Curriculum Vitae – Richard Tester

Name	Richard Frank Tester
Work address	School of Health and Life Sciences (Biological and Biomedical Sciences) Glasgow Caledonian University Cowcaddens Road Glasgow G4 0BA
Citizenship	British
Present residence	UK
Education	Sheffield University (1979-82) - BSc Biochemistry & Physiology Reading University (1984-1985) - MSc Food Science Strathclyde University (1986-88) - PhD Carbohydrate Chemistry Fellow of the Institute of Food Science and Technology Elected Member of the Society of Chemistry and Industry (SCI) Chartered Scientist (CSci.) status granted (2004)
Work experience	• Research Biochemist for RHM (at the Lord Rank Research Centre, High Wycombe) on cereal, carbohydrate and lipid technologies (1985-1986). • Post-doctoral Research Fellow at the University of Strathclyde (Department of Bioscience and Biotechnology) on carbohydrate biochemistry, chemistry and physico-chemical properties (1989-1991). • Strathclyde Institute for Drug Research on the synthesis of novel carbohydrate based drug delivery systems (1992). • DFL on the design of a sugar extraction plant which was ultimately built in Muscat, Oman (1992-1993). • Senior Research Fellow in the Department of Food Science and Technology at The University of Reading working on polymer processing (1993-1994). • Lecturer in Biological and Biomedical Sciences at Glasgow Caledonian University (1994, accelerated promotion in 1997). • Senior Lecturer in Biological and Biomedical Sciences and Programme Leader for Food Technology at Glasgow Caledonian University (1999). Teaching within the following subject areas: Biochemistry, Chemistry, Chemical and Instrumental Analysis and Food Toxicology. • Co-founder of Temp-tell Limited University spin-out company (2000). Company develops and manufactures time-temperature monitoring devices for food and pharmaceutical applications. Intellectual property (IP) granted internationally. • Secretary and co-founder of GW Biologic Limited start-

	up company (2001). Developing biotechnological products labels. • Editor – Journal of the Science of Food and Agriculture (2001). • Co-founder of University's United Kingdom Accreditation Service (UKAS) accredited food-testing service (2001) which is unique for the University sector. • Professor of Carbohydrate Chemistry at Glasgow Caledonian University (2002). • Research and Managing Director and founder of Glycologic Limited (2002). Specialist company focused on use of carbohydrates for nutrient and drug delivery applications. • Development of new BSc Food Bioscience degree (2003/4) and Programme Leader for the programme • Editor - Food Hydrocolloids (2003) • Editor - Progress in Food Biopolymer Research (2004) • External Examiner University of Nottingham (2004) • Advisory Board Starch/Stärke (2004) • Chartered Scientist (CSci) status granted (2004) • Editor Starch/Stärke (2005) • External Examiner NEWI (2005) • Development of new MSc Food Bioscience degree (2006) and Programme Leader for the programme. • Member of University Health and Safety Committee (2006). • Member of the West of Scotland KTP Committee by invitation (2006) • Member of the University's 'Commercial Forum' Commercialisation Committee (2007). • Member of University's New Research Committee (2007) • External Examiner (PhD) – King's College, London (2007) • External Examiner (PhD) – University of Lincoln (2007) • External Examiner – Norwegian University of Life Science, Norway (2008) • External Examiner – University of the West of Scotland, Paisley (2009 and 2010) • Editor in Chief Starch (2010) • Visiting Professor University of Kragujevac, Serbia 2010
Research and development	The major focus of my research work concerns the biosynthesis, extraction, properties, modification and usage of plant carbohydrates. Major application fields are foods and pharmaceuticals. I have many links with academic and industrial researchers in Britain, Europe and beyond. I have created and lead the Glasgow Caledonian University carbohydrate research group. The group is funded from a number

