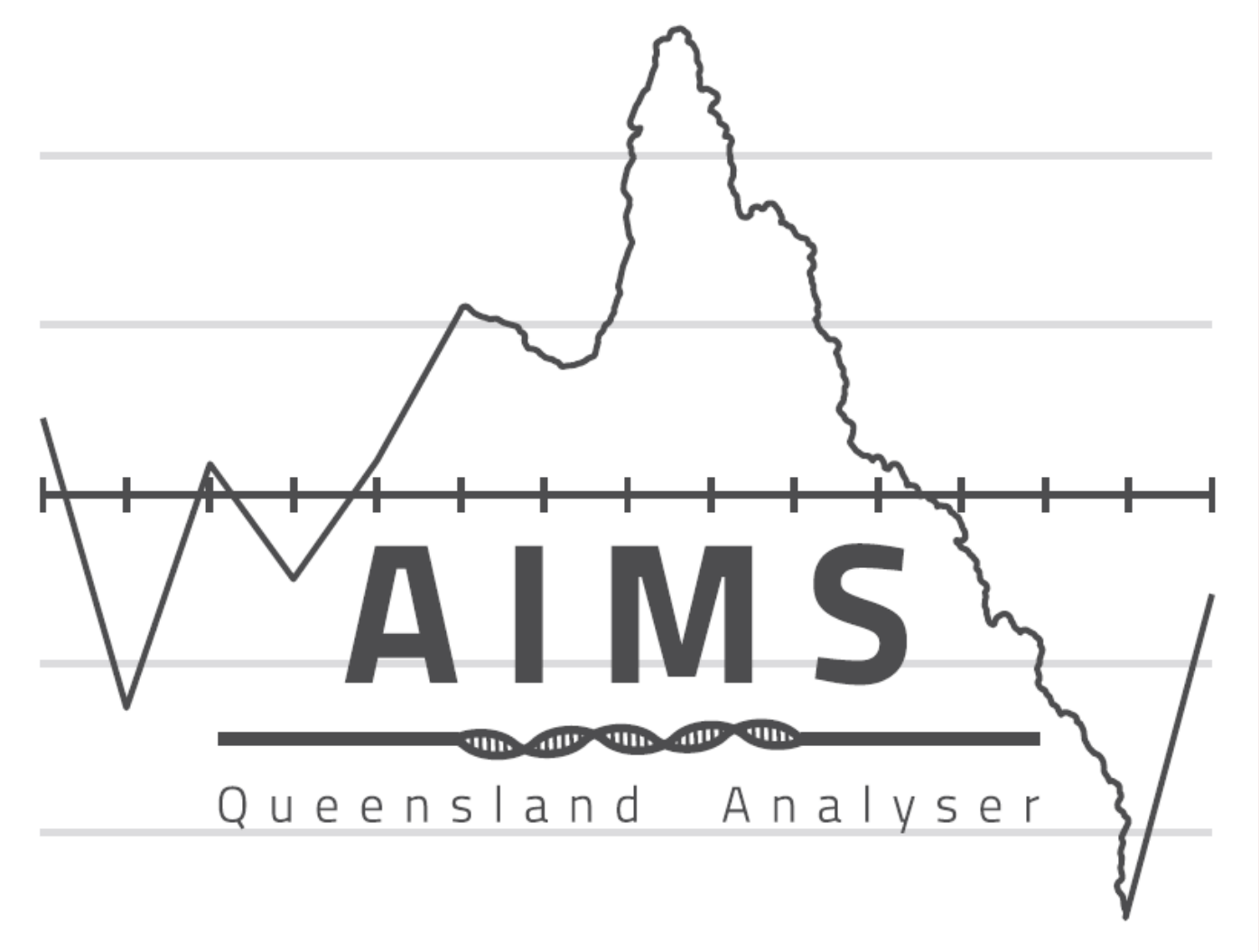

The Official Newsletter of the Queensland Branch of the Australian Institute of Medical Scientists

In this Edition

AIMS Qld Branch Committee Members 2017

Chair: Anne-Marie Christensen

Vice Chair: Indu Singh

Treasurer: Christine Knauth

Secretary: Jacqueline Shaw

Committee Member: Deborah Orr (Chair, PaLs QLD)

