



PDS and COVID-19

It has been an unusual six months since our last *Monitor* newsletter in April. The whole world has become used to daily news on COVID-19, has faced new challenges of social distancing, and has experienced lockdown. We are all developing our “new normal” at work as well as at home and we, in PDS, are no exception.

We have remained “open for business” throughout the last six months and have adapted our working practices to keep staff safe, whilst providing comprehensive services to our customers at a difficult time. We have helped the UK response to COVID-19, supporting not only our key-worker customers in a variety of sectors, but also importantly the emergency response within the COVID-19 wards of our hospitals, where both NHS and private-sector medical workers have worked valiantly (and continue to do so), caring for our friends and families.

We have been reviewing all our business processes and increasing our resilience in order to ensure that we can continue to deliver our excellent level of service to you over the coming months, looking particularly at this coming winter. We have been working together safely

and flexibly, providing key-worker status for our critical suppliers and developing cover for tasks by training more staff. Although some weeks have been tough, we have tried to keep positive as a team, getting together virtually at least three times a week, including a themed “Fun Friday” to give us a bit of a boost – see the photo below of our Wild West themed meeting!

We are missing being able to attend conferences and exhibitions, and to have visitors come to see us here in Chilton, but we very much hope that we can return to this in the coming months. In the meantime, please do give us a call or contact us via e-mail as we are all still here – ready to help!



STOP PRESS!

Please remember to return your dosimeters to us either in our green envelope or using the post-paid label we supplied.



PHE's PDS moves to the new NIHP

On August 18th 2020, the Government announced the creation of a new National Institute for Health Protection (NIHP). All the radiation protection services currently provided by the Centre for Radiation, Chemical and Environmental Hazards (CRCE) within PHE will transfer into NIHP. The administrative process to finalise the establishment of this new body will be completed by April 1st 2021.

Please be assured that this transition does not affect arrangements with PDS customers; all contracts for services and appointments of PHE in a radiation protection expert capacity will remain valid. Customers will be advised when the transition is complete, and when the change of name comes into force.

Non-mutational effects of ionising radiation on the heart

Dr Ken Raj - Radiation Effects Department, PHE

The earliest report on the effects of radiation on the heart was published in 1897, just two years after the discovery of X-rays. For example, incidences of cataracts and heart abnormalities were observed and reported before cancers were associated with ionising radiation. These pathologies were rarely investigated, largely due to the comparatively greater importance of cancer, which attracted the attention of the radiobiologists of the day. This then had a profound effect on the later understanding of the route by which radiation elicits biological effects - namely through DNA damage which, when incorrectly repaired, results in the acquisition of mutations. The clarity and elegance of this mechanism inadvertently led to the assumption that all biological effects of radiation would naturally be mediated through mutations, which was supported by the gene-centric view of pathology at that time. This notion is, however, incompatible with cardiovascular disease, cataracts and other non-cancer pathologies, which are neither initiated by nor sustained by mutations.

