



# APFCB News

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

2016  
Issue- I



## Publication Team, 2016 Issue- I

Chief Editor	Praveen Sharma Jodhpur, India praveensharma55@gmail.com
Immediate past Chief Editor	Joseph B Lopez Kualalumpur, Malaysia jblopez2611@gmail.com
General and Case Studies Editors	Leslie Lai Kuala Lumpur, Malaysia lesliecharleslai@gmail.com
	Tester Ashavaid Mumbai, India dr_tashavaid@hindujahospital.com
	Aysha Habib Karachi, Pakistan aysha.habib@aku.edu

## 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)  
Mongolian Association of Health Laboratorians (MAHL)  
Iranian Association of Clinical Laboratory Doctors (IACLD)

## Affiliate Members

Chinese Association of Clinical Laboratory Management CACLM)  
Association of Medical Biochemists of India (AMBI)  
Macao Laboratory Medicine Association (MLMA)  
Nepalese association of Clinical Chemistry (NACC)  
Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL)  
College of Community Physicians of Sri Lanka (CCPSL)

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Snibe Diagnostics  
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APFCB Executive Board and Chairmen  
of Committees, Elected October, 2016

## Executive Board

President	Leslie C Lai Consultant Chemical Pathologist, Kuala Lumpur, Malaysia lesliecharleslai@gmail.com
Immediate Past President	Joseph B Lopez MAHSA University College, Kuala Lumpur, Malaysia jblopez2611@gmail.com
Vice-President	Sunil K Sethi National University Hospital, Singapore patsks@nus.edu.sg
Secretary	Endang Hoyaranda Prodia, Jakarta, Indonesia ehoya@prodia.co.id
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Corporate Representative	Alexender Wong Siemens Healthcare Diagnostics Holding GmbH, Germany alexender.wong@seimens.com

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Education & Laboratory Management	Tony Badrick Brisbane, Australia tony_badrick@snp.com.au
Scientific	Kiyoshi Ichihara Yamaguchi University, Japan ichihara@yamaguchi-u.ac.jp
Conference	Joseph B Lopez MAHSA University College Kuala Lumpur, Malaysia jblopez2611@gmail.com
Hon. Auditors	Woei-horng Fang. President Chinese Association for Clinical Biochemistry, Taipei, Taiwan whfang@ntu.edu.tw
	Romeo Joseph Ignacio Vice President & General Manager Sysmex Philippines Inc. Ignacio.RomeoJoseph@sysmex.com.ph

## 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 page: "Squirrels enjoying Hawthorn Berries "**

**Contributed by Tan It Koon**

**Founding and Past President APFCB**

## Address

The registered address of APFCB is as follows:  
APFCB, c/o Solid Track Management Pte Ltd.  
150 Cecil Street, #10-06, Singapore 069543  
Tel: 6223 9118 Fax: 6223 9131



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Australasian Association of Clinical Biochemists (AACB)

Indonesian association of clinical chemistry (IACC)

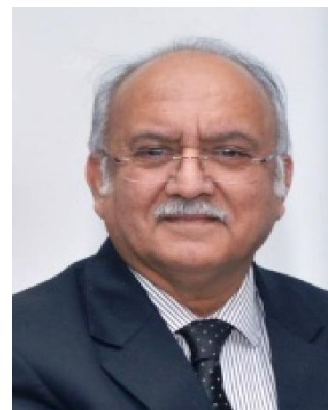
Hon Kong Society of Clinical Chemistry (HKSCC)

Singapore Association of Clinical Biochemists (SACB)

## **Features**

Scientific article: Vitamin B<sub>12</sub> Deficiency: Active B<sub>12</sub> Assay – M Saleem





## From the desk of Chief Editor...

Dear Colleagues,

Greetings!

I extend my warm gratitude for your continuous support to me and the communication committee that has helped us in successful publishing of APFCB news all through these years. I am pleased to inform you that from this year – on APFCB news shall be published twice in a year as issue –I and issue –II. This issue comes right before we meet at the 14th APFCB Congress, Taipei and so is all the more significant. We have tried to gather as much information as possible from the first half of this year.

We present to you issue –I of the APFCB news 2016. Although a small issue it highlights the various events occurring in the first half of the year. I take this opportunity to thank those member societies and national representatives who have contributed by sending the activities report from their societies.

We have been extremely fortunate to have consistently got support and encouragement from Tan It Koon, the founding and the past president of APFCB. He has been an active contributor to the progress and development of APFCB. I'm thankful to him for providing beautiful paintings from his art treasure for the fourth consecutive issue of APFCB news. The cover page of the APFCB news 2016 volume-I has been graciously provided by him. It shows "Squirrels enjoying Hawthorn Berries".

Looking forward to meet you all at Taipei!



Praveen Sharma  
Editor in Chief





## Message from APFCB President...

My greetings to one and all.

This is the last time I will be contributing an article to the APFCB eNews as President of the Asia-Pacific Federation for Clinical Biochemistry (APFCB). Elections for the new Executive Board (EB) will be held on 26 November in Taipei prior to the commencement of the APFCB Congress. The term of office for the new EB will begin on 1 January 2017 and I will continue as the Immediate Past President on the new EB.

