

Shang-Tian Yang

Professor, Department of Chemical and Biomolecular Engineering
Director, Ohio Bioprocessing Research Consortium
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EDUCATION

B.S. *Agricultural Chemistry*, National Taiwan University, 1976.
M.S.E. *Food & Biochemical Engineering*, Purdue University, 1980.
Ph.D. *Biochemical Engineering*, Purdue University, 1984.

EMPLOYMENT

10/1985 - present **The Ohio State University**, Columbus, Ohio
Department of Chemical and Biomolecular Engineering (Assistant Prof., 10/1985; Associate Prof., 9/1991; Professor, 9/1997 – present; Graduate Studies Committee Chair, 1999 – 2004, 2016– present)
Department of Food Science & Technology (Courtesy, 9/1993 – present)
Environmental Science Graduate Program (Courtesy, 9/1993 – 2012)
Department of Biomedical Engineering (Courtesy, 9/2002 – present)
Ohio State Biochemistry Program (7/2004 – present)
Molecular, Cellular and Developmental Biology Program (7/2010 – present)
Department of Molecular Genetics (Courtesy, 9/2011– present)

1/1985 - 9/1985 **Bio-Process Innovation, Inc.**, West Lafayette, Indiana
Research Process Engineer

6/1984 - 5/1985 **Lab. of Renewable Resources Eng. (LORRE), Sch. of Chem Eng, Purdue U.**
Postdoctoral Research Associate

3/1977 - 8/1978 **Material Test & Evaluation Service, Combined Services Force**, Taipei, China
Chemistry & Radiation Officer (2nd Lt.)

CONCURRENT APPOINTMENTS

- Director, Ohio Bioprocessing Research Consortium (7/1996 – present)
- Overseas Scholar Professor, Dalian University of Technology, Dalian, China (2011 – 2017)
- Chair Professor, South China University of Technology, Guangzhou, China (2007 – 2012)
- Adjunct Professor, Southwest University, Chongqing, China (2012 – 2015)
- Adjunct Professor, Beijing University of Chemical Technology, Beijing, China (2012 – 2015)
- Adjunct Professor, Zhejiang University of Science & Technology, Hangzhou, China (2011 – 2014)
- Adjunct Professor, Changzhou University, Changzhou, Jiangsu, China (2013 – 2016)
- Adjunct Professor, East China University of Science and Technology, Shanghai, China (2009 – 2011)
- Adjunct Professor, Jiangnan University, Wuxi, China (2008 – 2011)
- Visiting Professor, University Technology Malaysia, Johor Bharu, Malaysia (7/2010; 7/2011)
- Visiting Professor, University of the Philippines at Diliman, Quezon City, Philippines (9/2009)
- Visiting Professor, National Taiwan University, Taipei, Taiwan (10/1997–2/1998; 9/2005-2/2006)
- Adjunct Professor, Sichuan Normal University, Nanchong, China (10/2000 – 9/2004)

- Visiting Professor, Swiss Federal Institute of Technology at Lausanne (EPFL) (3/98 – 6/98)
- Visiting Professor, Tianjin University, Tianjin, China (summer, 1996)
- Associate Editor (4/2009 – present); Editorial Board Member, Process Biochemistry, Elsevier (2005 – present)
- Associate Editor, International Journal of Biotechnology for Wellness Industries, Life Science Global (2012 – present)
- Review Editor, Frontiers in Bioengineering and Biotechnology and Energy Research, "Bioenergy and Biofuels" special section (2014 – present)
- Editorial Advisory Board, Recent Patents on Biotechnology, Bentham Science (2006 – present)
- Editorial Board Member, Open Biotechnology Journal, Open Biotechnology Letters, Open Biotechnology reviews, Current Biotechnology, Bentham Science (2007 – present)
- Editorial Advisory Board, Engineering in Life Sciences, Wiley-VCH (2008 – present)
- Editorial Board Member, World Journal of Stem Cells (WJSC), Baishideng Publishing Group (BPG), Beijing, China (2009 – present)
- Editorial Board Member, Journal of Tissue Science & Engineering, Journal of Microbial & Biochemical Technology, OMICS Publishing Group, CA (2010 – present)
- Editorial Board Member, Pharmaceutical Bioprocessing, Future Science Group (FSG), London, UK (2012 – 2016)
- Editorial Board Member, Bioresources and Bioprocessing (BRBP), Springer (2013 – present)
- Co-founder and Chief Scientific Advisor, Bioprocessing Innovative Company (BIC) (1998 – present)
- Co-founder and Scientific Advisor, BioLOC (Biological Lab-On-a-Chip) (2005 – 2008)
- Co-founder and Scientific Advisor, PSG (a biotech company with special interests to develop novel cancer immunotherapies and diagnostic assays) (2014 – present)
- Consultant and Technology Advisor, BioNaturals (2016 – present)
- Advisory board member, ButylFuel (2010 – 2011); Green Biologics Limited (2012 – 2016)
- Member, Scientific Advisory Panel, American Dairy Assn. & Dairy Council Mid East (2005 – 2008)
- Member, Board of Directors, Ohio Chinese Academic & Professional Association (1992-96; 2002-05).
- Member, Board of Trustee and Cultural and Education Committee, Chinese American Association in Central Ohio (CAACO) (1990-1992)
- Review committee member for the Discovery Grant Program, The Natural Sciences and Engineering Research Council (NSERC) of Canada (2017-2019)