Committee Member: Kathryn Eckersley

Committee Member: Yun-mi Nguy

Committee Member: Callum Bradshaw

Committee Member: Vacant

Student Members: Rebecca Geary & Vacant (QUT)

Ellen Palmer & Rebecca Ward (Griffith University)

If you are interested in becoming a committee member please make contact via queenslandaims@gmail.com

Chair's Report

Welcome to the mid-year edition of the *Queensland Analyser* – it seems like just a short while ago we were complaining about the relentless heat of summer. It has been another busy start to the year for the QLD Branch Committee as we prepare for our upcoming meeting with the QLD Preanalytical & Laboratory Staff (PaLs) on Saturday/Sunday 24 & 25th June on the Gold Coast – '*Preventing Preanalytical Errors*'. Over the last few months we have been working to bring together a range of speakers from QLD, Australia and New Zealand to cover all disciplines and departments that will interest laboratory staff as well as our BMLS AIMS Student Members. See the flyer on pg. 8 for more information.

In this issue we also look back and review some of events we held late last year. The first is the AACB & AIMS Combined Meeting on Myeloma which was held at QUT and then the AIMS & AACB Annual Christmas Quiz. We also report on the BMLS Student Awards at Griffith University and QUT and again congratulate the winners and 2016 graduates. After that we look forward to our events planned for the rest of this year including our 2017 Annual Meeting and regular combined meeting with the Histotechnology Group QLD (HGQ) and the AACB a bit later in the year. These events are now regulars on our calendar and drawing larger numbers and more students each time we get together.

We also have a news update on some interesting developments in the medical science world with some links to papers of interest to check out. Our guest this edition for our regular feature '5 minutes with…' is Deborah Orr from Pathology Queensland Mackay Base Hospital. Deborah is the Chair of PaLs and recently joined the Branch Committee and represents PaLs in that capacity – welcome Deb! Last but not least, we have a very interesting case study from one of our Branch members (thanks Callum!) on an 'Atypical MAHA' along with some excellent references if you are keen to follow up and learn more about it.

Enjoy for now and we hope to see you at the Gold Coast in June!

Anne-Marie Christensen
annemarie.christensen@qut.edu.au

Queensland Branch Events Update

AACB & AIMS Combined Scientific Meeting – Steven Weier

On Tuesday the 25th of October AIMS and AACB held a combined scientific meeting on Multiple Myeloma. The event was held at QUT in the recently refurbished Q Block. The meeting has two presenters Matthew Burke who is currently the Supervising Scientist in Protein at Pathology Queensland at RBWH, and Associate Professor Peter Mollee, Haematologist at Pathology Queensland at, Princess Alexandra Hospital.

Matthew gave an enlightening presentation on Protein electrophoresis; Past, Present and Future, which was well received and prompted much discussion especially regarding the interference seen by some of the new monoclonal antibody therapeutics.

Associate Professor Mollee presented some interesting case studies highlighting the progression of the disorder, difficulties with result interpretation and current treatments. The presentation was very informative and comprehensive. The Queensland committees of both AIMS and AACB would like to thanks both speakers for their time and support. The committee would also like to thank Diagnostic Solutions for sponsoring the meeting and their ongoing support of our joint educational activities.

2016 AIMS & AACB Annual Christmas Quiz

Do you know your Australian prime ministers, how to make a Harvey Wallbanger, and your Mr Men and Little Misses? How about whether a tadpole grows its front or back legs first as it develops into a frog? If you do, and even if you don't, but still like trivia, you'd be great at the AIMS/AACB annual end of year quiz night.

Yes, there is more than one team here

AIMS National Office seem to take quizzing seriously

2016 AIMS & AACB Annual Christmas Quiz

Smiles all round ☺

Happy Jacqui

The 2016 quiz night was held on the evening of 29th November at the QUT Botanic Bar, with a solid turnout for a fun competition. We thank Invitro Diagnostics for their continued support and sponsoring of the event, and in-person representation from Ray and Krystle. AIMS and AACB members plus interested quizzy participants came from varied areas of medical science as well as allied health. Students, scientists, techs, company representatives, pharmacists, the AIMS national office and others all teamed up for an enjoyable night. Thank you all for coming and participating.