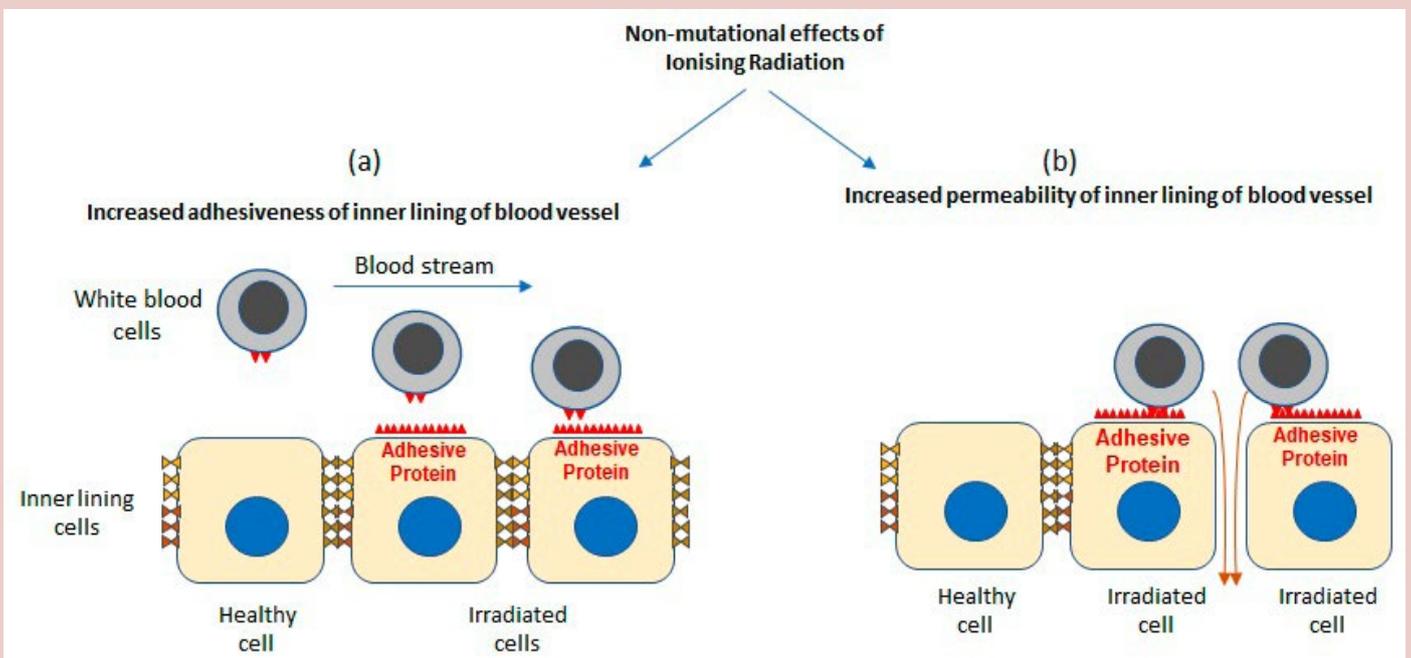
New insights into the effects of radiation on cells have come to light recently, and importantly, whilst these are also non-mutational, they can nevertheless instigate changes to cells and endow them with properties that can increase the risk of cardiovascular disease. The cells in question are those that form the inner lining of the blood vessels that irrigate the heart muscle. When the DNA of these cells is damaged by radiation, they attempt, and mostly succeed, in repairing the damage. If, however, the damage cannot be repaired, the cell enters a state that is termed senescence, where it instigates chemical modifications to specific locations in the DNA strand. Importantly, these modifications preserve the A, C, G and T sequences of the DNA, i.e. the DNA itself is

not mutated, but instead they change the magnitude of expression of genes near the modified region. One such gene encodes a highly adhesive protein that appears on the upper surface of the inner lining cells. Healthy cells produce very small amounts of this protein but, upon irradiation, followed by senescence and modification of the DNA close to this gene, very high amounts of this protein are produced, which appear on the cell surface. This now highly adhesive surface can now capture white blood cells in the blood that would normally go by unimpeded (figure a).

This, by itself, is a benign event, unless there is a breach of the inner lining of the blood vessel through which the trapped white blood cells can gain access into the wall of the blood vessel. The presence of white blood cells in the vessel wall is a crucial step in the development of a swelling, which can mature into an atherosclerotic plaque – the plaques that can lead to cardiovascular disease.

Radiation can indeed induce such a breach by causing the inner lining cells to cease production of the necessary proteins – the junction proteins – that bind together tightly to create an inner lining that is impermeable to white blood cells and other blood-borne factors such as cholesterol (figure b). The cessation of this protein's production is triggered in part by highly reactive oxygen atoms and molecules, which are generated when radiation interacts with water in the cell. This is yet another biological effect of radiation that does not involve mutations of specific genes, and yet is able to inhibit the production of specific proteins.

Collectively, these insights demonstrate that ionising radiation can readily induce non-mutational biological effects that can increase the risk of cardiovascular disease. Given that cancer is the only known mutation-driven pathology associated with radiation, it prompts the question as to whether mutation induction is the rule or the exception with regards to radiation effects on human health.



PHE enhances its Security with Cyber Essentials Plus accreditation



PHE is pleased to announce that it was awarded its Cyber Essentials Plus Certificate on June 25th 2020, a position which builds on its achievement of Cyber Essentials as first awarded to the organisation back in early 2019.

This latest certificate is a clear demonstration from the National Cyber Security Centre (NCSC) of PHE's commitment to securing its external-facing infrastructure and associated internal operations. It enhances our Cyber Essentials accreditation whilst retaining the NCSC's trademark simplicity of approach; the protections that organisations like PHE are asked to put in place are the same, but for Cyber Essentials Plus a hands-on technical verification needed to be carried out.