PROFESSIONAL AFFILIATION

American Institute of Chemical Engineers (AIChE)
 American Chemical Society (ACS, BIOT)
 Society for Biological Engineering (SBE)

American Society for Engineering Education
 Institute of Food Technologists (IFT)

HONORS & AWARDS

- Outstanding ABE Alumnus, Purdue University (2018)
- AIChE Division 15 Food, Pharmaceuticals & Bioengineering Plenary Lecture Award (2011)
- Fellow, American Institute of Medical and Biological Engineering (2007)
- Du Pont Young Faculty Award (1989-1991)
- Outstanding Contribution Award, Chinese Academic and Professional Assn. in Mid-America (1992)
- Lumley Research Award, College of Engineering, Ohio State University (1995; 2001; 2007; 2013)
- Research Accomplishment Award, College of Engineering, Ohio State University (1997)
- Visiting lectureship from Chinese National Natural Science Foundation, Beijing, China (summer, 1996)
- Visiting professorship from Chinese National Science Council, Taipei, Taiwan (10/97–2/98; 9/05–2/06)

- Visiting professorship from Swiss Federal Institute of Technology at Lausanne (EPFL) (3/98 – 6/98)

PROFESSIONAL ACTIVITIES

- Over 300 journal papers, 25 proceedings papers, 2 edited books, 36 book chapters, 20 issued or pending US patents, over 450 technical presentations at professional meetings, and over 280 invited lectures
- Advisor for 52 Ph.D. dissertations, 31 M.S. theses, and 8 B.S. honor theses at OSU
- Advisor/co-advisor for 25 PhD dissertations at universities in China, Brazil, Egypt, Pakistan, Philippines, Switzerland, and Thailand
- Advisor/Consultant for more than 25 companies in the US and internationally
- Panelist for 25 proposal review panels for the National Science Foundation, the U.S. Department of Agriculture, the National Institute of Health, NASA John Glenn Research Center SBIR Phase II, the Natural Sciences and Engineering Research Council (NSERC, Canada)
- Reviewer of over 400 proposals for National Science Foundation, U.S. Dept. of Agriculture, Dept. of Energy, ACS Petroleum Research Funds, Hong Kong Research Grants Council, Swiss National Science Foundation, Canadian Research Council, National Science Council of Taiwan, Florida Department of Health, W. M. Keck Foundation, Biotechnology and Biological Sciences Research Council (BBSRC, UK) etc. (Average 10 proposals per year in the last 3 years)
- Reviewer of over 400 papers for more than 30 journals including Nature Biotechnology, Biotechnology & Bioengineering, Biotechnology Progress, Tissue Engineering, Biomaterials, Process Biochemistry, J. Biotechnol., etc. (Average 15 papers per year in the last 3 years)
- Faculty advisor, Society for Biological Engineering (SBE) student chapter at Ohio State Univ. (2005 -)
- AIChE Division 15 Food Pharmaceutical and Bioengineering (FPBE) (Chair, 2010; 2nd vice chair, 2008; first vice chair, 2009; Director, 2012-13; 15a Program Chair, 2012-13)

RESEARCH

- Research fields: bioprocess engineering, fermentation, biocatalysis, metabolic engineering, cell and tissue engineering, microfluidic bioreactors and biochips for high throughput screening and biodiagnostics
- Current research projects: novel bioprocesses for value-added products from biomass, metabolic engineering of anaerobic bacteria for enhanced production of chemicals and biofuels, novel bioreactors for fermentation and cell and tissue cultures, *in vitro* expansion and differentiation of embryonic stem cells, microfluidic biochips for biodiagnostics and high-throughput drug screening