At half time in the quiz, Pin Pals was solidly leading, and with a near-perfect second round, looked likely to win the night. After Jacqui goofy-footed her way to victory for her team in the to-and-fro segment which required you to know your Kaths from your Kims, your Good Golly Miss Mollies, and Beethovens from Mozarts (amongst many other more important things of course), the final round was neck and neck. It was Quiztoblasts who prevailed and won in the end. Congratulations to them, a mixed team that formed on the night.

We hope you all enjoyed the evening, and look forward to you coming along again in 2017. Pencil in the evening of **Tuesday 28th November** for this year's end of year quiz. See you there!

Griffith University Medical Sciences Student Award Night

Griffith University School of Medical Science recognised outstanding achievement of the 2016 graduates of the Bachelor of Medical Laboratory Science program.

2016 Griffith Medical Laboratory Science Graduates Award Ceremony

The Griffith University School of Medical Science awards were held at Gold Coast Exhibition and Convention centre following the graduation ceremony. Students were awarded by the Head of School Prof Mark Forwood. Ms Joanna Morgan was crowned the all-around Dux of Class with top grades in Clinical Biochemistry, Clinical Microbiology, Haematology, Histology and Transfusion Science. Other graduates recognised for their very high GPA included Ms Jacqui Miller, Ms Rebecca Steele and Mr Kion Lei Lay.

Every year the formal award ceremony is followed by staff and students social boat cruise across the Gold Coast Harbour to celebrate the achievements of all the graduates of Bachelor of Medical Laboratory Science program.

Staff Celebrating with New Scientists

QUT School of Biomedical Sciences Student Award Night

The QUT School of Biomedical Sciences Awards Ceremony was held on Tuesday the 21st of February in the picturesque Room Three Sixty With its panoramic views of the city. The evening is the highlight of the annual academic calendar, as it is the time we can recognise and acknowledge student success and achievement. It was well attended by academic staff and representatives from various professional organisations and the in vitro diagnostic industry. AIMS sponsored four awards on the night with awards presented by Queensland Branch Vice Chair Dr Indu Singh. Lexi Davies was awarded the James Vincent Duhig Prize for Histopathology Prize, Arthur Stanley-Davies the S. Walsh Memorial Prize for Blood Banking, Megan van Schie the IM & MJ Makerras Prize for Parasitology Prize and James Newman the JR Saal for Outstanding Performance in Medical Laboratory Science Prize. All the recipients were deserving winners and highlight the ability of the next generation of Medical Laboratory Scientists.

Megan van Schie

Arthur Stanley-Davies

Lexi Davies

James Newman

PREVENTING PRE-ANALYTICAL ERRORS

A COMBINED STATE SCIENTIFIC MEETING BROUGHT TO YOU BY THE

AIMS QLD BRANCH & PRE-ANALYTICAL & LABORATORY STAFF (PaLs)

Saturday 24 & Sunday 25 June 2017

Griffith University, Gold Coast Campus

REGISTRATION

AIMS & NZIMLS Members $250.00
AIMS Student Members $100.00
Non-Members $325.00

Registration includes conference dinner Saturday 24 June at Mantra on the View

Additional dinner tickets $95.00
GLink 3-day Go Access Tram Ticket $12.00

Mantra on the View Hotel has a limited number of discount rooms. Mention this meeting to check availability when enquiring.