I look back on my 18 years' involvement with the APFCB with great fondness, first as Chair of the Education Committee from 1998 till 2004, then as Vice President from 2004 till 2010 and as President from 2010 till the end of 2016. I have had the great fortune to have worked closely with people who have been committed to the growth and development of the APFCB and I would like to thank them all. It will not be possible for me to name them all and I shall not attempt to do so. I would, however, like to thank the current Executive Board members who have worked tirelessly for the APFCB and their dedication should be acknowledged and appreciated:

Mr Joseph Lopez, Immediate Past President  
Associate Prof Sunil Sethi, Vice President  
Dra EndangHoyaranda, Secretary  
Dr Elizabeth Frank, Treasurer  
Dr Alexander Wong, Corporate Representative

There has been an increase in the number of educational and scientific activities conducted by the APFCB. The APFCB Travelling Lectureship has been a permanent fixture since 1998. We have a Vietnam Chemical Pathology course and a Point of Care Testing (POCT) workshop held annually in Vietnam sponsored by Roche and organised by Dr Ronda Greaves, APFCB-Beckman Coulter Scientific Symposia in the region, APFCB-Siemens workshops, APFCB-IFCC-Abbott Turning Science in Caring Scientific Symposium, APFCB-Roche Lean/Six Sigma workshops, BD May I Help You campaigns, APFCB-BD Speciality Regional meeting, APFCB Chemical Pathology regional course modelled on the AACB curriculum, Interpretative Commenting EQAP as well as IFCC Visiting Lectureships to our region. The person responsible for many of our educational activities is Dr Tony Badrick, Chair of the Education and Laboratory Management Committee. The number of scientific activities has also increased, with expansion of our Asia-Pacific regional reference interval study to an IFCC global reference interval study under the chairmanship of Prof Kiyoshi Ichihara, and several harmonisation projects and paediatric research projects chaired and coordinated by Dr Ronda Greaves. I am very grateful to our Corporate members, our knowledge partners, for the many joint workshops which have benefited our members greatly. The Chair of the Congress and Conferences Committee, Mr Joseph Lopez who is also the Immediate Past President of APFCB, has been responsible for the granting of APFCB auspices to scientific workshops, meetings and conferences, and for the APFCB congress guidelines, as well as overseeing the APFCB congresses and in establishing the regional Chemical Pathology course. The Chair of the Communications Committee, Professor Praveen Sharma, has been responsible for getting the APFCB website up and running as well as updating the contents of the website. Professor Sharma is also the Chief Editor for the APFCB eNews which will now be published twice a year.



We have Memoranda of Understanding (MoUs) with the World Association of Societies of Pathology and Laboratory Medicine (WASPaLM) and the American Association for Clinical Chemistry (AACC). Two joint projects between WASPaLM and APFCB are planned: Joint accreditation workshops for our region and a joint Chronic Kidney Disease (CKD) regional project. The CKD project is under the Chairmanship of Dr Graham Jones who is also the APFCB Travelling Lecturer for 2015/2016 and the topic of his travelling lectureship is CKD. AACC has commenced a quality initiative programme focused on our region similar to that with South America and the first such programme will be conducted this September with the Chinese Society of Laboratory Medicine (CSLM).

I would like to take this opportunity to welcome our newest Ordinary member, Iranian Association of Clinical Laboratory Doctors (IACLD) and our new Affiliate members, College of Chemical Pathologists of Sri Lanka (CCPSL) and Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL) who joined us in 2016. The APFCB now has 18 Ordinary members, 6 Affiliate members and 18 Corporate members.

I look forward to seeing many of you at the 14th APFCB Congress, 26th till 29th November 2016 in Taipei.

Best wishes



Dr Leslie Charles Lai  
President, APFCB



## AACC approached APFCB for symposia

*Tony Badrick*

The APFCB were approached by the AACC to propose a Symposium for the 2016 Philadelphia Meeting. The concept was that the Symposium showcase some of the activities sponsored by the APFCB that may be of broad interest and relevance to a general audience.



The proposal was for the following topics and speakers:

Moderator: Tony Badrick

1. Driving change in the pre-analytical phase of testing – Endang Hoyaranda
2. Ethnic and Regional Differences in Common Laboratory Tests and their Implications for the Globalization of Medical Practice – Kiyoshi Ichihara
3. Improving Clinical Commenting by an EQA program - Tony Badrick

The proposal was accepted by the oversight committee and was run as a Symposium on Wednesday 3 August.

There were approximately 60 participants in the audience at the beginning of the two and a half hour session, though the number did drop as the afternoon progressed. This is not unusual for afternoon Symposia and we were competing against seven other sessions. There were a broad range of questions at the end of each paper and I believed the audience were interested in the topics. I also presented a brief overview of the APFCB and its activities. The talks were well presented and of a high scientific value.

This was an AACC sponsored session with the AACC waiving Registration fees, paying for airfares and some accommodation. This sponsorship allowed more of the EB to attend the meeting and the AACC Leadership forum which was a bonus for the APFCB. The value to the APFCB was high with greater visibility to a wide audience and some insight into the range and depth of scientific and educational activities we are engaged in in our Region.





## Report from the EFLM-UEMS conference 2016

*Ronda Greaves*

Prepared by the person who was arrowed when he left the breakfast table for a glass of juice...



*The speakers at the APFCB Symposium, Pediatric Endocrine. From left to right: Dr Ronda Greaves, Dr Tze Ping Loh, Dr Chung Shun Ho and Prof Stefan Wudy.*

The Asia Pacific Federation for Clinical Biochemistry sponsored a symposium entitled "Pediatric Endocrine" at the 4th Joint EFLM-UEMS Congress, which was held over 21-24 September 2016 in Warsaw, Poland. The congress hosted more than 700 delegates with over 200 proffered abstracts presented as posters and orals over the four days. Importantly, the structure of this congress brought together clinical and laboratory professionals as part of the important clinical interface. The four speakers representing the Federation, were Dr Tze Ping Loh (Chemical Pathologist, Singapore), Dr Chung Shun Ho (Scientist, Hong Kong), Prof Wudy Stefan (Paediatric Endocrinologist, Germany) and Dr Ronda Greaves (Paediatric Clinical Biochemist, Australia) together complemented this clinical interface theme.