LIST OF PUBLICATIONS (S.T. Yang)

Books & Book Chapters

1. S.T. Yang and E.M. Silva, Biochemical Engineering, in J.J. Lagowski (ed.), "Encyclopedia of Chemistry," MacMillan Publishing Company (1997).
2. J. Reese, E.M. Silva, S.T. Yang, and L.S. Fan, "Industrial Applications of Three-Phase Fluidization Systems," in Yang, W.-C. (ed.), "Selected Topics on Fluidization, Solids Handling, and Processing," Noyes Publications (1999), pp. 582-682.
3. S.T. Yang and J.A. Bednarcik, Production of Galacto-Oligosaccharides from Lactose by Immobilized β -Galactosidase. In B.C. Saha, D.C. Demirjian (eds.), "Applied Biocatalysis in Specialty Chemicals and Pharmaceuticals" ACS Symposium Series 776, American Chemical Society (2001), pp. 131-154.
4. S.T. Yang and Y. Zhu, Anaerobic Reactions. In D.R. Heldman (ed.). "Encyclopedia of Agricultural, Food, and Biological Engineering" Marcel Dekker (2003), pp. 25-31.
5. Y. Zhu and S.T. Yang, Enhancing Butyric Acid Production with Mutants of *Clostridium tyrobutyricum* Obtained from Metabolic Engineering and Adaptation in a Fibrous-Bed Bioreactor, in B. C. Saha (ed.), "Fermentation Biotechnology," ACS Symposium Series No. 862, American Chemical Society (2003), pp. 52-66.
6. N. Thongchul and S.T. Yang, Controlling Filamentous Fungal Morphology by Immobilization on a Rotating Fibrous Matrix to Enhance Oxygen Transfer and L(+)-Lactic Acid Production by *Rhizopus oryzae*, in B. C. Saha (ed.), "Fermentation Biotechnology," ACS Symposium Series No. 862, American Chemical Society (2003), pp. 36-51.
7. S.T. Yang, J. Luo, and C. Chen, A Fibrous-Bed Bioreactor for Continuous Production of Monoclonal Antibody by Hybridoma, in J.J. Zhong (ed.), Advances in Biochemical Engineering/Biotechnology, Biomanufacturing (2004), 87: 61-96.
8. Y. Li and S.T. Yang, Stem Cell-Based Tissue Engineering. In D.R. Heldman (ed.). "Encyclopedia of Agricultural, Food, and Biological Engineering" Marcel Dekker (2004), online publication.
9. S.T. Yang and S. Basu, Animal Cell Culture, in S. Lee (ed.), "Encyclopedia of Chemical Processing," Marcel Dekker (2005), pp. 67 - 79.
10. S.T. Yang and C. Robinson, Tissue Engineering, in S. Lee (ed.), "Encyclopedia of Chemical Processing," Marcel Dekker (2005), pp. 3115 - 3128.
11. S. Basu and S.T. Yang, Bioseparations, in S. Lee (ed.), "Encyclopedia of Chemical Processing," Marcel Dekker (2005), pp. 221 - 236.
12. L. J. Lee, S.T. Yang, S. Lai, Y. Bai, W.-C. Huang and Y.-J. Juang, Microfluidic Enzyme-Linked Immunosorbent Assay (ELISA) Technology, in Gregory S. Makowski (ed.), Advances in Clinical Chemistry (2006), 42: 255-295.
13. S.T. Yang (ed.), "Bioprocessing for Value-Added Products from Renewable Resources: New Technologies and Applications," Elsevier (2007), 660 pages.

