

Membership

Ordinary Members

The following Area or National Societies are members of the APFCB:

1. Australasian Association of Clinical Biochemists (AACB)
2. Chinese Society of Laboratory Medicine (CSLM)
3. Hong Kong Society of Clinical Chemistry (HKSCC)
4. Association of Clinical Biochemists of India (ACBI)
5. Indonesian Association of Clinical Chemistry (IACC)
6. Japan Society of Clinical Chemistry (JSCC)
7. Korean Society of Clinical Chemistry (KSCC)
8. Malaysian Association of Clinical Biochemists (MACB)
9. Nepal Association for Medical Laboratory Sciences (NAMLS)
10. Pakistan Society of Chemical Pathologists (PSCP)
11. Philippine Association of Medical Technologists (PAMET)
12. Singapore Association of Clinical Biochemists (SACB)
13. Association for Clinical Biochemistry, Sri Lanka (ACBSL)
14. Chinese Association for Clinical Biochemistry, Taiwan (CACB)
15. Thailand Association of Clinical Biochemists (TACB)
16. Vietnamese Association of Clinical Biochemistry (VACB)

Corporate Members

- | | |
|-------------------------------|---------------------------------|
| 1. Abbott Diagnostics | 8. PM Separations (Australia) |
| 2. BD Diagnostics | 9. Randox Laboratories |
| 3. Beckman Coulter | 10. Roche Diagnostics |
| 4. Beijing Wantai (China) | 11. Sekisui Chemical Co (Japan) |
| 5. Bio-Rad | 12. Siemens |
| 6. Olympus | 13. Sysmex |
| 7. Ortho-Clinical Diagnostics | |



Affiliate Members

1. Chinese Association of Clinical Laboratory Management (CACLM)
2. Macao Laboratory Medicine Association (MLMA)

Office Bearers

The Executive Board of the APFCB was elected at the Council Meeting in Seoul on 3rd October 2010 while the chairs were appointed in November 2010 based on nominations by APFCB member associations.

The office-bearers will serve until the 31st of December 2013.

Executive Board

President	Leslie Lai (Malaysia)
Immediate Past President	Joseph Lopez (Malaysia)
Vice-President	Sunil Sethi (Singapore)
Secretary	Endang Hoyaranda (Indonesia)
Treasurer	Elizabeth Frank (India)
Corporate Representative	Martin Fuhrer (Siemens)

Chairs of Committees

Communications (C-Comm)	Praveen Sharma (India)
Congress and conferences (C-CC)	Joseph Lopez (Malaysia)
Education (C-Edu)	Samuel Vasikaran (Australia)
Laboratory Management (C-LM)	Tony Badrick (Australia)
Scientific (C-Sci)	Kiyoshi Ichihara (Japan)

Honorary Executive Officer: Dr Johnson Wijaya (Indonesia)

Committee members and Corresponding members to the five standing committees of the APFCB were appointed in early 2011.

Resolutions adopted

Following resolutions adopted at the APFCB Council meeting in Seoul on 3rd October 2010, the following changes have been approved for implementation by the Registrar of Societies of Singapore:

- Name change from Asian and Pacific Federation of Clinical Biochemistry to Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine. The abbreviation APFCB remains unchanged
- Term of office-bearers to begin on 1 Jan after the Council meeting for 3 years to end on 31 December after the next Council meeting.
- Collection of a tiered subscription from APFCB Ordinary members
- New 2-tiered subscription rate for corporate members, one for the multinational companies and a lower rate for the companies from the region.



12th APCCB, Seoul Financial Report

The financial report from the 12th Asian-Pacific Congress of Clinical Biochemistry was received on 11th July 2011. A sum of USD 25,015.44 was received by APFCB in August 2011, this being equivalent to 20% of surplus. The IFCC should receive a remittance of USD 6,253.86

Golden Jubilee Celebrations

Heartiest congratulations to JSCC and AACB on their golden jubilee in 2011.

Memorandum of Understanding (MoU) between APFCB and World Association of Pathology and Laboratory Medicine (WASPaLM)

An MoU between APFCB and WASPaLM was signed on 17 May 2011 during the IFCC WorldLab in Berlin by the Presidents of APFCB (Dr Leslie Lai) and WASPaLM (Prof Michael Oellerich). As an initial co-operation between APFCB and WASPaLM, WASPaLM has granted its auspices to the 13th APFCB Congress in Bali and will sponsor speakers to participate in the 13th APFCB Congress in Bali. APFCB, in return, will sponsor a symposium on reference intervals at the WASPaLM World Congress to be held from 8-11 June 2013 in Quebec City, Canada. Other areas of co-operation include laboratory accreditation.



Signing of MoU between APFCB and WASPaLM. Seated from left to right: Dr Leslie Lai, President of APFCB and Prof Michael Oellerich, President of WASPaLM. Back row from left to right: Dra Endang Hoyaranda, Secretary of APFCB, Mr Joseph Lopez, Immediate Past President of APFCB, Prof Gamze Mocan Kuzey, President-elect of WASPaLM, and Dr Elizabeth Frank, Treasurer of APFCB.

2. APFCB ACTIVITIES

APFCB Education Committee (C-Edu)

Chair: Prof Samuel Vasikaran (Australia)

I. APFCB Travelling Lecturer 2011/2012

Dr Angela Wang from Hong Kong the APFCB TL for 2011/12 delivered her lecture titled, “Inflammatory markers in chronic kidney disease” in Sydney, Australia at the AACB Annual Scientific Conference and Golden Jubilee celebrations in October 2011, and in Hong Kong, to the HKSCC in November 2011. Dr Wang hopes to deliver lectures in Malaysia, Indonesia and China in 2012.

II. IFCC-Abbott Visiting Lecturer 2011/2012

Dr Gary Myers of the Centers for Disease Control and Prevention in the US will be the next IFCC-Abbott Visiting Lecturer. This visiting lectureship was to have commenced in 2011 and to be completed in 2012. However, due to Dr Gary Myers' work commitments it will now take place in 2012. He will speak on “Current Markers of Cardiovascular Disease”. AACB, CSLM, HKCC, IACC, MACB, MLMA and PAMET have expressed interest in hosting Dr Gary Myers in 2012.

III. APFCB Webinar

The Webinar in 2011, sponsored by Siemens Diagnostics, was delivered on June the 24th by Dr Ian Goodall of Australia. The topic was “HbA1c standardisation”.

IV. APFCB Interpretative Comments Education Program

The Interpretative Comments Education Programme in 2011 was coordinated by Dr Gordon Challand of the UK. There were 52 registrants. Five cases were circulated in 2011 and the participation rate was around 50%.

V. APFCB Scholarships

Two scholarships of up to SGD 3,500 each were awarded for attendance at the IFCC WorldLab in Berlin in May 2011. The recipients were Dr Uditkumar Agrawal of India and Dr Rojeet Shrestha of Nepal.

Two scholarships of SGD 3,500 each were awarded for attendance at the AACB 49th Annual Scientific Conference and Golden Jubilee celebrations in Sydney in October 2011. The recipients were Le Thi Thuy Nhu of Vietnam and Ming Li of China.

Scientific Committee (C-Sci)

Chair: Prof Kiyoshi Ichihara (Japan)

I. Reference Interval Projects

a. Publication of results from the 2009 Asian study

The Asian project for collaborative derivation of reference intervals: the main papers consist of three parts:

- Part 1: strategy and major results.
- Part 2: transference of reference intervals to the participating laboratories based on cross-comparison of test results.
- Part 3: exploration of variation sources for evidence-based medicine.



Part 1 and Part 2 are to be submitted together to CCLM. Prof Kiyoshi is awaiting approval from IFCC Scientific Division to submit them and hopes both will be accepted in 2012.

Other colleagues have been asked to write on other aspects of the study.

- Dr Xuejing Wang of Beijing University has written on the renal aspect, entitled "GFR estimating equations in multiethnic Asian population and the bias source" to be submitted to CCA or CCLM.
- Dr Shimizu (of Prof Ichihara's laboratory) is now writing on isoenzyme results from the Asian study.
- Dr Ihara of Toho University has already written on the results of vitamin B12 and folic acid. He is waiting for the preliminary paper to be published first before submitting this paper.

b. Web pages

Professor Ichihara has been working on the development of web pages offering evidence acquired by the Asian study. It will provide user-friendly interfaces for dynamic graphics to be drawn on request by the users. It is currently 70% built and will be available from the JSCC, APFCB and IFCC websites from around the middle of 2012.

c. Worldwide study on reference values (extension of the Asian study)

As an IFCC C-RIDL work, the common protocol for the study was finalised on 5th September 2011.

- A pilot study on the panel of sera based transference of reference values was undertaken. As multiple testing centres are to be set up in the worldwide study, test results have to be aligned based on this panel of sera. It was conducted in April-May 2011 with the collaboration of four labs in USA, Turkey and Japan. This strategy worked nicely and it would be adopted in the main study as well.
- Currently five (seven labs) countries are expected to take part in the first phase of the study: USA, UK, Turkey, China and Japan.
- Total of 3100 volunteers are to be recruited starting from November 2011. The study is being well managed financially.
- Requests from India, Pakistan, Saudi Arabia, Indonesia and Vietnam have been received for participation in the second phase of the study, as well as nations from Asia among others (African nations and other European countries). For launching of the second phase, funds will be needed to support each domestic study. Although the matter has been discussed with the relevant IFCC committees, no commitment is expected until results are obtained from the first phase. In any case, active discussions are expected on the regional collaboration in Asia which starts in early 2012.

II. Project on standardisation of testosterone and related analytes assays by mass spectrometry
(Coordinator: Dr Ronda Greaves)

Dr Ronda Greaves (Australia) is a member of C-Sci. Dr Greaves is coordinating a joint project on the standardisation of testosterone and related analytes assays by use of mass spectrometry in the APFCB region. This project was approved by APFCB C-Sci during the APFCB Congress in 2010, in Seoul. The results are to be reported soon.

III. Project on development of a new biochemical test to diagnose and monitor neuroblastoma in Vietnam (Coordinator: Dr Ronda Greaves)

Dr Ronda Greaves is also collaborating with VACB to establish gas chromatography - mass spectrometry (GC-MS) based paediatric screening for neuroblastoma in Vietnam. The APFCB EB has approved a project grant of AUD 5,000 to Ronda Greaves to undertake a project entitled "Development of a new biochemical test to diagnose and monitor neuroblastoma in Vietnam".



Laboratory Management Committee (C-LM)

Chair: Associate Prof Tony Badrick (Australia)

I. Quality Assurance/Quality Control Workshops

The major activity of the C-LM is the organisation and delivery of the QA/QC Workshops. The first workshop in 2011 was conducted in Manila on 24-25 March together with the IFCC and with the local support of PAMET. There were approximately 130 registrants at the workshop which was deemed to have been successful. The IFCC-Abbott Visiting Lecturers were Miss Janet Smith (UK), Dr Leslie Lai (Malaysia), Associate Prof Tony Badrick (Australia) and Dr Elizabeth Frank (India). The workshop programme is shown in Appendix 1.

The second successful workshop was held in Nepal from 22-24 November 2011 in conjunction with the IFCC and NAMLS (IFCC-APFCB-NAMLS workshop). The return air tickets were funded by the IFCC-Abbott Visiting Lecturer Programme. Generous sponsorship was also provided by Becton Dickinson for the workshop, sourced by the APFCB. The IFCC-Abbott Visiting Lecturers were Miss Janice Gill (Australia), Dr Clare Murphy (New Zealand) and Dr Elizabeth Frank (India). The workshop programme is shown in Appendix 2.

II. Environmental Initiative

One of the goals of the C-LM is to begin raising awareness amongst members of the APFCB of the importance of lessening the environmental impact of clinical laboratories. The aim is to produce some detailed content for the new APFCB website and some planning has begun on this project. Joseph Lopez and Tony Badrick have written a document "PROPOSALS FOR THE MITIGATION OF THE ENVIRONMENTAL IMPACT OF CLINICAL LABORATORIES" which will be the basis for further educational activities in the area of Environmental Awareness

Communications Committee (C-Comm)

Chair: Prof Praveen Sharma (India)

I. APFCB e-News

As has been decided by the APFCB EB, the APFCB News, henceforth, will be published online as a section on the website. The PDF file of the APFCB e-News 2010 has been sent to all Council Members and is available on the APFCB website, www.apfcb.org.

II. APFCB Website

The Communications Committee has taken up the work related to launching, coordination, maintenance and improvement of the APFCB website. Dr MVR Reddy (India) has been assigned the responsibility of being the web editor. The site was successfully launched on 1 Nov 2011. The website provides comprehensive information about the APFCB which includes:

- Membership information
- Details of Member societies (organisations and individuals)
- Details of Corporate members (companies and individuals)
- Members of the EB and Committees
- Congresses, meetings, symposia, APFCB Travelling Lecturer, etc
- APFCB e-News

III. Public Relations

A power point presentation on the APFCB, its members and its activities has been developed by Mr Martin Fuhrer, Corporate Representative to the EB, and is ready for use at member society conferences and at regional and international meetings to promote the APFCB. It will be updated as and when necessary. A project entitled "Development of a new biochemical test to diagnose and monitor neuroblastoma in Vietnam".



Congress and Conferences Committee (C-CC)

Chair: J Lopez (Malaysia)

I. Guidelines for auspices

A set of guidelines for obtaining APFCB auspices has been prepared, based on the IFCC guidelines. A copy was extended to Prof Tomris Ozben, Chair of the IFCC Congresses and Conferences Committee, who has said that his committee will allow APFCB and IFCC “to collaborate very closely and award IFCC auspices almost automatically to the meetings in the Asia-Pacific Region organised under APFCB auspices”.

II. Progress Report of 13th APFCB Congress

The C-CC has been in close contact with the Organising Committee of the 13th APFCB Congress. The following is a brief progress report of the preparations for the congress:

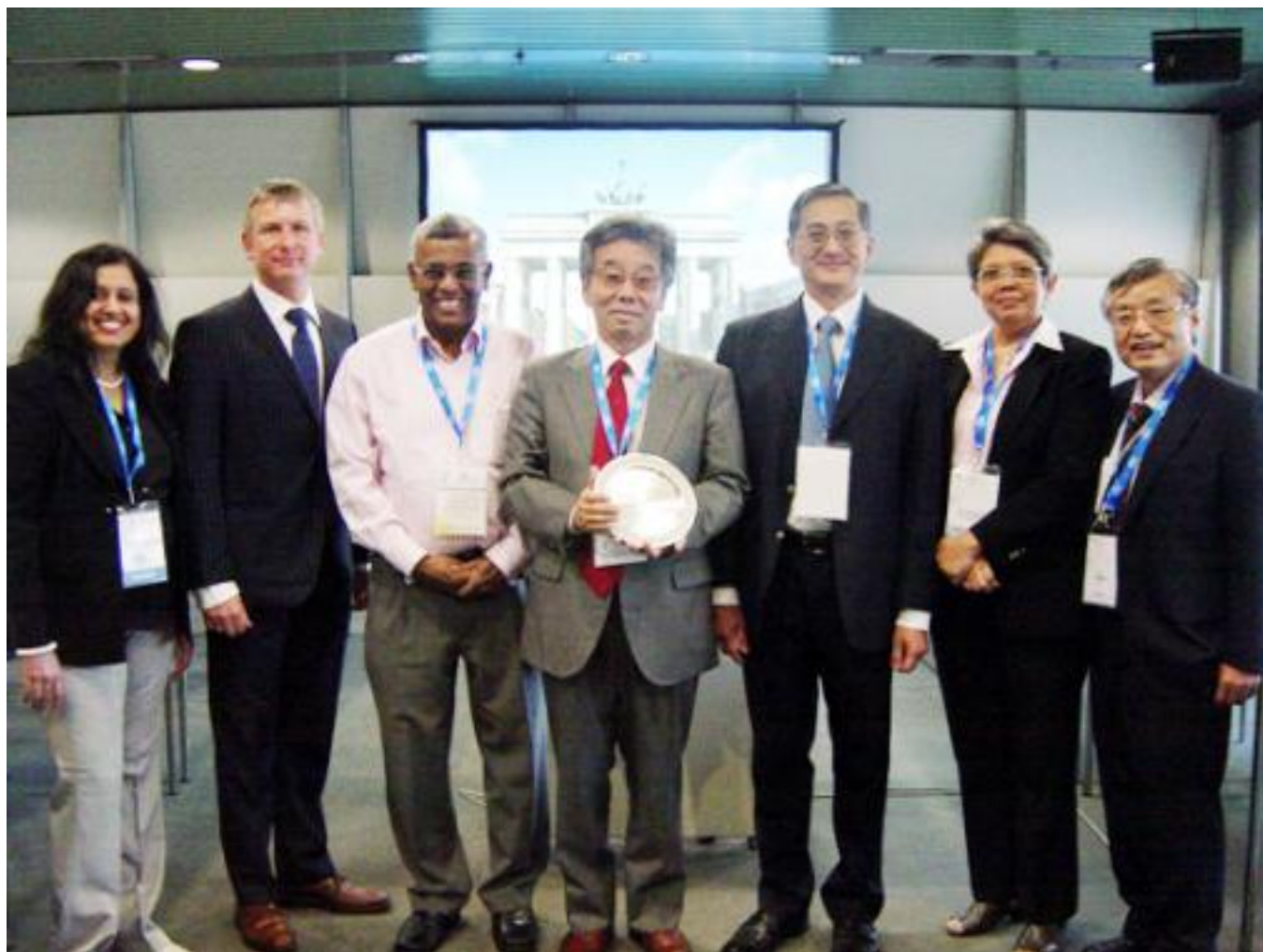
- **Dates:** Feedback was received from some diagnostic manufacturers stating that the original scheduled dates for the APFCB Congress, 17-20 November 2013 clashed with the Medica Düsseldorf Trade Show. The dates of the APFCB Congress 2013 were, therefore, changed to 6-9 October 2013.
- **APFCB, IFCC, WASPaLM:** The APFCB will be the co-organiser of the APFCB Congress and the IFCC, co-sponsor. Auspices for the congress has been provided by WASPaLM.
- **Venue:** The congress venue has been moved from Bali International Convention Centre (BICC) to the new convention centre named Bali Nusa Dua Convention Centre (BNDCC) because BNDCC has better value for money and facilities than BICC.
- **Flyer:** The flyer and poster of the 13th APFCB Congress have been modified accordingly.
- **Promotion:** The event has, thus far, been promoted by the distribution of flyers and posters at the following conferences:
 - “12th APCCB Congress” in Seoul, South Korea, 3-7 October 2011.
 - “AACB 49th Annual Scientific Conference & Golden Jubilee in Sydney, Australia, 10-13 October 2011.
 - The national meeting of the Japan Society of Clinical Chemistry (JSCC) in Sapporo, Japan, 26-28 August 2011.
- **Event organiser:** The Organising Committee has issued a letter to appoint Pactoconvex as the event organiser of the 13th APFCB Congress and the final agreement between the both parties will be signed in the near future. Both parties have agreed to a 50:50 sharing of the surplus generated by the congress.
- **Programme:** a preliminary programme has been sent to the APFCB EB and Chair of the Scientific Committee for comment and feedback has been given. This programme is being gradually filled. IFCC, EFCC and WASPaLM have agreed to sponsor symposia and speakers.
- **Corporate sponsorship:** A meeting with the major APFCB Corporate members will be held in Singapore on 7th February 2012 to discuss corporate sponsorship of the congress.



APFCB Membership

Japan Society of Clinical Chemistry (JSCC)

The JSCC celebrated its 50th Anniversary in 2011. The APFCB presented the JSCC with a pewter plaque at the IFCC WorldLab in Berlin this year.



From left to right: Dr Elizabeth Frank, Treasurer of APFCB, Mr Martin Fuhrer, Corporate Representative to the APFCB EB, Mr Joseph Lopez, Immediate Past President of APFCB, Prof Hamasaki, JSCC representative, Dr Leslie Lai, President of APFCB, Dra Endang Hoyaranda, Secretary of APFCB, Prof Kiyoshi Ichihara, Chair of APFCB C-Sci.

Australasian Association of Clinical Biochemists (AACB)

The AACB was formed on the 21st May 1961, thus attaining its 50th Anniversary in 2011. The Golden Jubilee celebrations were held in conjunction with the 49th Annual Scientific Conference from 10-13 October in Sydney. The APFCB, represented by Dr Leslie Lai, presented a pewter plate to the AACB to commemorate the Golden Jubilee of the AACB.



Dr Leslie Lai presenting pewter plate to Prof Leslie Burnett, President of AACB

This report has been prepared by Dr Leslie Lai with contributions from

- Mr Joseph Lopez (Chair, APFCB C-CC)
- Associate Prof Tony Badrick (Chair, APFCB C-LM)
- Prof. Kiyoshi Ichihara (Chair, APFCB C-Sci)
- Dr Samuel Vasikaran (Chair, APFCB C-Edu)
- Prof Praveen Sharma (Chair, APFCB C-Comm)

Appendix I. IFCC-APFCB-PAMET Workshop in Manila, Philippines, 24-25 March 2011

DAY 1 PROGRAM	9:15	Accreditation	JS
	Pre-analytical Workshop		
	9:45	Sample Integrity	JS
	10:45	Instruments & Reagents	EF
	11:30	Staff Procedures & Training	EF
	Analytical Workshop		
	13:30	Internal QC Principles	TB
	14:30	Internal QC Application	TB
	Post Analytical Workshop		
	15:30	Laboratory Reporting	LL
	16:30	Reference Intervals	LL
DAY 2 PROGRAM	Advanced Quality Control Workshop		
	9:00	Checking Results	JS
	10:00	Impact of Errors of Patients	LL
	EAQ Workshop		
	10:30	External Quality Assurance	TB
	Audit Workshop		
	13:30	Internal Audits and Complaints	EF
	14:30	External Assessments	EF
	Laboratory Quality Workshop		
	15:30	Improving the Laboratory	EF
	16:30	Panel Discussion	All
DAY 3 PROGRAM	8:30	Registration	
	8:45	Inauguration of the Seminar	
	8:50	Address by President PAMET	
	9:00	Address by Miss Janet Smith (Chair of IFCC-	
	Morning Session		
	09:10-10:00	WHO Diagnosis of Diabetes	JS
	10:00-10:30	Global Standardisation of HbA1c	LL
	10:30-11:10	Morning Tea	
	11:10-11:50	Liquid Disorders	EF
	11:50-12:30	Renal Disease	TB
	Lunch		
	Afternoon Session		
	13:30-14:10	Thyroid Disease	JS
	14:10-14:50	Common Tumour Markers	TB
	14:50-15:30	Electrolyte and Fluid Disorders	LL
	15:30-15:45	Afternoon Tea	
	15:45-16:15	Adrenal Disease	LL
	16:50-16:45	Questions & discussion	All

IFCC-Abbott Visiting Lecturers: Janet Smith (JS), Elizabeth Frank (EF), Leslie Lai (LL) and Tony Badrick (TB)



Appendix 2. IFCC-APFCB-NAMLS Workshop in Kathmandu, Nepal 22 – 24 November 2011

22 November 2011		
VLP to visit 2-3 laboratories		
23 November 2011		Who
10:00	Welcome	Binod
	VLP team introduce themselves and the program	
	Participants introduce themselves	
10:20-10:40	The Need for Quality	JG
10:40-11:00	Laboratory Errors	EF
	Internal Quality Control	
11:00-11:10	The Current Practice of Using IQC in Nepal	From Nepal
11:10-12:00	The Principles of Internal Quality Control	CM
12:00-12:15	IQC Products Available	BioRad
12:15-13:15	Lunch	
13:15-13:45	Setting IQC Acceptance Limits	CM
13:45-15:00	IQC Small Group Exercises	CM
15:00-15:15	Break	
	Pre-Analytical Errors	
15:15-15:45	Sample Collection-Artefacts & Improving Quality	Adarshpal Singh (BD)
15:45-16:15	Pre-analytical Errors Small Group Exercises - cases	Adarshpal Singh (BD)
16:15-16:30	Questions	Panel
16:30	Close	
24 November 2011		
10:00-10:20	Recap from Day 2	
	External Quality Assurance	
10:20-10:30	The Current Practice of EQA in Nepal	From Nepal
10:30-11:15	The Principles of External Quality Assurance	JG
11:15-11:30	Break	
11:30-12:00	How to Run EQA & Interpret Reports	JG
12:00-13:00	EQA Small Group Exercise – report interpretation	JG
13:00-14:00	Lunch	
	Post-analytical Factors	
14:00-14:20	Reference Intervals	JG
14:20-14:40	Critical Limits and Patient Report Comments	JG
14:40-15:10	Discussion - Reporting Results - Current Practice in Nepal & How to Improve	Chair:EF
15:10-15:30	Laboratory Documentation	EF
15:00-16:00	Discussion – Implementation of QC/EQA in Nepal	
16:00	Close	

IFCC-Abbott Visiting Lecturers: Janice Gill (JG), Clare Murphy (CM) and Elizabeth Frank (EF)



APFCB Education Committee

2011 Report

Contributed by Samuel Vasikaran, Chair APFCB Education Committee

APFCB Travelling Lecture

Dr Angela Wang from Hong Kong the APFCB TL for 2011/12 delivered her lecture titled, "Inflammatory markers in chronic kidney disease" in Sydney, Australia at the AACB ASC in October 2012, and in Hong Kong, to the HKSCC in November 2012. Dr Wang hopes to deliver lectures in Malaysia, Indonesia and China in 2012.