The preparation for the symposium began many months before the congress with the speakers discussing their topics to ensure a coherent theme. It was decided that the lectures would be presented as "Clinical Utility of Steroid Analysis", followed by "Mass Spectrometry Analysis of Serum Steroids", "Interpreting of Mass Spectrometry Data for the Diagnosis of Disorders of Sexual Development" and "Mass Spectrometry Reference Intervals for Serum Steroids". With the unique clinician-laboratorian audience mix in this joint congress, equal consideration was given to both parties.

In the opening lecture, Dr Loh provided an overview of the steroidogenesis pathway, the function of steroid hormones, and went on to discuss clinical scenarios, with particular reference to the paediatric population, where steroid analysis would be important.



The challenges of both clinical and laboratory assessment of patients with steroid hormone disorders were discussed. Finally, a clinical case of isolated, gross elevation of androstenedione was used to illustrate these challenges.

In the second lecture, Dr Ho gave the audience a quick 101 on liquid chromatography tandem mass spectrometry using illustrative animations. Following this, through a mix of data presentation and clinical cases, the unique advantages and operational challenges were discussed. Bringing balance to his pitch, Dr Ho also provided evidence that liquid chromatography tandem mass spectrometry may not be the silver bullet laboratorians and clinicians have hoped to believe. Finally, digging into his deep experience, Dr Ho provided practical tips on pitfalls to avoid during the set-up of a tandem mass spectrometry facility/assay.

Prof Wudy picked up from Dr Ho and switched the focus to gas chromatography mass spectrometry. The advantages and disadvantages between liquid and gas chromatography were elegantly articulated with a strong message that both methods are complementary, not competing. The clinical utility of gas chromatography mass spectrometry was further illustrated through cases and data published by Prof Wudy on disorders of sex development. Finally, some fresh off the press data on the novel use of gas chromatography mass spectrometry in the field of steroidomics was also shared.

Shouldering the heavy duty of keeping everyone awake and in the lecture hall, instead of rushing for the coffee break was Dr Ronda Greaves. She shared the five pillars of harmonisation, with an emphasis on reference interval harmonisation. The concept of reference intervals was quickly visited. Data on the paediatric reference intervals for select steroid hormones for preterm babies, which is the fruit of a labour of love spanning four years, were also shared as an example of the challenges. Thereafter, the findings of a hardworking PhD student, who systematically reviewed all published data related to paediatric steroid hormone reference intervals were presented using a traffic light system to gauge the quality of the data, as well as the presence of analytical pre-requisite for reference intervals harmonisation. Overall, the clinical need for harmonised reference intervals is recognised, although, more scientific work needs to be done to achieve that.

Beyond the lectures, the Congress also provided opportunities for old friendships to be renewed and new friendships forged. Internally, the group took the opportunity to discuss many projects and collaborations over countless glasses of orange juices. The paediatric endocrine group also interacted with members of the IFCC Task Force for Paediatric Laboratory Medicine, who were also presenting at the Congress. All work and no play makes a scientist dull. Some of the additional highlights of the congress included the opening lecture presented by Prof Dennis Lo with the cultural interlude from the string quartet performance and the social event comprising of a guided tour around the Old Town of Warsaw, which is a UNESCO World Heritage site. Finally the wonderful and warm hospitality of the organising committee lead by Professors Grazyna Odrowqz-Sypniewska and Eberhard Wieland made this an extraordinarily successful and rewarding meeting for all. We are very grateful and wish to thank both the APFCB and the EFLM-UEMS for supporting our symposium.





## Australasian Association of Clinical Biochemists (AACB)

*Activity report for January – June 2016 by Helen Martin*

### Current Council Members

President: Ms Helen Martin

Vice President – Finance, Planning and Branches: Mr Bruno Sonza

Vice President – Education and Training: Dr Ken Sikaris

Vice President – Scientific and Regulatory Affairs: Ms Maxine Reed

Vice President – Media and Communications: Ms Sandra Klingberg

Chair, Board of Examiners: Mr Greg Ward

Branch Representatives to Council

New South Wales & Australian Capital Territory (NSW&ACT): Mr Peter Ward

New Zealand(NZ): Dr Samarina Musaad

Queensland (QLD): Ms Kate Waller

South Australia and Northern Territory (SA&NT): Mr Bruno Sonza

Tasmania (TAS): Mr Robert White

Victoria (VIC): Dr Ronda Greaves

Western Australia (WA): Ms Liz Byrnes

Chief Executive officer: Mr Chris Harnett

### Council Meeting

Council met at the national office in Sydney on the weekend of 16th and 17th April.

Strategic objectives were reviewed on the 16th and general business was conducted on the 17th.

### Branch Activities

The large state branches usually provide a monthly scientific meeting for the membership at large and also monthly tutorials for those sitting examinations (although all are welcome). Smaller branches find it more suitable for their membership to hold full day or weekend meetings as this format allows more of their local membership to attend. Amongst other meetings, most branches have held a movie night to screen “That Sugar Film”, a documentary style film that tells a startling story about the metabolic effects of a mere two month period of dietary change from unprocessed food to processed foods that are either specifically labelled, or at least perceived by the consumer as “healthy”, has on a lean, young, healthy Aussie male. Our own Professor Ken Sikaris has a role in the film as an expert in the interpretation of pathology tests; in the film Ken (Professor Blood) states he is amazed at the level of changes in liver function tests that has occurred during the experimental period. I highly recommend this film to anyone interested in health.

### NSW&ACT

February: Illicit drugs in society – clinical, social and analytical issues. Dr Alex Wodak, Dr Santiago Vazquez, Todd McBriar

March: Movie night “That Sugar Film”

April: Cases – back to basics. Dr Jason Chung, Dr MacmurphyAlbeos, Peter Ward



June: NSW Posters from 2015 AACB Annual Scientific Meeting. Various presenters.

