

Clinical Biochemistry News



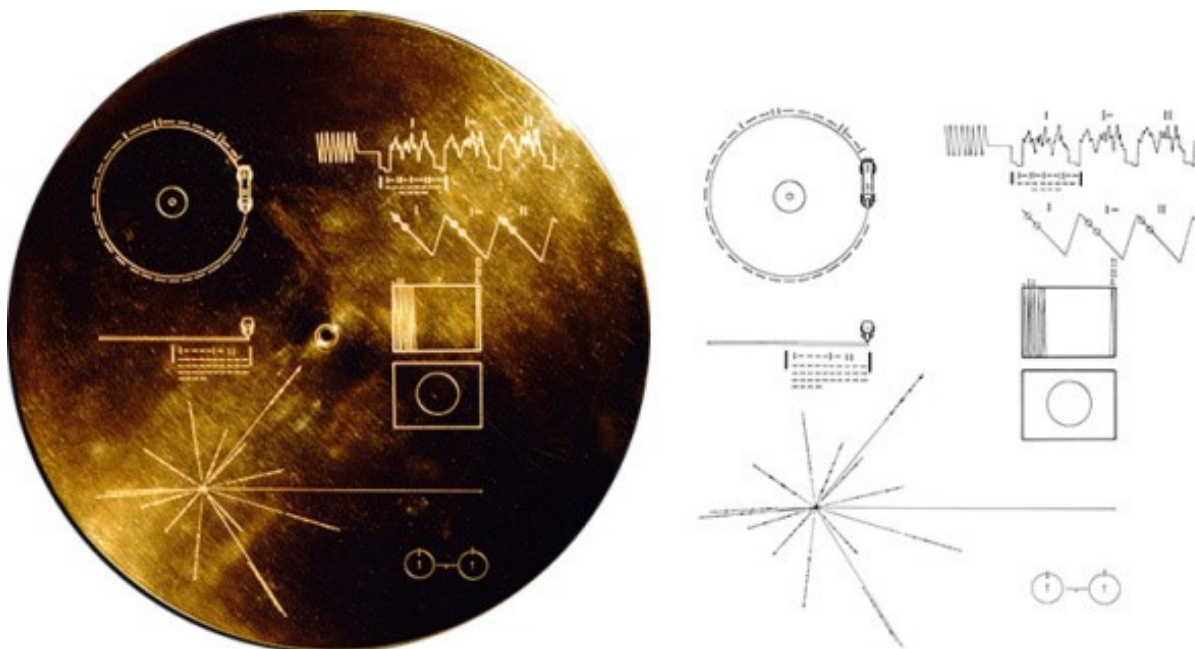
ACBI



ACB

November 2017

Newsletter of the Association of Clinical Biochemists in Ireland
and the Association for Clinical Biochemistry and Laboratory Medicine (Republic of Ireland Region)



To boldly go....This year is the 40th anniversary of the launch of Voyager 1 and 2. Both contain a metal disc, the Golden Record, which contain images and sounds of Earth. Included also is information on science, language and culture. The discs also contain a road map to Earth in case ET wants to visit.

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Reflections from the outgoing ACBI President **Professor Maria Fitzgibbon, Mater Hospital**

It has been an interesting 2 years within clinical biochemistry in Ireland and it has been a great pleasure to serve as President and to lead ACBI Council in many initiatives.

As always ACBI held a number of well organised and well attended conferences including the ACBI Annual Conference in Cork last year and we look forward to the forthcoming meeting in Galway. We had a number of one-day seminars in emerging diagnostics and workshops in new areas of development and bioinformatics with national and international speakers sharing their expertise.

We have revisions in qualifications for our posts to continue to attract good quality graduates into the profession. Our formal training programme for trainee/basic biochemists as well as more advanced training for clinical biochemists taking FRCPath examinations is developing and evolving and expanding in areas of professional competency training. This training has necessitated specialist training in UK and Spain, when the skill set is not available in Ireland.

We have embraced new technologies, including molecular techniques comprising next generation sequencing, together with further developments in mass spectrometry for new analytes.

