Matthew Dalby started his research career as a PhD student at the IRC in Biomedical Materials, Queen Mary, University of London on osteoblast response to bioactive composites. After becoming interested in the effects of topography (due to lathe cutting of the composites) on cell function, he moved to Glasgow in 2000 to work for Adam Curtis, Chris Wilkinson and Mathis Riehle where thy published some of the early papers on cell-nanoscale interactions. In 2003 he became an independent researcher securing a BBSRC David Phillips Fellowship to explore mesenchymal stem cell response to nanotopography where he published a number of papers including on nanotopographical triggering of osteogenesis. Appointed to a lectureship in 2008 and a Readership in 2010 he focussed more on control of mesenchymal stem cell self-renewal with nanotopography. In 2014 he became Professor of Cell Engineering at the University of Glasgow and diversified his research to include, with Manuel Salmeron-Sanchez, understanding of cells with protein nanonetworks / ultra-low dose growth factor delivery which recently resulted in a first veterinary trial in a dog where the a large bone defect in the front leg of a Münsterländer that was about to be amputated was fully regenerated and is now functional and load bearing. Also, with Stuart Reid and Adam Curtis, he has developed a nanovibrational bioreactor, the Nanokick, that can be used to drive three dimensional bone formation with no need for material or chemical inducement; this is just published in Nature Biomedical Engineering. Further, he has developed an interest in metabolomics, specifically using materials to identify biologically active metabolites that can influence mesenchymal stem cell growth and differentiation.

He has published around 160 papers focussing on osteogenesis and mesenchymal stem cells, perhaps the most noteworthy including Nature Materials 2007 on nanotopographical control of osteogenesis (this was voted by Nature Materials as one of their top 20 landmark papers in the first 10 years of the journal), Nature Materials 2011 on nanotopographical control of self-renewal, Science Advances 2016 on ultra-low dose BMP2 for bone repair, Chem 2016 on materials based selection of bioactive metabolites and Nature Biomedical Engineering 2017 describing a nanovibrational bioreactor. Much of this work was reviewed in Nature Materials 2014; 13:558.

He holds UK grants from BBSRC, EPSRC and MRC and, with Manuel Salmeron-Sanchez, holds major UK funding from EPSRC looking to deliver on grand challenges using ultra-low dose growth factor delivery and Find a Better Way looking to tissue engineer large bone constructs for civilian survivors of land mine injuries combining ultra-low dose growth factor and nanovibrational technologies; this will include delivery of a first in man trial.

He has won research prizes from the Society for Experimental Biology and Tissue and Cell Engineering Society amongst others and was, in 2016, elected a Fellow of the Royal Society of Edinburgh for his contribution to life sciences in Scotland. Research he has contributed to has been regularly featured in BBC TV, radio and web news as well as in newspapers and websites around the world. He is regularly invited to give conference presentation including at ESB and TERMIS.

He dedicates this talk to his colleague, mentor and friend Professor Adam Curtis 1934-2017 without whom his career would have been very different and much diminished.