## NZ

Full day meeting held 1 June 2016 “The eclectic world of clinical chemistry”

### Program: morning

#### Troponin session

Appropriate use of cTNs-don't forget pre-test probability: Chris Florkowski

Troponin assays revisited in 2016 – including a snapshot of NZ practice: Jill Tate

Troponin as a risk management marker in cardiac disease: Andrew St John (Abbott)

#### Special chemistry session

Mass Spectrometry: Opening Up Pandora's Box: Ronda Greaves

High Performance Liquid Chromatography: Gerald Woollard

Mass Spectrometry: Models for on-going education: Ronda Greaves

### Program: afternoon

#### Young scientists session

Kavain interference in urine Amphetamine and Ethanol drug screening: Tejal Patel

Quality matters from a quality officer: Matthew Slater

Hypopituitarism: Mijoo Kim

#### Miscellaneous session

POCT and harmonisation: Lyn Clarke; Mind the Gap: Geoff Herd

Scientific and Regulatory Committee matters (AACB): Maxine Reed

The Cost of Quality: Nico Vandepoele (Bio-Rad)

Neonatal Screening: Mark De Hora

Best Practice Advocacy Centre (BPAC): Tony Fraser on NZ Ministry of Health PSA guidelines

## QLD

March: Queensland member posters from the Annual Scientific Meeting

April: Back to basics. HbA1c

May: Translation of diagnostic pathology to research

June: Ordinary general meeting

## SA&NT

February: Clinical cases – Focus on liver function tests. Helen Martin

March: Drowning in honey – cases in diabetes. Dr Wayne Rankin

April: Cases from the Northern Territory. Robert McFarlane

May: Young scientist's presentations. Ashley Chandler, Alan Vrbanc, Cory Markus, Dennis Penglis

June: MARS – liver disease and the ICU. Dr Alpesh Patel

## TAS

Weekend meeting to be held 21st and 22nd August 2016 in the beautiful Tamar Valley. Hobart will host the Chemical Pathology Course in 2017.

## VIC

February: Cases in clinical biochemistry. Drs Kartika Henry, Geetha Rathnayake, Christina Trambas, Kay Wen Choy, Mirette Saad, Abdul Wahab.

March: Ricketts and osteomalacia. Dr Tina Yen

April: Allergy and specific IgE. Dr David Tran

May: Challenges in HbA1c analysis. Dr Trefor Higgins





June: Extreme cases in clinical biochemistry. Drs Julie Ryan, G Liu, Jim Doery, Kay Weng Choy, Ray Czajko

#### **WA**

March: Movie night "That Sugar Film"

April: Industry developments presentation – Beckman Coulter, Bio-Rad and Thermo Fisher

May: Bone Health – Dr Paul Chubb and Dr Sam Vasikaran

#### **National Meetings**

Chemical Pathology Course – 8th-12th February 2016

The AACB-RCPA Chemical Pathology Course is the educational highlight of the first half of our calendar year. This year, 144 delegates from 6 countries attended the course held in Melbourne at the beautiful and historic State Library right in the centre of the city. Scholarships to support attendance were awarded to: Nicole James, Dr MiretteSaad, Sabrina Koetsier, Robin Williams and Aida Mulabecirovic.

#### **Program**

##### **Monday 8<sup>th</sup> Morning sessions**

Immunoassay sensitivity and specificity: Dr Fernando San Gil

Osmometry: Mr Steven Weier

Acid-Base Measurement - what's going on in the black box?: Mr Joe D'Agostino

Organising for a quality laboratory: Mr Ray Czajko

How to troubleshoot failing QC: Dr Douglas Chesher

Laboratory Accreditation; ISO, NATA: Dr Ronda Greaves

##### **Monday 8th Afternoon sessions**

Massively parallel sequencing: Dr Susan Matthews

Molecular Markers for Tumours: Dr MiretteSaad

DNA - inherited disorders: Dr GeethaRathnayake

Measurement and estimation of GFR. Why do we do it and what problems arise: Ms Christine Mandelt

What is the best way to measure protein in urine and what does it mean?: Ms Helen Martin

Biochemical testing in acute and chronic kidney failure: Dr Kay Weng Choy

##### **Tuesday 9th Morning sessions**

How well do labs measure thyroid hormones? Standardisation versus harmonization: Prof Howard Morris

Interpretive comments for TFTs. If you put anything, what should it be?: Dr Penny Coates

Thyroid diseases in pregnancy. Prevalence, significance and diagnosis: Dr David Deam

Pre-analytical factors in glucose testing: Ms Daniella Atanasovski

Diabetic emergencies: Dr Wayne Rankin

Glucose measurements in pregnancy. Why are these important and what has changed: Dr Nilika Wijeratne

##### **Tuesday 9th afternoon sessions**

Breakout Sessions: Cases and calculations

Endocrine cases: Dr Wayne Rankin

pH/blood gas cases: Alan Riglar

Miscellaneous cases: Dr Que Lam

Electrolyte cases: Dr David Deam

Calculations: Dr Andrew Wootton

Clearance creatinine/drugs: Valena Braniff



Statistics/uncertainty of measurement: Dr Ian Farrance.