IFCC VLP

Dr Gary Myers of the Centers for Disease Control and Prevention in the US will be the next IFCC VL. It is expected that travel will occur during 2012. He will speak on "Current Markers of cardiovascular disease". Australia, Philippines, China and Pakistan have expressed interest in hosting him.

APFCB Webinar

The Webinar for this year sponsored by Siemens Diagnostics was delivered on June the 24th by Dr Ian Goodall of Australia. The topic was "HbA1c standardization".

APFCB Interpretative Comments Education Program

The Interpretative Comments Education Program this year was coordinated by Dr Gordon Challand of UK. There were 52 registrants. Five cases were circulated this year; participation rate was around 50%.

APFCB Scholarships

Two scholarships of up to SGD3,500 each were awarded for attendance at the IFCC WorldLab in Berlin in May 2011. The recipients were Uditkumar Agrawal of India and Rojeet Shrestha of Nepal. Two scholarships of up to SGD 3,500 each were awarded for attendance at the AACB ASM in Sydney in October 2011. The recipients were Le Thi Thuy Nhu of Vietnam and Ming Li of



Uditkumar Agrawal receiving scholarship from Martin Fuhrer, Siemens Healthcare Diagnostics Holding GmbH

APFCB Education Committee Membership 2011-2013

Chair	Samuel Vasikaran (AACB)
Secretary	Sun Fei (CSLM, China)
Member	Shu-Chu Shiesh (CACB, Taiwan)
Member	DM Vasudevan (ACBI, India)

Corresponding Members

AACB (Australasia)	Jeffrey Barron
HKSCC (Hong Kong)	Joseph Lee
IACC (Indonesia)	Tjan Sian Hwa
JSCC (Japan)	Susumu Osawa
KSCC (Korea)	Dong Hoon Shin
MAML (Macau)	Henry Tong Hoi Yee
MACB (Malaysia)	Raja Elina Raja Aziddin
NAMLS (Nepal)	Binod Yadav
PSCP (Pakistan)	Brig Rizawan Hashim
PAMET (Philippines)	Soledad Bautista
SACB (Singapore)	Sharon Saw
ACBSL (Srilanka)	Sumedha S Wijeratne
TACB (Thailand)	Dr Saravut Saichanma
VACB (Vietnam)	Pham Thien Ngoc



Report Of The Clinical Laboratory Management Committee

Report 2011

Contributed by Tony Badrick, Chair APFCB Lab Management Committee

1. Formation of New Committee

The year for the CLM Committee began with the formation of the new committee which now comprises the following members: Tony Badrick (AACB), Chair; Marilyn Robles-Atienza (PAMET), Secretary; Tran Huu Tam (VACB); and July Kumalawai (IACC). The corresponding members are Mark Rayner (AACB), John Joseph (AACB), Judy Lai (HKSCC), Wang Zhiguo (CSLM), Arun Raizada (ACBI), Yutaka Yatomi (JSCC), Sharon Saw (SACB), Amara Mudgamuwa (ACBSL), Jau-Tseun Kao (CACB), Andy Lee Hin Chio (MAML), Jung Han Song (KSCC), Norhazwati Mokhtar (MACB) and Utane Rungpanich (TACB).

2. Quality Assurance/Quality Control Workshops

The major activity of the CLM is the organisation and delivery of the QA/QC Workshops. There were two workshops in 2011. The first Workshop was conducted in Manila in March under the auspices of the IFCC and with the local support of PAMET. Approximately 130 registrants attended the meeting which was deemed to be successful. I attach a program.

The second Workshop was held in Nepal during November (program attached). The Workshop has been prepared with the local input of the NAMLS, the IFCC and the generous support of Becton Dickinson.

3. Environmental Initiative

One of the goals of the CLM was to begin raising awareness amongst members of the APFCB of the importance of lessening the environmental impact of clinical laboratories. The aim would be to produce some detailed content for the new APFCB website and some planning has begun on this project.

Joseph Lopez and Tony Badrick have written a document "PROPOSALS FOR THE MITIGATION OF THE ENVIRONMENTAL IMPACT OF CLINICAL LABORATORIES" which will be the basis for further educational activities in the area of Environmental Awareness.

4. Needs Survey of Members for Quality/Accreditation Activities

This activity is on the Work Plan but no action has taken place as yet. It may be of benefit to link this Survey in with other requests for information from member organisations.



5. QA/QC Self-directed learning material for the APFCB Website

One useful activity that the CLM has started now that the APFCB website is functional is to create a page of useful links to information on QA/QC.

1. Quality management systems and ISO 15189
2. Leadership roles
3. Accreditation and certification issues
4. Resource management
5. Quality Improvement
6. Training and Competence
7. QC and QAP
8. Quality Indicators
9. Safety

2011 Work Plan of the APFCB

No.	Activity	Time-Frame	Progress
	Laboratory Management Committee (Chair: Tony Badrick)		
1.	Analysis of the Interpretative Comments Education Program 2010 data and its publication in an appropriate journal Sam Vasakaran will continue this project	2011	
2.	Planning for the QA workshop (in conjunction with PAMET and IFCC) to be held in Manila, Philippines in March 2011	Workshop: Mar 2011	Workshop successfully completed
3.	Planning for Second QA workshop 2011	Workshop: 2011	Workshop to be held in Nepal. Initial contact made with NAMLS and organisation ongoing
4.	Needs survey of members for quality/accreditation activities	2011	
5.	Awareness of Environmental Impact of Clinical Laboratories	Planning 2011. Use of Newsletters	Awaiting website. Some planning occurring on content
6.	Development of Material for self directed learning for QA/QC/Lab Accreditation	Planning for material: 2012 release	No action as yet





VISITING LECTURER PROGRAM SURVEY: FOR THE NATIONAL SOCIETY

Name of Visiting Lecturers: Prof. Janet Smith, Dr Leslie Lai, Dr Tony Badrick, Dr Elizabeth Frank

Name of National Society: PAMET

Number of participants: 131 participants

Did you find the visit useful?	Very useful
Did you receive sufficient help and information from the VLP Chair and the EMD?	Most of the participants were very grateful for the lectures given by the visiting lecturers
Was the application process clear and easy?	Yes
Do you have any suggestions or recommendations for the VLP?	Suggestion: Have problem-based workshop and group discussion.

Please complete the survey and also submit a brief report to the Chair of the VLP within 2 months of the visit concerning the visit and the impact on your National Society.



IFCC-APFCB-PAMET

DAY 1 PROGRAM	9:15	Accreditation	JS
	Pre-analytical Workshop		
	9:45	Sample Integrity	JS
	10:45	Instruments & Reagents	EF
	11:30	Staff Procedures & Training	EF
	Analytical Workshop		
	13:30	Internal QC Principles	TB
	14:30	Internal QC Application	TB
	Post Analytical Workshop		
	15:30	Laboratory Reporting	LL
	16:30	Reference Intervals	LL
DAY 2 PROGRAM	Advanced Quality Control Workshop		
	9:00	Checking Results	JS
	10:00	Impact of Errors of Patients	LL
	EAQ Workshop		
	10:30	External Quality Assurance	TB
	Audit Workshop		
	13:30	Internal Audits and Complaints	EF
	14:30	External Assessments	EF
	Laboratory Quality Workshop		
	15:30	Improving the Laboratory	EF
	16:30	Panel Discussion	All
DAY 3 PROGRAM	8:30	Registration	
	8:45	Inauguration of the Seminar	
	8:50	Address by President PAMET	
	9:00	Address by Miss Janet Smith (Chair of IFCC-	
	Morning Session		
	09:10-10:00	WHO Diagnosis of Diabetes	JS
	10:00-10:30	Global Standardisation of HbA1c	LL
	10:30-11:10	Morning Tea	
	11:10-11:50	Liquid Disorders	EF
	11:50-12:30	Renal Disease	TB
	Lunch		
	Afternoon Session		
	13:30-14:10	Thyroid Disease	JS
	14:10-14:50	Common Tumour Markers	TB
	14:50-15:30	Electrolyte and Fluid Disorders	LL
	15:30-15:45	Afternoon Tea	
	15:45-16:15	Adrenal Disease	LL
	16:50-16:45	Questions & discussion	All



APFCB Visiting Lecture Program, Kathmandu, Nepal, November 2011

Day 1	
VLP to visit 2-3 laboratories	
Day 2	
10:00	Welcome
	VLP team introduce themselves and the program
	Participants introduce themselves
10:30	The Need for Quality
10:50	Questions
11:00	Internal Quality Control: Need for and selecting of with exercise
12:00	Lunch
13:00	Setting Acceptance Limits for IQC, statistics with exercise
	QC graphs and exercise and Trouble shooting
14:30	Break
15:00	Reference Intervals
	Critical Limits & Commenting
16:00	Close
Day 3	
10:00	Recap from Day 2
10:20	External Quality Assurance
	Alternative EQA
11:00	Sample Collection – Speaker from BD
11:30	Questions
11:40	Pre-analytical Errors
12:00	Small groups – examples of pre-analytical errors on lab results
12:30	Lunch
13:30	The Need for Laboratory Documentation
13:50	Analytical Phase
14:00	Reporting results
14:30	Maintenance of Laboratory Equipment
15:00	Interactive – problems in Nepal and suggested solutions
16:00	Close



IFCC-Task Force For Young Scientists Educational Workshop 2011 at India "Think The Unthinkable- A Guide To Select The Right Path"

Contributed by Pradeep Kumar Dabla - IFCC-TF YS Member & National Representative

Gwalior, MP, India 3rd December 2011. As a part of efforts of IFCC-Task Force Young Scientists (IFCC-TF YS) to promote networking between young scientists, to involve them in activities of laboratory medicine, and to promote the future of laboratory medicine, the IFCC-TF YS in collaboration with the Association of Clinical Biochemists of India (ACBI) held an Educational Workshop on 3rd Dec 2011. The programme was well attended by more than 100 candidates from various streams all over India. The event was hosted by the ACBI Conference (ACBICON) 2011 Organising Committee under supervision of Dr Neelima Singh (Organising Secretary), and held at the ITM University, Gwalior, MP, India.

IFCC has identified the need for young scientists to participate in Task Force activities and to understand the latest practices in laboratory healthcare sector. Therefore, various Educational workshops have been organized during IFCC and Member Societies Congresses under the roof of IFCC-TF YS. The concept of these activities is to encourage interactions between young scientists to face challenges, and to brighten the future prospects of self and laboratory medicine.

In keeping with these objectives, the Task Force organised Educational Workshop themed "Think The Unthinkable". For the first time, this workshop, second in continuation of the one-day workshop organized during the 37th Conference of the Association of Clinical Biochemists of India in December 2010, brought the laboratory medicine and Industry together, stressing on Various Job Opportunities present in Industry and other sectors related to Laboratory Medicine. This was an important step since it sought to share experiences, scope and a common platform for both the laboratory personnel and the industry which will lead to well-thought solutions to bridge the gap.

The workshop was organised with close co-operation with IFCC and ACBI. Addressing the conclave, Mr. J. Lopez (EB-IFCC & Past-President APFCB) praised the Task Force initiative and stressed upon the need to share experiences and challenges around the world. He explained the need of live sessions to demonstrate the laboratory management to build the future leadership.



Then, Dr Sucheta Dandekar (President ACBI) addressed and summarised the ACBI initiatives for the young biochemists. Dr Pradeep Kumar Dabla, Convener and National Representative IFCC-TF YS discussed the Task Force objectives and commitment of focused trainings to strengthen the future prospects of young laboratorians in absence of Damien Gruson, Chair IFCC-TF YS. The all senior members and EB-ACBI were present to support the cause.

Dr Dabla stressed that "With a robust general economy and with extraordinary advances being made in biotechnology and biopharmaceuticals, excellent positions are available in a wide variety of fields for current and future college graduates". While discussing various fields he emphasized on making a decision about what type of career and exactly what field will be best for you and the importance of dual proficiency of management training. Dr Elizabeth Frank (Chair of the Clinical Lab Management Committee of the IFCC & elected Secretary APFCB) explained the work strategies related to jobs vs careers. Then she discussed about Entrepreneurship and how to start and managing your own business. Dr Gurumukh Advani (Sales President Transasia) gave the view on how India is emerging as leading player in business and economy. He pointed out that "Healthcare delivery is growing as a largest service sector with excellent 15% growth per annum in India" and explained the role of biochemists in lab industry. In this blend of excellent professionals, Mr Shankar Haveri, (Head Healthcare Learning Academy, Siemens Healthcare) discussed the learning academy programmes and opportunities in various less known areas of IVD Industry. In row, Dr Rajesh Bendre (Consultant Pathologist & HOD Immunochemistry, Metropolis Healthcare) explained the concept of Clinical Reference laboratories, the role of laboratory professionals and the job profiles and career opportunities. He emphasized on the need of multitasking behaviour and flexibility. Dr Dabla, ended by giving Dr Gruson's view about the young scientists and laboratory medicine.

To summarize, the workshop has provided tangible results for the young laboratory professionals to select the right path after completing their studies. It has provided the vision about the various techniques and essentials to reach the right destination.



Dr Pradeep Kumar Dabla, Head of the Department of Biochemistry, Chacha Nehru Bal Chikitsalya Pediatric Super-specialty Hospital, New Delhi (left) receiving a memento from Mr Joseph Lopez, IFCC Executive Board Member, representing the President Dr Graham Beastall.

Australasian Association of Clinical Biochemists (AACB)

AACB 2011 Activities Report

2011 has been a year of milestones for The Australasian Association of Clinical Biochemists (AACB), the most notable of these being the celebration of 50 years since the formation of the AACB in May 1961.

Our Golden Jubilee was celebrated throughout the year with special events held in each of the Branches including the Roman Lecture tour featuring one of our founding fathers, Professor Geoffrey Kellerman. The Golden Jubilee was also the key focus of our Annual Scientific Meeting (ASM) in October celebrating 'Laboratory Medicine-Past, Present & Future.' At both the ASM and Branch meetings many of our Founding Members and Fellows were present to help celebrate and reflect on the growth and the development of the Association. Notably, Mrs Norma Curnow was present at the ASM and gave a brief overview of the life-work of her late husband, Prof David Curnow, and the early days of the fledgling AACB. Norma's own contributions to the Association should also not go without mention; as they say, behind every good man is a great woman!

As part the AACB Golden Jubilee celebrations many of its long-serving members were recognised with Outstanding Service Medallions (OSM), as nominated by the Branches and unanimously endorsed by the AACB Executive and Council. Many of these people are well-known throughout the clinical biochemistry realms, not just for their work for the AACB but for the APFCB, IFCC and other national and international organisations. OSM recipients include:

Paul Sheehan	WA	Michael Metz	SA
Sam Vasikaran	WA	Neil Pascoe	SA
Ian Goodall	VIC	John Galligan	QLD
Ann Read	VIC	Sandra Klingberg	QLD
Sujiva Ratnaike	VIC	George Koumantakis	NSW
Margaret Jenkins	VIC	Lyn Boscato	NSW
Nick Balazs	VIC	Fred San Gil	NSW
Michael Staley	TAS	Irene Gould	NSW
Deb Kunde	TAS	Jill Tate	QLD
Ruben David	TAS	Helen Martin	SA
Denise Burns	TAS	Tony Prior	WA



Other significant milestones for the AACB include the induction of a new President and a new Chief Executive Officer (CEO).

Professor Leslie Burnett vacated the office of President at the annual general meeting of the Association in October after five years of dedicated service with Dr Andrew St John taking the helm. In articles recently published in the Clinical Biochemists Newsletter, both Prof Burnett and Dr St John reflected on things past, present and future.

Key issues and highlights noted in these two reports included:

- Development of international collaborations and co-operation with sister Associations such as the APFCB, IFCC, AACC and ACB
- Forging new links with the EFCC and emerging Associations in South-East Asia
- Progression of workforce issues through the reactivation of Pathology Associations Council
- Initiation and participation in a number of major new scientific initiatives, including the introduction of reporting of the eGFR, international standardisation and dual reporting of HbA1c, standardisation of pathology and terminology, and most recently, pathology harmonisation
- Increasing activities of the Scientific and Regulatory Affairs Committee (SRAC) under the guidance and leadership of Ms Jill Tate with increasing numbers of scientific educational seminars that not only provide education and training to the AACB membership but have helped forged links and collaborations with other professional entities
- Development and ongoing support for Lab Tests Online (LTO) with its 'translation' from the American into Australian English, ably led by Dr Bruce Campbell as Chief Editor
- Relocation of the AACB Head Office from Perth to Sydney with co-location and strategic alliance with the Human Genetics Society of Australia (HGSA) to better position the AACB for the genomic revolution



Dr Andrew St John presenting Mr Tony Prior with his Outstanding Service Medallion



The new AACB President, Dr Andrew St John, with the immediate Past President, Prof Leslie Burnett



Peter Graham
New AACB CEO

The relocation of the Office has also brought about another of the significant changes to the 'face' of the AACB in 2011 with the recent retirement of our CEO, Mr Tony Prior. The AACB is indebted to Tony's dedicated service over the last ten years which was recognised with the presentation of an outstanding service medallion at the annual scientific meeting. The good news is that we have a new CEO in Mr Peter Graham who brings a wealth of laboratory and management experience with him. The AACB looks forward to long and productive working relationship with Peter as we move forward into our next 50 years!

The future is bright and ever challenging and changing for the Clinical Biochemist; it will be no different for the AACB Executive, Council and Membership. We will be faced with a new and exciting period in laboratory medicine – the world of genomics,

genetics and bioinformatics. The lines between phenotype and genotype, traditional/core services and new technologies (e.g. Next Gen Sequencing and 'Omics) are becoming increasingly more blurred as the new merges with the old. The challenge for the AACB and its sister organisations around the globe is to adapt and integrate these new frontiers into our routine lives.

We look forward to 2012 and the next 50 years of the AACB with hope and a new enthusiasm for clinical biochemistry and the challenges it throws our way. Prof Geoffery Kellerman (2011 Roman Lecturer and Founding Member) gives us all perhaps the best advice when he wrote:

"We of the old guard have given you, the new generation of laboratory workers, a firm basis of excellence in our day-to-day activities. It will be up to you to maintain this excellence in the face of rapidly evolving knowledge and technology, and to ensure that we have our say in the overall organisation of the health professions. There is work to do!"



Sandra Klingberg
Chair, AACB Media &
Communications Committee;
Editor, Clinical Biochemists
Newsletter



Celebrating the AACB's 50th Birthday: Prof Geoffrey Kellerman (2nd from the left), 2011 AACB Roman Lecturer, with the Victorian AACB Branch Committee

Reported by Sandra Klingberg, Chair Media & Communications Committee AACB





Japan Society of Clinical Chemistry

JSCC 2011 Activities Report

Naoki Watanabe

Fifty-first (51st) Annual Academic Conference of the Japanese Society of Clinical Chemistry was held at Sapporo Medical University in Sapporo city, Hokkaido, Japan, from August 26 through 28, 2011.

The history of the Japan Society of Clinical Chemistry spans over five decades. In order to make a further leap forward, a new perspective and strong engagement of the members are required. So, with high expectations for the future, the theme we set for the Conference was "Seeking New Possibilities in Clinical Chemistry." The member of the Japanese Society of Clinical Chemistry is comprised of medical doctors, pharmacists and clinical laboratory technologists, collaborating with a broad range of parties including universities, hospitals and the industrial world. The Annual Academic Conference is a forum for building social relationship and exchanging information among people engaging in clinical chemistry, regardless of specific occupations or professional fields.

End of August in Sapporo is a pleasant season when the summer heat subsides and the autumn brings beautiful sunset in the clear blue sky. We set the reception party at the International Convention center Pamir, Sapporo Prince Hotel, where





Now, during we were soliciting general speeches, the East Japan Earthquake occurred. Though we were forced to prepare the conference under extreme unstable condition, tremendous cooperation from various people resulted in the submission of 107 speech topics. It was the first time the number of submissions exceeded 100 under the current conference format. Six-hundred and sixty-eight participants engaged in active discussions. Excepting oral presentation, the program consisted of a special lecture, 5 educational lectures, 4 symposiums, 2 workshops, 13 sponsored luncheon and evening seminars. Through this meeting, we were able to feel the increasing potential of clinical chemistry. Finally, I would like to present our sincere appreciation to all of the members who have offered cooperation in the planning and management of the event, as well as the sponsors for their understanding the concept of the conference.

Report received from Kaori Soeda, JSCC secretariat (JAPAN)

Chinese Association for Clinical Biochemistry, Taiwan (CACB)

CACB 2011 Activities Report

Scientific Activities

One year ends, opening for another year of learning, continuing the quest for new discoveries, CACB on the year 2011 had its annual conference held on March 19th at the National Defense Medical University, Taipei. During the 26th Joint Annual Conference of Biomedical Science, distinguished speakers talked mainly on Genomic Medicine, Dr Joe-Yuan Howard Doong, Ph.D from TrimGen Corporation and University of Maryland Biotechnology Institute gave a very informative lecture regarding KRAS & BRAF Mutation - "From Whole Genomic Sequencing to Molecular Diagnostics-A Study of KRAS & BRAF Mutation Detection". While Dr Tu, Ph.D. from Roche Diagnostics Taiwan also shared information regarding their product thru his "Roche 454 Sequencing-enabling NextGen Technology for Biological and Clinical Research" and Dr Jeongsun Seo, M.D., Ph.D. from the Department of Biochemistry and Molecular Biology, ILCHUN Genomic Medicine Institute, Seoul National University College of Medicine shared his insights with his lecture "Massively Parallel Sequencing Technologies Have Enabled High-throughput Detection of a Broad Spectrum of Variants in the Human Genome". NTUH's Associate Professor Yu Sung-Liang from the Department of Clinical Laboratory Sciences and Medical Biotechnology updated about cancer with his "Discovery of Novel Genomic Alterations in a Multiplex Lung Cancer Family". Alighting students and professionals regarding the new whole genome sequencing and its clinical diagnostics application, the speakers shared their new knowledge to students and professionals as well.

CACB did not keep idle, during the middle of the year, another symposium was conducted, this time it was a joint symposium of the National Taiwan University (NTU) and University of Southern California (USC) on July 9th, featuring Frontiers in Liver Disease Research. Several respected speakers from the USC joined and contributed to a interesting event, Dr Hidekazu Tsukamoto talked about "Epigenetic regulation of hepatic stellate cells in liver fibrosis, regeneration, and cancer", Dr Jun Xu presented an informative talk on "Notch signaling in macrophage M1 activation in steatohepatitis" while Dr Keigo Machida introduced about "TLR4/Nanog-dependent tumor-initiating stem cells in the genesis of hepatocellular carcinoma".



Coming from University of Hong Kong, Dr Jack Chun-ming Wong enhanced the audience with “Molecular genetics and cell signaling of liver cancer”. Representing Taiwan are speakers from NTUH Department of External Medicine, Liver cancer center, Dr Huang Kai-Wen, PhD talked about “ Transactional research of liver fibrosis”, while Dr Wu Huey-Lin, PhD shared her views on “Animal models for studying liver diseases”. From the Academia Sinica's Biology research center, Dr Chen Shi-Long, PhD featured “Autophagy as a novel guardian against HCV from antiviral innate immune response”, and Dr Yang Ying talked about “What's new in diagnosis and prognosis of liver fibrosis, cirrhosis and carcinoma”.



CACB President Lai and Secretariat Chung join the meeting at China

Laboratories in Taiwan” during the 11th Fookien Medical Laboratory Association in Fookien China held last October 15.

And also this year, CACB is pushing a drive to implement Professional Clinical Chemistry Medical Technologist which is aimed at promoting research studies in the field of Clinical Chemistry, its development and application, to improve quality of medical service and upgrade the citizen's health.

Several contributions from the CACB members made it possible to complete these memorable events, together with this year's President Dr Lai, the Secretary General Mr. Jun-Jen Liu, an Associate Professor from the Taipei Medical University, Professor Shwu-Bin Lin, from NTU Laboratory Sciences and Medical Biotechnology, College of Medicine, Mr. Ming-Yi Chung, also from NTUH and Cheng-Kuang Lee Sam acting as Secretaries devoted much of their time in accomplishing the year's academic activities. And also in preparing for the upcoming big event in the year 2016, the 14th Asian-Pacific Congress of Clinical Biochemistry, which CACB will be hosting here in Taiwan. We welcome our valued members to attend, hope to see everyone and share with us to make it memorable.