In the past year we have had success in attracting new members and have successfully filled a number of posts nationally. We look forward to the implementation of regulation of health professions including the establishment of our own clinical biochemists regulatory board, as set out in the Health and Social Care Professionals Act (2005).

Clinical Biochemists are active on many committees nationally including NCCP, MedLiS, IEQAS and RCPATH (UK). Members have been actively publishing in peer-reviewed journals in clinical biochemistry, endocrinology and general medicine and have contributed to the development of national guidelines.

The Sudden Arrhythmic Death Syndrome (SADS) National biobank is an invaluable diagnostic facility that has been established by the team in Clinical Biochemistry with Cardiology at Mater and Histopathology at St Vincent's University Hospitals. Information from genetic testing combined with specialist cardiac histopathological examination has provided definitive diagnoses in many cases of SADS-related deaths.

The ACBI has been incorporated and is now a company limited by guarantee with a revised constitution.



"Cholesterol - A problem solved?"

HEART UK 31st Annual Medical & Scientific Conference
Wednesday 5 - Friday 7 July 2017
Warwick Arts Centre, University of Warwick, Coventry, UK

**Karen Heverin, Trainee Clinical Biochemist,
Mater Hospital Dublin**

I WAS FORTUNATE ENOUGH TO ATTEND Heart UK's training day and annual conference in Warwick this year, organised by Prof. Elizabeth Hughes. The main topics covered at the meeting

were an update on cholesterol and preventative medicine, Familial Hypercholesterolaemia and the role of Lipoprotein (a). Prof. Gray gave an interesting overview on FH. Heterozygous FH is common (1:250-1:500 in UK) and is underdiagnosed resulting in at least 10 years of life lost. He also highlighted the NICE CG71 (revision:2017) recommendations to consider FH if chol > 7.5mmol (\pm family history-cardiac event in anyone <60Y in a first degree relative/index case). Primary care patients with chol >9.3mmol should be referred for specialist review. Prof. Wald explained that the best time to genetically screen for FH is in childhood, one year after birth. Between 1-9yrs old, the detection rate is 88%. In one study a third of children with FH mutation didn't have elevated cholesterol. The importance of FH diagnosis was highlighted by the patient interaction session where an FH patient spoke about the effect of an FH diagnosis on his family, particularly his young son who was also diagnosed with FH.

Dr. Datta gave an interesting insight into the lipoprotein apheresis service in the UK. Only eight locations in the whole of the UK provide this service that is required by patients every two weeks. Apheresis is very effective at reducing lipoprotein (a), usually by 70% in the first few hours, and as such lipoprotein (a) reduction is the target for measuring apheresis effectiveness. The indications for apheresis were also discussed and it should be given to FH homozygotes, FH heterozygotes poorly controlled, or those with very high Lp(a). Apheresis treatment is much more expensive than PCSK9 so the cost vs benefit must be examined case by case.

Overall a lot of information was absorbed at the Heart UK conference and I would certainly recommend attending the 2018 conference due to be held in Warwick again in July.

ACBI 40 at the Ardilaun Hotel, Galway

This year sees the 40th gathering of the ACBI's annual conference and the 53rd anniversary of the founding of the ACBI. The conference has been an enduring item on the Association's calendar and continues to go from strength to strength. The first meeting took place in 1978 in the Marine Hotel, Sutton, Co. Dublin. The Chairman of the ACBI at the time was the late Des Kenny and it was at his instigation that an ACBI annual conference be held. The first organiser was John McSweeney aided and abetted by Tony McGill.

ACBI 40 takes place on November 10th and 11th in the Ardilaun Hotel Galway, chaired by Paula O'Shea, with the usual excellent line-up of national and international speakers. The hotel itself has an interesting history. Initially called Glenarde House it was built c1840 as a townhouse for the Perrse family. The Perrse dynasty had a long association with the Galway area which started with the Rev Dudley Persse being granted a parcel land in the 1670s by King Charles II. The Persse ancestors built up large landholdings and became involved in the commercial, maritime, political, social and sporting affairs of Galway. One of the most illustrious members of the family was Isabella Augusta Persse, later Lady Gregory, co-founder of the Abbey Theatre. Glenarde House was sold to Patrick Boland of Boland's Biscuits fame in 1922 and in 1962 was sold again to Mr. & Mrs. Patrick D. Ryan who converted the property into a hotel, the Ardilaun. The hotel first opened its doors on St. Patrick's Day 1962.