#### **Wednesday 10<sup>th</sup> morning sessions**

Drugs of abuse - GC and LCMSMS compared: Mr Amir Naimi

Why are therapeutic drugs ineffective in some people and toxic in others?: Prof Hans Schneider

The 5 most common phone questions in a toxicology laboratory: Ms Helen Martin

What are cryo-proteins and how do you test for them?: Mr Geoff Raines

Should serum light chains replace urine Bence Jones protein?: Dr Christina Trambas

Plasma Protein Electrophoresis: measurement and interpretation: Ms Catherine Lynch

#### **Wednesday 10<sup>th</sup> afternoon – free time**

#### **Thursday 11<sup>th</sup> morning sessions**

1st Trimester Screening: Mr Greg Ward

The metabolic autopsy: Dr James Doery

Neonatal Biochemical Emergencies: Dr Tina Yen

Investigation of Iron Overload: Dr Paul Chubb

Investigation of Iron deficiency: Mr Robert White

Investigating B12 deficiency: Dr Zhong Lu

#### **Thursday 11<sup>th</sup> afternoon sessions**

Biochemical Investigation of Malabsorption: Dr Alan McNeil

Pancreatitis: Ms Janine Grant

Faecal Occult Blood Testing: Mr Steven Weier

Lipoprotein metabolism: Dr Douglas Chesher

Lipoprotein disorders: Dr Ken Sikaris

#### **Friday 12<sup>th</sup> morning sessions**

Insulin-like Growth factors: Dr Penny Coates

Menopause: diagnosis and management: Dr Ken Sikaris

Adrenal Cortical Function Testing: Dr Cherie Chiang

Quiz: Dr Andrew Wootton

The Examiners: "a blues band": Mr Greg Ward

#### **Webinars**

AACB provides webinars most months, 2016 webinars have been as follows:

March: An introduction to porphyrins and porphyria. John Zoanetti

April: Biochemical testing in acute and chronic renal failure. Dr Kay Weng Choy

June: Biliary atresia: Dr Stephen Mouat

#### **Publications**

**Clinical Biochemist Newsletter:** is published quarterly and as the name implies, is principally intended to keep the membership informed about AACB activities; issues this year were released in March and June.

The Clinical Biochemist Reviews is a peer reviewed journal of review style articles also published quarterly; two editions have been produced so far this year.





## Hong Kong Society of Clinical Chemistry (HKSCC)

The year started with the newly elected office bearers elected at the Annual General Meeting (AGM) of the Hong Kong Society of Clinical Chemistry held on 23 January 2016, taking up their office. The office bearers elected were:

President	Dr Doris CK CHING
Vice President	Mr Yun Chuen LO
Immediate Past President	Ms Judy PS LAI
Secretary	Dr Iris HS CHAN
Treasurer	Ms Cybil TY WONG
Council Members	Prof YM Dennis LO
	Prof Allen CK CHAN
	Prof Joseph LEE
	Dr Liz YP YUEN
	Dr Lydia CW LIT
	Dr Eric LK LAW
	Dr Jeffery SS KWOK
	Mr Michael HK LEE
	Ms Karen KT LAW
	Mr Eric WK WONG
National Representative to IFCC	Prof Allen CK CHAN
National Representative to APFCB	Dr Doris CK CHING
Representative to FMSHK	Prof Joseph LEE

Dr Graham Jones of St Vincent's Hospital, Sydney, Australia was the APFCB Travelling Lecturer. He was invited to deliver two APFCB lectures entitled: "Chronic Kidney Disease – the Role of the Routine Laboratory" and "HbA1c – Measurement and Interpretation" in the 2016 Annual Scientific Meeting (ASM). There were also 5 presentations from the industries (Roche, Abbott, Thermo-Fisher, Beckman-Coulter and AB Sciex). The 14 industrial booth exhibitions and lectures were well attended by over 190 members and guests.

Education activities for the year carried on with presentations by distinguished academia and scientists. Two scientific meetings were organized in the first half year of 2016:

1. Professor Mitchell G. Scott, External Examiner for Chemical Pathology, Chinese University of Hong Kong delivered a dinner lecture at the Cordis Hong Kong Hotel on 12 April 2016. The title of his talk was 'Laboratory Testing for Growth Hormone Abuse in Sports Perspective'. The event was attended by 110 members and guests.
2. A joint afternoon seminar with Hong Kong College of Pathology (HKCPATH) was held at Queen Elizabeth Hospital on 7 June. Dr John Christopher Coakley, Specialist in paediatric/ neonatal chemical pathology, has been appointed the RCPA Visiting Lecturer 2016 and he delivered two lectures on "Investigation of Jaundice in Infants and Children" and "Lipid Problems in Children". To keep abreast of the recent advances and service developments of Clinical Chemistry in Hong Kong locality, presentations were followed and delivered by two distinguished members: Dr Chloe Mak and Dr Felix Wong. Dr Mak introduced "Pilot Study of Newborn Screening for Inborn Errors of Metabolism in collaboration with Department of Health and Hospital Authority" and Dr Wong highlighted "Inborn Errors of Carbohydrate Metabolism: two recent cases in Hong Kong". The event was attended by about 100 members and guests.