	of sources (below). The group consists/has consisted of technicians, PhD students, graduates and post-doctoral scientists. The group has many commercial linkages within the food and pharmaceutical sectors. With a colleague, we have successfully and uniquely achieved UKAS accreditation for contract food analysis for the University and pursue commercial options with this enterprise. In terms of research funding I receive substantial funding from government (e.g. MAFF/DEFRA, EPSRC, FSA, POC, KTP, DTI etc.), EU, charities and industry amounting to approximately £250,000 per annum. I collaborate with colleagues in many European and non-European countries for different projects. In 1992-1996 I worked as an advisor to the formation of the DFL company which led to the creation of novel date based products and the capacity to produce sugars within Oman and helped avoid imports of sucrose. In 1999 I became involved in the initiation of the establishment and funding of two University spinout companies, Temp-tell Limited dedicated to temperature monitoring and Glycologic Limited, a specialist pharmaceutical (drug delivery) and encapsulation focused company. Temp-tell has been fully spun-out of the University (2001) having (i) won the Glasgow heat of the John Logie Baird Innovation Award and (ii) having been placed second overall in Scotland (1999). The Company is developing commercial success with the patented technology developed by colleagues and myself (based on lipid indicators of temperature). In 2001 I was involved in the formation of GW Biologic Limited with a local printing company dedicated to the development of 'smart' environmental specific detection and monitoring labelling systems. This Company has subsequently (2008) been purchased by another enterprise. In 2002 I created Glycologic Limited – a specialist carbohydrate based drug delivery company – utilising expertise of a colleague and myself and funded by a private share issue. This company is developing specialist IPR and expanding its commercial base in different fields of nutrient / drug delivery and API development – all based on carbohydrates. The Company has successfully developed a client base comprising many well established pharmaceutical companies. Currently, I, with a colleague, am working on the establishment of a new paper technology licensing vehicle/company based on work on cellulosics. The technology has been funded by EPSRC/POC but has received interest from industry for paper security applications. The technology is developing into a paper technology platform – security, health, hygiene etc.
Relevance of experience to the	I have worked with many food companies in many different capacities to commercialise my expertise in carbohydrate

food sector	biochemistry and chemistry. These include food, feed and ingredient manufacturers. Work has included sugars, starch and non-starch polysaccharides. I have a broad range of contacts in this sector and have collaborated with many individuals both within and outside the UK. The experience includes applications and formulations for traditional processing technologies and more novel processes (e.g. high pressure).
Relevance of experience to the pharmaceutical sector	I have developed expertise in the pharmaceutical sector focused on carbohydrates, with a focus on drug delivery, prebiotics and APIs. I have developed a number of products (with associated patents) and have taken them to pre-clinical, clinical trials and commercialisation stages with relevant companies and have organised the necessary stages of research and commercial development. In addition, I have developed new technologies to provide solutions to pharmaceutical problems, include gel systems, powders, tablet excipients and glasses. These products have been patented or have patents applied for. Product size usually represents a few hundred grams at early stages of development to the establishment of contract manufacturing facilities for many tonnes.
Relevance of experience to the chemistry sector	My research experience has broad applications to the chemical sector, where I have worked with many companies on particular technological challenges and process developments. These include carbohydrate isolation, synthesis, characterisation, chemical modifications and applications into industrial products. Work on cellulosics is heavily embedded in this sector.
Academic responsibilities	Teaching responsibilities focus on chemistry and biochemistry with a particular focus on food. I have full responsibility for Food Bioscience programme. This relates primarily to the structure and operation of the food degrees but also incorporates liaison with external bodies responsible for this area (Food Standards Agency, Institute of Food Science and Technology and related bodies). I am co-responsible for the new MSc in Food Bioscience (2006 start). Within the School of Health and Life Sciences (Biological and Biomedical Sciences) I am a member of the Health and Safety Committee, Animal Ethics Committee and Research Active Grouping. Within the University body itself, I am/ have been a member of the (i) Health and Safety, (ii) Intellectual Property, (iii) Knowledge Transfer and Research and Commercialisation (responsible for strategic research strategy) Committees for a number of years. I also support the University's UKAS commercial activity. Externally from the University, I am member of the Food Industry's professional body (Institute of Food Science and Technology, IFST) subject interest group (SIG) Research and Development Committee. I manage research staff and budgets for the different activities I