INVITED PRESENTERS

Robyn Wells (QLD)
Gillian Trealor (VIC)
Dr Danny De Lore (NZ)
Karen Dent (QLD)
Dave Kendall (NZ)
Eli De Leon (QLD)
Donna MacGregor (QLD)
Helen O'Brien (QLD)
Debbie Gercovich (VIC)
Jo Northfield (VIC)

Ailsa Bunker (NZ)
Jane Kendall (NZ)
Dr Nicole Martin (QLD)
Debbie Elliott (QLD)
Dr Ian Cassidy (QLD)
Dr Shannon Emmett (QLD)
Matthew Burke (QLD)
Rose Condon (NZ)
Chris Philippa (QLD)
Angela Coriot (QLD)

Robyn Coleman
2017 AIMS Travelling Orator

Monique Murphy
Paralympic Swimming
Silver Medallist Rio 2016

To see Meeting Program or to register go to
www.aims.org.au/events/event/qld-aims-and-pals-combined-conference-2017

AUSTRALIAN INSTITUTE OF MEDICAL SCIENTISTS

Apace

PaLs Queensland
Pre-analytical & Laboratory Staff

Proudly supported by Griffith UNIVERSITY

Upcoming Branch Events in 2017

June

- The combined **AIMS QLD & PALS State Scientific Meeting** will be held at the **Griffith University Gold Coast Campus on June 24 & 25**. See flyer on page 8 for more information or check the AIMS website

August

- The AIMS Queensland Branch will be hosting another **Combined Scientific Meeting** with the **Queensland Histotechnology Group** on **Tuesday 29 August** at the Pineapple Hotel. **'Skin'** will be this year's theme**.** The Branch **2017 Annual Meeting** will also be held on this night. Keep your eyes open for more and the chance to RSVP.

October

- The AIMS Queensland Branch will be hosting another **Combined Scientific Meeting with the AACB** in October this year. Keep your eyes open for more updates and the chance to RSVP.

November

- **Essential Haematology & Transfusion CPD Workshop 13 – 17 November** at Griffith University. See flyer on page 17 for more information.
- The **Annual AIMS & AACB Christmas Quiz Night** has been booked for **Tuesday 28 November** at the Botanic Bar, QUT Gardens Point. Stay tuned for updates and the opportunity to register your team!

For more information on other AIMS events check…
http://www.aims.org.au/services/related-meetings-webinars

General News Update & Interesting Developments

Largest Ever Brain Cancer Study Provides Key Insight Into One of Its Deadliest Forms. A recent study from the Institute of Cancer Research in the UK, published in Nature, revealed the results of 12,496 cases of glioma, a deadly form of malignant brain tumour. The study, conducted in 2015, explored the genomes of glioma patients and healthy individuals and found strong evidence for 26 locations on the genome that individually increase the risk of developing a form of glioma. The study also identified interactions between a pair of proteins and glioma development which could lead to a new early detection pathology test.

Read more on ScienceAlert here: http://www.sciencealert.com/record-sized-brain-cancer-study-reveals-a-bunch-of-new-cancer-genes
And access the full article here:
http://www.nature.com/ng/journal/vaop/ncurrent/full/ng.3823.html

An Unexpected New Lung Function Has Been Found - They Make Blood. A study by the University of California has discovered that lungs are responsible for platelet production. In experiments using mice, researchers observed megakaryocytes functioning within lung tissue – a function previously thought to only occur in the bone marrow. In the mice it was found that at least half of the body's supply of platelets were produced by megakaryocytes in the lungs, and researchers believe this strongly suggests a similar lung function could be present in humans.

Read more on ScienceAlert here: http://www.sciencealert.com/an-unexpected-new-lung-function-has-been-discovered-and-it-could-disrupt-decades-of-scientific-thought
And access the full article here:
http://www.nature.com/nature/journal/vaop/ncurrent/full/nature21706.html

Australian of the Year winner: Emeritus Professor Alan Mackay-Sim. The 2016 Australian of the Year has been awarded to Professor Alan Mackay-Sim, a pioneer in stem cell research and Queensland resident. Professor Mackay-Sim's research into the biology and regenerative properties of olfactory sensory neurons, which he has continued over some 20 years, proved these cells could be safely transplanted to treat spinal cord injuries.

Find out more about this inspiring Queenslander here:
http://www.abc.net.au/news/2017-01-25/australian-of-the-year-winner-professor-alan-mackay-sim/8212886?section=science

Note on Student Membership Application Forms

The one page form is currently for full-time students only and has to be signed by the Course Coordinator or an officer of the university. The two-page form is for all other applicants. Both forms are available at http://www.aims.org.au/membershipinformation/join

History of AIMS

The History of AIMS is now complete. Written by Ian Stanger, Bruce Munro, Jim Ruxton, Emeritus Prof. Tony Webber, Tom Bell and Len Lawler, the book is a detailed and rich recount of the history of AIMS in the past 100 years.