Rev Dudley Persse
(1625-1699)



Isabella Augusta Persse
(Lady Gregory)



Ardilaun Hotel

Members' Publications

Ambient UVB Dose and Sun Enjoyment Are Important Predictors of Vitamin D Status in an Older Population.

O'Sullivan F, **Laird E**, Kelly D, van Geffen J, van Weele M, McNulty H, Hoey L, **Healy M**, McCarroll K, Cunningham C, Casey M, Ward M, Strain JJ, Molloy AM, Zgaga L. *J Nutr.* 2017 Mar 22. pii: jn244079. doi: 10.3945/jn.116.244079. [Epub ahead of print]

High-sensitive cardiac troponin-I facilitates timely detection of subclinical anthracycline-mediated cardiac injury.

Jones M, **O'Gorman P**, Kelly C, Mahon N, **Fitzgibbon MC**. *Ann Clin Biochem.* 2017 Jan;54(1):149-157. doi: 10.1177/0004563216650464.

Hypertension: The role of biochemistry in the diagnosis and management.

O'Shea PM, **Griffin TP**, **Fitzgibbon M**. *Clin Chim Acta.* 2017 Feb;465:131-143. doi: 10.1016/j.cca.2016.12.014. Review.

IgG N-Glycosylation Galactose Incorporation Ratios for the Monitoring of Classical Galactosaemia.

Stockmann H, Coss KP, Rubio-Gozalbo ME, Knerr I, **Fitzgibbon M**, Maratha A, Wilson J, Rudd P, Treacy EP. *JIMD Rep.* 2016;27:47-53. doi: 10.1007/8904_2015_490.

Screening for pheochromocytoma and paraganglioma: impact of using supine reference intervals for plasma metanephrines with samples collected from fasted/seated patients.

Casey R, **Griffin TP**, Wall D, Dennedy MC, Bell M, **O'Shea PM**. *Ann Clin Biochem.* 2017 Jan;54(1):170-173. doi: 10.1177/0004563216646395

β -Blocker withdrawal is preferable for accurate interpretation of the aldosterone-renin ratio in chronically treated hypertension.

Browne GA, **Griffin TP**, **O'Shea PM**, Dennedy MC. *Clin Endocrinol (Oxf).* 2016 Mar;84(3):325-31. doi: 10.1111/cen.12882.

Stability and accuracy of total and free PSA values in samples stored at room temperature.

Forde JC, **Blake O**, Crowley VE, Lynch TH. *Ir J Med Sci.* 2016 Nov;185(4):989-991.

Predictors of longitudinal change in bone mineral density in a cohort of HIV-positive and negative patients.

Tinago W, Cotter AG, Sabin CA, Macken A, Kavanagh E, **Brady JJ**, McCarthy G, Compston J, Mallon PW; HIV UPBEAT Study Group.. *AIDS.* 2017 Mar 13;31(5):643-652. doi: 10.1097/QAD.0000000000001372.

Calcium intake in winter pregnancy attenuates impact of vitamin D inadequacy on urine NTX, a marker of bone resorption.

O'Brien EC, **Kilbane MT**, McKenna MJ, Segurado R, Geraghty AA, McAuliffe FM. *Eur J Nutr.* 2017 Feb 21. doi: 10.1007/s00394-017-1385-3. [Epub ahead of print]

Multiple Looser zones of osteomalacia in Byler disease with associated vitamin D deficiency, phosphaturia, and elevated FGF23.

Tarazi M, Ellanti P, McKenna MJ, **Kilbane M**, McCormick PA, Hurson C. *Int J Surg Case Rep.* 2016;19:150-3. doi: 10.1016/j.ijscr.2015.12.037.

Greater yogurt consumption is associated with increased bone mineral density and physical function in older adults.

Laird E, Molloy AM, McNulty H, Ward M, McCarroll K, Hoey L, Hughes CF, Cunningham C, Strain JJ, Casey MC. *Osteoporos Int.* 2017 Aug;28(8):2409-2419. doi: 10.1007/s00198-017-4049-5. Epub 2017 May 1.