14. S.T. Yang, Bioprocessing – from biotechnology to biorefinery, in S.T. Yang (ed.), “Bioprocessing for Value-Added Products from Renewable Resources,” Elsevier (2007), pp. 1-24.
15. S.T. Yang, X. Liu, and Y. Zhang, Metabolic engineering: applications, methods, and challenges, in S.T. Yang (ed.), “Bioprocessing for Value-Added Products from Renewable Resources,” Elsevier (2007), pp. 73-118.
16. S.T. Yang, H. Huang, A. Tay, W. Qin, L. De Guzman, and E.C. San Nicolas, Extractive fermentation for the production of carboxylic acids, in S.T. Yang (ed.), “Bioprocessing for Value-Added Products from Renewable Resources,” Elsevier (2007), pp. 421-446.
17. L. Wang and S.T. Yang, Solid state fermentation and its applications, in S.T. Yang (ed.), “Bioprocessing for Value-Added Products from Renewable Resources,” Elsevier (2007), pp. 465-490.
18. S.T. Yang, Bioenergy, in “Renewable Energy Focus Handbook,” Academic Press, San Diego, CA (2009), Chapter 12.1, pp. 467-482.
19. S.T. Yang, X. Zhang, and Y. Wen, Animal Cell Culture, in Dennis R. Heldman, Anne Bridges, Dallas Hoover, and Matthew B. Wheeler (eds.), *Encyclopedia of Biotechnology in Agriculture and Food*, Taylor and Francis (2010), 1: 1, 18 - 24.
20. S.T. Yang, Y. Zhu, M. Yu, and I.C. Tang, Anaerobic Reactions. In D.R. Heldman (ed.). “Encyclopedia of Agricultural, Food, and Biological Engineering” 2nd edition, Taylor and Francis (2010), 1: 1, 46 - 54.
21. G. Chen, X. Zhang, and S.T. Yang, Genomics in Cancer Biomarker Discovery, in X. Zhang (ed.), “Omics Technologies in Cancer Biomarker Discovery” Landes Biosciences, Georgetown, TX (2011), Chapter 1, pp. 1-21. <http://www.landesbioscience.com/curie/chapter/4371/>
22. S.T. Yang, K. Zhang, B. Zhang, H. Huang, Bio-Based Chemicals | Fumaric Acid, in M. Moo-Young (ed.) “Comprehensive Biotechnology” 2nd Edition, Elsevier (2011), volume 3, pp. 163–177.
23. X. Zhang, Y. Wen, S.T. Yang, The Biological Basis | Modes of Culture/Animal Cells, in Murray Moo-Young (ed.). “Comprehensive Biotechnology” 2nd Edition, Elsevier (2011), volume 1, pp. 285–302.
24. Y. Wen, X. Zhang, and S.T. Yang, Medium to high throughput screening: Microfabrication and chip-based technology, in Michael Balls, Robert D. Combes and Nirmala Bhogal (eds), “New Technologies for Toxicity Testing,” Landes Biosciences, Georgetown, TX (2012), Chapter 11, pp. 181-209. <http://www.landesbioscience.com/curie/chapter/4493/>
25. S.T. Yang and C. Lu, Extraction-fermentation hybrid (extractive fermentation), in S. Ramaswamy, B.V. Ramarao, H. Huang (eds.), Separation and Purification Technologies in Biorefineries, John Wiley & Sons, Ltd, Chichester, UK. (2013), Chapter 15. pp 409-437. doi: 10.1002/9781118493441.ch15.
26. S.T. Yang, Hesham A. El-Enshasy, N. Thongchul (eds.) “Bioprocessing Technologies in Biorefinery for Sustainable Production of Fuels, Chemicals, and Polymers” Wiley (2013). 450 pages. DOI: 10.1002/9781118642047
27. S.T. Yang and M. Yu, Integrated Biorefinery for Sustainable Production of Fuels, Chemicals and

