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Meet Dr. Adrian Waring

Adrian has planted deep roots in the CRO industry.

At the University of Wales, Adrian earned his BSc. degree in biochemistry. It was here he became interested in xenobiotic metabolism, which simply put, is how biological systems deal with foreign compounds, such as drugs and pesticides, they encounter. Radiolabelled tracers are essential for this work to enable the biotransformation of the molecule to be followed. He still enjoys identifying novel metabolites.

Adrian's Ph.D. studies centered on metabolism as a mechanism for herbicide selectivity and the use of cell cultures as a metabolic model for whole plants. His early career was spent in environmental fate, which involves conducting small-scale lab studies to investigate the fate and behavior of xenobiotics in soil, sediment and water. This has been a strong growth area in metabolism. When Adrian started in the industry in the mid-1980s, this work was predominantly performed on compounds that are deliberately introduced into the environment, such as pesticides. Today, environmental risk assessments are needed on a variety of different molecules that enter the environment, including pharmaceuticals, veterinary products, biocides and industrial chemicals.

Now with thirty years of industry experience under his belt—Lean Sigma Master Black Belt, that is—he is focused on the growth of all areas of the metabolism business and driving operational efficiency to ensure delivery of high-quality, cost-effective and on-time studies for our partners.

As Director of Metabolism at Pharmaron, he leads the radiolabelled metabolism team to provide solutions in the areas of drug disposition, including non-clinical QWBA, MARG and *in vitro* ADME, clinical drug metabolism and pharmacokinetics to support clinical studies and regulatory NDA submission using radiolabelled test articles. In addition, his team offers services in evaluating environmental fate for the chemical, crop protection, human and animal healthcare industries.

Adrian notes that it's an exciting time for the metabolism group.

"As we develop integrated services with other parts of the rapidly growing Pharmaron organization, we are adapting our service offerings to meet the needs of partners working with new therapies, such as oligonucleotides, ADCs and other biologics. Science and technology in key areas of metabolism, such as drug-drug interactions (DDIs) and drug transporters, are advancing rapidly and our services need to continually evolve to keep pace with regulatory thinking."

About Dr. Adrian Waring

Adrian is the Director of Metabolism at Pharmaron (formerly Quotient Bioresearch) at the Rushden, UK facility. Prior to Pharmaron, he worked at Covance and Envigo. He received his Ph.D. in biochemistry from the University of London. He is a certified Lean Sigma Master Black Belt. In his spare time, Adrian roots for Peterborough United, his home town football team. He's been a loyal fan since childhood and is hopeful that one day Peterborough United ("The Posh") will play in the Premier League.

2 Achieving FDA Drug Approval

Client success is the top priority for every project we take on, with the ultimate measure of success often being FDA drug approval. Pharmaron's radiolabelled sciences division provides services to support compound development from non-clinical studies to clinical trials, enabling partners to reach critical development milestones and achieve successful compound registration.

A 2016 client study, published in Drug Metabolism & Disposition, focused on AstraZeneca's small molecule kinase inhibitor, AZD-9291 (osimertinib), a treatment for non-small cell lung cancer. Pharmaron's Accelerator Mass Spectrometry (AMS) technology was used in the human metabolism study (mass balance and metabolite profiling), which contributed to the speedy clinical development and FDA approval of the drug now marketed as Tagrisso™. [*Drug Metab Dispos*, 44:1201-1212, August 2016]

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3 Pharmaron's Building Blocks

When you look at the Pharmaron logo, what do you see? The figure and name are inspired by tangram, building blocks, chemistry and biology.

Tangram is a thousand-year-old children's game from China that consists of seven flat pieces, with the objective to use all seven pieces to create numerous, new shapes.

Dr. Boliang Lou, CEO and Chairman, also a chemist, saw the similarities between tangram and chemistry. "Like tangram, chemists start with the same building blocks, but each creates something different. Both the game and the science have the potential for endless opportunities to build something new."

The red and blue shapes in the logo are seven pieces representing the binding of molecules to their biological targets. The Chinese characters reflect key aspects that Pharmaron represents to its partners: health, dragon (a symbol of a vigorous business), transformation/chemistry and success. And lastly the name "Pharmaron" completes the building block metaphor, as it is reminiscent of the word synthon, a synthetic building block or a pharmaceutically relevant synthon.

The whole of Pharmaron's logo represents our core values, including diversity, unity and a team spirit, in addition to our ongoing commitment to build strong relationships with our partners and provide diverse drug R&D services.

4 Pharmaron Acquires SNBL-CPC

On February 28, Pharmaron announced the majority stake acquisition of SNBL CPC, a clinical pharmacology facility located in Baltimore, Maryland that is a leading provider of moderate and highly complex Phase I/II clinical development services for the life sciences sector. Over 200 studies have been completed at this facility, with numerous completed clinical studies submitted in support of global regulatory filings for drug approval for marketing of both small and large molecules.

"This acquisition allows our company to be one-step closer to offering a full spectrum of R&D services and fulfill our vision to be a globally leading organization in the life sciences service industry," said Mr. Larry Lou, President and COO of Pharmaron.

5 Focus On: Oligonucleotides, Radiolabelling and Metabolism

The design and application of oligonucleotides as therapeutic agents requires a basic understanding of their pharmacokinetic properties and bio-distribution. Radiolabelled tracers play an essential role in developing such an understanding. Pharmaron is the largest provider of custom radiosynthesis services using ^{14}C and tritium and has the capability to synthesize radiolabelled oligonucleotides using traditional and automated synthetic methods.

Pharmaron can assess ADME properties of radiolabelled oligonucleotides by conducting pharmacokinetic, excretion balance and biodistribution studies, including quantitative whole body autoradiography (QWBA) and micro autoradiography (MARG), and has recently demonstrated that high quality pharmacokinetic and tissue distribution data can be obtained following radiolabelling of oligonucleotides with tritium. The PK and tissue disposition of potent oligonucleotides radiolabelled with ^{14}C can also be determined using AMS detection. Pharmaron (formerly Xceleron) developed a novel assay combining different methods of chromatography of separation and detection, SPE, UPLC, AMS, to provide high quality PK data for parent ^{14}C-oligonucleotide in plasma, urine and tissues such as liver and kidney.