β hCG-secreting osteosarcoma.

Harrold E, McMahan E, **McGing P**, Higgins M. *BMJ Case Rep.* 2017 Apr 28;2017. pii: bcr-2016-218438. doi: 10.1136/bcr-2016-218438.

Time and temperature affect glycolysis in blood samples regardless of fluoride-based preservatives: a potential underestimation of diabetes.

Stapleton M, Daly N, **O'Kelly R**, Turner MJ. *Ann Clin Biochem.* 2017 Jan 1;54(1):168-173. doi: 10.1177/0004563216682978. [Epub ahead of print]

A 1-year prospective study of the effect of infliximab on bone metabolism in inflammatory bowel disease patients.

Veerappan SG, **Healy M**, Walsh B, O'Morain CA, Daly JS, Ryan BM. *Eur J Gastroenterol Hepatol.* 2016 Nov;28(11):1335-44. doi: 10.1097/MEG.0000000000000719.

Generating method-specific Reference Ranges - A harmonious outcome?

Lee GR, Griffin A, Halton K, **Fitzgibbon MC**. *Pract Lab Med.* 2017 Jul 5;9:1-11. doi: 10.1016/j.plabm.2017.06.001.

The prevalence of vitamin D deficiency and the determinants of 25(OH)D concentration in older Irish adults: Data from The Irish Longitudinal Study on Ageing (TILDA).

Laird E, O'Halloran AM, Carey D, **Healy M**, O'Connor D, Moore P, Shannon T, Molloy AM, Kenny RA. *J Gerontol A Biol Sci Med Sci.* 2017 Sep 2. doi: 10.1093/gerona/glx168. [Epub ahead of print]

LET ME TELL YOU ABOUT..... AN ARTICLE ON THE BT YOUNG SCIENTIST EXHIBITION BY DR PEADAR MCGING, PRINCIPAL CLINICAL BIOCHEMIST, MATER HOSPITAL, DUBLIN

PHOTOGRAPHY BY SUSAN MCGING

Working in laboratories we can easily become isolated from those we help in our work every day, the patients. There is one non-academic conference I attend each year where the enthusiasm, curiosity, and ability to ask questions (and get some answers), of our country's youth brings me insight into so many aspects of healthcare. The next edition of the conference is in two months' time (Jan 11-13) and I would like to encourage you all to attend at some stage. To whet your appetite and give you a flavour of the event I have chosen to describe nine of the 550 projects on display at the 2017 exhibition.

I'm sure it will come as no surprise that the event I'm talking about is the BT Young Scientists and Technology Exhibition in the RDS. It's an event where you could easily spend the whole day just visiting healthcare-related projects, and still not get to see them all. The projects I have chosen are not specifically laboratory topics but do relate to our work. What makes the YSTE so special, in my mind, is the way projects are conceived, and the personal insight this gives those of us working in healthcare into real-life impact of disease. It also brings a way of communicating with the general public through young and very enthusiastic messengers.

The title *My Cancerous Cell* was what drew me to poster number 3535, the work of Katarzyna (Kasia) Skoczen, Meghan McGill, and Mary Lugemba, Third Year students from Coláiste Bríde in Clondalkin. The project arose from Katarzyna's diagnosis with Hodgkin's Lymphoma in November 2015. She was playing basketball in a school match and got pushed up against the wall by a player from the other team. Later on that day she started coughing up blood. Subsequent investigations led to diagnosis of Hodgkin's Lymphoma resulting in surgery and chemotherapy.

Kasia and her friends set up a web-page (<http://mycancercell.mandmg.com>) which included many features such as a diary of her diagnosis and treatment, some extracts from her friend Megan's diary, and separate Do's and Don'ts sections aimed at teachers and at fellow students and friends. On this website they tried to pass on advice based on their joint experience of Kasia's cancer and having a friend who got cancer. Their advice on issues such as the difficulty Kasia had with learning (schoolwork) during and even after chemo and what young patients and their teachers could expect in this regard particularly caught my attention.