So why has PHE pursued Cyber Essentials Plus? Well, there are a number of reasons why this is important, as it not only benefits PHE as a whole, but also its various constituent parts, of which PDS is one of course. Such reasons include: -

- Cyber Essentials Plus is a certified standard for securing computers, networks and other IT infrastructure.
- It should reassure PDS customers that we will always work to secure our IT against cyber-attack, thus helping greatly to protect client-sensitive information.
- Some Government contracts require Cyber Essentials Plus certification and increasingly the commercial sector is looking to adopt this standard too. New clients also may be attracted to PDS by the promise that we have robust cyber security measures in place.
- Both PHE and PDS have a clear picture of the organisation's current cyber security level and what is needed to keep it secure into the future.

Hugh Schoenemann, Customer Services Manager for PDS says, "Gaining Cyber Essentials Plus is a huge achievement which will further cement our commercial relationship with our service users. It demonstrates a commitment to cyber security that few in the personal dosimetry world can match, and puts us in good shape for some time to come. Many congratulations to the PHE ICT Security Team."

Should any PDS clients require a copy of our CSE accreditation certificate, please e-mail either Nicky Gibbens, Personal Dosimetry Services Manager or Hugh Schoenemann, Customer Services Manager.

Sean Baker retires

Since the last issue of *Monitor*, PDS has bid a fond farewell to Sean Baker, who has retired recently and who fulfilled the role of PDS Lab Manager for many years.



Sean joined what was then the National Radiological Protection Board (NRPB) back in 2002, which subsequently changed its name to the Health Protection Agency (HPA) in 2003. He was still around when the HPA became PHE back in 2013 but retired only a few days short of the recent announcement of PHE becoming the National Institute for Health Protection (NIHP).

All of us in PDS (and PHE Chilton as a whole) wish Sean all the best in his well-deserved retirement, knowing that his inimitable style will be a tough act to follow.

Please note that PDS should be in a position to announce Sean's replacement in the next issue of *Monitor*.

PDS welcomes Shakirah Nambalirwa

Replacing Andy Horton (who left us in January), we are pleased to announce that Shakirah Nambalirwa has been recruited to take over the role of Customer Services Supervisor in our group here at Chilton.

Shakirah graduated from Cardiff Metropolitan University where she studied Environmental Health. Whilst there she also had the opportunity to present at the International Federation of Environmental Health Conference in Blantyre, Malawi in 2016.

Shakirah enjoys watching football, especially the best team in the world - Manchester United - and believes that they're going to win the treble this coming season. She also enjoys travelling (especially road trips), watching nature documentaries, and going on safaris.

Welcome, Shakirah, to your new role.

Editor's comment: The scientific evidence is tenuous (at best) that Manchester United are the best team in the world. Just saying.

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Duncan Cox appointed new head of Dosimetry Services Department

With the retirement of Neil McColl as Head of the Dosimetry Services Department (see the previous issue of *Monitor*), PHE is delighted to announce the arrival of Duncan Cox as Neil's replacement.

Duncan began his career in radiation protection at the Atomic Weapons Establishment in 1996, where he worked in radiation metrology and supported AWE's own Personal Dosimetry Service. In 2001 he moved to PHE's radiation predecessor, the NRPB, to join the Emergency Response Group where he became Group Leader in 2014 before becoming Head of PHE's Dosimetry Services Department in February of this year.

Duncan remains one of CRCE's radiation emergency on-call officers who provide 24/7 activation of PHE's emergency arrangements for radiation incidents, including emergency dosimeter reading. Sitting on the Society for Radiological Protection (SRP) Source Security and Emergency Preparedness Topic Group, Duncan has been a member of SRP for over two decades, has acted as a specialist advisor to the UN's International Atomic Energy Agency (IAEA) and World Health Organisation (WHO), and is a UK representative on the Global Initiative to Combat Nuclear Terrorism.

Outside of work, Duncan enjoys rock climbing, walking and canoeing and, as a Scout leader, has a keen eye on the environment. Enabling the Personal Dosimetry



Service to grow in an environmentally sustainable manner and develop further its already excellent customer service are key priorities for Duncan in his role as Head of Department; "We must act responsibly and ethically in looking after our staff, our customers and the environment. I believe that by looking at the purpose of what we do, we can aim to improve each and every aspect of it, even if we're already really good at it", he says.

Stay connected with Personal Dosimetry Services (PDS)

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A SHORT REMINDER THAT, AS OF APRIL 1ST 2020, PDS "WENT PAPERLESS" TO IMPROVE SUSTAINABILITY AND LESSEN OUR ENVIRONMENTAL IMPACT. IF YOU HAVE OPTED TO STILL RECEIVE REPORTS IN PAPER FORM, A FLAT FEE OF £100 WILL BE PAYABLE ANNUALLY FROM JANUARY 1ST 2021.