Prof. Shu-Chu Shiesh and Dr Westgard at IFCC Council meeting, Berlin, Germany

It was indeed a fruitful day enriching the listeners mind and leading them to new issues regarding research in liver diseases.

Prof. Shu-Chu Shiesh of National Cheng Kung University represented CACB in attending another significant international council meeting May, 2011 in the 19th IFCC-EFCC European Congress of Clinical Chemistry and Laboratory Medicine held in Berlin Germany .

Dr Min-Long Lai also attended and shared his experiences in Cross-strait academic activities when he talked about “Management of Community Medical



Reported by Min-Long Lai, President CACB

Indonesian Association For Clinical Chemistry (IACC)

IACC 2011 Activities Report

1. Workshop on ANA IF

A workshop with the theme “Better Understanding and Interpretation on ANA IF” was held in Jakarta on July 23rd, 2011. This workshop was sponsored by PT. Inti Makmur Meditama, distributor of Euroimmun, and aimed to give better understanding of the Anti nuclear antibody tests using indirect Immunofluorescence (ANA IF) as the gold standard in autoimmune diseases screening, as well as help the participants to learn the interpretation of the tests. The speakers were dr. Alida R. Harahap, SpPK, PhD, Dr Nanang Sukmana, SpPD, KAI, dan Dr Farida Oesman, SpPK. There were 50 participants that consisted of physicians, pathologists and lab managers.



Committees at the workshop

2. Scientific Meeting by Prof. Shuguang Zhang, PhD

Prof. Shuguang talked about the topic of “The ultimate noninvasive medical diagnosis: methods towards structure and function studies of smell receptors. This meeting was held on August 10th, 2011, and attended by 39 participants.



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3. The 12th Working Conference of IACC

The conference together with scientific seminar with the theme of “The Role of Laboratory in Diagnosis of Cardiovascular and Metabolic Disorders” was held in Yogyakarta on December 8-10, 2011. There were more than 300 participants attending the seminar, together with 18 exhibitors.

Topics presented at this meeting included Recent Update in Acute Coronary Syndrome and Venous Thromboembolism, Risk Factor of Cardiovascular Diseases and Venous Thromboembolism, Role of Laboratory in Neonatus Screening, Stem Cell in Cardiovascular Diseases, Laboratory Information Systems, Optimization of Point of Care Testing, and Role of Laboratory in Diabetes and Geriatric Health Monitoring.

4. Workshop on Preanalytical Quality Improvement

In adopting the IFCC Program of Laboratory Patient Safety, IACC together with Becton Dickinson (BD) held a workshop on Preanalytical Quality Improvement on December 14th 2011. The expected outcomes of this workshop to improve the quality of the pre-analytical phase of laboratory practices, increase awareness of patient safety, and implement total quality management practices in clinical laboratories. There were 98 participants in total. In this event, we also announced the joint IACC/BD Initiative to improve compliance with best preanalytical practices.

Reported by Yusmiati Liau (IACC), Corresponding Member, APFCB Communication Committee

Hong Kong Society of Clinical Chemistry (HKSCC)

HKSCC 2011 Activities Report

1. The 11th Annual Scientific Meeting (15 January 2011)

- The ASM was held at the Assembly Hall, 4/F, YMCA, Salisbury Road, Tsim Sha Tsui.
- Program: Recent Advances in DM: Clinical & Laboratory Medicine.
- The speakers were Prof Kathryn Tan, Dept of Medicine, HKU, Prof Peter Tong, Dept of Medicine & Therapeutics, CUHK and 4 industrial representatives.
- The number of participants was 155 with 147 participants stayed for AGM dinner.

2. Heart and Brain Biomarkers: A Personal Journey from Science to Clinical Applications (6 April 2011)

- The speaker was Professor Jack Ladenson, Oree M. carroll and Lillian B. Ladenson Professor, Co-Medical Director, Clinical Chemistry Washington University School of Medicine USA.
- The dinner lecture was held at the Intercontinental Grand Stanford Hotel and well attended by 150 participants. The dinner was attended by 101 participants.



Prof Ladenson lecture

3. HbA1c: What is Important in it? (19 October 2011)

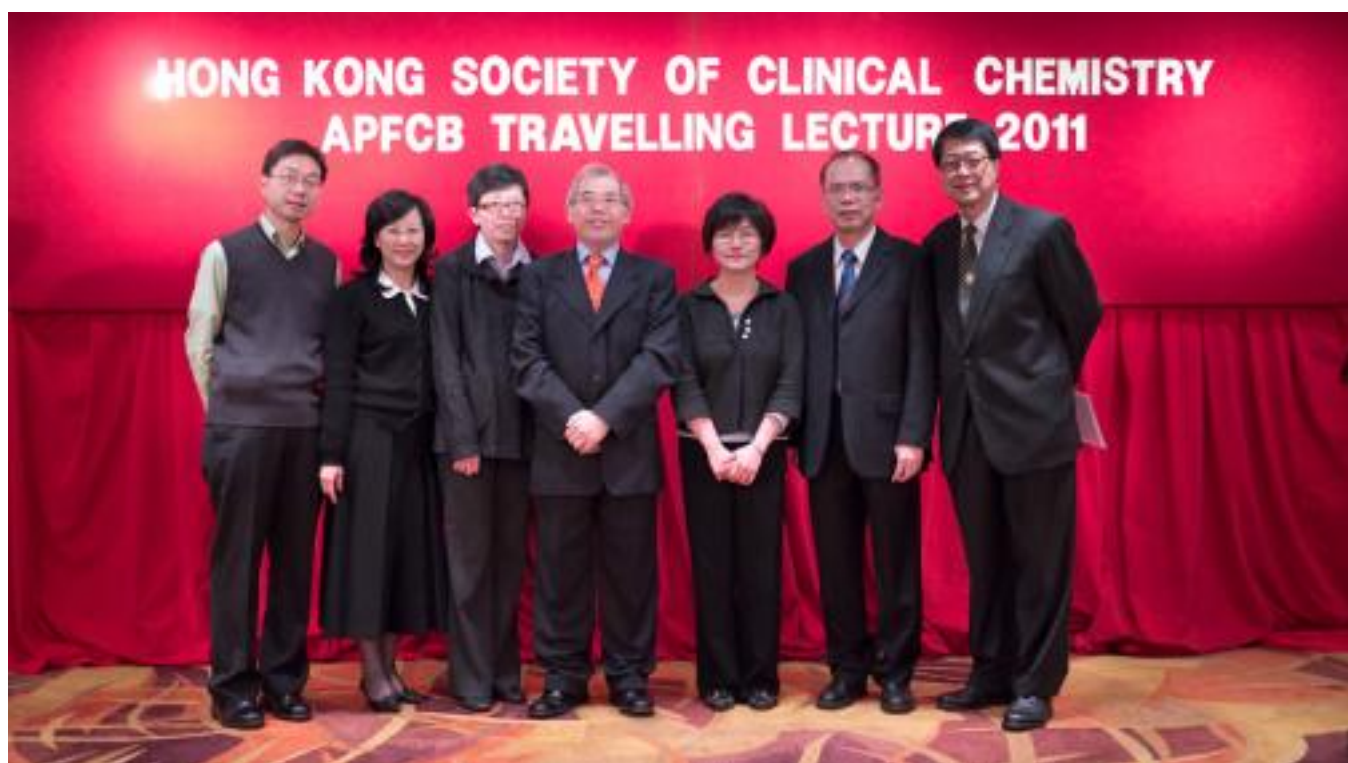
- Dinner lecture was co-organized with the Bio-Rad Pacific Ltd. (HK)
- Lectures were delivered by:
 - Dr Randie Little, NGSP Network Coordinator, Research Associate Professor, Depts. of Pathology and Child Health, University of Missouri-Columbia, and
 - Dr Ross Molinaro, Assistant Professor, Dept. of Pathology and Laboratory Medicine, Emory University School of Medicine.
- The dinner lecture was held at the Intercontinental Grand Stanford Hotel and well attended by 183 participants. The dinner was attended by 135 participants.

4. PSA-based Screening for Prostate Cancer, A Healthcare Conundrum- Can PSA Subforms like p2PSA be of Aid (3 November 2011)

- Dinner lecture was co-organized with the Hong Kong College of Pathologists and the Beckman Coulter, Inc.
- The speaker was Dr Monique J. Roobol, Associate Professor & the Head of the Screening Office, Department of Urology, Erasmus Medical Centre Rotterdam, The Netherlands.
- The dinner lecture was held at the Langham Place Hotel and well attended by 190 participants. The dinner was attended by 148 participants.

5. APFCB Travelling Lecture 2011/12 (22 November 2011)

- The topic was Inflammatory Markers in Chronic Kidney Disease.
- The speaker was Dr Angela Wang, Associate Consultant, Division of Nephrology, Department of Medicine, Queen Mary Hospital, Hon Clinical Associate Professor, University of Hong Kong.
- The dinner lecture was held at the Intercontinental Grand Stanford Hotel and well attended by 126 participants. The dinner was attended by 95 participants.



APFCB Travelling Lecture 2011

Reported by Eric Law, President, HKSCC



Philippine Association of Medical Technologists (PAMET)

PAMET 2011 Activities Report

PAMET envisions that it shall be the constant prime mover in advancing the Medical Laboratory Science profession for the continuous growth and development of its members.

To realize its vision, PAMET shall be an association that will uphold professional core values; develop and sustain comprehensive programs to enhance competencies of the Medical Laboratory Science professionals; collaborate with the different stakeholders of health and make its services important to the beneficiaries of its services.

Integrity was added as the highest in the core values which includes professionalism, commitment, excellence and unity.

Goals were set and to carry out our goals, the newly elected Board of Directors together with the four Regional Directors and Advisory Council arranged program of activities during the Planning Session held at the start of the year. Each committee laid down strategies and plan of action, reviewed what was done in the past and made corrective actions, discussed time tables and budget.

REPORT OF THE DIFFERENT COMMITTEES FOR 2011:

COMMITTEE ON AWARD

Yearly, PAMET recommends nominees for Most Outstanding Professional Award for Medical Technology to Professional Regulation Commission through the Committee on Awards. The prestigious PRC Most Outstanding Medical Technologist Award for 2011 was given to Ms. Lerma Paris of Iloilo Chapter last June 22, 2011 at the Manila Hotel.

Through the Committee on Awards, we honored the four PAMET's major awardees: the Most Outstanding Medical Technologist, Distinguished Service Award, Crisanto Almario Research Award and the Most Outstanding Chapter's Award. The PAMET's 2011 Most Outstanding Medical Technologist was Dean Zenaida Cajucum, the Distinguished Service awardee was Sr. Niña Balbas, the Crisanto Almario Research awardee was Dr Supachai Basit and the Most Outstanding Chapter was Surigao del Norte Chapter. The Hall of Fame award was conferred to Batangas Chapter.





The Outstanding Awardees together with the Keynote Speaker, Sen. Edgardo Angara, the PAMET officers and Board of Directors during the 47th PAMET Annual Convention held at Manila Hotel last November 30-December 2, 2011.

COMMITTEE ON EDUCATION

Post- Graduate Scholarship was granted to the following members:

- Julius Capili, RMT, Ph.D. – Part of his tuition fee in the last semester was subsidized to complete his academic requirements in Doctor of Philosophy, Major in Science Education.
- Ms. Ruth Pineda - An initial Php 40,000 was granted to subsidize her expenses for the Dissertation.

COMMITTEE ON RESEARCH

- A Research Forum was conducted during the Med Tech Week Celebration. It was held at Arellano University in Legarda, Manila last September 20, 2011. Students from San Pedro College of Davao City, San Juan de Dios College and Trinity University of Asia participated in the research forum. Twelve (12) papers were presented. Trinity University of Asia bagged the 1st and 3rd place while San Juan de Dios got the 2nd place.
- Articles submitted by different authors who are registered Med Techs are being edited for publication in the Philippine Journal of Medical Technology.
- The committee prepared a Research Project to help assess the Med Tech profession. This would require participation of the members in the survey. The survey is divided into different sections such as: course of the studies, retrospective evaluation of studies, job The Outstanding Awardees together with the Keynote Speaker, Sen. Edgardo Angara, the PAMET officers and Board of Directors during the 47th PAMET Annual Convention held at Manila Hotel last November 30-December 2, 2011. search and transition to employment, training after graduation, current employment situation, work, professional requirements and the use of qualifications, assessment of professional situation and other formal higher or professional training.



- A Research Council composed of experts along Med Tech discipline will be created. Experts have been identified. The Council is expected to meet early next year to develop a Research Agenda.

COMMITTEE ON CONTINUING PROFESSIONAL EDUCATION

Seminars:

1. A seminar on Homocysteine: A Risk Factor for CVD and Dementia was held at the Veteran's Memorial Medical Center, North Avenue, Quezon City. The speaker was Dr Frederick R. Llanera, RMT, MD, FPSP. Another lecture was preceded by Ms. Mitzie Zapanta of Abbott, Philippines. She introduced the platforms accessible for homocysteine testing.

2. The 2nd seminar was about The Role of the laboratory in the prevention and control of HIV in the Philippines. It was held at the Veterans Memorial Medical Center, Quezon City during the Med Tech Week last September 23, 2011. The 1st speaker was Dr Rosanna Dytangco of RITM, an advocate and a principal investigator of Philippine Site of the TREAT ASIA Data Base Study and evaluation of HIV Drug Resistance. The 2nd speaker was Dr MaryAnn Joy Aguadera, who is a psychiatric consultant and an expert in HIV counseling.

Proficiency Trainings:

Serology/Immunology

PAMET coordinated with SACCL in the conduct of Proficiency Training in HIV/Serology/Immunology. A training is scheduled on November 21-29, 2011.

Microscopy

In 2010, Mr. Gamaliel Fulgueras attended a workshop in Seminal Analysis conducted by PSREI. Eventually, for the year 2011, he shared his knowledge to the members not only in NCR but to the chapters as well by giving lectures. Likewise, BODs Dr Soledad Bautista and Lito Atienza who attended the workshop on DSSM conducted by PTSI last 2010, gave advocacy lectures to the members in NCR and different chapters this 2011.

Pre-Convention Workshop Training on different disciplines of Medical Technology is conducted on November 30, 2011 at the Manila Hotel.

Histopath/Cytology

The course director of "HPV and Cytology Techniques" is Ms. Rosalina C. Reyes, BSMT, SCT CT (ASCP) IAC, who works as cytotechnologist at the Department of Pathology, Louisiana State University Health Sciences Center, Shreveport, Los Angeles, USA.

Hematology

The course directors of "Standardizing Hematology Procedures in the Clinical Laboratory" are Ms. Glaiza Miranda, RMT, Ms. Zykhar Batulan, RMT and Ms. Laurie Anne Reyes, RMT. This is in coordination with Sysmex Phils. Inc. Chemistry: The course directors of "Basic Quality Control Practices in Clinical Laboratory" are Dr Rodelio Lim, MD, FPSP and Ms. Heidi Fababier, RMT. This is in coordination with Lifeline Diagnostic Supplies.

Serology

A workshop on Hepatitis B, C and Syphilis testing strategies will be conducted by Dr Razel Kawano, Mr. Marco Hernando and Ms. Susan Leaño.



COMMITTEE ON LABORATORY MANAGEMENT & PRACTITIONERS

1. The 1st Laboratory Management and Practitioners meeting was held last February 24 at Zafire's Office in Quezon Avenue. The meeting was attended by 30 Chief Med Techs/Asst. Chief Med Techs and Section Heads. A training needs survey was conducted to align the needs to the committee plans. The results of the survey identified the most requested topics: Quality Management, Leadership Skills and Personality Development.

2. 2nd Laboratory Management and Practitioners Assembly A Training course on Quality Standards for Clinical Laboratory Practices was held last June 30 to July 1, 2011 at the Asian Institute of Management Conference Center Manila Electronic Library, Benavidez corner Trasierra Streets Legaspi Village Makati City.

Professor Sunil Sethi, who is the Chief of Department of Laboratory Medicine, National University Hospital in Singapore, headed the discussion together with the other foreign speakers such as, Dr Sharon Saw, Scientific Officer of NUHS, Ms. Yang Zhixin, Medical Technologist of NUHS and Ms. Ruby Khoo, Principal Medical Technologist of NUHS. Prof. Sunil Sethi is the Vice President of APFCB (Asia & Pacific Federation of Clinical Biochemists) wherein PAMET is a member. Topics discussed mostly answered the training needs of the Chief Med Techs and Laboratory Managers. The seminar was supported by J and J Ortho Clinical Diagnostics, Co-organized by PAMET and the NUHS Department of Laboratory Medicine.



A Training course on Quality Standards for Clinical Laboratory Practices was held last June 30 to July 1, 2011 at the Asian Institute of Management Conference Center at Makati City, Phils. Shown in the picture are the speakers: Prof. Sunil Sethi, Dr Sharon Saw, Ms. Yang, Shixin, Ms. Ruby Khoo and the participants.

COMMITTEE ON MEMBERSHIP

In terms of members' ID system, our firmware integration software has been used by the staff successfully. The database has been stable and reliable for almost two (2) years now. The next project is to upgrade the database so that the seminars/conventions attended by the members with the corresponding CPE units will be included. Since the year 2009, ten (10) members who are 65 years old and above were given a free lifetime membership.



COMMITTEE ON CHAPTERS

Throughout the year, a good number of chapters were visited by the committee, either to participate in scientific seminars, conduct election and induction, give PAMET Updates and hold membership fora, conduct ocular inspection for conference venues, reactivate some chapters or confer with officers and members with urgent and special concerns.

MID-YEAR CONVENTION

This annual event which took place at the scenic Bohol Tropics & Convention Center last May 18-21, 2011 adopted the theme “Medical Technology: Gearing Towards Idealism and Beyond”, which underscored the profession’s intense passion to move beyond the confines of clinical laboratories and be recognized as important part in the delivery of quality healthcare services both here and abroad.



PAMET’s 16th Mid Year Conference held at Bohol Tropics and Convention Center, Philippines last May 18-21, 2011. Shown in the picture are the National Officers and the Bohol Chapter organizing committee together with the Keynote Speaker, Congressman Chato.

REGIONAL CONFERENCES

The year 2011 is a banner year for the committee in terms of Regional Conferences. For the first time in several years, the committee was able to have 100% conduct of regional conferences in 4 PAMET regional divisions.

5th North Luzon Regional Conference –SBMA, Olongapo, Zambales – Aug
Theme: “PAMET North Luzon: Promising...Moving Forward”

8th South Luzon Regional Conference –Villa Caceres, Camarines Sur – September 30, 2011
Theme: “PAMET Nurtures Nature”

5th Mindanao Regional Conference – Kaamulan Open Theater Malaybalay, Bukidnon – October 7-8, 2011
Theme: “Adopting New Trends and Technologies Towards Excellence”



2nd Visayas Regional Conference – Westtown Hotel, Iloilo City – October 19-20, 2011

Theme: “PAMET: Touching Lives Through Lenses, Senses and Sensitivities”



The 2nd Visayas Regional Conference. Shown in the picture are the organizers together with National Officers and Congresswoman Janette Garin.

NEW CHAPTER GUIDELINES

Among the various accomplishments for the year, the committee considers the formulation and approval of the two important guidelines related to efficient and effective operations of different chapters as the most important. These landmark achievements will serve as the backbone of all chapters from formation to accreditation to hosting of various chapter activities. These are:

- GUIDELINES AND DETAILED PROCEDURES ON CHAPTER FORMATION, RECOGNITION, ACCREDITATION, DELISTING AND RESTORATION - Approved on October 15, 2011 during the 10th Regular Board Meeting in Manila Hotel
- GUIDELINES FOR REGIONAL CONFERENCES. - Approved on July 9, 2011 during the 7th Regular Board Meeting at PAMET Secretariat, Makati City

COMMITTEE ON WELFARE AND BENEFITS

The committee sponsored job fairs for the year. These were held at the PAMET office. Another activity of the committee is the Bayanihan Program. The assistance extended by PAMET is given only to active members who contracted a dreaded disease or disability.



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COMMITTEE ON PROFESSIONAL PRACTICE AND ETHICS

The committee will work on updating the Medical Technologists' Code of Ethics to align with the present demands of the profession globally and its responsibility with our environment. Policy guidelines and procedures have been drafted.

COMMITTEE ON PUBLICATION AND DOCUMENTATION

The aim of the Committee is to make sure that we provide all our colleagues with the latest happenings in the organization. As such, the Committee on Documentation and Publication was able to release three (3) issues of PAMETLINK for this year. The first issue was released last May 2011, followed by September 2011 issue and the last on November 2011. The whole year round activities of PAMET were documented and published. This includes not only the National activities but it includes as well, the Regional Programs all over the country.

SPECIAL COMMITTEE: MEDICAL TECHNOLOGY WEEK

PAMET celebrated its 39th Medical Technology Week through a series of activities which ran from September 18-25, 2011. The activities were chaired by different committees of the association.

- **WAYS AND MEANS**

A Walk for A Cause kicked off the weeklong activities last September 18, 2010 at the Plaza Lawton in Manila. A wellness program followed at the Quirino Grandstand.

- **THANKSGIVING MASS**

A Thanksgiving Mass was held on the same day at the chapel of San Juan De Dios Hospital. The National Board and Board of Directors of Batangas Chapter together with some students of San Juan de Dios were present.

- **RESEARCH FORUM**

A Research Forum for students was held at Arellano University in Legarda, Manila last September 20, 2010.

- **ADVOCACY**

Two days were devoted to the Advocacy Program of the association. The major event took place on September 21, 2011 at Paranaque Science High School. On September 23, a career activity was conducted at St. Paul's College in Makati City. Another career orientation was held at the Manila Science High School.



- QUIZ SHOW

The 30th PAMET-PASMETH Interschool Quiz Show was held at the Librada Avelino Auditorium of the Centro Escolar University Mendiola, Manila on September 22, 2011. This annual brain twisting event sponsored by the Philippine Association of Medical Technologists (PAMET) in cooperation with the Philippine Association of Schools of Medical Technology and Public Health (PASMETH) was participated by the best students of 28 schools. Participants from University of Santo Tomas came out as winners while Adventist University of the Philippines landed for second place. The last time UST bagged the title was in 2009. Far Eastern University (FEU)- NRMF settled for third place.

- CONTINUING PROFESSIONAL EDUCATION

A seminar about "The Role of the laboratory in the prevention and control of HIV in the Philippines" was held at the Veterans Memorial Medical Center, Quezon City during the Med Tech Week last September 23, 2011.

- COMMUNITY OUTREACH

A community outreach was held last September 24, 2011 at Wagas Sport Complex, Brgy 32, Tondo, Manila, as part of The Med.-Tech Week celebration. A total of 182 patients (children and adults) were served for CBC (complete blood count).

- SPORTSFEST

The sportsfest culminated the weeklong celebration. An Interlaboratory bowling tournament was held at the Playdium in Quezon City. Winners were Veterans Memorial Medical Center for 2 consecutive years, San Juan De Dios Hospital, second place and the finishing third place was Manila Adventist Hospital. A total of 95 medical technologists participated in this year's bowling tournament.

SPECIAL COMMITTEE: COMMITTEE ON SPIRITUAL DEVELOPMENT

In preparation for the Lenten season, the PAMET conducted a spiritual recollection last April 18 to 20, 2011 at the Tahanan Sta. Monica in Tagaytay City. Father Aljim Tuazon was the retreat master.

COMMITTEE ON SOCIALS

The Committee coordinated with all the Committee Chairs in disseminating information of the different activities of the Association.

The Committee together with the Committee on Sports Development organized the social activities during the Med Tech Week and Annual Convention.

COMMITTEE ON LEGISLATION

- Pursued groundworks and support on the amendment/revision of R.A. 5527.
- Communicated with the sponsors of the bill and provided necessary information/materials/documents.
- Conducted meetings with different sectors of the medical technology profession regarding R.A. 5527.
- Conducted assessments/discussions regarding laws, rules and regulations that can affect the medical technology profession.
- Resolution 2011-12 was made recommending the use of accurate method in determining hemoglobin.



COMMITTEE ON CONSTITUTION AND BY-LAWS

The committee met several times for the following matters:

- Reviewed the Constitution and benchmarked with other professional associations
- Prepared implementing guidelines for the by-laws.
- Reviewed of the existing Administrative Manual and made the necessary modifications/ additions. Policy guidelines, systems and processes and operational metrics were formulated by the committee. Within the set timeline, the implementing rules and regulations is presented to the board for approval.

COMMITTEE ON FINANCE AND AUDIT/ BUSINESS DEVELOPMENT

Operating expenses through the years were projected during the planning session. Hence, it was clear to the board of directors that expenses for 2011 should be within limited budget. Otherwise, each committee shall look for other resources to finance their projects.