The three girls believe the recent TV ads have heightened awareness of cancer and they want to build on that

to develop workshops to bring to schools, particularly for Transition Year. They point out that "cancer isn't on the curriculum for Science or Home Economics in the Junior Cycle. How cancer is formed is mentioned in the Senior Cycle, and that's only if you chose to do Biology. Even still, it's very minimalistic. It talks about how cells can sometimes divide abnormally, and form tumours." They would like to improve that.

A project on using stairs versus a lift was one I definitely wanted to visit. Thaara Wilson, Divya Kripakaran, and Sherine Shibhu, from St Mary's Secondary School in Glasnevin asked the question *Does using the lift have a negative impact on the health of teenage girls?* The girls told me they were conscious of how "nearly everybody moans about using the stairs" with their heavy bags (average weight 5.2kg) in their 4-storey school building.

For their project eight students from each year except Transition Year were allowed use the lift and instructed to do so. After three weeks various measurements were made and these showed that fitness in those allowed use the lift had declined even in that short time. Such a short study with two groups of only n=20 is clearly not definitive, but for me the important thing was that these students focussed on an important simple health benefit, using the stairs, which is often neglected within our society and within hospitals (where you sometimes have to search to even find the stairs). It turned out in this project that the stairs was often the main exercise for a lot of students (as evidence by pedometer readings) and, encouragingly, 75% of those using the lift wanted to go back to using the stairs at the end of the experiment. Coincidentally a paper in the journal *Med. Sci. Sports Exer.* in February concluded 'brief, intense stair climbing is a practical, time-efficient strategy to improve CRF [cardiorespiratory fitness]' (Allison et al, 2017, 49; 298-307).

An investigation into the public's attitudes and perceptions towards antibiotic use and antimicrobial resistance was another project I made sure to visit. Amy Richards, from Loreto Secondary School in Wexford, became interested in the topic when she watched a TED talk by Maryn McKenna on YouTube. She and her fellow Transition Year students, Rebecca Thomas and Sadhbh Cullinane, surveyed members of the public in Ireland and abroad, particularly France, to compare practice.

For this brief article, I'm just reporting their findings in the 960 Irish responses. Of these, 11% stated they stopped taking a course of antibiotics when feeling better, with

86% stopping when finished the full course. That antibiotics act against bacteria, and only bacteria, was known to 82% of the respondents 25 years or over, but only 60% of the under-25s. In fact one-fifth of the under 25s thought antibiotics only killed viruses. Nearly everyone in the age 25+ groups had heard of antibiotic resistance (95%) but less than three-quarters responded positively to that question from the younger cohort (73%). So I think we can believe that the messages are getting out there but there is more work to be done, particularly among younger adults.

There were six projects related to Diabetes Mellitus, of which I've chosen to tell you about three. I've chosen three because DM is a disease with very significant clinical chemistry input, and also because these projects show the variety of approaches adopted by students. The first such project is *Do you understand Type 1 Diabetes?*, the work of Seán Power, a First Year student at Portumna Community College. Seán believed many fellow students had incorrect knowledge of Type 1 Diabetes and he set out to investigate. His eleven-question survey elicited 93 responses (60% female; age range 12-18). From those he learned that many students were well informed, but equally many were not. For example one half of all respondents were aware that Type 1 Diabetes cannot be cured (at present) but one quarter thought it could, and one-quarter didn't know. The figures for those who knew Type 1 was not caused by too many sweet foods were very similar with one half getting this correct and one-quarter each incorrect or 'don't know'. The problem with the incorrect impression regarding sweets and Type 1 was a tendency to induce an "it's your own fault" reaction from some.

Rachel Campbell, Bronagh Cassidy, and Aoife Lowth, Transition Year students in St. Vincent's Secondary School in Dundalk, won the Bristol Myers Squibb award for their project *ARIA or Manual? – A statistical analysis into which method of grading retinal images for diabetic retinopathy is better*. Having friends and acquaintances in the school with Diabetes, and having been told of the strong fear of blindness caused by the disease, the three girls were interested in doing a project on that. But they wanted to deal with data from real patients.