	am responsible for. These include students, RAs, Post Docs and more senior staff.
Commercial overview	Extensive experience of commercialising research directly from the university sector, from within industry and via spin-out ventures from the university sector. I have been very successful in generating funding for these activities. I hold a number of granted patents and patents in press. I have a broad experience of technology development, control and licensing. I have also brought a number of pharmaceutical and food products to the market.
Publications	*About one hundred published articles – most recent publications cited below.* Tester, R. F., Yousuf, R., Karkalas, J., Kettlitz, B. and Röper, H. (2008) Properties of protease treated starches. *Food Chemistry 109, 257-263*. Elamir, A. A., Tester, R. F., Al-Ghazzewi, F. H., Kaal, H. Y., Ghalbon, A. A., El-Megrahai, N. A. and Piggott, J. R. (2008) Effects of konjac glucomannan hydrolysates on the gut microflora of mice. *Nutrition and Food Science 38, 422-429*. Sutherland, A., Tester, R. F., Al-Ghazzewi, F., McCulloch, E. and Connolly, M. (2008) Glucomannan hydrolysate (GMH) inhibition of *Candida albicans* growth in the presence of *Lactobacillus* and *Lactococcus* species. *Microbial Ecology in Health and Disease 20, 127-134.* Khondkar, D., Tester, R. F. and Karkalas, J. (2009) Effect of cross-linking on the resistance to enzymatic hydrolysis of waxy maize starch and low-methoxy pectin. *Food Hydrocolloids 23, 387-393.* Alvani, K., Qi, X. and Tester, R. F. (2009) Rapid method to determine the molecular weight of dextrins and dextrans. *Carbohydrate Polymers 78, 997-998.* Donthidi, A. R., Tester, R. F. and Aidoo, K. E. (2010) Effect of lecithin and starch on alginate-encapsulated probiotic bacteria. *Journal of Microencapsulation 27(1) 67-77*. Al-Ghazzewi, F. H. and Tester, R. F. (2010) Effect of konjac glucomannan hydrolysates and probiotics on the growth of the skin bacterium *Propionibacterium acnes* in vitro. *International Journal of Cosmetic Science 32, 139-142*. Khondkar, P., Aidoo, K. E. and Tester, R.F. (2010) The effects of temperature, pH and cations on the rheological properties of the extracellular polysaccharides of medicinal species of the genus *Tremella* Pers. (heterobasidiomycetes). *International Journal for Medicinal Mushrooms 12 (1), 73-85.* Tang, M., Alvani, K. and Tester, R. F. (2010) Production and utilisation of gastric rafts from polysaccharides combinations to induce: a preliminary study. *Nutrition and Food Science 40 (2), 155-165*. Qi, X., Band, M., Tester, R. F., Piggott, J. and Hurel, S. J. (2010) Use of slow release starch (SRS) to treat hypoglycaemia in diabetics. *Nutrition and Food Science 40 (2), 228-234*.

	Qi, X. and Tester, R. F. (2011) Bioadhesive properties of β-limit dextrin. *Journal of Pharmacy and Pharmaceutical Sciences 14 (1), 60-66*. Alvani, K., Qi, X. and Tester, R. F. (2011) Use of carbohydrates, including dextrins, for oral delivery. *Starch/Stärke 63, 424-431*. Tester, R. F. and Al-Ghazzewi, F. H. (2011) A preliminary study of the symbiotic effects of konjac glucomannan hydrolysates (GMH) and lactobacilli on the growth of the oral bacterium *streptococcus mutans*. *Nutrition and Food Science 41, 234-237*. Tester, R. F. and Qi, X. (2011) β-limit Dextrin – Properties and applications. *Food Hydrocolloids 25, 1899-1903*. *Filed and Granted Patents* Tester, R. F., Aidoo, K. and Karkalas, J. (1996) Method of Producing Foodstuff. WO1996/037116 and PCT/GB1996/001207. Tester, R. F. and Karkalas, J. (1996) Process for Producing a Flavouring Substance. WO1997/001286 and PCT/GB1996/001482. Tester, R. F. (1997) Compositions Containing Starch Excipients. WO1997/034932 and PCT/GB1997/000788. Tester, R. F. and Karkalas, J. (1999) Orally Administrable Compositions Comprising Cation Cross-linked Polysaccharide and a Polymer Digestible in the Lower Gastrointestinal Tract. WO1999/053902 and PCT/GB1999/001240. Tester, R. F. (2000) Thermal History Indicators. WO2000/047964 and PCT/GB2000/000398. Tester, R. F. and Al-Ghazzewi, F. (2002) Time Temperature Indicators Linked to Sensory Detection. WO2003/006941 and PCB/GB2002/003106. Qi, X. and Tester, R. F. (2003) A Chemical carrier Based on Beta-limit Dextrin. WO2004/014156 and PCT/EP2003/008358. Qi, X. and Tester, R. F. (2004) Compositions and Uses Thereof. WO2005/044284 and PCT/GB2004/004682. Al-Ghazzewi, F. and Tester, R. F. (2005) Improved Prebiotic. WO2005/111195 and PCT/GB2005/001888. Hooper, D. and Tester, R. F. (2006) Gastric Raft Composition Comprising Preferably Processed Starches for Inducing Satiety. WO2007/104905 and PCT/GB2006/000953.
Present appointment	Professor of Carbohydrate Chemistry at Glasgow Caledonian University. Managing Director of Glycologic Limited.