The book is available for purchase in the online store.

AIMS members have access to the electronic version, and can be accessed in the Members Centre of the AIMS website.

The **APACE** (**Australasian Professional Acknowledgement of Continuing Education**) scheme is a voluntary programme that recognises continuing education, formal courses and a wide range of professional activities which contribute to your professional growth.

The healthcare industry is undergoing rapid change. We are expected to keep our knowledge and skills up to date to enable us to perform to the highest professional standard. The **APACE** scheme provides a method by which your professional activities are recognised.

APACE has been approved by the **New Zealand Medical Laboratory Science Board** as a re-certification programme for **New Zealand Medical Laboratory Scientists**.

APACE has been approved by the **Royal College of Pathologists Australia** (**RCPA**) as a continuing professional development recognition programme for Fellows of the Faculty of Science.

For more information and to enrol visit http://www.aims.org.au/apace

‘5 minutes with… Deborah Orr

In this issue, we introduce you to our most recent Branch Committee member and PaLs Special Interest Group Chair (QLD)….

Where do you work?

Pathology Queensland at Mackay Base Hospital

What future development/s direction/s in the industry are you excited about?

Electronic ordering and upskilling frontline staff.

What do you like about your current position?

Helping people reach their full potential by encouraging them to challenge themselves by stepping outside their comfort zone and to continue to expand their knowledge and learn new skills.

What makes you smile?

Rescued animals finding a loving home and having a happy life.

What has been your favourite holiday?

Tasmania in Autumn.

Which 3 people, alive or dead, would you have around for dinner?

Dalai Lama, Richie McCaw, Oprah Winfrey

What’s your guilty pleasure?

Watching the NZ Super Rugby teams play on Friday nights having a couple of beers.

Case Study: An atypical MAHA by Callum Bradshaw

A 17 year old female presented with symptoms of nausea and vomiting. The patient has a history of septicaemia, being hospitalised a month prior to this presentation. A FBC revealed anaemia (Hb 110g/L) and thrombocytopenia (PLT 85 x 10^9/L) with the remainder of parameters being unremarkable. Schistocytes were noted on the blood film. From these characteristic findings, a microangiopathic haemolytic anaemia (MAHA) was suspected. An E/LFT showed abnormal renal function (urea 14.4 mmol/L, urate 0.42 mmol/L, creatinine 333 mmol/L) and indicated haemolysis (LDH 811U/L). All analytes can be seen in table 1. The patient was transferred to a major hospital, arriving two days after her first presentation. A repeat FBC and E/LFT were performed, showing worsening parameters. Coagulation studies were also performed, which showed normal function. The severely decreased haptoglobin confirms marked intravascular haemolysis.

Table 1: Comparison of haematological and biochemical results

Analyte (R/Interval)	Day 1	Day 3	Day 4	Day 5	Day 6	Day 7
Hb (115-165 g/L)	110	84	83	75	71	67
Hct (0.35 – 0.47)	0.34	0.24	0.23	0.21	0.20	0.18
RCC (3.9-5.6 x 10^{12}/L)	3.6	2.8	2.8	2.4	2.3	2.2
PLT (150-400 x 10^9/L)	85	48	48	47	48	65
Urea (2.5-6 mmol/L)	14.4	28.9	30.4	30.9	34.3	35.0
Urate (0.15-0.40 mmol/L)	0.42	0.58	0.60	0.60	0.64	0.69
Creatinine (45-85 mmol/L)	333	593	633	748	845	872
Protein (65-81 g/L)	74	54	56	53	52	48
Albumin (34-47g/L)	35	27	29	27	25	22
LDH (120-250 U/L)	811	1212	1199	1459	1234	930
PT (8-12 sec)		12	13			
APTT (24-40 sec)		29	29			
Haptoglobin (0.16 – 2.0 g/L)		<0.08				

As disseminated intravascular coagulation (DIC) and HELLP syndrome can be ruled out by coagulation results and the patient's history, TTP (thrombotic thrombocytopenic purpura) and HUS (haemolytic uraemic syndrome) are the likely differential diagnoses. The history and age is also more suggestive

of TTP over HUS, and an ADAMTS13 assay was performed on the third day (after presenting). A value of 98% (40-130%) was reported, normal, excluding TTP from the diagnosis. While the patient is older than expected for typical HUS presentation, her recent septicaemia may provide a point of origin and infection for the symptoms. Aerobic and anaerobic blood cultures were collected and sterile after five days[1].