A lot of the Young Scientist medical projects I visit each year work involve collaboration between professionals with expertise and students with intelligence, enthusiasm, and a willingness to do the hard graft. These young people approached an Ophthalmologist, and the result was a project of value to all. ARIA (Automated Retinal Image Analysis) is free-access software written for the analysis of blood vessels in retinal images. From their analysis they proposed that ARIA could safely fit into the initial stages of retinal screening, replacing the level

one grader, and thereby speeding up the overall process.

The title *Diabetica* drew me to the project of Second Year students Aoibhín Foley and Caoimhe Woods from Presentation Secondary School in Clonmel. Their project won the Alexion Award for 'research into the most innovative ways in which technologies and the data they capture can have a beneficial impact on patients managing chronic conditions'. These girls developed an app to help individuals with Diabetes. One part of their project involved taking glucose readings from a glucose meter, transferring these to the app using encrypted data, and then processing the data to produce graphs. These graphs allowed patients to follow trends in their blood glucose levels much more easily, and to respond appropriately.

Those of us working in healthcare will be conscious of the risks involved in buying medication over the internet. But what about the public's knowledge? That was one of the questions Jennifer McCarthy, a Transition Year student from Kinsale Community School, set out to answer in her project *Not What the Doctor Ordered: A statistical study investigating whether cost is the main incentive for self-medication*. She interviewed 876 adults and learned that about one-third of those she spoke to would purchase medicine from the internet. Worryingly almost half of all those surveyed (49%) believed there was no risk to the potency of medicines if obtained in that way.

The shock of finding out during Home Economics class that women are so prone to osteoporosis and osteoporotic fractures was what prompted a project by Ella Brennan and Jessie Oyenuga from Loreto Secondary School, Kilkenny. They analysed detailed food logs collected over five days by 100 girls aged 13 to 17, plus 509 responses to questionnaires on teenage girls' knowledge of osteoporosis, calcium, and Vitamin D. They found a lack of awareness among teenage girls of the importance during adolescence of calcium and vitamin D intake and weight bearing exercise in preventing osteoporosis in later life. Like so many groups I met at this exhibition Ella and Jessie not only identified gaps in knowledge but then set about correcting the deficit. The educational activities they introduced did improve intake of these nutrients though overall intake was still below recommended levels. These students believe that some advertising needs to focus specifically on teenage girls, rather than just young children and older adults.

To finish I'll fly through three other projects that caught my attention. Tony O'Halloran from Coláiste an Spioraíd Naomh in Cork city was curious about portion size and found his bowl of cereal was actually twice the recommended amount. His subsequent research on 200 fellow students showed they were eating 2-2½ times the recommended portion sizes, without realising that.

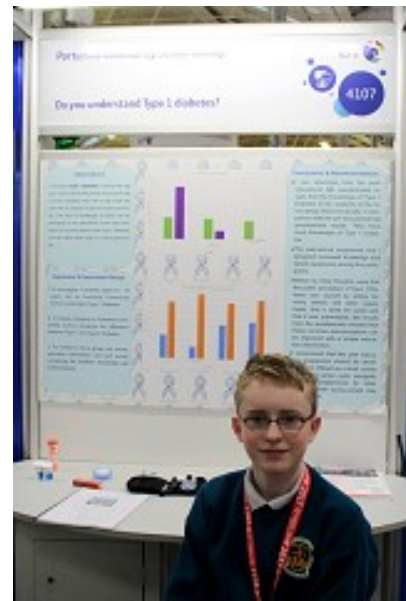
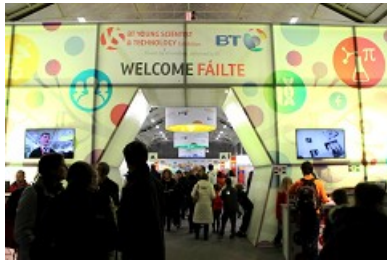
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He proposed that 'grams' is an abstract concept and that portion size should be described using something more understandable such as one tea-cup or similar. Oisín Gartlan of Patrician High School in Carrickmacross investigated impact of anti-smoking ads on teenagers. He proposed that ads aimed at young people needed to be directed primarily through social media and needed a different focus than the current TV ads. Finally, Zacharie Carr and Sophie Lee from St Conleth's College in Dublin interviewed 233 third level students on their favourite toys when young. No surprise that for architecture students they preferred Lego and other construction toys. For science students the picture was more mixed – 24% for electronic games and 21% construction toys, with lesser numbers choosing dolls or action figures.