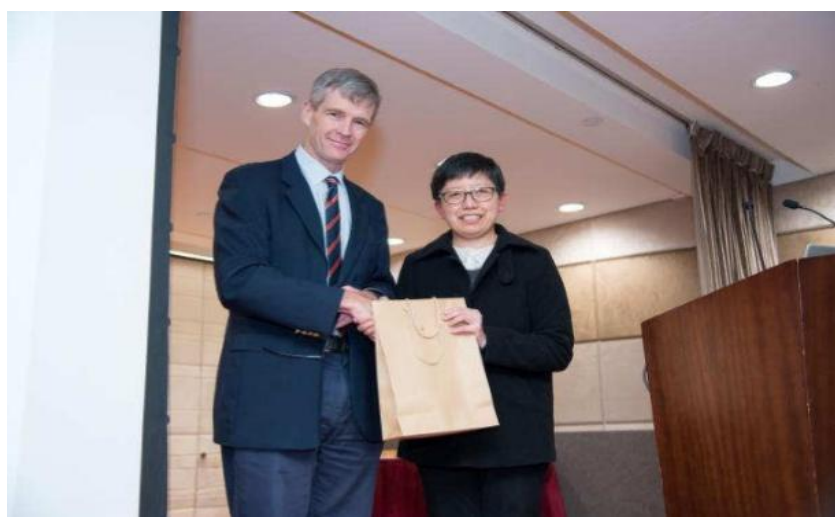




## Council 2016 – 2017

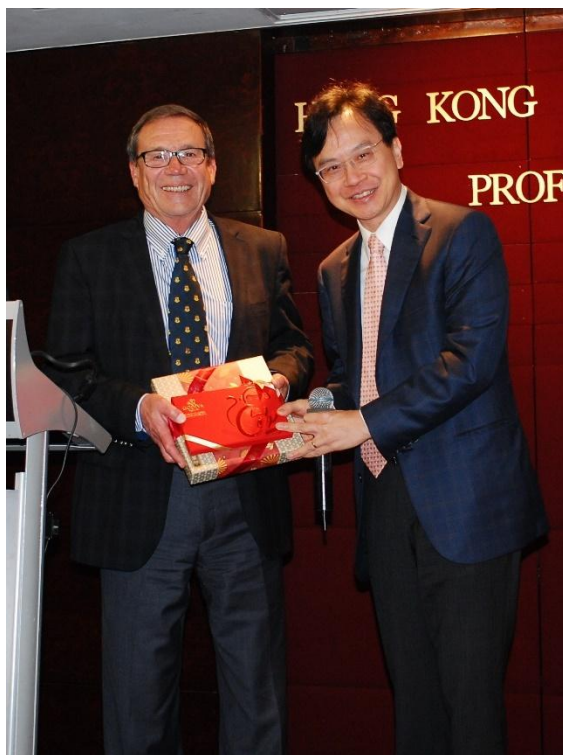


*Dinner lecture (12 April 2016): Professor Mitchell G. Scott*



*Dinner lecture (12 April 2016): Professor Mitchell G. Scott*





*Joint seminar (07 June 2016): Dr John Christopher Coakley*











## Indonesian Association for Clinical Chemistry (IACC)

### 1. 14th National Congress of Indonesian Association for Clinical Chemistry

Indonesian Association for Clinical Chemistry (IACC) held a National Congress in Hotel Bumi Surabaya, 21 April 2016. Dr. July Kumalawati, DMM.,SpPK (K) elected by all congress delegation to continue her success to lead IACC for second period 2016-2019.



### 2. Workshop and Seminar

IACC held Workshops and Seminar during 14th National Congress for Clinical Chemistry in Hotel Bumi Surabaya, 22-24 April 2016. Seminar topic is IVD Innovation for the enhancement of Clinical Laboratory Quality. Around 600 participants were attended this Seminar.



*Elected President IACC, dr. July Kumalawati, DMM.,SpPK(K) and Congress Chairman dr. RobiulFuadi, SpPK opened the 14th National Congress of IACC Seminar and Workshops.*



IACC delightedly give the appreciation and honorary award for the founders of IACC during the 14th National Congress of IACC. IACC was founded in January 1980 by some Indonesia scientist as follow:

1. Prof. dr. Marsetio Donoseputro, SpPK
2. Prof. dr. Tedjo Baskoro, SpPK
3. Dr. Yohanes Widyaharsana
4. Drs. Andi Wijaya
5. Dr. Ing. Bina Suhendra



*Past IACC President DewiMuliaty, PhD (right) and Elected President dr. July Kumalawati, DMM., SpPK (K) of IACC give the honorary award for Founder of IACC. Left-Right: Mrs. Widyaharsana, Prof. dr. Marsetio D, SpPK family, Andi Wijaya, PhD*



*Prof. dr. Jusak NugrahaSpPK(K) talked with exhibitor staff during IVD Exhibition in 14<sup>th</sup> National Congress of IACC.*





*The Organizing Committee of 14<sup>th</sup> National Congress of IACC*

### 3. APFCB Travelling Lecture

Supported by APFCB, Dr. Graham Jones, PhD from New South Wales University Australia kindly visited Indonesia and spoke about Laboratory Management and Chronic Kidney Disease during 14th National Congress of IACC.



*Prof. Jusak Nugraha, SpPK the head of IACC Surabaya Branch as the host of 14<sup>th</sup> National Congress IACC give the appreciation for Dr. Graham Jones, PhD as the speaker from APFCB Travelling Lecture.*

**4. MIHY Program**

IACC and BD has extend the agreement to continue May I Help You Program to increase the quality of Pre-analytical in Laboratory Medicine in Indonesia. This program has reached 58 hospitals/laboratories and many more in the waiting list.

**5. PROJECT OF INDONESIA PEDIATRIC REFERENCE INTERVAL (PIPER Study)**

IACC and new Board of Indonesian Association of Pediatrics (IDAI) has preliminary understanding to held the study for set up the reference range for Indonesian child population.

**6. RESULT INTERPRETATION AND COMMENTING PROGRAM**

IACC launched the online training on result interpretation and commenting through IACC website namely [www.hkki.org](http://www.hkki.org) . We called this program by Interactive Case Study. Every three month we update the case study and result.







## **Singapore Association of Clinical Biochemists (SACB)**

The first half of this year was filled with a multitude of activities for the Singapore Association of Clinical Biochemists (SACB).