A urine m/c/s was requested on the fourth day, showing no glucose and ++++ protein on a dipstick. Microscopy of the urine showed a WCC of 350 x 10^6/L (<10 x 10^6/L), which was subsequently sent to be cultured. Based on this information, the patient was treated empirically for a bacterial UTI. HUS is caused by *Escherichia coli* O157:H7, the UTI could potentially be the cause of the patient's symptoms.

The patient did not respond to the antibacterial treatment over the following days, even with a positive culture of *E coli* with greater than 100x10^6 CFU/L. Her anaemia and renal function continue to worsen. On the seventh day, Shiga toxin PCR is requested to confirm a diagnosis of HUS with its causative toxin. This toxin is not detected, ruling out a diagnosis of HUS and confirming a diagnosis of atypical HUS (aHUS)[1].

Atypical HUS is mediated by dysregulation of the complement system, unlike that of Shiga toxin HUS, which inhibits protein synthesis. The complement system is comprised of three pathways: the classical, lectin, and alternative pathways. aHUS affects the alternative pathway as shown in figure 1.

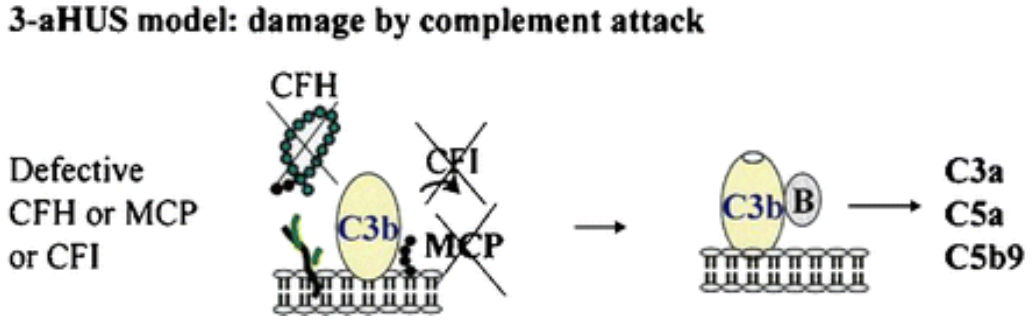

Figure 1: Alternative complement pathway mechanism of action by atypical HUS[1]

Host cells are protected from the formation of C3 convertase (an alternative pathway protease, providing cleavage of C3b leading to formation of C5 convertase and the membrane attack complex) by regulatory proteins complement factor H (CFH), I (CFI), and membrane cofactor protein (MCP). In aHUS, CFH does not attach to surfaces through its heparin/anionic binding sites, and complement factor B binds C3b where it would usually be discouraged. The role that MCP and CFI usually perform, degrading C3b to iC3b cannot be performed in situations of deficiency, like in aHUS. It is the absence of some or all of these proteins that cause the unregulated complement activation, resulting in the symptoms seen[2].

The prognosis of aHUS is poor with 50 to 60% of patients progressing to end stage renal disease. As aHUS has a wide variety of causes, it is difficult to pinpoint exactly what triggered this disease state, or the specific cause, which can be genetic, acquired, or idiopathic. Unfortunately, as no further investigation was performed, this is an idiopathic presentation. However, genetic aHUS typically has a triggering event so it is possible that the patient's history of sepsis contributed to the disease.

Genetic cases, which make up 50-70% of aHUS, are typically more severe, have a poorer prognosis compared with other causes, and are associated with a higher percentage of relapse. To be classed as genetic, at least two family members must be affected by the disease within six months and common triggering agents of acquired aHUS ruled out, such as *Streptococcus pneumoniae* infections, some immunosuppressants, certain cancers, pregnancy, and HELLP syndrome. Disease causing mutations may also be identified[3].