ACBI and ACB (Republic of Ireland Region)

One of the very interesting aspects of so many of the medically-related projects in the Young Scientists' Exhibition was the efforts to communicate about clinical conditions to a lay audience. In particular a desire to communicate with young people was evident, and many of the projects proposed mini-modules on these matters for inclusion in the new Junior Cert cycle as well as in Transition Year. Maybe an increased communication between education and health authorities would help inform our young people better. This exhibition shows their interest in asking the questions and finding the answers. If you haven't visited before then bear it in mind for next January – you'll get lots of answers for yourself.

Photos taken at the Young Scientists Exhibition, 2017



EFLM Update

European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) Working Groups have recently published a couple of interesting papers. The first by the Working Group on Patient Focused Laboratory Medicine is a survey of patients' views from eight European countries of interpretive support from Specialists in Laboratory Medicine. It can be found at *Clin Chem Lab Med* 2017;55:1496-500. Of 1084 individuals interviewed over 70% expressed an interest in receiving their reports with individualised interpretation. This is an ongoing debate which in general has gained little traction.

A paper on behalf of the European Biological Variation Study of the EFLM Working Group on Biological Variation (otherwise known as EuBIVAS) was published in *Clin Chem* 2017 doi 10.1373/clinchem.2017.275115. This group was tasked with assessing biological and analytical variation of serum creatinine analysed by both enzymatic and picrate methods. Both assay types yielded similar biological variation values (4.7 and 4.2% respectively). Analytical variation for the picrate method was significantly higher compared to the enzymatic method (4.4% v 1.1%). The authors raise doubts about the future use of the picrate method for routine determination of creatinine.

Useful Websites/Apps

<https://www.guidelinecentral.com/summaries/>

A comprehensive library of guidelines searchable under several headings e.g. category or speciality. Searchable and returns can be ranked in several ways. Most guidelines are freely available but some have paywalls.

Reddit Lectures

<https://www.reddit.com/r/lectures/>

Crowdsourced collection of top lectures from professionals, academia, governments.

Radio Garden

<http://radio.garden/live/>

A Google map for radio. 10,000 stations available. Drag the globe and click your station.

Upcoming Meetings



21st Workshop on Vitamin D, May 16-19 2018, Barcelona

<http://www.vitamindworkshop.org/barcelona.html>

World Congress on Prevention of Diabetes and its Complications, July 15-18 2018, Edinburgh

<http://wcpd10.com/>

World Congress on Osteoporosis, Osteoarthritis & Musculoskeletal Diseases, April 19-22 2018, Krakow

www.wco-iof-esceo.org/

21st European Nutrition and Dietetics Conference, June 11-13 2018, Dublin.

<http://www.nutritionalconference.com/europe/>

The 22nd International Mass Spectrometry Conference (IMSC 2018), 26 - 31 August 2018, Florence.

<http://www.imsc2018.it>

PUBLICATION IN THE NEWS

X-L Bu, Y Xiang, W-S Jin et al. Blood-derived amyloid- β protein induces Alzheimer's disease pathologies. *Molecular Psychiatry*, (31 October 2017) | doi:10.1038/mp.2017.204

This paper caused a bit of a stir. It claims that in conjoined rats, one of whom was genetically modified to develop early Alzheimer's, the other developed the condition over time presumably as a result of the mixing of blood between the two animals. The researchers suggest that β -amyloid protein produced in the Alzheimer's affected rat passed into its conjoined partner and this animal subsequently developed plaques. The presumption from this is that blood transfusions from patients with Alzheimer's could pass on the disease to a healthy recipient. It is a big leap, however, to extrapolate from the highly unusual conditions of the conjoined rats whose blood is mixing on a continual basis with irregular or once-off transfusions. It took one year for the normal rat to develop signs of disease and the lead author of the paper says it is unlikely that patients will develop Alzheimer's from transfusions. This is also the position other researchers have taken claiming that the rat experiments are a far cry from human Alzheimer's disease.

(Thanks to Eamon Laird for alerting me to this paper)