COMMITTEE ON PERSONNEL & OFFICE MANAGEMENT

1. Hired new staff to assist in processing of CPE requirements
2. Acquisition of new equipment. - replaced the Xerox copier

COMMITTEE ON PROFESSIONAL RELATIONS

Representation of PAMET has been done in various societies and organizations.

LOCAL ACTIVITIES:

PAMET is a member of the Council of Professional Health Associations (COPHA), the Council of Health Agencies (CHAP) and the Philippine Federation of Professional Associations (PFPA).

President Florento attended the induction of officers which was held at New Horizon Hotel in EDSA. It was followed by the convention which was held at Bayanihan Center of United Laboratories, Inc. last October 2, 2011.

The TB Control Ordinance in Quezon City was created and PAMET was represented by Mr. Gamaliel Fulgueras and Ms. Gina Noble. The involvement of PAMET will be through advocacy of DSSM. Pres. Florento, Ms. Agnes Medenilla and Ms. Luella Vertucio represented PAMET in the meeting with Phil. Society of Endocrinology regarding IFCC HbA1c reporting. It was held at Eastwood Richmond Hotel last July 29, 2011.



The 2011 new 15 Scholars during the awarding ceremony held at Mandarin Hotel, Makati City, Phils. last November 3, 2011.

SAFEGUARD SCHOLARSHIP

The “Handog ng Safeguard MedTechs ng Kinabukasan Scholarship Program” was started in 1990 during the time of Mrs. Carmencita Acedera as PAMET President and Mrs. Norma Chang, as PASMETH President who was then Dean of San Juan de Dios College. The grant is for academically gifted but financially deprived 2nd year Medical Technology/Medical Laboratory Science students of PASMETH-member schools.



We are now on the 23rd year of partnership with P and G in this endeavor. Another 15 Safeguard Scholars were awarded last November 3, 2011 in the Handog ng Safeguard, Med Techs ng Kinabukasan Scholarship Program. New graduates and board passers who maintained their scholarship until they graduate were also present to receive plaque of recognition.

PRC (Professional Regulation Commission)

1. PRC Awarding

The PRC Outstanding Medical Technologist for the year 2011 is Prof. Lerma dela Llana Paris of University of San Agustin, Iloilo. The awarding ceremony was held last June 22, 2011 at Fiesta Pavillion of The Manila Hotel during the PRC Week Celebration with the theme "PRC: Bagong Mukha, Ibayong Sigla". Prof. Lerma Paris was named for her professional competence and major contributions to the profession as a researcher. She was also cited for sharing unselfishly her expertise through advocacy in promoting diagnostic and research competencies in Parasitology.



Prof. Lerma Paris awarded as the 2011 Most Outstanding Professional Medical Technologist. The awarding was held last June 22, 2011 at the Manila Hotel, Philippines.

2. CPEC (Continuing Program for Education Council)

Dir. Magdalena Natividad, President of PASMETH took oath of office as member of the CPEC (Continuing Professional Education Council) with PRC Chairperson Hon. Manzala. She replaced Dean Zenaida Cajucom and now joined the council composed of Pres. Leila Florento as another member and Hon. Marilyn Atienza as CPEC chair. The functions of the CPEC are to accept, evaluate and approve CPE applications, monitor the implementation by the CPE providers of their program, activities or sources and assess periodically and upgrade criteria for accreditation of CPE providers and CPE programs, activities or sources.

CHED (Commission on Higher Education)

The CHED Technical Committee for Med. Tech Education (TCMTE) is composed of Chairman Dr Leila Florento (PAMET Pres.), and members are Dr Jurel Nuevo (Dean, Our Lady of Fatima University), Hon. Marian Tangingco (Member, PRC Board of Medical Technology, Dr Anacleto Valdez (Dean, Lyceum of the Phils-Batangas) and Dr Soledad Bautista (Dean, EAC).

The activities of the committee were:

- Accreditation of Clinical Laboratories utilized for Medical Technology / Medical Laboratory Science Internship Training Program.
- Finalization of Policies and Standards for Graduate Program for Medical Technology/Medical Laboratory Science.
- Resolutions passed by the committee and submitted to Technical Panel for Health Profession's Education for approval.
 - Affiliation Fee for Medical Technology/Medical Laboratory Science Internship
 - Moratorium on Opening of New Med Tech/MLS Schools in the country
 - Guidelines for phasing out of Med Tech program
 - Centralization of processing of permits for health professions
- A survey was passed to different institutions to evaluate CMO No. 14 series of 2006. This was developed to answer the call of the CHED Chairperson to evaluate the existing program and see if there is a need to improve the program. The result will be evaluated and processed. After which, there will be a consultation with the different stakeholders and assess the need to improve the curricula for Medical Technology/Medical Laboratory Science Program.

With such limited time, the public hearing and consultation will be scheduled next year. The CHED Pool of Experts for Ladderized Education Program (LEP) for Medical Technology, which is composed of highly competent Medical Technologists from different areas of practice was formed under Office of Programs and Standards, Division of Alternative Learning System in close coordination with TESDA. This is composed of Dr Anacleto Valdez (LPU-Batangas), Dr Jurel Nuevo (OLFU), Mr. Ronaldo Puno (PAMET), Dean Bernard Ebuena (Arellano University) and Dean Ernesto Ramirez (UPH Biñan). It is tasked to develop and recommend a ladderized curriculum called "Model Embedment in Bachelor of Science in Medical Technology /Bachelor of Science in Medical Laboratory Science Program". This curriculum shall be made available to Higher Education Institutions (HEIs) which may consider offering the program. Such offering is optional and not mandatory.

PASMETH (Phil. Association of Schools of Medical Technology and Public Health)

The PASMETH Annual Convention was held in Camp John Hay, Baguio City on May 4 to 7, 2011. The keynote speaker was Hon. Vice Major Daniel Farinas. The convention was highlighted by the launching of the DSSM (Direct Sputum Microscopy) Competency-based Module and lectures on Spiritual and Ethical Norms for Educators, Legal Issues in Higher Education and Research Publication. The launching of the DSSM CBLM was embarked through the specialists from PTSI TB LINC (Dr Lalaine Mortera and Dr Jubert Benedicto). PASMETH also recognized members and institutions whose contributions to the association helped in the realization of its goals. PAMET was one of the recipients of the Gratitude Award.

DOH (Department of Health) Activities

PAMET is represented in the following DOH activities:

I. Technical Working Group (TWG) for the Implementation of the Standards on Quality Management System in the Clinical Laboratory was created under the DOH coordinating committee of the National Health Laboratory Network. Three committees were formed: Committee on Standards, Committee on Training and Committee on Assessment. Involved in these activities are: L. Florento in the QMS training, R. Puno and R. Kawano in the assessment of NRLs in compliance to QMS by the trained assessors.



2. The task force LABNET (Laboratory Network) was created to formulate the framework and strategic plan for the National Health Laboratory Network. The LabNet TWG was spearheaded by Dr Maramba. He formed the TWG worked on the strategic plan for the National Health Laboratory Network. The plan shall set the direction, through National Action Plans, in improving, strengthening and upgrading laboratory services and facilities and in ensuring equitable access of the general public to these quality services. The action plans were formulated by several groups including PSP, PCQACL and chosen members of PAMET.

PAMET is included as member of the National Advisory Council to the National Unit for Health Laboratories (NUHL) of the National Center for Health Facilities Development (NCHFD), the unit which shall implement the National Strategic Plan for the National Health Laboratory Network.

3. DSSM (Direct Sputum Smear Microscopy) Project

PAMET's involvement in DSSM Project is to advocate involvement of private sector's participation in TB control. President L. Florento was invited as one of the speakers during the PhilCAT (Philippine Coalition Against Tuberculosis) Convention last August 18-19, 2011 which was held at the Crown Plaza Hotel, Ortigas Quezon City. The theme of the two-day event is "Beyond TB control: Bridging the Gaps".

A core group composed of PAMET and PASMETH's representatives completed the DSSM Competency-based Learning Module. The module is made up of student's module, teacher's module and instructor's session plan. This will be integrated in the curriculum of Bachelor of Science in Medical Technology / Medical Laboratory Science. It was launched during the PASMETH's Convention. Cascade of the module and distribution of materials will be given during the pre-convention workshop on November 30, 2011 at The Manila Hotel.

4. BOD Lily Alquiza and Mindanao Regional Director Richard Tabuniag attended the 3rd National Lymphatic Filariasis Forum which was held at Dynasty Court Hotel in Cagayan de Oro City on September 1 and 2, 2011. The DOH has established the National Filariasis Elimination Program which aims to eliminate Lymphatic Filariasis as a public health problem. With PAMET's commitment to help eliminate Filariasis, there is a follow-up meeting to discuss its involvement in the program.

5. Participation in the 12th National Forum on Health Research for Action held at the Pan Pacific Hotel on November 14-15, 2011 with the theme "Strengthening Health Systems Research to Achieve Kalusugan Pangkalahatan".

PCQACL (Phil. Council for Quality Assurance in Clinical Laboratories)

PAMET is a charter member of the Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL). During the recent PCQACL Annual Convention held at Crown Plaza last October 26-28, 2011, Dr Januario Veloso was re-elected as the President. PAMET Vice President Ronaldo Puno was elected as Treasurer. Likewise, PRO Gamaliel Fulgueras was appointed as Asst. Treasurer and President Leila Florento was appointed as Auditor.

INTERNATIONAL LINKAGES

AAMLS (Asia Association of Medical Laboratory Scientists) On May 14, 1997, the Asia Association of Medical Laboratory Scientists was inaugurated in Nagoya, Japan. The founding members of AAMLS are MIMLS (Malaysia), BAMLS (Brunei), SAMLS (Singapore), AMTT (Thailand), PATELKI (Indonesia), PAMET (Philippines), JAMT (Japan), HKMTA (Hong Kong), KAMT (Korea) and AIMLTA (India). TAMT (Taiwan) is the newest member of the Association. The current President of AAMLS is Dr Rachana Santiyanont of Thailand Association of Medical Technologists. The next AAMLS Congress will be hosted by Singapore Association for Medical Laboratory Sciences on 2013.





The AAMLS Board of Directors during the meeting in Tainan, Taiwan last April 30, 2011.

AACLS (ASEAN Association of Clinical Laboratory Sciences)

In 1985, PAMET became a charter member of the ASEAN Association of Medical Laboratory Technologists (AAMLT) now called ASEAN Association of Clinical Laboratory Scientists (AACLS). PAMET hosted the 2nd ACMLT in 1986 and the 3rd ACMLT in 1997 in Manila. In 1999, Ms. Norma Chang became the President of AAMLT. The AAMLS Board of Directors during the meeting in Tainan, Taiwan last April 30, 2011.

PAMET will host the 14th ASEAN Conference of Clinical Laboratory Sciences. It will be held at the Manila Hotel on November 27 – 30, 2012. The current President of AACLS is Mr. Woon Sung Thong of Malaysia.

PAMET-USA

The Liaison Officer of PAMET-USA to the Philippines is former Pres. Shirley Cruzada. Dr Shirley Cruzada now holds the 2nd Vice President position of PAMET-USA and as expected she works actively for the organization. She was instrumental to the establishment of PAMET-USA, Nebraska Chapter.

IFBLS (International Federation of Biomedical Laboratory Sciences)

PAMET joined IAMLT (International Association of Medical Laboratory Technologists) on May 28, 1970 during the Presidency of Mr. Nardito Moraleta. PAMET rejoined IAMLT in 1994 during the term of Ms. Marilyn Atienza. IAMLT was later changed to IFBLS (International Federation of Biomedical Laboratory Scientists).

The 30th World Congress of Biomedical Laboratory Sciences will be held at the Kongresshotel & Conference Center, Potsdam, Germany on August 18-22, 2012. Block these dates in your diary. You may periodically check the IFBLS website (www.ifbbs.org) for updates on the Congress program and other related information. The President of IFBLS is Dr Vincent Galicho from USA.

IFCC (International Federation of Clinical Chemistry and Laboratory Medicine)

PAMET is the 83rd full member of IFCC in 2009 with IFCC numbering system 02.01.92.



Workshop in Quality Assurance

Another honor and milestone was added on Philippine Association of Medical Technologists' (PAMET) cap when it was granted the privilege to host for the first time the International Workshop on Quality Assurance Program on March 23-25, 2011, at the Crown Plaza Galleria Hotel in Ortigas Avenue, Quezon city. The event was under the auspices of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and the Asia-Pacific Federation of Clinical Biochemistry (APFCB), where PAMET is a regular member of both organizations.

PAMET successfully held the 3-day scientific workshops which covered wide range of topics that dealt with various aspects of quality assurance in laboratory science with emphasis on blood chemistry. The four foreign speakers namely Dr Tony Badrick (Australia), Dr Elizabeth Frank (India), Dr Leslie Lai (Malaysia) and Prof. Janet Smith (Great Britain), who alternately shared their expertise during the entire event, were delighted with the high level of interest among Filipino participants which was composed of Pathologists, Medical Technologists and other quality health care advocates. Eager participants came all the way from various regions of the country who spent time and travelled for many hours just to be part of this very important gathering.

The opening day of the event started with simple ceremonies introducing the four speakers. It was immediately followed by workshops on Pre-analytical, Analytical and Post-Analytical. The 2nd day focused on Advance Quality Control, External Quality Assurance, Audit and Laboratory Quality. The delegates had interactive participation in various discussions. Topics on the last day were dedicated on specific tests in blood chemistry. It included WHO Diagnosis of Diabetes, Global Standardization of HbA1C, Lipid Disorders, Renal Disease, Thyroid Disease, Common Tumor Markers, Adrenal Disease and Electrolytes and Fluid Disorders.

The event was supported by different diagnostic companies such as Lifeline, TNC, Abbott, Roche, Zafire, Rainphil and Sysmex. The evaluation results revealed that majority of the participants were happy with the outcome, thus cited good comments about the workshop. PAMET hopes to cascade the knowledge learned in this workshop to as many laboratories and Medical Technologists in the country with the end-view of improving laboratory services and the delivery of health care nationwide.

IFCC Conference

President L. Florento and Vice Pres. R. Puno attended the meeting in Berlin. PAMET is the 83rd member of the organization. APFCB is one of the regional affiliates of IFCC wherein Dr Leslie Lai is the current president. Dr Lai represents the Asia-Pacific region in the executive board of IFCC.

Pres. Florento was invited to join the General Council Meeting called by Prof. Janet Smith. During the meeting, Pres. Florento was asked to report the activities held in Manila and Prof. Smith highly commended the said event to the Executive Board.

The next IFCC conference will be in Istanbul on 2014.



IFCC President Dr Graham Beastall with PAMET Pres. Dr Leila Florento and PAMET Vice Pres. Ronaldo Puno during the IFCC Conference in Berlin.

APFCB (Asian and Pacific Federation of Clinical Biochemistry)

- PAMET has been a member of APFCB since 2007.
- The new President is Dr Leslie Lai from Malaysia Association of Clinical Biochemistry (MACB), the Vice-President is Dr Sunil Kumar Sethi from Singapore Association of Clinical Biochemists (SACB), the Secretary is Dr Endang Hoyaranda from Indonesian Association for Clinical Chemistry (IACC) and the Treasurer is Dr Elizabeth Frank from Association of Clinical Biochemistry in India (ACBI).
- The APFCB has five (5) standing committees. Each member countries are represented in the standing committees.
- Laboratory Management Committee
 - Dr Tony Badrick (Australia) is the Chairman
 - Ms. Marilyn Atienza is the Secretary
- Congress and Conferences
 - Mr. Joseph Lopez (Malaysia) is the Chairman Committee
 - Ms. Marian Tangingco is the Secretary
- Education Committee
 - Dr Samuel Vasikaran (Australia) is the Chairman
 - Dr Soledad Bautista is PAMET's representative
- Scientific Committee
 - Professor Kiyoshi Ichihara (Japan) is the Chairman Committee
 - Ms. Agnes Medenilla is PAMET's representative
- Communications Committee
 - Professor Praveen Sharma (India) is the Chairman Committee
 - Ms. Luella Vertucio is PAMET's representative

The 13th APFCB Congress will be held in Indonesia on 2013 followed by Taiwan on 2016.



Prof. Janet Smith, Dr Leslie Lai, Dr Elizabeth Frank and Dr Tony Badrick with some of the PAMET officers and members during the Quality Assurance Workshop held in Manila on March 23-25, 2011.

PAMET 47TH ANNUAL CONVENTION

The 47th PAMET Annual Convention was held at the Manila Hotel last November 30 – December 2, 2011 with the theme “Unfolding Opportunities through Technology Innovations”. It was attended by members all over the country. The event started with five (5) pre-convention workshops on November 30, 2011 followed by opening ceremony and fellowship dinner. There were seven (7) plenary sessions, fifteen (15) simultaneous sessions, two (2) roundtable discussions and paper presentations.



Shown in the pictures are some of the participants and the board of directors during the closing ceremony of the 47th PAMET Annual Convention.

Reported by Leila Florento, PAMET President

Association of Clinical Biochemists of India (ACBI)

ACBI 2011 Activities Report

The year 2011 academic activities all around the country. The Biggest event in the Association's calendar was the Annual National Conference which was held in Gwalior, Madhya Pradesh. Apart from this, we also saw scientific programmes organized in all corners of the country.

Conference Report – ACBICON 2011

National annual conference of Association of Clinical Biochemists of India was held in a beautiful and magnificent complex of ITM University, Gwalior from 2nd-6th December 2011.

Conference began with Professional course on 2nd December 2011. It was inaugurated by Hon'ble vice Chancellor Dr M. Kidwai of Jiwaji University Gwalior. More than 60 delegates registered for this course.



Eminent speakers were called from different parts of India. The theme of Professional course was "Advances in Laboratory medicine towards molecular diagnostics. Following speakers delivered lectures :

Dr K.K. Srivastava	Keynote Address
Dr Sucheta Dandekar	Pre analytical errors in molecular diagnostic techniques
Dr Shyamali Pal	Evolution of quality control in molecular diagnostics
Dr Deshratana Asthana	Technological advances in molecular diagnostics
Dr Udayan Ray	Molecular Medicine in Clinical Practice
Dr Renu Saxena	Molecular Diagnostics of Common Genetic Disorders
Dr Parmeswaran V.	Molecular diagnostic of endocrine disorders
Dr P. Chavan	Analytical errors during PCR
Dr Mawava	Epigenetics

Second CME topic was Stem cell therapy. Dr Mrinalini Chaturvedi, Dr Himanshu Bansal, Dr I.K. Patro, highlighted their views on how stem cells are obtained and handled and their importance in treatment of various diseases.

Workshop was organized at DRDE Gwalior where 20 delegates participated. Dr Rama Rao conducted the workshop on MALDI-TOF. Total 101 delegates were registered for CME and workshop.

The main academic session of the conference started from 4th Dec. 2011. More than 800 delegates from India and Abroad attended the conference.

On 4th Dec 2011, morning session started with key note address by Dr Joseph Lopez. He talked on "Pride and Professionalism: The way forward for the Laboratory Scientists" followed by two Orations, namely

- Prof. Awadhesh Saran Memorial Oration entitled "Evolution of HIV tests" was delivered by Dr N. C. Sharma (Ahmedabad).
- KEM Hospital and Seth G. S. Medical College Oration entitled "Genetic basis of atherothrombotic CAD in the Indian population" was delivered by Dr T. F. Ashavaid (Mumbai).



Inaugural function ACBICON 2011



Dr N. C. Sharma (right) receiving Prof. Awadhesh Saran Memorial Oration award from Dr K.K. Srivastava and Dr Rajeev Sinha

Dr Udyan Ray from Australia dealt on “Ischemic heart disease and insulin”

Dr M. Ollerich (Germany) spoke on “Use of endogenous biomarkers to achieve personalized immunosuppression in transplant recipients”

Dr Sucheta P. Dandekar (Mumbai) spoke on “Redefining the Medical Biochemistry Undergraduate Curriculum”.

Dr V. Permeswaran (Australia) spoke on “Does your value add your laboratory service?”

Dr A. S. Kanagsabapathy (Hyderabad) spoke on “Clinical Chemistry Trainee Council”



Post GB Executive meeting

The AFMC Quiz was conducted in pre-lunch session by Dr T. Malati and Dr R Chawala in which Mr. Rajesh Kumar Thakur stood 1st & Ms. K. Sreeni Varulu stood 2nd and were awarded certificates and cheque of Rs. 5000.00 & Rs. 3000.00 respectively. Total Twenty five students participated in the quiz.



Dr Sucheta Dandekar receiving Presidential Orator Award

Orator by Dr Jasvinder K. Gambhir, U.C.M.S., New Delhi.

She spoke on “Evaluation of Lipoprotein(A) and Apo(A) polymorphism as risk factors for premature Coronary Artery Disease in Asian Indians: A Journey through the last Decade”.

Three special lectures were delivered by:

(1) Dr T. Malati (Hyderabad) on “Complex genetics of diabetes: A global scenario”.

(2) Dr Jay Kalra, (Saskatchewan, Canada) on topic entitled “Quality care and patient safety: Medical error and disclosure - putting the pieces of the puzzle together”.

(3) Dr A. S. Kanagsabapathy entitled “QA of blood gas analysis”.

On the same day two industrial lectures were also organized which were delivered by Dr T. Vaidhyanathan and Dr Praveen Kumar.

In the evening of 4th Dec 2011 the Inaugural Function was organized. DR D. P. Lokwani Ji, Hon'ble Vice-Chancellor of Medical university of Madhya Pradesh addressed the delegates. Dr Giridhar Gyani, Secretary General, Quality Council of India was the Guest of Honour.

On 5th Dec 2011, the session started with key note address by Dr Michael Ollerich entitled “Therapeutic drug monitoring – key to personalized pharmacotherapy”, followed by Dr T. N. Pattabiraman



During the conference 59 oral presentations, 75 poster presentations and 48 invited lectures were delivered. Three industrial lectures were delivered by esteemed speakers Dr Mavankar, Dr Gajendra Gupta and Dr Jose Jacob, followed by 30 minutes session by Johnson and Johnson on “Kaun Banega Gyanpati” game show for 20 mins.

Open session with experts was organized on 5th. Dec. 2011 in post-lunch session by Dr T. Malati. Young students and scientists participated and exchanged their views.



On 6th Dec 2011, the session started with keynote address by Dr P. S. Bisen (Ex-Vice Chancellor Jiwaji University) entitled “Diagnostics and pathological testing market in India- growth path” followed by Mrs. & Dr G. P. Talwar Oration by Dr D. Dash (IMS, BHU, Varanasi) on “Biomedical perspective of graphene: the new star in “nano” firmament”.

In this conference many eminent International and National speakers had participated: Dr Joseph Lopez, Dr H. C. Michell Ollerich, Dr Bharti Jhaveri, Dr Annu Khajuria, Dr Ravindra Singh, Dr J. Kartzmann, Dr Stephen K. J. G. Grebe, Dr Deshratan Asthana, Dr V. Parmeswaran, Dr Udayan Ray, Dr T. Vaidhynathan, Dr Kanagsabapathy, Dr Adwani, to name a few. The corporate wing also participated in scientific sessions in a big way.

On 6th Dec 2011 afternoon, the Valedictory function was presided by Dr V. S. Tomar, Hon'ble Vice-Chancellor, Agriculture University, Gwalior and concluded with award ceremony. The conference declared closed by president ACBI 2011.

DELHI STATE BRANCH

2nd Dr Yellapragada SubbaRow Memorial Oration Award Lecture

Dr Yellapragada SubbaRow memorial oration award has been instituted by Association of Clinical Biochemists of India (ACBI) to honor eminent Biochemists and Scientists of the country. First Dr Y. SubbaRow oration award lecture was delivered by Dr R.A. Mashelkar, Director General of CSIR and Secretary, Govt. of India on February 14th 2005. Dr P.M. Bhargava, the founder director of CCMB, was unanimously nominated for second Y. SubbaRow memorial oration award. Oration award ceremony was held on 10th February 2011 at the seminar hall of V. Patel Chest Institute, Delhi University. The function was co-sponsored by Indian National Academy of Stress Sciences (INASS), Bharat Shakti, Spiritual, Cultural and Educational Society, India, Iris, and Medikit.

The award ceremony was graced by the presence of senior members of INASS and ACBI including Dr V.K. Vijayan, Director, VPCI, Dr L.M. Srivastava, Dr Thuppil Venkatesh, Dr Arun Raizada, Dr U.N. Donde, Dr P. Usha Sarma, Dr B.K. Goel and future ACBI president Dr Neelima Singh (Organizing secretary ACBICON 2011), Teachers, Medical Professionals, Scientists, Fellows, Honored public persons and Students. from V. Patel Chest Institute, Sir Ganga Ram hospital, Medanta-The Medicity hospital, Hindu Rao Hospital, various departments of Delhi University, researchers from Institute of Genomics and Integrative Biology (IGIB), Defence Institute of Physiology and Allied Sciences (DIPAS), faculty members of All India Institute of Medical Sciences (AIIMS), Maulana Azad Medical College, University College of Medical Sciences (UCMS), Batra Hospital, Sharda Institute of Medical Sciences & Research, and G.R. Medical College, Gwalior etc.