Opinions on the standard course of treatment vary. No studies exist proving the use of plasmatherapy; despite this, it remains as the mainstay and first line of treatment. In theory, fresh frozen plasma replaces a deficiency of any of the complement regulatory proteins, while using plasmapheresis to replace a patient's plasma with FFP would also replace defective proteins. A drug proving to be effective and recommended treatment is eculizumab. It targets the membrane attack complex, the final portion of complement activity, C5, and has been shown to markedly reduce intravascular haemolysis, need for transfusion, and fatigue[4].

Within three weeks of commencing treatment, the patient was no longer anaemic, thrombocytopenic, her renal function had almost normalised and she had returned home.

References

[1]Loriat C, Noris M, Fremeaux-Bacchi V. Complement and the atypical hemolytic uremic syndrome in children. Ped Nephrol [Internet]. 2008 [cited 2016 May 17]; 23(11): [about 20p.]. Available from: http://link.springer.com/article/10.1007%2Fs00467-008-0872-4#Fig1 DOI: 10.1007/s00467-008-0872-4

[2] Noris M, Bresin E, Mele C, Remuzzi G. Atypical Hemolytic-Uremic Syndrome. Gene Reviews [Internet]. 2013 [cited 2016 May 17]: [about 10 pages.]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK1367/

[3] Picard C, Burtey S, Bornet C, Curdi C, Montana M, Vanelle P. Pathophysiology and treatment of typical and atypical hemolytic uremic syndrome. Pathologie Biologie [Internet]. 2015 [cited 2016 May 18]; 63(3): [about 1p.]. Available from: http://www.em-consulate.com/en/article/980790 DOI: 10.1016/j.patbio.2015.03.001

[4] Waters AM, Licht C. aHUS caused by complement dysregulation: new therapies on the horizon. Pediatr Nephrol [Internet]. 2011 [cited 2016 May 18]; 26(1): [about 10 p.]. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2991208/ DOI: 10.1007/s00467-010-1556-4

Essential Haematology & Immunohaematology/Transfusion Continuing Professional Development Workshops

Workshop convenors: Assoc Prof Indu Singh & Ms Alison Weston

Registration Details Coming Soon

Contact Assoc Prof Indu Singh at i.singh@griffith.edu.au

One-week (40 hours) intensive refresher training course

Essential Haematology & Immunohematology:

Theory & Practical

Who can benefit: Scientists, technicians or other medical science graduates working in pathology related fields returning to work after a break, wanting to rotate around as multi-skilled scientists after a period of working in a specific discipline only. Anyone interested in refreshing his or her knowledge in essential Haematology and Immunohematology (Blood Banking). It will be useful to have some basic knowledge of Haematology and Transfusion to get most out of this refresher course.

When: 13th November 2017 – 17th November 2017

How long: 0830-1700 everyday (Morning Tea, Lunch and Parking provided)

Where: Griffith University Gold Coast Campus

Cost: Maximum $1200 for all 5 days with discounts for attending 2 or 3 days only or where an organisation sending more than 2 attendees. AIMS members pay $1100.

Course content: Two days will be dedicated to morphology and haemoglobin electrophoresis; one day will cover haemostasis and 2 days for immunohematology/ transfusion/ blood banking. Everyday first 2 hours lecture will provide the theoretical background including physiology, pathophysiology and principles behind the material to be covered in hands on laboratory session on the day. All attendees will get a chance to perform all the tests under supervision of experienced practising scientists also involved in teaching Medical laboratory Science students at university.

Certification: Griffith University will provide a certificate of completion to all attendees who complete the workshops. AIMS will provide 10 CPD credit points towards APACE for each day attended.

Maximum Capacity: Only 20 attendees can be accommodated on each day due to need for individualized supervision during laboratory session.

Print a copy of the latest '*Queensland Analyser*' and leave it in the tea/lunch room for others to enjoy!

Got any suggestions or contributions for future editions? Let us know…

queenslandaims@gmail.com