On 5th March 2016, our annual scientific meeting (ASM) was held at the Carlton Hotel, Singapore. Speakers came from Australia, China, Malaysia, Singapore, UK and USA. This year, 172 participants attended the ASM and were rewarded with a range of talks in the scientific programme, covering topical issues including patient safety, laboratory automation, point-of-care testing, management of quality controls, troponins, HIV testing, clinical and analytical aspects of vitamin D and Graves disease. After the scientific programme, members of the SACB conducted our annual general meeting and elected new council members for a term of two years. We thanked the council members who had contributed their time and effort in the last two years, and welcomed new council members. Welcomed new council members.

The SACB, in conjunction with the Mayo Clinic (USA) and the Endocrine and Metabolic Society of Singapore, co-organised a Laboratory Endocrinology course at the Pan Pacific Hotel, Singapore. The two-day course in February 2016 covered the principles, methodology, utility and potential pitfalls of various laboratory assays of relevance to clinical endocrinologists. International and local experts spoke on a number of topics ranging from mass spectrometry, assay performance, lipids, adrenal disorders, thyroid hormones, reproductive endocrinology to the growth hormone axis. Multiple members of the SACB participated in this course. Clinical case discussion sessions during the course also provided a platform for constructive dialogues between clinicians and laboratory professionals.

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Looking ahead, the SACB will be conducting its annual series of educational lectures scheduled for the second half of the calendar year. As the only professional body dedicated to clinical biochemistry in Singapore, the SACB will continue to take the lead in education and skills improvement for the profession.



## Vitamin B<sub>12</sub> Deficiency: Active B<sub>12</sub> Assay

*Dr M. Saleem*

*Consultant Chemical Pathologist: MBBS, MAACB, FRCPA*

*South Australia Pathology*

*Adelaide*

*Australia*



### Introduction

Vitamin B<sub>12</sub> also called cobalamin, is a water soluble vitamin utilised as a cofactor for enzymes that catalyse methyl group transfer. This includes DNA methylation, myelin formation and the conversion of homocysteine to methionine and therefore plays a fundamental role in the normal functioning of the brain and nervous system, and for the formation of blood.

Estimates of the prevalence of B<sub>12</sub> deficiency vary depending on the population tested and the diagnostic test cut-offs used. The incidence appears to increase with age (>65 years) and with the ubiquitous use of gastric acid-blocking agents.

### Consequences of Vitamin B<sub>12</sub> deficiency

Vitamin B<sub>12</sub> deficiency can interrupt key biochemical pathways which may disrupt DNA synthesis resulting in megaloblastic anaemia and other adverse effects on the nervous system and other organs.

A full blood count which shows anaemia and macrocytosis has traditionally prompted practitioners to look for Vitamin B<sub>12</sub> deficiency. The presence of hypersegmented neutrophils (Figure 2) has been considered to be of high diagnostic accuracy although there are other non-specific causes for this finding (eg iron deficiency anaemia). Untreated, deficiency of Vitamin B<sub>12</sub> may lead to severe anaemia.

Importantly, Vitamin B<sub>12</sub> deficiency may present without any haematological abnormalities at all. There is a broad range of neurological symptoms associated with Vitamin B<sub>12</sub> deficiency which may include peripheral neuropathy, irritability, tiredness and mild deterioration of memory and cognitive ability. Severe deficiency causes subacute combined degeneration of the spinal cord. In pregnancy, maternal Vitamin B<sub>12</sub> deficiency is associated neural tube defects in infants and deficiency in childhood is associated with developmental delay and failure to thrive.

Impaired DNA synthesis may also affect other rapidly dividing cells causing glossitis, gastrointestinal symptoms and infertility.

### Causes of Vitamin B<sub>12</sub> deficiency

Vitamin B<sub>12</sub> deficiency due to poor nutrition is rare, given the small daily requirement of Vitamin B<sub>12</sub> (1-5 mg/day) and its presence in abundant quantities in animal products. Populations at risk for nutritional deficiency include elderly population at risk of poor intake of meats and dairy products, chronic alcoholics and strict vegans. Vitamin B<sub>12</sub> deficiency may also occur at times of increased requirement such as in pregnancy and during lactation.



Absorption of Vitamin B<sub>12</sub> requires adequate gastric acid and intrinsic factor as well as a functional terminal ileum. Pernicious anaemia is caused by the autoimmune destruction of the gastric parietal cells and loss of intrinsic factor. Total or subtotal gastrectomy and gastric bypass procedures may result in Vitamin B<sub>12</sub> deficiency. Exocrine pancreatic failure and loss or disease of the terminal ileum may also impede absorption. Intestinal bacterial overgrowth may consume Vitamin B<sub>12</sub> causing deficiency.

### **Who should be tested for Vitamin B<sub>12</sub> deficiency?**

Several guidelines recommend that patients with symptoms or signs of Vitamin B<sub>12</sub> deficiency including anaemia (macrocytic anaemia or macrocytosis) and patients with suspected neuropsychiatric abnormalities should be tested for Vitamin B<sub>12</sub> deficiency. Other populations where testing could be considered include the elderly, long-term vegans, patients who abuse alcohol, people on drugs that interfere with vitamin B<sub>12</sub> absorption (long-term H<sub>2</sub> receptor antagonists, proton pump inhibitors or metformin) and patients with inflammatory bowel disease, gastric or small intestine resection.

### **Forms of Vitamin B<sub>12</sub> in the blood**

Serum Vitamin B<sub>12</sub> is bound to two major carrier proteins; (Figure 1)

- 1) Haptocorrin (HC, also called Transcobalamin I) binds the major portion of plasma Vitamin B<sub>12</sub> which is not active in Vitamin B<sub>12</sub> delivery to cells.
- 2) Transcobalamin II: binds Vitamin B<sub>12</sub> to form a complex called holotranscobalamin (holoTC). Transcobalamin II binds only 20–30% of vitamin B<sub>12</sub> circulating in the blood, but is responsible for delivery of Vitamin B<sub>12</sub> to cells, hence its name active-B<sub>12</sub>.