At the outset, Dr K.K. Srivastava, President, Delhi Chapter of ACBI welcomed the audience and guests. He thanked Dr P.M. Bhargava for accepting the honor and gracing the event by his presence. He also welcomed and thanked Dr V.K. Vijayan, Director VPCI, for accepting our invitation to grace the occasion. He thanked the esteemed members of the audience for coming to attend the award ceremony and listen to the esteemed orator.

Dr Srivastava addressed Dr Bhargava as a towering personality, a mentor and distinguished researcher in the field of clinical biochemistry. Dr V.K. Vijayan



Dr Y. SubbaRow memorial oration delivered by Dr P.M. Bhargava



Dr P.M. Bhargava receiving Dr Y. SubbaRow memorial award from Dr K.K. Srivastava

addressed the gathering and introduced the Speaker to the audience. He elaborated major scientific accomplishments of Dr P.M. Bhargava during his research career and also remembered his own association with Dr Bhargava during his research work on human sufferings following Bhopal Gas tragedy. He addressed Dr Bhargava as visionary and also thanked him for being closely affiliated with developmental activities of V. Patel Chest Institute during recent years.

Dr P.M. Bhargava thanked ACBI for the honor of awarding Dr Y. SubbaRow memorial award and remembered working with researchers who knew Dr Y.

SubbaRow closely. He then delivered his oration lecture on "The Likely Medical and Health Care Scenario in 2050". During his lecture, he brought out his vision on likely face of medical health care and clinical management in the years to come. Dr Bhargava shed light on the potential of immense development in the fields of family medicine, novel drug delivery systems such as nanotechnology and liposomal formulations, pharmacogenomics, personalized medication, aroma and pheromone therapies and other alternative medicines as well. A brief summary of his oration is attached herewith.

Dr K.K. Srivastava congratulated Dr P.M. Bhargava for sketching an encouraging view of future of Medicare in 2050 and handed over the Yellapragada SubbaRow Oration Gold Medal and Scroll of Honor to him on behalf of ACBI. Dr Harsh Vardhan Singh, Jt. Secretary, Delhi Chapter of ACBI, proposed a vote of thanks. He thanked Dr P.M. Bhargava for delivering the oration. He also thanked Dr V.K. Vijayan for providing excellent venue for the oration. He also thanked Dr S.K. Bansal, secretary Delhi Chapter of ACBI, for his immense contribution to make the oration successful. He also thanked members of ACBI and INASS and corporate friends for making the event a big success. The award ceremony was rounded up with high tea.

BIHAR BRANCH

Bihar Branch of ACBI organized a 1 day BIHAR ACBICON 2011 on the 1st May 2011. It was a Workshop (Professional Course) on ACID-BASE BALANCE. The session was inaugurated by Dr Girdhar J. Gyani, Secretary-General, Quality Council of India. The workshop attracted not only Biochemists & Pathologists from all over the state but, also many Physicians, especially those in the field of critical care Medicine.



The workshop started with Dr D.M. Vasudevan, Past President, ACBI & Distinguished Professor of Biochemistry, Amrita Institute of Medical Sciences, Kochi, taking us through –“ACID BASE BALANCE – INTRODUCTION”.

The second speaker was Dr Kannan Vaidyanathan, I/c Clinical Biochemistry Lab, Amrita Institute of Medical Sciences, Kochi who spoke on “ABG – Instrumentation”. The 3rd. session was on the topic - :”QA of Blood Gas Analysis” and Dr A.S. Kanagasabapathy, Formerly, Professor & Head, Department of Clinical Biochemistry,



CMC, Vellore, took the audiences thru the total gamut of how to maintain the quality of the ABG report. After a sumptuous lunch, we had the last speaker, Dr N. P. Verma, Consultant Physician, ICU I/c, Sahyog Hospital, Patna & Secretary, Critical Care Society of India (Bihar Branch). Dr Verma's talk was on “ACID-BASE – from a Clinicians Perspective”



WEST BENGAL STATE CHAPTER 2011

Dr Shyamali Pal, State Secretary and Dr Jayanta Dey, under the aegis of The West Bengal State Chapter organized a one day CME on 12th February, 2011 at S.Serum Analysis Centre, Kolkata on “Quality Assessment as per ISO 15189”. Dr P.D. Sawant, Lead Assessor NABL and CAP Inspector was the Guest



speaker of this CME. He talked about all the clauses of Section 4 and Section 5 of ISO 15189.

He gave great stress on document control, the basic difference between documents and records, the need for regular review within the agreed upon time and proper archival of documents and records. The lecture was followed by group discussion and question answer session. Biochemists of reputed hospitals of the city participated in the CME. The questions on technical competence records and archival of such records were answered by Dr Sawant and two other dignitaries, Dr Alka Singh and Dr B.B. Patel, Technical Assessors NABL.



Other important personalities present in the CME were Mr. Sanjib Acharya, The Chairman, S. Serum Analysis Centre and Thalassemia Prevention Society of West Bengal and Dr Krishnajyoti Goswami, Ex president, ACBI. The CME was sponsored by S. Serum Analysis Centre.

CME conducted by ACBI Mangalore Chapter

Department of Biochemistry, KMC Mangalore, in association with the local chapter of ACBI conducted a CME on "Glycomics" on October 8th 2011 at Medical Education Unit Seminar Room, KMC, Mangalore. Dr.Venkatraya Prabhu, Associate Dean, KMC Mangalore, inaugurated the CME, and highlighted the importance of research in the field of Glycomics. Dr Poornima Manjrekar,



HOD, welcomed the gathering. Mr. Eric Lobo, Secretary, ACBI, briefed the audience about the activities of ACBI. Dr Ashok Prabhu, President, ACBI local chapter, proposed the vote of thanks. Distinguished speakers, Dr Rathika Shenoy, Prof of Paediatrics, KSHEMA, Dr Pradeep Kumar Shenoy, Consultant Rheumatologist, KMCHAC, Dr Manjunath Joshi, Asst Prof, Manipal Life Sciences Centre, Dr Gururaj Rao, Consultant Endocrinologist, and Dr Srikala Baliga Prof & HOD of Microbiology, KMC Mangalore, delivered talk on inborn errors, glycobiology of rheumatic diseases, cancer glycomics, metabolic syndrome and newer approaches to bacterial infections

respectively. The audience interacted with in-depth discussions. Over 150 delegates from different Medical Colleges attended the CME.

ACBI KERALA CHAPTER

REPORT ON CME

An one day CME programme on advances in laboratory medicine was conducted by the Kerala chapter of ACBI in association with Society of Clinical Chemist of Kerala and MES Academy of Medical Sciences, Perinthalmanna, Malappuram, Kerala at the MES Medical College on 18-12-2011. More than 300 delegates (Faculty, students & Laboratory Technologists) participated. The CME was inaugurated by Dr Mujeeb Rahman, Medical Supt of the hospital & the key note address on "MARKERS OF DIABETES & DIABETICOMPLICATIONS" was delivered by Dr D.M. Vasudevan, past President of ACBI Prof Dr T. Vijayakumar, ACBI representative of Kerala gave a talk on Pre-analytical Variables. Dr K.A. George of Malabar Institute of Medical Sciences, Calicut took class on Total Quality Assurance while Dr Dinesh Roy of Genetika-Center for Advanced Studies in Genetic took class on Cytogenetics as Diagnostic tools and Mr. Riju Mathew of Medivision Laboratories, Kochi, Kerala took class on Advances in laboratory Medicine.

Reported by Dr Rajeev Sinha, Secretary, ACB



Singapore Association of Clinical Biochemists (SACB)

SACB 2011 Activities Report

Singapore Association of Clinical Biochemists (SACB) started their year's activities with the Annual Scientific Meeting held in Sheraton Hotel on 5th March 2011. The sessions were a combination of Diagnostic company sponsored speakers as well as prominent overseas and local speakers. Our company sessions included "Autoverification" by Mr Dominique Fuzier from Ortho-Clinical Diagnostics; "The latest standard in automated vitamin D assays on ADVIA Centaur" by Mr Dean Whiting of Siemens Healthcare Diagnostics and "Translational medicine: Bringing life science discovery to innovative clinical practices" by Dr Tiffany Jiang of Beckman Coulter. Our invited overseas speakers were Prof Shieh Shu-Chu (Taiwan) presenting on the "Quality requirements of HbA1c" and Dr Yam Wing Cheong (Hong Kong) presenting on "Moving towards better control for MRSA". Our local speakers were Dr Cheng Chee Leong sharing on "National electronics health record – the road ahead for laboratory informatics"; Dr Joey Chan on "New developments in clinical microbiology" and Prof Aw Tar Choon on "Managing the clinical biochemistry lab for the next decade".

In May and September we jointly organized a Quality Control Education Workshop with Bio-Rad Laboratories. The speakers were Mdm Ou Mui Geok, and Ms Ong Siew Kim, both SACB council members.

The 13th module of our SACB Education Programme was held between August and October 2011 for ten weeks duration. The lectures comprised: How to fulfill the CLIA requirements for assay calibration, calibration verification and establishing the reportable range; Iron studies; The laboratory identification of haemoglobinopathies, Calcium and magnesium physiology and metabolism; The basis of nucleic acid testing; Uncertainty of measurement; Reference intervals – practical approaches; Laboratory testing in kidney disease – an update; Quality improvement in the clinical laboratory – practical approaches for detecting errors and implementing improvements; The role of biomarkers in the diagnosis, monitoring and treatment of cancer; Case studies. The council members are happy to report that there is still significant support of this programme by our members.

Our last event of the year was a joint session organized by the Chapter of Pathologists, Singapore Society of Pathology and Singapore Association of Clinical Biochemists hosting Professor Gregory Tsongalis from Department of Pathology, Dartmouth Medical School, USA, a Health Manpower Development Programme visiting expert, sharing on Quality control and monitoring of molecular tests.

Reported by : Dr Sharon Saw, Secretary, SACB



Pakistan Society of Chemical Pathologists (PSCP)

PSCP 2011 Activities Report

The election for the executive council of PSCP was held in Lahore in Feb 2011; the election commission was headed by Dr Dilawar. After voting from all the members; 11 executive council members were elected. In April 2011, these members amongst themselves elected the following for the recently vacated executive posts of the PSCP for a period of 3 years (2011-2013):

President	Dr Imran Siddiqui(The Aga Khan University)
Vice President	Dr Aamir Ijaz(PNS Shifa Hospital)
General Secretary	Dr Adnan Zubairi(Ziauddin University)

Annual scientific conference was held by PSCP along with the 35th Annual and 5th international conference of Pakistan Association of Pathologist at the College of Physicians and Surgeons of Pakistan from 16 -18 December, 2011. The theme of the conference was "New frontiers in Pathology". It was attended by renowned Chemical Pathologist from all over Pakistan. Dr Aw Tar Choon from Singapore also attended the Conference.



A workshop on “Good Professional Practices in Chemical Pathology” proceeded the scientific sessions at Pathology Department of PNS Shifa Hospital on 16th December 2011. The workshop was designed according to guidelines from Royal College of Pathologist for budding specialists of Chemical Pathology to develop the right professional and communication skills vital for their future careers. This workshop was conducted by Dr Adnan Zuberi and Dr Aamir Ejaz.

The workshop was followed by a mock OSPE for trainee fellows. Stations covered core concepts of Chemical Pathology including a preparatory station for biochemical test, quality control (QC), quality assurance (QA), instrument handling, method evaluation (calculation), problem solving in varied clinical situations, calculation of derived tests, lab biosafety (observed station) and data interpretation. At the end of the workshop, participants were distributed certificates.

Major Gen. Farooq Ahmed Khan, patron PSCP in his keynote address talk about “Medical Ethics for Pathologist” while Dr Aw Tar Choon updated the pathologist about advancement in understanding of thyroid function test.

A “meet the expert session” was arranged at breakfast on 18th December for fellow trainees to discuss “How to prepare for final assessment for fellowship exam” on December 18th, 2011. This session was conducted by Dr Imran Siddiqui and Adnan Zuberi. Another “meet the expert session” was also held simultaneously by Dr Aw Tar Choon, to discuss new developments in cardiac biomarkers.

Scientific sessions covered broad areas of subjects by invited speakers and oral presentations by the fellow trainees and technologist. The best oral presentations was awarded to Dr Lena Jafri and Miss Ghazala Naureen; trainee fellow and technologist respectively at at The Aga Khan University in the concluding ceremony.



Reported by Dr Aysha Habib Khan, PSCC

APFCB Laboratory Management Committee Project

Interpretative Comments Educational Programme 2011

Gordon Challand, Ken Sikaris, Leslie Lai and Sam Vasikaran

The Interpretative Comments Education Program in 2011 was coordinated by GC who chaired the Expert Panel which also included KS and LL. There were 52 registrants, mostly from the Asia-Pacific region but also from Africa and Europe. The participation rate for the individual cases ranged from about 50% down to <30% for the last case. We present below the cases, a summary of the responses from participants and the Expert Panel's opinion and a suggested comment.

We would be very happy to receive any comments from Readers on the educational value of this Scheme, or suggestions for improvement which should be sent to: gordonchalland@hotmail.co.uk

Case 1

Patient: 29 year old woman

Requested by family practitioner

Clinical History: On methadone. Erratic periods. Polycystic ovaries?

Serum	Results	Reference interval
FSH	<0.1 U/L	(follicular phase 2 – 11)
LH	1.7 U/L	(follicular phase 1 – 10)
Prolactin	3025 mU/L	(80 – 530)
Oestradiol	13200 pmol/L	(follicular phase 75 – 260)

Comments received

This real Case brought a wide range of opinion and suggested comments. Some of these are listed below.

- Consistent with polycystic ovary syndrome;
- Not suggestive of polycystic ovary syndrome;
- The abnormalities are likely to be due to methadone use;
- Results are likely to be due to an ovarian tumour;
- Results are likely to be due to a pituitary tumour;
- Results are likely to be due to pregnancy;



- Results may be due to oestradiol administration
- Results may be due to HCG injection;
- Results may be due to thyroid disease;
- Suggest measuring HCG;
- Suggest measuring macroprolactin;
- Suggest measuring thyroid function tests;
- Suggest measuring free androgen index;
- Suggest measuring insulin. o be due to an ovarian tumour;
- Results are likely to be due to a pituitary tumour;
- Results are likely to be due to pregnancy;

Expert Opinion

Polycystic ovary syndrome is usually associated with a high LH and a high normal or high FSH. According to USA guidelines, the LH/ FSH ratio is usually greater than 2 (though UK guidelines do not mention this, and simply suggest the need to find clinical and/or biochemical evidence of androgenisation). These low gonadotropins do not suggest PCOS. A pituitary tumour would not usually produce such a high oestradiol; an ovarian tumour would not usually produce such a high prolactin. Methadone use (like other opiates) can increase prolactin, but would not be expected to increase oestradiol.

Pregnancy usually causes major increases in oestrogens (and androgens), together with a raised prolactin and low gonadotropins. The simplest explanation for these abnormalities is therefore pregnancy. In this Case, the serum HCG was found to be 28000 U/L, suggesting a pregnancy of around 7 weeks' duration.

A suggested comment

These results are not suggestive of polycystic ovary syndrome. Although methadone can cause some increase in prolactin, the likeliest explanation for these extreme abnormalities is early pregnancy. Suggest you measure HCG urgently, since methadone is contra-indicated in pregnancy. If the patient is not pregnant, suggest urgent referral to Endocrine specialist for further investigation.

Case 2

Patient: 19 year old woman

Requested by family practitioner

Clinical History: High cholesterol, on simvastatin

Serum	Results	Reference interval
CK	14100 IU/L	(< 160)
LDH	1610 IU/L	(< 580)
Bilirubin	8 umol/L	(< 19)
ALP	45 IU/L	(< 120)
ALT	150 IU/L	(< 45)
Albumin	47 g/L	(35 – 48)
Total calcium	2.47 mmol/L	(2.10 – 2.55)

No previous laboratory results were available on this patient.



Comments received

This Case again produced a wide range of opinion and suggested comments. These covered both a philosophical question: how valid was the previously measured cholesterol result? ; and the interpretational problem.

Validity of the cholesterol measurement.

This was likely to have been measured as a POCT test, carried out either in the Family Doctor's surgery or in a Pharmacy. Several participants suggested measuring cholesterol in an official laboratory; one participant commented 'Since POCT of cholesterol can be done in a local Pharmacy or a local surgery without any quality assurance, and since Pharmacies can prescribe statins without prescription, misuse of statins must be widespread'. However POCT testing outside the control of the laboratory is increasing and is likely to involve a wider range of tests, and in the laboratory we have to learn to accept this. Interestingly, no-one queried what was a 'high cholesterol'. In developed countries where most eat a Western diet, at least half the adult population are likely to have a serum cholesterol value above current internationally recommended limits – should all of these be prescribed a statin?

Interpretation of results

Some of the comments received were

- Familial hypercholesterolaemia;
- Statin-induced hepatitis;
- Statin-induced myopathy;
- Stop therapy immediately;
- Muscular dystrophy;
- Hypothyroidism;
- Trauma;
- Intense exercise;
- Myocardial infarction;
- Megaloblastic anaemia;
- Haemolysis.
- Among the suggested additional tests were
- Renal function tests;
- Thyroid function tests;
- Troponin;
- CK and LDH isoenzymes;
- Haptoglobin.

Expert opinion

Although many participants suggested a myocardial infarction, the CK is too high to be typical of this, and this diagnosis would be very unlikely in a 19 year old visiting her Family Doctor. Instead, the results are typical of skeletal muscle damage (rhabdomyolysis). Although urine myoglobin is often suggested to confirm this, the test is quite insensitive. However, it is important to check renal function. Following acute muscular damage, there is a rapid rise in CK, which then declines within a few days. However there is often a secondary rise probably reflecting repair to striated muscle fibres, but this also declines quite rapidly.

There are many possible causes of rhabdomyolysis. In an acute presentation, these include statin-induced myopathy; unaccustomed or strenuous exercise; hypothyroidism; and the use of recreational drugs particularly Ecstasy. A crush injury would be unlikely in a patient visiting her Family Doctor. Although a muscular dystrophy cannot be ruled out, this would be an unusually late presentation.



A suggested comment

Abnormalities are likely to reflect acute skeletal muscle damage, possibly due to statin therapy. Suggest you check renal function tests, and stop statin therapy immediately. Re-check CK after two weeks and also check thyroid function tests. If CK remains high, and other causes of myopathy (strenuous or unaccustomed exercise; hypothyroidism; use of recreational drugs; recent trauma) can be excluded, suggest referral for investigation of a possible muscular dystrophy.

Case 3

Patient: A 54 year old man, working as a commercial heavy goods vehicle driver. He has just moved to the area, and on his initial visit to his new Family Doctor, the Practice Nurse finds he has glycosuria and has a random blood glucose of 10.1 mmol/L. An appointment is made by the Family Doctor for him to attend the laboratory for a glucose tolerance test. The following day, the patient telephones the laboratory to cancel the glucose tolerance test, and the day after, brings to the laboratory a blood glucose sample taken by the Practice Nurse two hours after the patient was given a 75g glucose load to drink. On this sample, the blood glucose was 2.5 mmol/L.

Comments received

This real Case again attracted a wide range of opinion, but most participants agreed on the fundamentals. However only one participant suggested the correct explanation! Some of the comments received were:

- Vomiting;
- Renal glycosuria;
- Fanconi syndrome;
- Reactive hypoglycaemia;
- Has the patient taken the glucose load?;
- Use of hypoglycaemic drugs;
- Consistent with diabetes mellitus due to lack of insulin;
- Not suggestive of diabetes;
- Has the patient tried to conceal his diabetic status?;
- Falsely low laboratory result due to delay in sample analysis, incorrect preservative, sample mix-up, or analytical error;
- Inaccurate POCT glucose measurement;
- Insulinoma;
- Gastro-intestinal surgery.
- Suggest a repeat oral GTT under controlled laboratory conditions;
- Suggest an oral GTT with samples taken every thirty minutes;
- Suggest a 3 hour or 5 hour oral GTT.
- Suggest measuring serum electrolytes;
- Suggest measuring HbA1c; suggest measuring fructosamine;
- Measure insulin, insulin C-peptide, pro-insulin;

Expert Opinion

Of all the mistakes described as 'laboratory error', most occur in the pre-analytical phase, and many of these are outside the control of the laboratory (incorrect patient identification; incorrect patient preparation; incorrect sample type). A rarer type of pre-analytical error occurs when the patient or subject has something to hide. These are quite common in samples from patients undergoing an illicit drug rehabilitation programme; and mistreatment of a sample for blood alcohol often occurs when motorists have been arrested by the police on suspicion of driving while under the influence of alcohol.



Occasionally a patient's job may depend on the results of laboratory tests, and samples from such patients should always be treated with suspicion by the laboratory. In many countries, patients with diabetes mellitus are not allowed to have a licence to drive heavy goods vehicles. In this Case, the laboratory blood glucose result is surprising in view of the POCT results, and it is likely that a pre-analytical error has occurred.

A further difficulty is that the term 'glucose tolerance test' is not standardised: for example, it is often used by midwives to indicate a two-hour post-prandial sample. When a GTT was requested, this Family Doctor Practice gave the patient a glucose drink, told the patient to fast overnight, drink the glucose the following morning, and come to the Practice two hours later for a blood sample to be taken. It is likely that this patient had had a prolonged fast and had not taken the glucose.

A formal GTT was carried out by the laboratory two weeks later with the patient under supervision. The two hour sample showed a blood glucose of 12.1 mmol/L, confirming his DM status. Unfortunately for the patient, his licence to drive heavy goods vehicles was then withdrawn.

A suggested comment

The laboratory blood glucose result is surprising in view of the point-of-care test results; and it is possible a pre-analytical error has occurred. Suggest you arrange for a formal glucose tolerance test to be carried out under laboratory supervision.

Case 4

Patient: A 58 year old man, visiting his Family Doctor. The clinical information is 'Swollen foot, ?gout'. A serum sample taken at 11.30 am gave the following results:

Sodium	138 mmol/L
Potassium	4.5 mmol/L
Urea	6.4 mmol/L(2.8 – 7.0)
Creatinine	112 umol/L(62 – 133)
Adjusted calcium	2.41 mmol/L(2.10 – 2.55)
Phosphate	0.59 mmol/L(0.81 – 1.55)
Uric acid	489 umol/L(male, 208 – 506)

Comments received

There was a surprisingly wide range of opinion on this Case. Among the comments received were:

- Suggests acute gout;
- Does not suggest gout;
- Pseudo gout?;
- Mild loss of kidney function;
- Possibly due to liver cirrhosis;
- Primary hyperparathyroidism;
- Non-fasting sample?;
- Alcohol excess;
- Chronic use of antacids or glucocorticoids.



Several participants suggested repeating the tests on a fasting sample; but among the many other tests suggested were:

Magnesium; synovial fluid microscopy; 25-OH Vitamin D; PTH; liver function tests; FBC; ESR; rheumatoid arthritis tests; blood glucose; IgE; urine uric acid; and urine albumin.

Expert opinion

As with previously distributed Cases, some participants ignored the implicit clinical question: "are these results consistent with acute gout"; and instead commented on "what can cause a low serum phosphate?". Giving advice on clinical problems needs us to take account of the clinical information given, instead of just giving advice on all possible causes of the abnormalities in the results!

Most clinicians know that a uric acid within the reference range does not necessarily exclude the possibility of gout particularly during an acute attack (one participant commented that urate is normal in 30% of patients in such cases). However, few are aware that a low phosphate is also common. The mechanism is unclear: this may be due to deposition of phosphates as well as urates, but it may also be due to decreased tubular reabsorption of phosphate, as one participant commented. Pseudo-gout is due to deposition of pyrophosphates in affected joints. This could also cause a low serum phosphate but typically affects the knee joints of elderly females and would be unlikely in a middle-aged male.

Classically, the diagnosis of gout depended on the recognition of characteristic crystals in fluid from an affected joint; but two participants queried the utility of this – perhaps as a profession we have lost faith in microscopy as a valid analytical technique!

This is quite an old Case, first circulated before the days of IDMS-aligned serum creatinine assays and calculation of eGFR. Nonetheless, a high serum urate can lead to a risk of urate nephropathy, and this patient's renal function should be monitored.

A suggested comment

A high normal serum uric acid and a low phosphate are often found in cases of acute gout. Although pseudo-gout cannot be excluded, this would be unlikely to affect the feet of male subjects. Classically, the diagnosis of gout depends on microscopy of fluid from an affected joint and recognition of typical crystals.

A high serum urate carries the risk of urate-induced nephropathy: suggest you monitor serum urea and electrolytes together with urine microalbumin at three-monthly intervals.

Case 5

Patient: A 48 year old woman, visiting her Family Doctor. The clinical information is '12 weeks amenorrhoea – menopause?'

