

## Professor Colin Thomas MA(Cantab), PhD, CEng, FIChemE, CSci

Professor of Biochemical Engineering  
Head of Quality Assurance and Enhancement, College of Engineering and Physical Sciences

**[School of Chemical Engineering \(/schools/chemical-engineering/index.aspx\)](/schools/chemical-engineering/index.aspx)**

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### About

Colin Thomas is Professor of Biochemical Engineering in the School of Chemical Engineering. He has published over 100 research papers in scientific journals as well as reviews and books chapters in the fields of fermentation, shear on biological materials and biomechanics. He has received major grants from SERC, BBSRC, EPSRC and industry.

Colin teaches modelling concepts and tools to first year Engineers.

### Qualifications

- Chartered Scientist, 2006
- Fellow of the Institution of Chemical Engineers, elected 1997
- PhD in Biochemical Engineering, UCL, 1978
- MA(Cantab), 1976

### Biography

Professor Colin Thomas moved to the University of Birmingham from University College London in 1989. Previously, he had worked in the chemical industry for six years.

He was the Head of Chemical Engineering at Birmingham in 2001 – 2002, Deputy Dean of Physical Sciences and Engineering from 2002 – 2005, and Director of Teaching in Engineering from 2005 to 2008. He is currently Director of Quality Assurance and Enhancement in the College of Engineering and Physical Sciences.

In 2005 Colin was awarded the Donald Medal of the Institution of Chemical Engineers for services to biochemical engineering.

Colin developed two new analytical techniques that have underpinned most of his research. The first was the application of image analysis to studies of the morphology of filamentous fungi growing in submerged cultures. The second (with Professor Zhibing Zhang) was a micromanipulation technique with associated mathematical modelling for measuring the mechanical properties of biological cells.

### Teaching

- CH 1MCT Modelling Concepts and Tools
- Bioreaction Engineering module, MSc in Biochemical Engineering
- MSc Maths Revision Tutorials

### Research

#### RESEARCH THEMES

Measurement of the mechanical properties of biological materials, using micromanipulation-based compression testing and associated modelling. Earlier work concerned the novel application of image analysis to the study of filamentous fermentations.

#### RESEARCH ACTIVITY

- Intrinsic material properties of plant and yeast cell walls
- High Strain Rate Compression Tester: development of equipment for rapid compression of microscopic particles, with high-speed imaging. Intended to complement mathematical modelling of the compression process for the identification of particle material properties
- Microencapsulation

### Other activities

#### QAA

- Member of QAA Benchmarking Group for Engineering, 1999

## Research Councils

- Peer Review College, Engineering and Physical Sciences Research Council, 2010 –
- Member of the Life Sciences College of EPSRC, 1999 – 2005
- Chair, Physics Engineering Initiative Panel, 2003
- Member of the Chemical Engineering College of EPSRC, 1998 – 1999
- Member of Network Group, Engineering and Biological Systems Directorate, BBSRC, 1997 – 1998
- Committee Member, Engineering and Physical Sciences Committee, BBSRC, 1996 – 1997
- Scientific Adviser and Member (1996), Management Committee, Chemicals and Pharmaceuticals Directorate, BBSRC, 1994 – 1997

## Institution of Chemical Engineers

- Lead Accreditation Assessor, University of Cambridge, 2010
- Accreditation Assessor, University of Manchester, 2008
- Accreditation Assessor, University of Cambridge, 2005
- Membership Committee, 1998 – 2000, 2004 – 2008
- Committee 1989 – 1995 and 2006 – , and Chairman 1991 – 1992, Biochemical

## Engineering Subject Group

- Research Committee, 1992 – 1998
- Council, 1994 – 1997

## Science Council

- Elected Licensed Body Representative on the Science Council Registration Authority, 2004 – 2007
- Member Interim Registration Authority of the Science Council, 2004

## Outreach

- Member of Strategic Development Group, Dame Elizabeth Cadbury Technology College, Birmingham, 2000 – 2010; Chair 2006 – 2010

## Publications

Thomas, C.R. and Geer, D. (2011), Effects of shear on proteins in solution, *Biotechnol. Lett.* 33:443-456

Nguyen, B.V., Wang, Q.G., Kuiper, N.J., El Haj, A.J., Thomas, C.R. and Zhang, Z.B. (2010), Biomechanical properties of single chondrocytes and chondrons determined by micromanipulation and finite-element modelling, *J. R. Soc. Interface* 7: 1723-1733

Wang, Q.G., Nguyen, B., Thomas, C.R., Zhang, Z.B., El Haj, A.J. and Kuiper, N.J. (2010), Molecular profiling of single cells in response to mechanical force: comparison of chondrocytes, chondrons and encapsulated chondrocytes, *Biomaterials* 31: 1619-1625.

Stenson, J.D., Thomas, C.R. and Hartley, P. (2009), Modelling the mechanical properties of yeast cells, *Chem. Eng. Sci.* 64:1892- 1903

Wang, C., Wang, L., McQueen-Mason, S.J., J Pritchard, J. and Thomas, C.R. (2008), pH and expansin action on single suspension-cultured tomato (*Lycopersicon esculentum*) cells, *J. Plant Res.* 121: 527-534.

Zhang, Z., Stenson, J.D. and Thomas, C.R. (2009), "Micromanipulation in mechanical characterisation of single particles". In Li, J. (ed.) *Characterization of flow, particles and interfaces. Advances in Chemical Engineering* 37, pp 29-85.