### **Biochemical tests used in the diagnosis of Vitamin B<sub>12</sub> deficiency**

#### **Total Vitamin B<sub>12</sub> in Serum**

This is the most common test of Vitamin B<sub>12</sub> status and measures the sum of inactive (haptocorrin bound) and active Vitamin B<sub>12</sub> (HoloTC). In clinical situations where there is a significant change in the inactive Vitamin B<sub>12</sub> fraction (haptocorrin bound), total serum Vitamin B<sub>12</sub> may not reflect tissue status. Inactive Vitamin B<sub>12</sub> is decreased in pregnancy/oestrogen therapy but may be increased in renal failure and haematological malignancies. Therefore tissue deficiency of Vitamin B<sub>12</sub> may occur despite apparently normal serum total Vitamin B<sub>12</sub> levels and vice versa. Up to 30% of patients with Vitamin B<sub>12</sub> deficiency may show serum total Vitamin B<sub>12</sub> levels in the lower normal range.

#### **HoloTC in Serum**

HoloTC (active B<sub>12</sub>) levels give a better indication of biologically active B<sub>12</sub> available for the tissue. Levels ≤35pmol/L are considered to be deficient; in a minority of patients levels above this cut-point may still be associated with tissue deficiency and patients in whom there is clinical suspicion of deficiency may benefit from homocysteine or methylmalonic acid analysis.

#### **Intrinsic Factor Antibodies /Parietal Cell Antibodies**

Intrinsic factor antibodies and Parietal cell antibodies may be helpful in supporting a diagnosis of pernicious anaemia. The presence of IFA is virtually diagnostic of pernicious anaemia, but they are detected in only about 50% of cases. B<sub>12</sub> treatment can cause false negatives. In the past, the diagnosis of pernicious anaemia was usually established by assessing B<sub>12</sub> absorption with the Schilling test, but this test is no longer available.

#### **Homocysteine**

The poor conversion of homocysteine to methionine in Vitamin B<sub>12</sub> deficiency may cause an elevated fasting plasma homocysteine level. While a normal plasma homocysteine makes Vitamin B<sub>12</sub> deficiency unlikely,



it has limited specificity because elevations occur in inherited and acquired disorders, including folate and pyridoxine( $B_6$ ) deficiency and particularly in patients with chronic kidney disease.

#### Methylmalonic acid (MMA)

Poor conversion of methylmalonyl Coenzyme A to succinyl Coenzyme A in Vitamin  $B_{12}$  deficiency may cause an elevated serum level of MMA. Like homocysteine, MMA also has poor specificity as elevations may occur in rare inherited disorders and in chronic kidney disease. In the absence of these conditions a significantly elevated MMA strongly supports Vitamin  $B_{12}$  deficiency.

#### Summary

1. Vitamin  $B_{12}$  deficiency is common
2. Symptoms may be ill-defined and a high index of suspicion is necessary
3. Vitamin  $B_{12}$  exists as an active and an inactive form in the blood
4. Total serum Vitamin  $B_{12}$  assays measure active and inactive forms and are thus prone to false positives & negatives.
5. "Active  $B_{12}$ " assay measures only the active form and is thus superior for detecting deficiency.

#### References

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Figure 2 Blood film – megaloblastic anaemia

Hyper-segmented neutrophil

Oval macrocytes

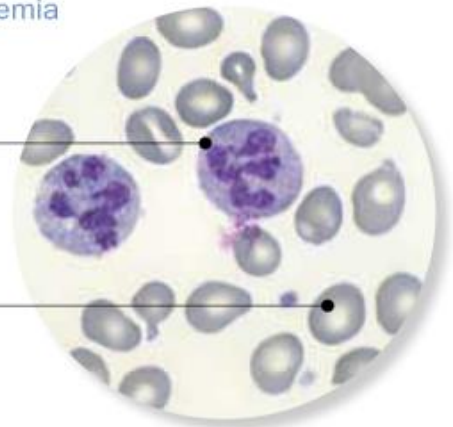
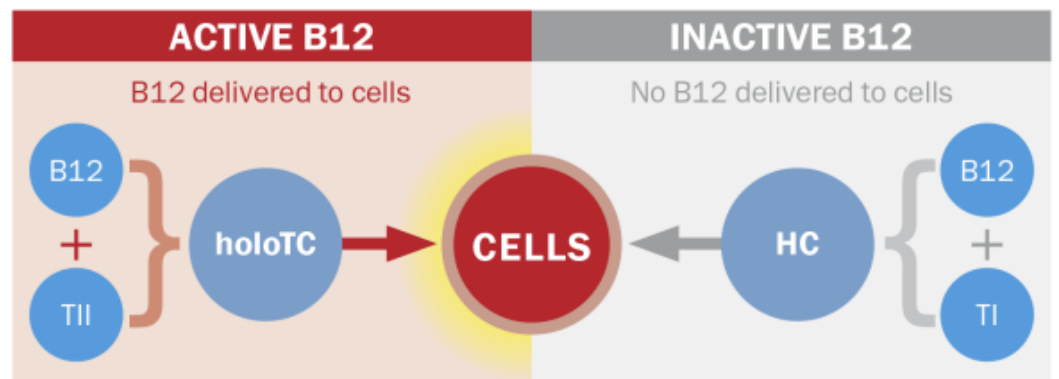


Figure 1 B12 binding







**14<sup>th</sup> Asia-Pacific Federation for Clinical Biochemistry  
and Laboratory Medicine Congress**

*Advancing Laboratory Medicine for Better Patient Care*

**November 26–29, 2016**

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