FSH	48 U/L	(follicular phase 1 – 9 U/L)
LH	65 U/L	(follicular phase 1 – 12 U/L)
HCG	< 0.5 U/L	



Comments received

A wide range of opinion was evident for this Case. Among the suggestions were:

- Suggests menopause;
- Probably perimenopausal;
- Atypical for menopause;
- Primary ovarian failure;
- Polycystic ovarian syndrome;
- Hyperpituitary syndrome;
- Adrenal disease;
- Ovarian tumour;
- Thyroid disease.

Among the additional tests suggested were:

TSH; oestradiol; testosterone, DHEAS; 17-OH progesterone; prolactin; inhibin B; a progestin withdrawal test; and pelvic ultrasonography.

Expert Opinion

There is a widespread belief even among experienced clinicians that the menopause can be diagnosed on the basis of laboratory tests: it cannot! Hormone measurements cannot distinguish between perimenopausal and menopausal status, and there can be other reasons for an increased FSH and LH. Perimenopausal status can persist for up to 5 years. The menopause is defined as amenorrhoea for more than 1 year due to primary ovarian failure in a woman over the age of 45 years (some would now increase this age limit to 50 years). Diagnosis is therefore a retrospective clinical decision, not a biochemical one. There is also a high risk of litigation if incorrect advice is given in this area!

During the perimenopausal transition, FSH and LH can vary widely, but FSH is usually greater than LH, as it is following the menopause. For this patient, LH is greater than FSH, so these results are not typical. Measuring oestradiol is unlikely to be helpful, since this can also vary widely and does not fall to a typical post-menopausal value until many months after the menopause. It is possible that the pattern here could be associated with polycystic ovarian syndrome, but the clinical information given does not suggest there is evidence of androgen excess. An alternative and more likely explanation is that the results are a peak in gonadotropins associated with ovulation.

Six weeks later, a further sample was taken, on which the LH was 8.2 U/L and the FSH was 5.3 U/L, so the patient was certainly not menopausal!

A suggested comment

Not pregnant. The pattern of gonadotropins is more suggestive of an ovulation peak than of perimenopausal or menopausal status. Suggest FSH and LH are measured again in 6 weeks. If perimenopausal status is confirmed, the possibility of further fertile cycles cannot be excluded, and contraceptive advice should not be given on the basis of these biochemical indices.



Prevalence and Causes of Vitamin D Deficiency in South Asian Population Residing in Different Geographical Areas

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Introduction

Adequate circulating vitamin D (25OHD) concentration is well known for maintenance of bone health. The primary role of 25OHD is in calcium (Ca) and phosphate (P) homeostasis (calcitropic functions). Inadequate levels of 25OHD have classically been associated with bone disorders, such as rickets, osteomalacia and osteoporosis [1].

Recent literature indicates that vitamin D deficiency is a global issue. However, it is a major public health problem in South Asia especially in India and Pakistan, despite their relatively closer location to the equator. Numerous reports highlight the widespread D deficiency and secondary hyperparathyroidism in immigrant South Asian population especially Pakistani men and women residing in other regions of the world such as in the UK. South Asian women are at high risk of osteoporosis, in addition South Asian Immigrants (Indians, Pakistanis, Sri Lankan and Bangladeshis) have higher prevalence of pain compared to Europeans and Caucasians, which is suggested to be due to vitamin D deficiency (Table 1). This potentially impacts negatively on their long term bone health.

Table 1 presents a summary of vitamin D deficiency prevalence in S Asian adults residing in South Asia as well as in different other regions of the world. Most of these studies shows prevalence of vitamin D deficiency (25OHD levels less than 20 ng/ml) and insufficiency (25OHD levels between 20-30 ng/ml) above 80% in the groups studied in Pakistan, India, Bangladesh and Kashmir. However, there is paucity of epidemiologic data from these countries.



Table I. Prevalence of Vitamin D Deficiency in South Asian Adults

Authors (ref) [1]	Place of study	Study site	Sample size (n)	VDD & insufficiency (Prevalence %)
Mansoor et al. 2010 [2]	Karachi, Pakistan	Tertiary Care Hospital	123 Apparently Health Adults	90 %
Khadgawat et al. 2010 [3]	India	All India Institute of Medical Sciences	50 Patients with fragility hip fracture	96.7 % Deficient
Tahrani et al. 2009 [4]	UK (South Asian)	Tertiary Referral Center	210 Diabetic Patients	83 % in Diabetic 70 % Non-diabetic
Zuberi M et al. 2008 [5]	AKU, Karachi, Pakistan	Hospital	119 adults ambulatory care patients	92% deficient
Goswami R et al. 2008 [6]	North India	Village	57	31.5 % deficient
Zargar AH et al. 2008 [7]	Kashmir	Urban and Rural Areas	92 healthy natives (64 men and 28 non-pregnant/non-lactating women, aged 18-40 years),	76 (83%) of the subjects studied had vitamin D deficiency--25%, 33%, and 25% had mild, moderate, and severe deficiency, respectively
M A Baig et al. 2007 [8]	Pakistan	Civil Hospital & Abbasi Shaheed Hospital, Karachi	79 Patients with structural & biochemical changes	92 % Deficiency
Islam MZ et al. 2006 [9]	Bangladesh	Dhaka city (3 different locations)	121 representative of 3 groups (A=veiled, B=non veiled, C=Non veiled, diabetic)	78% of group A, 83% in group B and 76% in group C, respectively
Sachan A et al. 2005 [10]	India	Urban and rural areas	207 pregnant subjects at term	Eighty-four percent of women (84.3% of urban and 83.6% of rural women) had 25(OH)D levels below the cutoff

Determinants of Vitamin D deficiency

The two main determinants of primary vitamin D deficiency include low vitamin D intake and lack or limited sunlight exposure. [1]

Low Vitamin D intake

A strict vegetarian diet is a cause of vitamin D deficiency as most of the natural sources of vitamin D are animal-based, including fish and fish oils, egg yolks, cheese, and beef liver [11]. Current estimates of vitamin D intake globally suggest that dietary supplement use may contribute 6-47% of the average vitamin D intake in some countries while in most countries the current food supply, supplementation practices, and dietary patterns are too low to sustain healthy circulating levels of 25OHD [12].



The strategies to increase vitamin D intake and to improve 25OHD status includes promotion of supplementation targeted to high risk groups and food fortification for the general population.

Limited sunlight exposure

The major source of vitamin D for humans is exposure to sunlight. Anything that diminishes the transmission of UVB radiation to the earth's surface or anything that interferes with the penetration of UVB radiation into the skin will affect the cutaneous synthesis of vitamin D (Table 2).

Table 2: Factors affecting exposure to sunlight

Factors affecting the transmission of solar UVB radiation to the earth's surface	Factors affecting the penetration of UVB radiation into the skin
Season	Individuals with higher skin melanin content
Geographic latitude	Sun screen
Time of day	Ageing skin
Cloud /fog	Excess skin cover
Window glass	Indoor life style

Factors affecting the transmission of solar UVB radiation to the earth's surface

Dermal synthesis of vitamin D requires the presence of UV-B light in specific wavelengths. The angle at which sun reaches the earth has a dramatic effect on the number of photons that reaches earth's surface. This is why the zenith angle is increased during the winter time and in the early morning and late afternoon little vitamin D synthesis occurs. People living in regions that fall above latitudes of 37° north or south of the equator are at risk of deprivation of vitamin D dermal synthesis between the months of October through April due to larger solar zenith angle (SZA) [13].

Factors affecting the penetration of UVB radiation into the skin

A critical determinant of vitamin D production is the presence and concentration of melanin. The concentration of melanin in the skin is related to the ability of UVB light to penetrate the epidermal strata and reach the 7-DHC containing stratum basale and stratum spinosum. Under normal circumstances, ample quantities of 7-DHC (about 25-50 µg/cm² of skin) are available to meet the body's D requirements, and melanin content does not alter the amount of vitamin D that can be produced. But aging is associated with decreased concentration of 7-DHC and individuals with higher skin melanin content will simply require more time in sunlight to produce the same amount of vitamin D as individuals with lower melanin content [14]. Similarly a sun screen with a sun protection factor of 15 absorbs 99% of the incident UVB radiations and wearing veil where by all skin is covered and prevented from being exposed to sunlight places those who practiced it at high risk of vitamin D deficiency.

Factors that affect vitamin D availability

Several factors may impede dermal synthesis of vitamin D and may result in vitamin D deficiency. In Pakistanis, an altered vitamin D metabolism has also been implicated by Awumey et al. 1998 [15]. The elderly, in particular, may be exposed to a combination of the factors listed below, in addition to their reduced dermal synthesis, possible malabsorption, liver and kidney diseases; which put them at an additional risk.

Discussion

Some of the reasons that have been suggested for this high degree of vitamin D deficiency in South Asians are darker skin and hence requirement of two to six times more ultra violet light than the Caucasian to make same amount of vitamin D.



Low UVB from the sun with too low an angle to penetrate the atmosphere has been proposed in Canada and US and UK as a cause of vitamin D deficiency in this group and it was presumed that vitamin D deficiency should not be a problem within South Asian countries.

A major limitation in the conduct of more research in the area of vitamin D is the lack of appropriate and inexpensive tools for measuring sunlight exposure, which is an important determinant of vitamin D levels in population based studies. No questionnaire is currently available for assessing sunlight exposure in South Asian population. Previously sunlight exposure has been measured by dosimeters or by a short sunlight diary. However these tools have certain limitations. The dosimeters are prohibitively expensive, therefore cannot be used in large epidemiological studies and the diaries estimate the duration of exposure to sunlight (time in minutes/day) with adjustment either for none or few covariates that could influence UVB activity, such as use of sunscreens, type of clothing, traveling in sun and working in shady area etc .

In addition, addressing dietary needs of calcium and vitamin D to optimize bone health are required in South Asian population. Newer strategies and recommendations for dietary and supplementation intake of vitamin D and calcium have been put forward but there is paucity of research specially targeting calcium intake and food source in these population especially in Pakistan. Evaluation of nutritional adequacy of diets can be performed by various dietary data collection techniques including interviewer-administered 24-h recalls, self-administered food records and food frequency questionnaires (self or interviewed administered).

Lastly, the limitation of all these studies on South Asian population is that these have followed the reference ranges for diagnosing Vitamin D deficiency developed for Caucasian populations. Even the reference ranges considered in west are controversial [7]. We have no evidence that the same ranges are applicable for Pakistani and other south Asian population or not.

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Co-Inheritance of HbD Iran/Beta Thalassemia IVS I-5 [G>C] Trait in a Punjabi Lady with Diabetes

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Abstract

The present report describes the molecular study of HbD Iran (beta) 22 GluGln associated with β -Thalassemia IVS I-5 [G>C] found in India, and the first case in which mutation has been identified using mass spectrometry. Given the apparent ethnic origin and the mobility of the variant hemoglobin at alkaline pH, hemoglobin D-Punjab would be suspected, but HPLC excluded this possibility. Further characterization of hemoglobinopathy was made by using nondenaturing gel electrophoresis and matrix assisted laser desorption ionization mass spectrometry and IVS I-5 being validated by reverse dot blot hybridization followed by sequencing of the β -globin gene.

Key words

Hemoglobin D-Iran, Mass Spectrometry, Matrix assisted laser desorption ionization mass spectrometry, High performance liquid chromatography, Reverse dot blot hybridization.

Introduction

The HbD-Iran Genotype: $\alpha_2\beta_2$ 22 Glu – Gln (GAACAA) was first described by Rahbar in 1973 (1). Found mainly in Iranian and Pakistani families, and generally in the heterozygous state, with no abnormality (2). There is no anemia or reticulocytosis, MCV and MCH are usually normal unless associated with an underlying iron deficiency.

But HbD Iran in combination with beta thalassemia produces a moderate microcytic and hypochromic anemia that is not transfusion dependent. It is a mutation caused by replacement of glutamic acid by glutamine at β 22, and this is the fourth substitution to be described at this site of beta globin gene. The others being G Coughatta (Ala), E Saskatoon (Lys) and G Taipei (Gly).



The issue to be addressed is that HbD Iran appears as HbSS on alkaline electrophoresis and migrates with HbA₂ and HbE using HPLC methods. So in laboratories utilizing HPLC instruments HbD Iran/ β Thalassemia compound heterozygotes are suspected of having either homozygous HbEE, if HbD Iran is misinterpreted as elevated HbE, or beta thalassemia major if the HbD Iran is thought to be elevated HbA₂ (3).

The present case study describes the HPLC and molecular findings of HbD Iran with a concomitant β -Thalassemia from a 32 year old lady who hailed from the state of Punjab in North India, was referred to Manipal Hospital, Bangalore, for a comprehensive check up as part of diabetic work up.

Material & Methods

Blood sample collected in Beckton Dickenson vacutainer EDTA tube was analysed for a routine blood count using Sysmex XT 1800i Hematology analyser.

As the patient was diabetic, the sample was analysed for glycated hemoglobin (HbA_{1c}) on BioRad D10 HPLC instrument as per standard procedures. During A_{1c} testing a variant window was detected in HPLC, which prompted us to proceed with its identification on this same platform, but by using the Beta Thal short program mode.

In this mode due to the presence of an elevated HbA₂ percentage, the sample was later centrifuged at 3000 rpm for 10 min. and obtained packed cells were lysed with hemoglobin lysing reagent. Electrophoresis was carried out on HELENASAS-II analyser at alkaline pH.

Gel was stained using Acid Blue stain and subsequently destained at room temperature. The hemoglobin bands were later excised from the gel, destained and desalted by vigorous shaking in a solution containing acetonitrile and 50Mm NH₄HCO₃ buffer in 1:1 (v/v) ratio. Gel pieces were dehydrated with acetonitrile for 5min. In-gel digestion was performed using Trypsin (TPCK treated, SIGMA, USA) in 50Mm NH₄HCO₃, Ph 8.0, at 37°C for 12 hours. Proteolytic peptides were eluted from gel with elution buffer (acetonitrile:water=60:40(v/v), 0.1% TFA).

MS analysis were performed on a MALDI mass spectrometer (Waters Synapt HDMS). PEG mix from Waters, UK was used as an external calibrant. The digested peptides were mixed with the matrix solution, α -cyano-4-hydroxycinnamic acid in 1:1 (v/v) ratio and spotted on a MALDI plate. Mass spectra for proteolytic peptides were recorded in the positive ion mode using a 200Hz laser. Mass spectral findings were analysed using MassLynx Software (4).

With prior consent and clearance from the Institutional Ethics committee, genomic DNA was extracted from the blood sample using the DNEasy kit from Qiagen. The β thalassemia mutations were characterized by a PCR method based on ARMS (5) by Newton et al.

For molecular characterization, a region containing exon 3 of β globin was amplified with the following primers:

RE (5'-CAATGTATCATGCCTCTTTGCACC – 3') and RD (5' – GAGTCAAGGCTGAGAGAGATGCAGGA – 3') the 861 bp PCR product of this amplicon was digested by EcoRI restriction enzyme (Roche, Germany). Direct β globin gene sequencing was performed in both directions on DNA sequencer.

ARMS PCR, consisted of 27 cycles, preheating at 94°C for 4min, denaturing at 94°C for 1 min, annealing at 67°C for 30secs and extension at 72°C for 1.5mins. The PCR product was electrophoresed on a 3% agarose gel stained in Ethidium bromide with ϕ X 174 Hae III digest as marker. The primers mentioned above for this run were selected from a published report. The amplification reaction was performed using a DNA thermal cycler (PTC-100 from M.J. Research). Sequencing of PCR product was conducted using ABI Prism Big Dye Terminator technology from Applied Biosystems, USA to confirm the mutation.



A screen for beta chain mutation(s) was conducted using the β -globin Strip Assay SEA (Vienna Lab Diagnostics GmbH). The kit follows a PCR based reverse dot blot hybridization (RDBH) protocol that simultaneously screens for 22 mutations covering >90% of the β -globin defects found and reported in South east Asia. Biotinylated primer products were detected using streptavidin alkaline phosphatase and colour substrates. The conditions for the PCR reaction and protocol for the RDBH assay for this sample were conducted following instructions from the kit.

Results

The examination of blood in a comprehensive health diabetic workup from a patient from Punjab in North India presented an anomalous blood picture. Based on the hematological data, the patient had Hb levels of 12.5gm%, RBC count of 4.7(10¹²/L), MCV of 70fl and MCH 23pg. Peripheral smear showed a mildly hypochromic and microcytic blood picture with occasional target cells. BioRad D10 HPLC profiles (reverse phase HPLC) (Fig 1A) showed an intense peak (variant window) at 1.6min with a percentage of 44.7% and glycated hemoglobin (HbA1c) was 10.4%.

To investigate the nature of the large unknown peak detected by HPLC, the same sample was run in beta thal short program mode, wherein a HbA2 level of 29.6% was obtained (Fig 1B). In a HPLC run a HbA2 value between 3 to 10% is indicative of thalassemia carrier status, between 10-25% Hb-Lepore, 25-60% HbE heterozygosity and more than that as homozygous. As there was an ambiguity in the result, based on the ethnicity of the patient, the sample was subjected to alkaline hemoglobin electrophoresis using SAS-Mx electrophoresis from Helena laboratories. An intense band in HbS/D/G position, as depicted in (Fig 1C), was obtained.

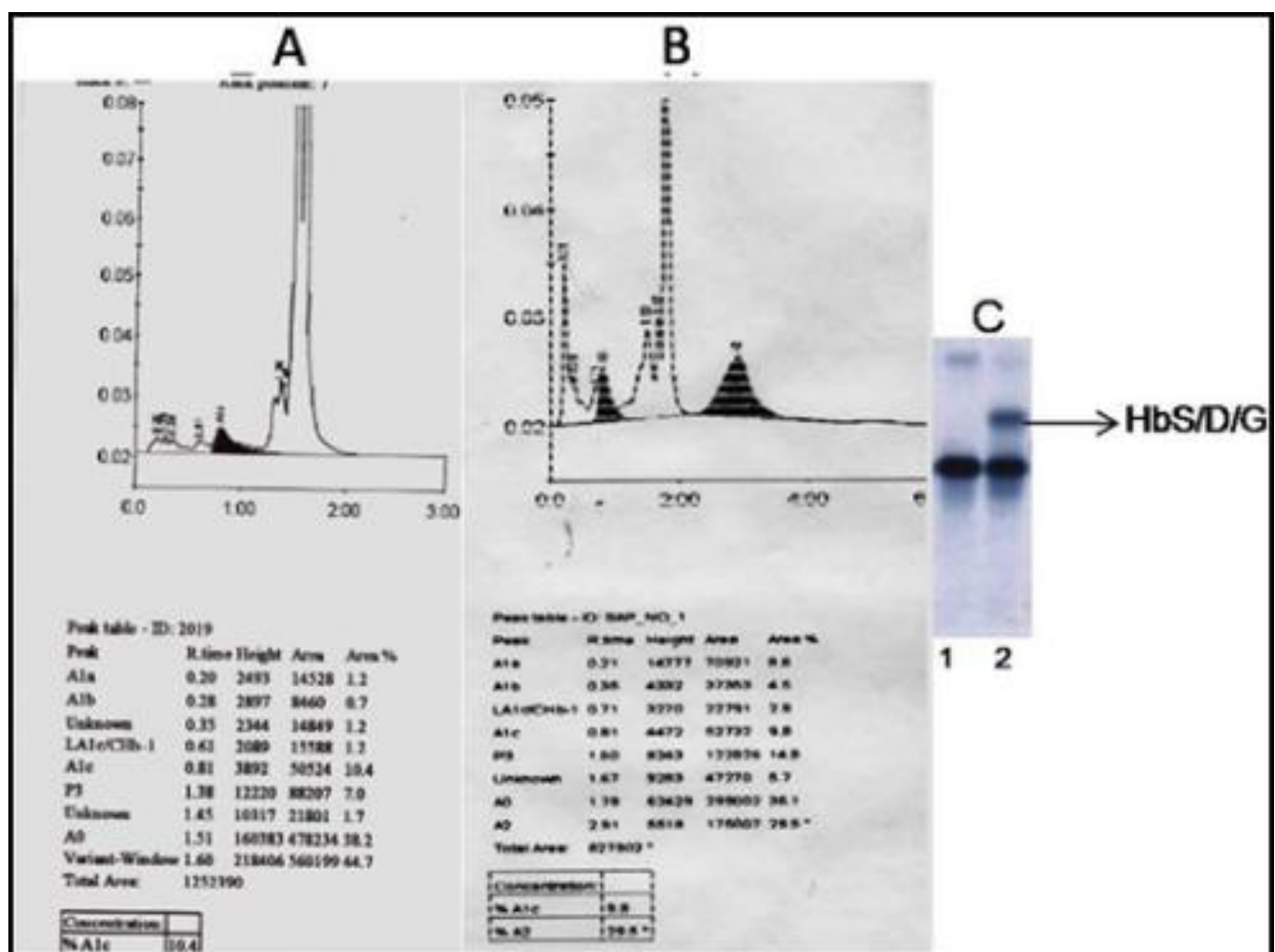


Fig 1: A) BioRad D10 HPLC pattern depicting a variant window at 1.6 min. RT.

B) BioRad D10 HPLC pattern in Beta Thal mode showing elevated HbA2 at RT of 2.9min.

C) Alkaline hemoglobin electrophoresis depicting intense band in HbS/D/G region.

As the HPLC findings and that of electrophoresis were contradictory, we proceeded with molecular analysis of sample using an amplification refractory mutation system PCR(ARMS-PCR). This analysis was done due to the fact that a concomitant presence of thalassemia trait was suspected by the finding in the index patient of microcytosis, hypochromia and occasional target cells in the peripheral smear.

Specific primers were used to see the site of alteration in the beta globin gene. The predicted 285 bp fragment resulting from the PCR reaction confirmed the mutation to be IVS I-5[G>C]. The ARMS –PCR was then further cross verified by sequencing the concerned region using the Big Dye Terminator DNA sequencer. Sequencing electrophoretogram clearly demonstrated the specific location of the mutation(Fig 2). A screening kit from Vienna Labs was also used for identifying the beta chain mutation. This kit uses β -globin gene specific primers in a multiplex PCR reaction and the amplified product is subsequently analysed to investigate if any of the 22 known common mutations that have been reported, has been amplified in a reverse dot blot hybridization strip assay.

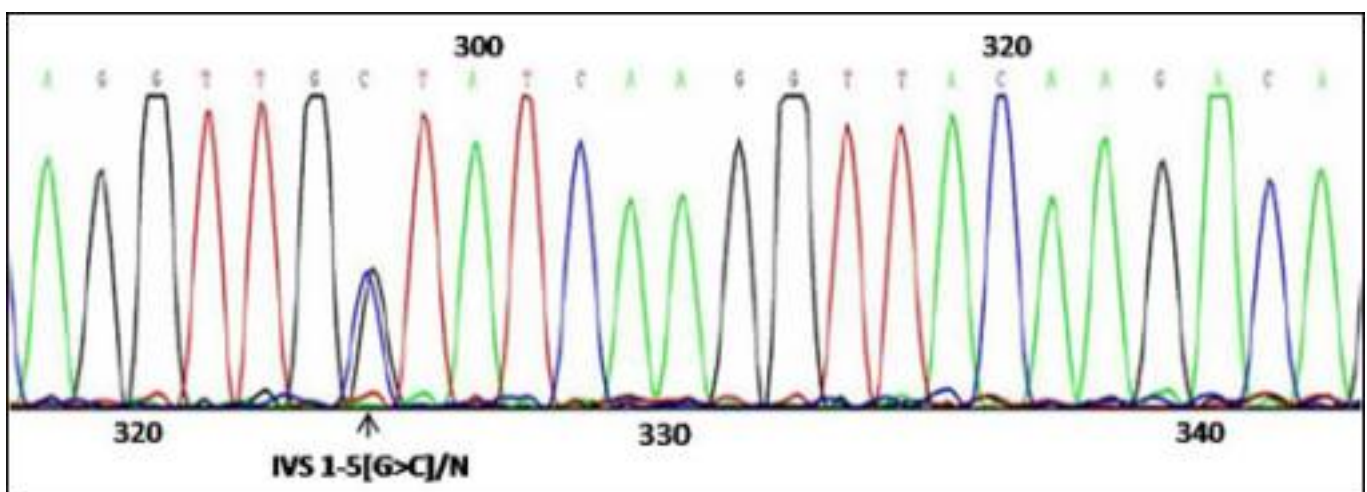


Fig 2: Arrow depicting position of IVS I-5[G>C] in chromatogram obtained by Big Dye Terminator DNA sequencer technology.

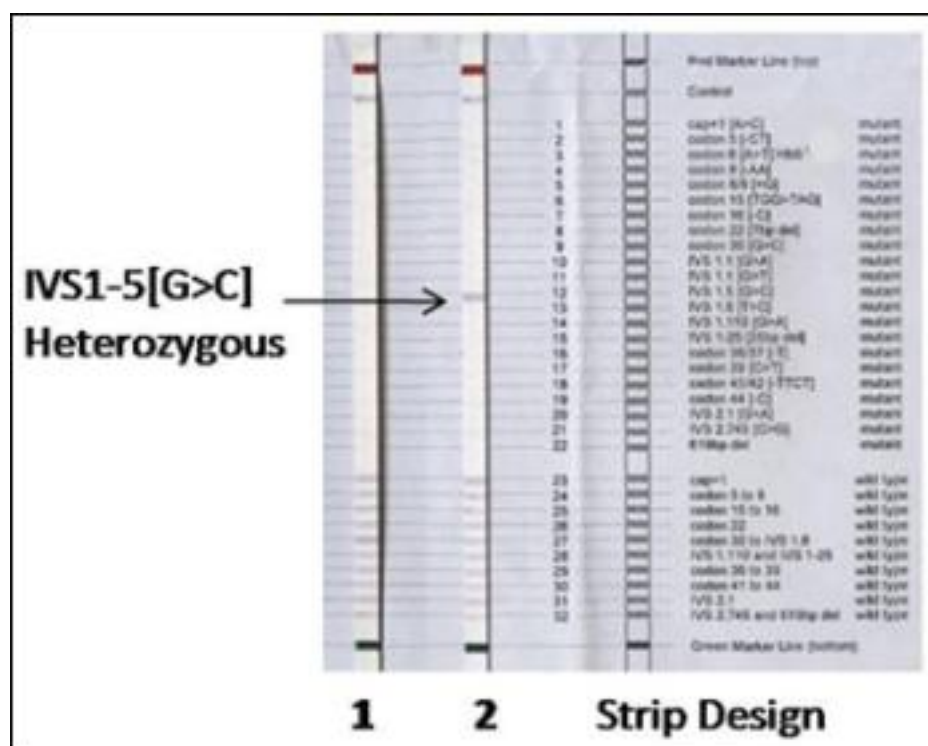


Fig 3: Arrow depicting position of band obtained by Reverse dot blot hybridization (RDBH) method using Vienna Lab Beta Globin strip assay, identifying heterozygosity of IVS I-5[G>C].

Presence of IVS1-5[G>C] band (arrow), as seen in (Fig 3), among the other 22 mutations in its panel confirming that the patient harbors a β -thalassemia. The presence of positive bands for the entire lower wild type panel in the assay strip further indicates that this mutation is present in the heterozygous state.

Post HPLC and Alkaline hemoglobin electrophoresis, there was an ambiguity regarding the variant type. So the variant band was isolated from gel and digested with trypsin and analysed in MALDI-MS. The peptide mass fingerprint was compared with that of normal hemoglobin. The beta globin gene sequence is represented by amino acids with one letter code which reads as:

1	11	21	31	41	51		
1	MVHLTPEEKS	AVTALWGKVN	VDEVGGEALG	RLLVYPWTQ	RFESFGDLS	TPDAVMGNPK	60
61	VKAHGKKVLG	AFSDGLAHL	NLKGTFATLS	ELHCDKLHVD	PENFRLLGNV	LVCVLAHHFG	120
121	KEFTPPVQAA	YQKVVAGVAN	ALAHKYH				

Using tandem mass spectrometry the characteristic peptide was fragmented and sequenced to identify and locate the mutation. (Fig4) depicts the MALDI-MS spectra of the tryptic peptide finger print.

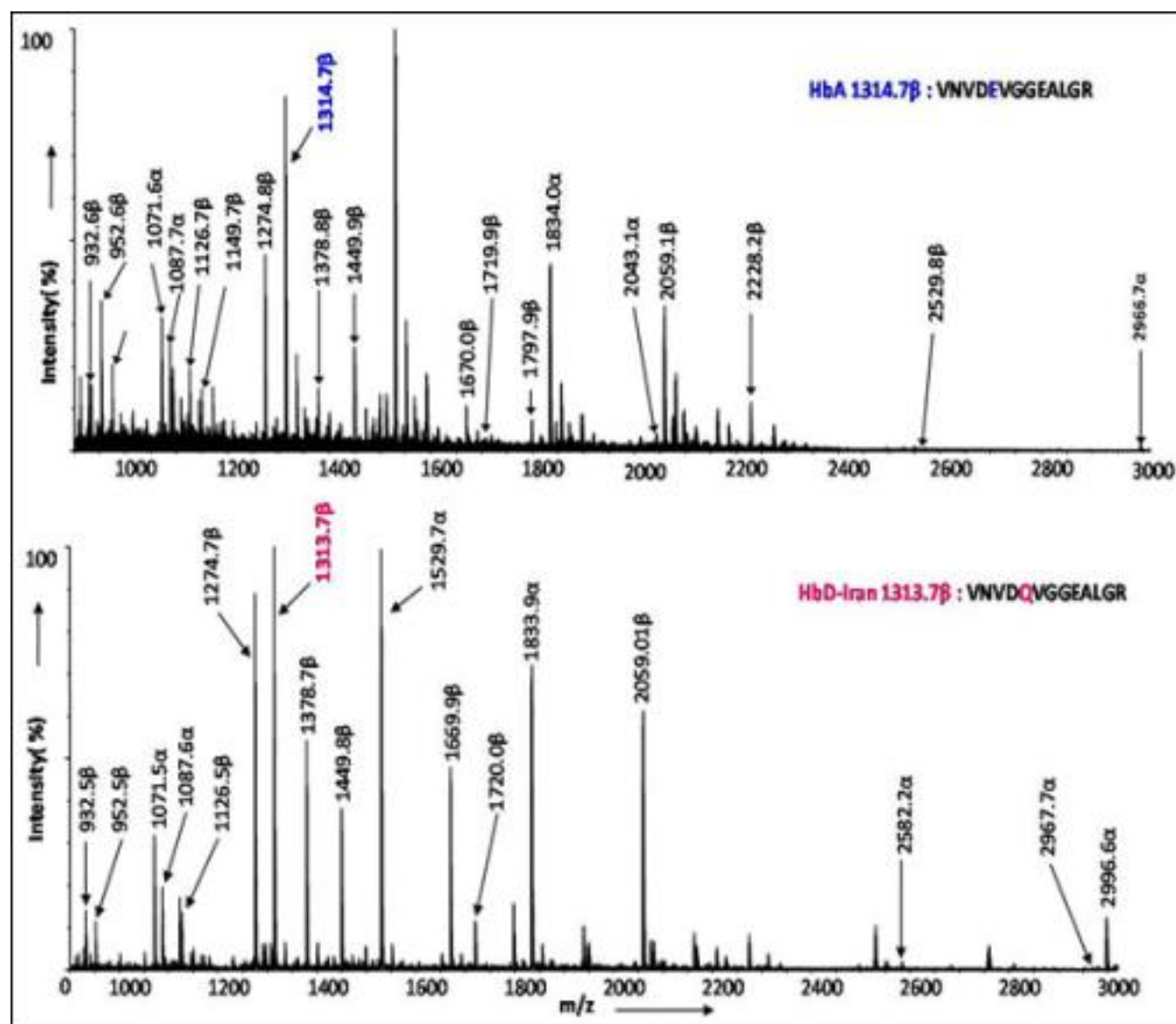


Fig 4: (A) Depicts the MALDI-MS spectra of the tryptic peptide finger print for normal hemoglobin (mass of 1314.7 Da) and (B) for the hemoglobin with the mutated peptide with mass 1313.7 Da.

The peptide fragment at 1314.7 Da is for normal hemoglobin and 1313.7 Da is the mutated peptide, differing by 1 Da, indicating the specific fragment harboring the putative E to Q mutant.

Discussion

Hemoglobin D Iran is formed as a result of a substitution of the amino acid glutamine for the wild type glutamic acid at position 22 of the β chain. It is a silent variant, and in this case its association with beta thalassemia trait IVS 1-5[G>C] also has not produced any clinical abnormality. HbD Iran with presence of beta thalassemia trait though have been reported using electrophoresis, HPLC and ARMS-PCR techniques, our emphasis has been on using nondenaturing gel electrophoresis and matrix assisted laser desorption ionization mass spectrometry with RDBH and DNA sequencing at arriving at a definitive diagnosis.

There is a masquerading effect seen between HbD Iran and HbE, and this has been resolved aptly using the mass spectrometry as can be seen by the fact that: When subjected to digestion with trypsin it is found in the T3 peptide which contains amino acids 21 to 30. The wild type T3 sequence of VNVDEVGGEALGR is altered to VNVDQVGGEALGR. No other single amino acid substitution in this peptide will cause a mass alteration of minus 1, therefore the mass alteration of the T3 wild type fragment from [M+H] 1314.7 Da to [M+H] 1313.7 is highly specific for haemoglobin Diran.

In the process of identifying the site of mutation, it is also evident that MS and DNA sequencing are complementary techniques, and can be a very useful tool in a molecular approach in identification of hemoglobin variants.

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Book Review

“Primary Care and Laboratory Medicine - Frequently Asked Questions”

Authors: Stuart Smellie, Cliona McNulty and Mike Galloway.

Edited by William Marshall and Beverly Harris.

Publisher: ACB Venture Publications 2010. 258 pp.

Reviewer: Joseph Lopez

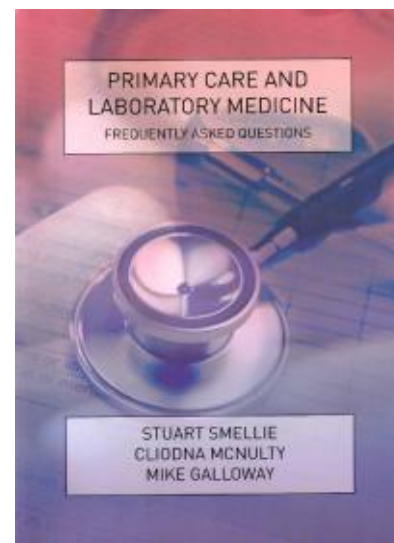
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The National Health Services of the United Kingdom has estimated that 70-80% of all health care decisions affecting diagnosis or treatment involve a pathology investigation (1). Yet, laboratory medicine, let alone clinical biochemistry, is not a part of the undergraduate medical curriculum of many medical schools.

The style of presentation of this book is unusual and may even be unique. It is written as answers to about 150 FAQs or frequently asked questions. The questions are preceded by a chapter on reference “ranges” (sic) and abnormal results. Subsequent chapters cover the most common areas of concern to the laboratory: allergy, arthritis and inflammation; anaemia; cancer; cardiovascular disease and hypertension; infection, diabetes; diarrhoea; drug safety and monitoring; gynaecology; infection; kidney function and electrolyte disorders; liver function tests; thrombosis and anticoagulation; and, thyroid disorders. Each chapter is divided into sections in which the FAQs are found. The answer to each question is a summary of current thinking and ends with a succinct “point(s) to note” and a useful reading list.

While the coverage is comprehensive, there are the inevitably questions that those from outside the UK may wish to pose but which are not asked in the book. This is to be expected since FAQs will differ in various parts of the world. For example, the tests for dengue fever, a potentially fatal infection in many countries, are not presented since it would be of less importance for a primary care doctor in the UK. While the usefulness of certain tests for screening is discussed, it may have also been helpful if a chapter on screening in the primary care setting, with its pros and cons, was included.

The preparation of this book has systematically involved all the major bodies in laboratory medicine, inter alia, the Royal College of Pathologists, the Royal College of General Practitioners, national associations of clinical biochemistry, medical microbiology and haematology.



ISBN: 978-0-902429-46-8;

Price £35.00;

Available from the Association of Clinical Biochemists, 1300-132 Tooley St., London SE1 2TU, UK

The guidance notes are the product of a wide-ranging consensus obtained with a well defined search strategy, rather than being the views of the authors alone. This is Level 4 evidence which is less robust than that based on randomised control trials because not many of these have been done in clinical biochemistry.

The intellectual challenge for laboratories is no longer just to produce good quality test results but, increasingly, to ensure the effective use of tests. Specialists in laboratories are now seen as an integral part of the health-care team. The authors are a chemical pathologist, a medical microbiologist and a haematologist, specialists who would cover three of the four major disciplines in a diagnostic laboratory. It is convenient that the common questions faced in each of these disciplines are discussed within a single volume. This book should be a useful update to anyone who either works in a clinical laboratory or uses its services.

Reference

1. Report of the Review of NHS Pathology Services in England" Department of Health Publication 275515, London, February 2006. Available from P.O. Box 777 London SE1 6XH or it is available from the Department of Health website. (Please see the following ULRs both of which were accessed on 18 July 2011:

(i) <http://www.dh.gov.uk/ab/Archive/IRNHSPS/index.htm?PageOperation=email> and

(ii) <http://collections.europarchive.org/tna/20081105144224/http://www.thecarterreview.com/downloads/CarterReviewPathologyReport.pdf>

(Joseph Lopez is Immediate Past President of the APFCB and member of the IFCC Executive Board)





Urine Specimen Collection, Handling and Transportation

Considerations for Best Preanalytical Practice and Optimisation of Specimen Quality

Urine has a long history as a specimen for analysis in clinical laboratories. After blood, urine is the most commonly used specimen for diagnostic testing, monitoring of disease status and detection of drugs. Urine testing using both automated and traditional manual methods is growing rapidly¹. As for all clinical laboratory specimens, preanalytical error in urine specimens is often difficult to detect. Because of this, it is important for laboratories to have processes in place to ensure compliance with best practice in specimen collection, handling and transport.

Urine Specimen Collection and Transportation Guidelines

As for any type of clinical laboratory specimen, certain criteria for collection and transportation of urine specimens must be met to ensure high quality specimens free of preanalytical artifact are obtained consistently. Without this, accurate test results cannot be guaranteed.

The CLSI² makes the following recommendations for urine collection:

- Urinalysis, culture and sensitivity testing to be performed within 2 hours of collection.
- Primary (routine) specimen containers to have a wide base and a capacity of at least 50 mL.
- 24 hour specimen containers to have a capacity of at least 3 litres.
- Sterile collection containers for all microbiology specimens
- Specimen containers to have secure closures to prevent specimen loss and to protect the specimen from contaminants.
- Amber coloured containers for specimens required for assay of light sensitive analytes such as urobilinogen and porphyrins.

Urine Specimen Preservation

As above, for urinalysis and culture and sensitivity testing, CLSI Guidelines recommend testing within two hours of collection². Different time limits may apply to specimens required for molecular testing of infectious agents (e.g. testing for *Neisseria gonorrhoeae*, *Chlamydia trachomatis*). For this type of testing, laboratories should ensure they are able to comply with specimen transportation conditions prescribed by the assay manufacturers. Where compliance with these and/or CLSI recommendations is not possible, consideration should be given to the use of a preservative.



For chemical urinalysis and conventional (culture based) microbiological testing, unpreserved specimens exceeding the two hour limit that have not been refrigerated should not be accepted for analysis due to potential bacterial overgrowth leading to disintegration of cells and casts*, invalidation of bacterial colony counts and errors in chemical urinalysis.

* bacterial growth increases the pH of the urine leading to lysis of red blood cells and white blood cells. Increased pH (alkalinity) can also cause casts to dissolve.

Preservatives for Chemical Urinalysis

A variety of urine preservatives is available that allow urine to be maintained at room temperature while still providing urinalysis test results comparable to those achieved with fresh specimens or those stored under refrigerated conditions. Commonly used preservatives for chemical urinalysis specimens include tartaric acid, boric acid, chlorhexidine, ethyl paraben, thymol and sodium propionate (and 'cocktails' of these). Preservation times are typically within the range 24 to 72 hours. Claims for the duration of stability for specific analytes should be obtained from the manufacturer.

Preservatives for Culture and Antibiotic Susceptibility Testing

The most common preservative used for this testing is boric acid. This preservative may be used in tablet, powder or lyophilized form.

Preservatives for culture and antibiotic susceptibility testing are designed to maintain the specimen in a state equivalent to that which would be achieved with refrigeration by deterring the proliferation of organisms that could result in a false positive culture or bacterial overgrowth. Careful attention must be given to the formulation of these preservatives to achieve this objective. There is evidence to suggest that non-pH buffered boric acid may be harmful to certain organisms and that buffered boric acid preservatives can reduce the harmful effects of the preservative on the organisms³. Preserved urine specimens can be stored at room temperature until the time of testing. Product claims regarding duration of preservative potency should be obtained from the manufacturer.

Preservatives for Molecular Testing

Preservatives are available for some molecular tests (e.g. BD™ UPT urine specimen tube for use with BD ProbeTec™ ET assay system).

Key Considerations When Using Preservatives

When specimens are directly transferred from a collection cup to a tube containing a suitable preservative, a stable environment is provided for the specimen until testing can be conducted. When a decision to use a preservative is taken – for any type of testing, potential interference with assay methods should be considered. Laboratories should validate all test procedures intended to be used for preserved specimens. Specimens may need to be split if various tests requiring different preservatives are requested.

Where preservatives are used, the correct specimen-to-additive ratio must be maintained. Care therefore needs to be taken when manually transferring specimens to a specimen tube containing a preservative. Use of the indicated fill lines on the tubes can assist with ensuring the correct fill volume. Under-filling the tube will lead to a high concentration of preservative in the specimen, while over-filling the tube will overly dilute the preservative. In both cases, the function of the preservative may be compromised. Evacuated urine collection tubes (below) are designed to achieve correct fill volume and thus ensure optimal specimen-to-additive ratio and proper preservative function. Evacuated systems also reduce the potential for exposure of the healthcare workers to the specimen.



Chemical preservatives should be non-mercuric and environmentally friendly. The US Environmental Protection Authority (EPA) cites mercuric oxide used in some urinalysis preservatives as a source of mercury contamination in medical laboratories. Additional information on this topic is available from the EPA website: <http://www.epa.gov>

Urine Collection Devices

An extensive array of urine collection products is available in the market. Some examples are illustrated below. Information on features, intended use and instructions for use should be obtained from the device manufacturer and reviewed before being incorporated into a specimen collection protocol. As a minimum, the products should comply with CLSI recommendations (above).

Some urine specimen containers have closures with special access ports that allow closed-system transfer of urine directly from the collection device to the tube. Urine collection containers for 24-hour specimens with this feature provide the option for the laboratory to receive only the aliquot tube and specimen weight (with the large 24-hour container and contents discarded at the point of collection). Evacuated urine specimen tubes, similar to evacuated blood collection tubes are gaining popularity, particularly in laboratories with 'front end' automation.



120 mL urine cup

24 hour urine collection bottle

Urine collection containers with integrated port for transfer of specimen to evacuated urine collection tube



Evacuated
urine collection tubes



Urine transfer 'straw' with adaptor
for transfer of specimen
to evacuated urine collection tube



Direct draw adaptor
for urine specimen collection
from Foley catheter

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This article was adapted from a longer review of this topic in Asia Pacific Preanalytical Notes (APPN), Volume 12, Number 1, 2009. BD wishes to thank the Editorial Board of APPN for permission to access this material.

Randox Biochip Array Technology is Revolutionising the Molecular Diagnostics Market

RANDOX

There is a revolution underway in the pharmaceutical and healthcare sector that will influence the way we prescribe therapeutics and how we deal with each individual patient. Enabled by the unraveling of the genetic code, a key component of this molecular revolution is the application of multiplex assays to provide greater information from a single patient sample.

The power of these assays may now enable detection of a disease earlier, even at the asymptomatic stage and is providing a much deeper understanding of what is afflicting a patient and how they will respond to particular therapies enabling a much more targeted approach to medicine.

Randox has been revolutionising healthcare on a global scale for 30 years, bringing innovative diagnostic solutions to the market. A major key development for the company was Biochip Array Technology, a unique multiplexing technique. Biochip Array Technology has now been adopted into hundreds of laboratories internationally, in many various institution types, from routine hospital laboratories to veterinary, forensic toxicology, pharmaceutical and research.

Biochip Array Technology (BAT) is an innovative assay technology for multi-analyte screening of biological samples in a rapid, accurate and easy-to-use format. The surface chemistry of the biochip and the analysis platforms allow BAT to be used with a range of patient samples, from whole blood, serum, saliva, urine and tissue biopsy, depending on the biochip assay under study.



Despite the innovative design of the biochip arrays and the award-winning analysers developed at Randox, the ELISA based assay is familiar and easy. With competitive or sandwich immunoassays, analyte-specific conjugates have been developed, to produce highly specific tests, coupled to highly sensitive chemiluminescent detection, providing quantitative results in easy to interpret reports.

With the ongoing tremendous growth of the molecular diagnostics market, applying Biochip Array Technology to this market will make molecular testing faster and simpler whilst delivering the highest quality and most accurate results. Multiplexing is integral to the molecular revolution as it provides greater information from a single patient sample, making it a faster and more economical method of testing. Single test assays are gradually being replaced by multi-analyte reactions that can simultaneously measure the levels of a suite of specific biomarkers (protein, DNA, RNA), designed to provide greater information than one test performed in isolation. In many cases, such tests do not require additional reagents or sample volume, so have benefits in all aspects of the procedure, from patient comfort, ease of use and cost-saving. With the advent of versatile platforms and assay procedures, such as Randox Biochip Array Technology, rapidly customisable arrays are possible.

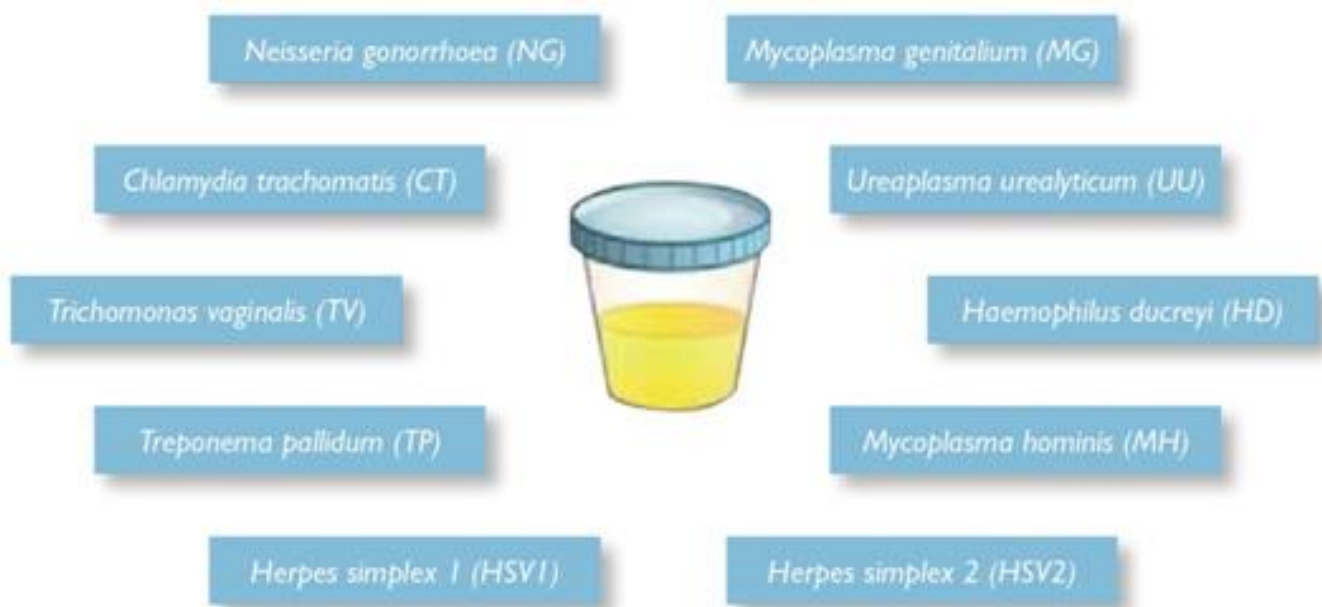
Multiplexing benefits the entire healthcare industry, but aside from being viable drug targets themselves, are now invaluable as guides to disease predisposition and as indicators for therapy efficacy. Developing multiplex assays for routine clinical use can potentially save healthcare institutions millions. They will result in more efficient treatments and fewer adverse side effects in patients. This will therefore provide a greater focus on preventative medicine, early detection and personalised medicine.



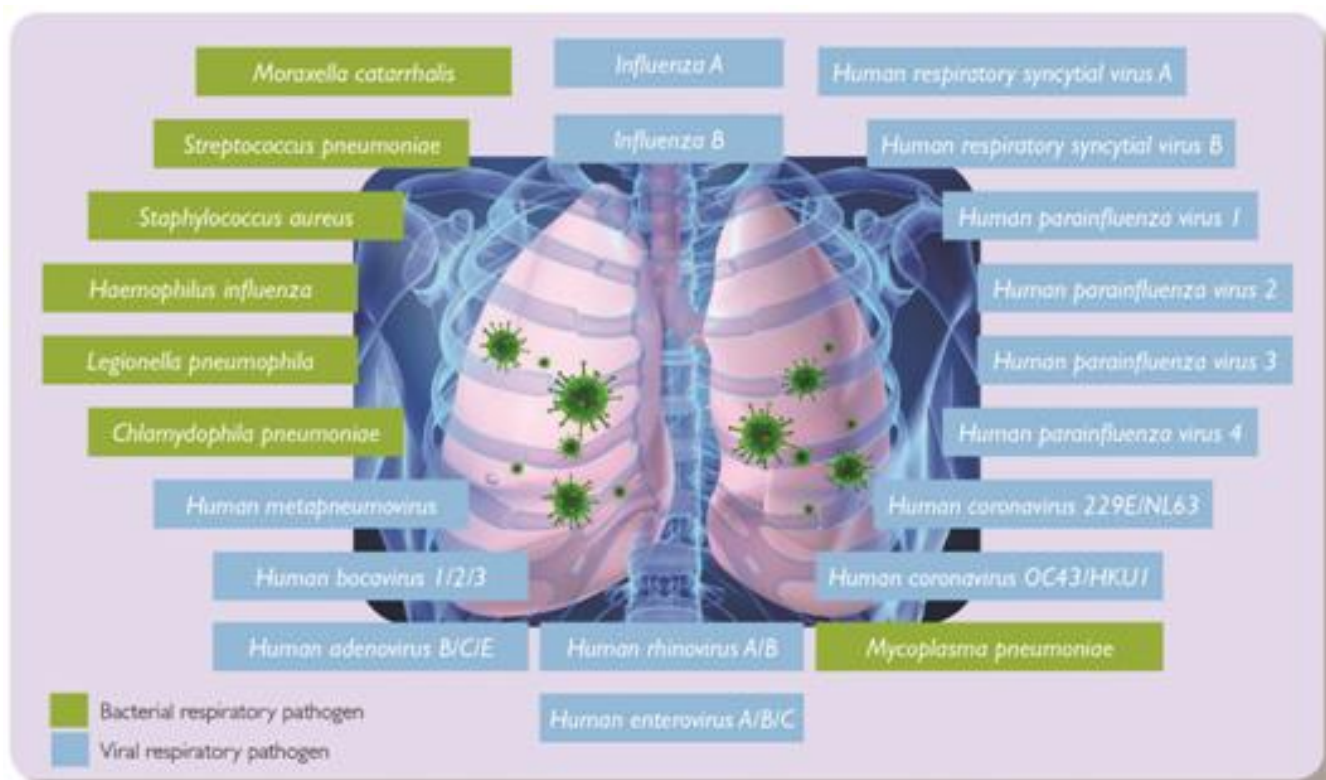
Randox Molecular Diagnostics (MDx) offers a range of Molecular Arrays and assay formats, providing diagnostic, prognostic and predictive solutions for a range of conditions including colorectal cancer, sexually transmitted diseases and respiratory infection, with many more applications currently in development. The versatility of the Randox multiplex PCR and proprietary Biochip Array Technology is exemplified by the broad range of array formats available.

STIs and related complications represent a significant public health issue in both developed and developing countries. Many infections are asymptomatic and remain undiagnosed, increasing the risk of unhindered spread. STIs may induce serious complications that reduce fertility, increase risks of ectopic pregnancies and increase infant mortality. Simultaneous screening for multiple STI pathogens will identify specific viral, protozoan or bacterial pathogens, permitting targeted antibiotic/viral therapy whilst also identifying secondary infections.

The Randox Sexually Transmitted Infection (STI) Array far exceeds current STI tests on the market. The array is based on a combination of multiplex PCR, probe hybridisation and chemiluminescence to allow semi-quantitative detection of STI pathogens. The STI Array simultaneously detects for 10 different STI pathogens from one single sample.



Respiratory diseases are increasingly common and are a leading cause of hospitalisation and death, particularly in immunocompromised patients and the elderly. Respiratory tract infections affect the air passages, including the nasal passages, the bronchi and the lungs and result in conditions such as bronchitis, pneumonia, asthma and chronic obstructive pulmonary disease (COPD). Admission rates to hospital due to respiratory diseases are taking up much needed beds. Early detection and accurate diagnosis would dramatically reduce hospitalisation rates and length of stay, thus also reducing overall healthcare costs. Accurate diagnosis also allows the correct treatment to be administered in a timely fashion, avoiding unnecessary side effects for the patient. The Respiratory Pathogen Array from Randox detects 22 bacterial and viral pathogens.



Personalised medicine is a major facet of the molecular revolution. It will truly change the future of healthcare, allowing for quicker diagnosis and very importantly, correct treatment. This will have dramatic effects on healthcare costs internationally; institutions will save on time, misdiagnosis and costly or sometimes life-threatening adverse side effects caused by an inappropriate treatment option. Randox has developed a new molecular array consisting of KRAS, BRAF and PIK3CA genes to aid in the selection of patients for appropriate treatment for metastatic colorectal cancer.

Monoclonal antibodies (MoAbs) targeting the epidermal growth factor receptor (EGFR) have proven effective in combination with chemotherapy or as single agents for treatment of mCRC. These molecules bind to the extracellular domain of EGFR with high affinity and competitively inhibit ligand binding, which leads to inhibition of phosphorylation and subsequent activation of downstream signalling pathways. However, only a subset of patients with mCRC clinically benefit from EGFR-targeted moAbs.

Mutations in the KRAS gene are known to disrupt the EGFR pathway, rendering anti-EGFR therapy ineffective. Presence of KRAS mutations accounts for approximately 35-45% of non-responsive patients. Oncogenic mutations in genes encoding key downstream effectors within the EGFR-signalling pathways may also be responsible for resistance to EGFR-targeted moAbs. Mutations within the BRAF and PIK3CA genes have now been reported to also affect patient response.

The scene is well set for molecular diagnostics to take over the future of healthcare. With the unraveling of the genetic code, we are learning more and more every day about how individuals will respond to therapy and treatment enabling us to tailor treatment. Multiplex testing has allowed us to develop rapid, simpler tests for viral and bacterial infections, enabling detection of asymptomatic infections. Platforms such as Biochip Array Technology from Randox will enable the rapid progression of this fast-paced market and revolutionise our approach to diagnostics and personalised medicine.





MULTIPLEX TESTS - PERSONALISED RESULTS

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Better Guidance for More Confident Prostate Biopsy Decisions

The Prostate Health Index

Non-invasively identify patients who are most likely to have a negative prostate biopsy.

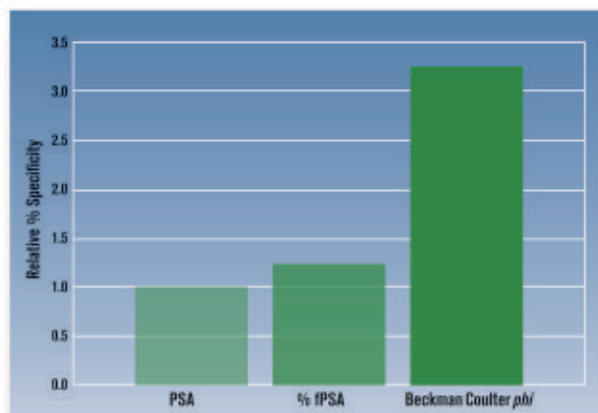
As the pioneer in PSA testing, Beckman Coulter understands that every biopsy decision must consider the patient's trauma as well as the use of resources. Complicating this choice can be an uncertain level of risk balanced with the possibility of a negative result. To give more information to confidently guide the biopsy decisions, Beckman Coulter introduces the Prostate Health Index (phi), which significantly improves the specificity of prostate cancer biomarker assessment. I

What exactly is phi?

The non-invasive Beckman Coulter phi combines three automated blood tests into one index that estimates a man's probability of having prostate cancer found on biopsy. Beckman Coulter phi is a composite score of Access Hybritech PSA, free PSA and the new p2PSA* assay, which measures the isoform [-2]proPSA.

In real-world terms, how much better is phi than PSA?

The following information shows that the specificity of phi is significantly higher than that of PSA or % free PSA taken separately. The result of this higher specificity will be a greater certainty that a patient actually needs a biopsy. This translates to a lower probability that a cancer-free patient will be referred for biopsy.



Prostate cancer detection at 90% sensitivity: Beckman Coulter phi increases specificity relative to % fPSA and PSA.

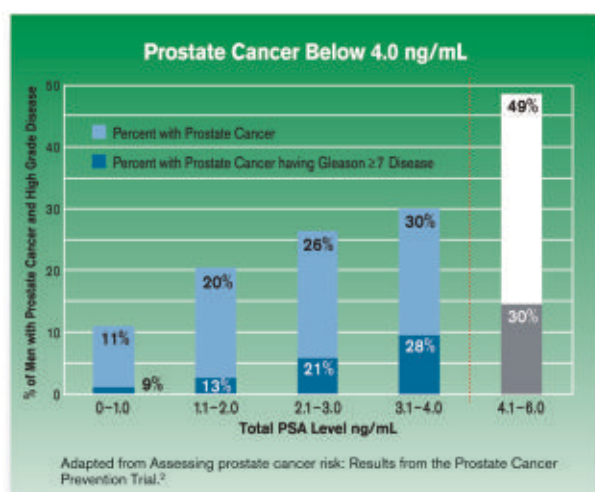


How can phi be useful to clinicians in their practice?

Every prostate biopsy referral has risk involved – risk that the result will be negative. Of course, a negative result is welcome news, but the biopsy also increases the patient's risk for undesirable side effects such as infection and bleeding. Compared with PSA, phi is a better indicator of prostate cancer risk. This empowers the clinicians to improve patient care and reduce the potential for unnecessary biopsies in their practice.

Without a biopsy, isn't there a greater chance that clinicians will overlook something?

On the contrary, Beckman Coulter phi is a better indicator of prostate cancer risk compare to PSA and % free PSA. Research has shown that many prostate cancers, and a significant number of high-grade cancers, are found in patients with PSA levels in the 2 to 4 ng/mL PSA range². Thompson et al², observed that among 2,950 men (age range 62 to 91 years), with PSA 4.0 ng/mL, prostate cancer was diagnosed in 449 men (15.2%). The prevalence of prostate cancer as a function of PSA concentrations is presented in the following bar graph:



From this study, Thompson concluded that biopsy-detected prostate cancer is not rare among men with PSA levels of 4.0 ng/mL or less, levels generally thought to be in the normal range². Beckman Coulter phi is designed to help clinicians identify such patients by applying a more comprehensive approach to risk assessment.

phi can help clinicians spot at-risk patients earlier?

Beckman Coulter phi has been validated in men with PSA levels from 2 to 10 ng/mL.** Clinical interpretive criteria have been developed for men in this entire range. As shown in the table below, phi facilitates consideration of both sensitivity (ability to detect cancer) and specificity (ability to avoid a false positive) in making an informed, balanced decision to order a biopsy.

Beckman Coulter phi Range (Hybritech Calibration of PSA, free PSA)	Prostate Cancer Risk Category	Probability of Cancer
0 – 20.9	Low	8.4%
21 – 39.9	Moderate	21.0%
40+	Significant	44.0%



What the experts are saying about phi?

The Beckman Coulter Prostate Health Index (phi) is a significant new diagnostic tool for managing prostate disease. Third-party studies confirm these findings and support the fact that the new phi and p2PSA assay provide clinicians with more robust information to identify patients who are most likely to have a negative prostate biopsy. Some publications are listed below for reference.

* Not available in the US at the time of publication of this write-up

** Hybritech calibration of Beckman Coulter PSA test

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- Combined with dual ISEs, up to 3,800 tests/hr





Vitamin D Clinical Information

Vitamin D deficiency has long been associated with bone disease, but more recently vitamin D has become a general health indicator as associations with major conditions such as cancer, cardiovascular disease, autoimmune disease, diabetes, and chronic kidney failure have been discovered in epidemiologic, clinical, and observational studies. Knowing the significance of vitamin D testing facilitates informed decision-making and helps healthcare professionals maximize the quality of care they provide for their patients.

Vitamin D

Vitamin D is a fat-soluble hormone involved in the intestinal absorption of calcium and regulation of calcium. It plays a vital role in the formation and maintenance of strong, healthy bones. Vitamin D deficiency has long been associated with rickets in children and osteomalacia in adults, and long term insufficiency of calcium and vitamin D leads to osteoporosis. However, in recent years, vitamin D has become an assay of general health status, and there have been multiple publications linking vitamin D deficiency to several disease states, such as cancer, cardiovascular disease, diabetes, and autoimmune diseases. (1)

Vitamin D Deficiency

Globally, over 1 billion people are vitamin D deficient,² and in the United States the NHANES III study from 2001 to 2004 indicated that 77% of U.S. adults are insufficient. Deficiency rates have increased as people have limited their sun exposure due to the risk of skin cancer. People living near the equator who are exposed to sunlight without sun protection have robust levels of vitamin D; however, vitamin D deficiency is found in regions where skin exposure is limited, such as Saudi Arabia, the United Arab Emirates, Australia, Turkey, India, and Lebanon.

Types of Vitamin D and How Vitamin D is Synthesized 1, 3

There are two major types of vitamin D:

Vitamin D(2) (ergocalciferol)—which is synthesized by plants and is not produced by the human body.

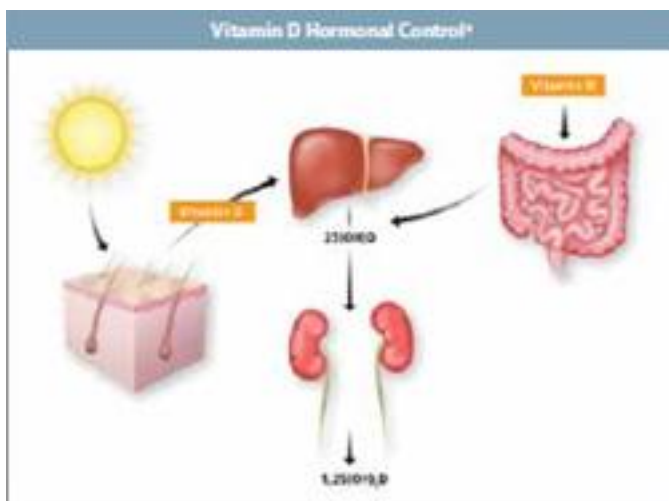
Vitamin D(3) (cholecalciferol)—which is made in large quantities in the skin when sunlight strikes bare skin. It can also be ingested from animal sources.

Factors that impact the ability of the body to synthesize vitamin D through the skin are geographic latitude, time of year, time of day, presence of clouds and/or smog, skin melanin content, and whether or not sunscreen has been applied. For example, residents at 42° N latitude or higher are unable to synthesize vitamin D via the skin during the winter months (from November through February).

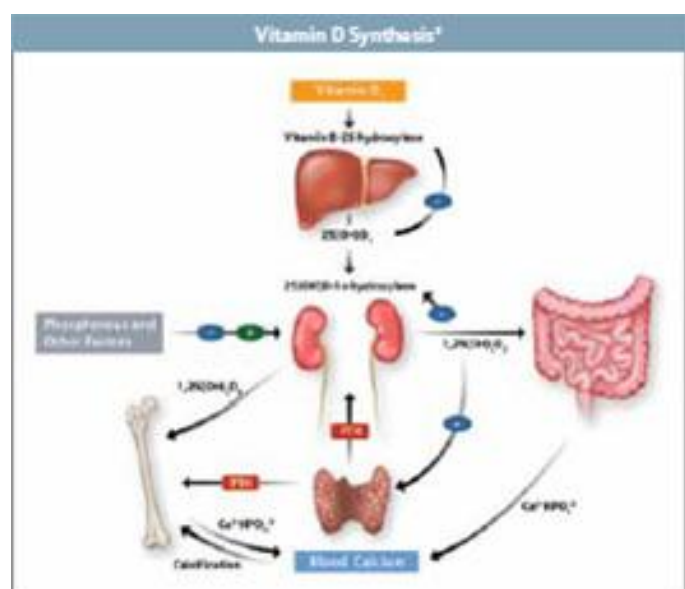


In supplements and fortified foods, vitamin D can be either D(2) or D(3). The two forms have traditionally been regarded as equivalent based on their ability to cure rickets, but evidence suggests that vitamin D(3) is approximately three times more effective at maintaining serum concentrations because the binding protein has a higher affinity to vitamin D(3) than vitamin D(2). This allows vitamin D(3) to reside in the circulatory system longer and increase the concentration to sufficient levels more quickly. The major preparations of vitamin D for prescription use in North America are in the form of vitamin D(2), while more over-the-counter vitamin/multivitamin preparations use vitamin D(3).

Whether it is synthesized through unprotected skin or ingested then absorbed by the intestines, vitamin D is bound to the binding protein (both albumin and vitamin D binding protein) and carried to the liver via the bloodstream. From there it begins two hydroxylation processes. Beginning in the liver it is transformed into 25(OH) vitamin D (calcidiol), which is the primary circulating form of vitamin D and the most commonly measured form in serum. Then in the kidneys it is transformed into 1,25 dihydroxy-vitamin D (calcitriol), which is the biologically active form of vitamin D.

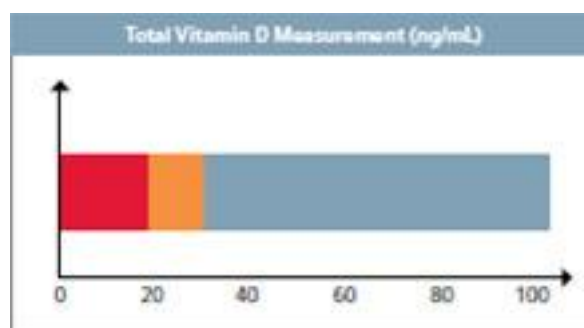


1,25 dihydroxy-vitamin D is the primary steroid hormone involved in mineral homeostasis. When serum calcium dips to below 8.8 mg/dL it prompts a proportional increase in the secretion of parathyroid hormone (PTH). PTH signals to the kidneys to increase the production of 1,25 dihydroxy-vitamin D by increasing the production of 25(OH) vitamin D-1 α -hydroxylase. Subsequently, the increase in 1,25 dihydroxy-vitamin D stimulates the increased absorption of calcium in the intestines to stimulate bone remodeling. When phosphorous and bone genes levels signal a normal state of bone remodeling, the kidney reduces the production of 1,25 dihydroxy-vitamin D to a normal level.



Vitamin D Sufficiency Levels

Although there is no consensus document on serum 25-hydroxy-vitamin D level, most experts (4, 5) agree that vitamin D sufficiency is above 30 ng/mL (75 nmol/L), an insufficient level is between 20 and 30 ng/mL (50 to 75 nmol/L), and a deficient level is any value below 20 ng/mL (50 nmol/L).



Groups at Higher Risk for Vitamin D Deficiency(6)

There are several groups at higher risk of vitamin D deficiency including:

- **Breastfed Infants**
Sufficiency is dependent on the mother's vitamin D sufficiency level, and mother's milk typically contains about 25 IU/L of vitamin D. Most breastfed infants are on 400 IU of vitamin D daily supplementation.
- **Older Adults**
As people age, the skin is not able to synthesize vitamin D as effectively, and reduced kidney function impacts the ability to convert vitamin D.
- **Dark Skinned People**
Melanin in darker skin reduces the ability to produce vitamin D from sunlight exposure.
- **Limited Sun Exposure**
Eliminates one of the two possible sources of vitamin D.
- **Obesity**
Vitamin D is fat soluble, which does not allow it to circulate as freely.
- **Other**
Gastric bypass patients have less small intestine available to absorb vitamin D.

	Avoid Deficiency	Treat Deficiency
Normal Insufficiency	800 – 1,000 IU vitamin D per day	50,000 IU vitamin D ₂ per week for 8 weeks, then every 2 – 4 weeks
Post-Menopausal Women	≥ 800 IU vitamin D per day + calcium	≥ 800 IU vitamin D per day + calcium
Intestinal Malabsorption	Up to 50,000 IU vitamin D per day	Up to 50,000 IU vitamin D per day
Impaired α-hydroxylation	1,25(OH) ₂ vitamin D or α-hydroxy vitamin D	1,25(OH) ₂ vitamin D or α-hydroxy vitamin D

Vitamin D Supplementation(6)

Oral vitamin D supplementation has proven to be very effective at raising vitamin D levels. Recommendations vary by subgroup:

Importance of Measuring Total Vitamin D

Risk of Vitamin D Toxicity(1)

When serum 25-hydroxy-vitamin D levels are consistently > 150 ng/mL (375 nmol/L), it is potentially toxic. This typically occurs due to

vitamin D over-supplementation and is observed in patients taking more than the prescribed 40,000 IU per day. Toxicity due to sunlight overexposure and/or diet is unlikely. When vitamin D levels are this high, calcium concentrations rise as well, which can result in nausea, weight loss, and constipation. As a result of increased levels of vitamin D and calcium, the patient can develop kidney stones.

Measuring Total Vitamin D

Vitamin D can be measured separately or as a total value, but not all immunoassays have the same reactivity to vitamin D(2) and D(3). Some immunoassays only detect one type of vitamin D and others may not fully detect the entire amount. No matter which methodology you use, the most important value is the final total value, since it represents the total amount of vitamin D (both D(2) and D(3)) in the blood. This ensures your patients have the most accurate result regardless of level and whether or not they are supplemented over-the-counter or by prescription.



Example A. Measuring Total Vitamin in Determining Sufficiency

In the case of a true concentration that is just into the sufficiency range, if the assay does not detect D(2), it is likely that result will be reported in the insufficient range. This could also happen if the assay detects only a fraction of the D(2) that is present. To get a true reading of the patient's vitamin D level, an assay should be used that detects both vitamin D(2) and D(3) equally.

Example B. Measuring Total Vitamin in Determining Toxicity

In the case of a patient that is being treated for malabsorption with a high dose of vitamin D, the different reactivity for D(2) and D(3) also can cause the patient status to be mis-identified. If the supplement is D(2), it is likely to be the largest vitamin D concentration in these patients. Consequently, by not having D(2) detected or partially detected, it may result in the under-reporting of the total vitamin D concentration. This can result in missing a patient that has levels that are toxic. In 2008 Phinney stated "the most widely used indicator of vitamin D status is the measurement of 25-hydroxyvitamin D [25(OH)D] in either serum or plasma. Because circulating 25(OH)D can arise from hydroxylation of either vitamin D(2) or vitamin D(3), measurement of total 25(OH)D [both 25(OH)D(2) and 25(OH)D(3)] is essential for accurate assessment of vitamin D status."

Vitamin D

Bone Disease and Beyond

Vitamin D deficiency has long been associated with bone diseases, but more recently vitamin D has become a general health indicator as associations with major conditions such as cancer, cardiovascular disease, autoimmune disease, diabetes, and chronic kidney failure have been discovered in epidemiologic, clinical, and observational studies. More randomized clinical trials are needed to validate the causal versus casual link to vitamin D deficiencies and overall health.

Autoimmune

Research on vitamin D in immune response has linked low vitamin D values to increased risk for such diseases as multiple sclerosis and rheumatoid arthritis.

- A prospective study indicated that women on supplementation had a
- 40% lower risk of developing multiple sclerosis than those who were not on a supplement(8)
- The Iowa Women's Health Study showed that women had a lower risk of rheumatoid arthritis the greater their intake of vitamin D(9)

Cancer

Research in cancer prevention has shown geographic correlation to cancer prevalence and death, the protective nature of vitamin D in proliferation and apoptosis studies, and implied the association with higher levels of vitamin D reducing the risk in common cancers such as colorectal and breast cancer.

- NHANES III (16,818 participants) showed that participants with a higher vitamin D level of ≥ 80 nmol/L had a
- 72% lower risk of colorectal mortality than those with a level < 50 nmol/L(10)
- Pooled studies suggest that women with vitamin D levels > 52 ng/mL are half as likely to develop breast cancer than those with 13 ng/mL(11)



Cardiovascular Disease

Studies have shown that vitamin D deficiency and supplementation affects the levels of hypertension. Lower values of vitamin D are linked to increased risk for myocardial infarction and are a predictor of all-cause and cardiovascular death.

- Framingham Offspring Study
- (1,739 adults) reported low vitamin D values (< 15 ng/mL) as a risk factor for cardiovascular events¹²
- NHANES III (13,311 adults) reported low vitamin D values (< 17.8 ng/mL) were associated with all-cause mortality than higher vitamin D values¹³

Diabetes

Research indicates that low levels of vitamin D are associated with a higher risk of metabolic syndromes, increased insulin resistance, and decreased insulin production.

- Finnish study (10,366 children) showed that infants who had received 2,000 IU/day of vitamin D³ their first year of life were 80% less likely to develop type 1 diabetes, while children who were deficient had an increased risk of 200%¹⁴
- Study found that vitamin D levels < 20 ng/mL resulted in decreased beta-cell function and that in adults with vitamin D levels > 30 ng/mL insulin sensitivity was 60% higher than in adults with vitamin D levels ≤ 10 ng/mL¹⁵

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