- Polymers, in S.T. Yang, Hesham A. El-Enshasy, N. Thongchul (eds.) “Bioprocessing Technologies in Biorefinery for Sustainable Production of Fuels, Chemicals, and Polymers” Wiley (2013), Chapter 1, pp. 1-26.
28. J. Zhao, C. Lu, C.-C. Chen, and S.T. Yang, Biological Production of Butanol and Higher Alcohols, in S.T. Yang, H.A. El-Enshasy, N. Thongchul (eds.) “Bioprocessing Technologies in Biorefinery for Sustainable Production of Fuels, Chemicals, and Polymers” Wiley (2013), Chapter 13, pp. 235-261.
 29. Z. Wang, J. Sun, A. Zhang, and S.T. Yang, Propionic Acid Fermentation, in S.T. Yang, H.A. El-Enshasy, N. Thongchul (eds.) “Bioprocessing Technologies in Biorefinery for Sustainable Production of Fuels, Chemicals, and Polymers” Wiley (2013), Chapter 18, pp. 331-349.
 30. S.T. Yang, M. Yu, W.-L. Chang, and I.-C. Tang, Anaerobic Fermentations for the Production of Acetic and Butyric Acids, in S.T. Yang, H.A. El-Enshasy, N. Thongchul (eds.) “Bioprocessing Technologies in Biorefinery for Sustainable Production of Fuels, Chemicals, and Polymers” Wiley (2013), Chapter 19, pp. 351-373.
 31. K. Zhang, B. Zhang, and S.T. Yang, Production of Citric, Itaconic, Fumaric and Malic Acids in Filamentous Fungal Fermentations, in S.T. Yang, H.A. El-Enshasy, N. Thongchul (eds.) “Bioprocessing Technologies in Biorefinery for Sustainable Production of Fuels, Chemicals, and Polymers” Wiley (2013), Chapter 20, pp. 375-397.
 32. Ulf-Rainer Samel, Walter Kohler, Armin Otto Gamer, Ullrich Keuser, Shang-Tian Yang, Ying Jin, Meng Lin and Zhongqiang Wang, Propionic Acid and Derivatives, ULLMANN'S Encyclopedia of Industrial Chemistry, Wiley (2014), DOI: 10.1002/14356007.a22_223.pub2
 33. J. Dong, Y. Du, Y. Zhou, and S.T. Yang, Butanol production from soybean hull and soy molasses by acetone-butanol-ethanol fermentation, in Robert Brentin (ed.) “Soy-Based Chemicals and Materials” ACS Symposium series 1178, American Chemical Society, Ch 2, pp 25-41 (2014).
 34. J. Wang, M. Lin, M. Xu, and S.T. Yang. Anaerobic fermentation for production of carboxylic acids as bulk chemicals from renewable biomass, in R. Hatti-Kaul (ed.), *Adv. Biochem. Eng./Biotechnol., Anaerobes in Biotechnology*, 156: 323-362 (2016) DOI: 10.1007/10_2015_5009
 35. S.T. Yang, K. Zhang, B. Zhang and H. Huang, Fumaric Acid, In Reference Module in Life Sciences, Elsevier (2017) ISBN: 978-0-12-809633-8, <http://dx.doi.org/10.1016/B978-0-12-809633-8.09141-X>
 36. F. Zhang, H. Yang, X. Xin, S.T. Yang, Engineering Stem Cell Environments in Bioreactors. In R. L. Reis, & M. E. Gomes (Eds.), *Encyclopedia of Tissue Engineering and Regenerative Medicine*, Academic Press: Elsevier. Vol. 2, pp. 551–560 (2019)
 37. S.T. Yang, K. Zhang, B. Zhang, H. Huang, Bio-Based Chemicals | Fumaric Acid, in M. Moo-Young (ed.). *Comprehensive Biotechnology*, Vol. 3, 3rd Edition, Elsevier: Pergamon (2019), pp 188–207.
 38. Teng Bao, Wenyan Jiang, Qurat-ul-Ain Ahmad, Shang-Tian Yang, Consolidated Bioprocessing for Ethanol and Butanol Production from Lignocellulosic Biomass: Recent Advances in Strain and Process Engineering, in Nuttha Thongchul, Antonis Kokossis, Suttichai Assabumrungrat (eds). *A-Z of Biorefinery*, Elsevier (2020), in press.

Papers (Refereed Journals)

1. S.T. Yang and M. Chang, Solubilizing Cellulosic Materials by Alkali-Cooking for Anaerobic Methane Production, *Ann. Reports on Fermentation Processes*, 8:187-209 (1985).
2. D. Feldman, S.T. Yang, and N. Ho. Construction of Plasmids for the Transformation of *Methanobacterium thermoautotrophicum*, *Biotechnol. Bioeng. Symp.*, 15:235-240 (1985).
3. S.T. Yang, I.C. Tang, and M.R. Okos, Kinetics of Homoacetic Fermentation of Lactate by *Clostridium formicoaceticum*, *Appl. Environ. Microbiol.*, 53: 823-827 (1987).
4. S.T. Yang and M.R. Okos, Kinetic Study and Mathematical Modeling of Methanogenesis of Acetate Using Pure Cultures of Methanogens, *Biotechnol. Bioeng.*, 30:661-667 (1987).
5. I.C. Tang, S.T. Yang, and M.R. Okos, Acetic Acid Production from Whey Lactose by the Coculture of *Streptococcus lactis* and *Clostridium formicoaceticum*, *Appl. Microbiol. Biotechnol.*, 28:138-143 (1988).
6. S.T. Yang, I.C. Tang, and M.R. Okos, Defined Bacterial Culture Developments for Methane Generation from Lactose, *Biotechnol. Bioeng.*, 32:28-37 (1988).
7. S.T. Yang, I.C. Tang, and M.R. Okos, Kinetics and Mathematical Modeling of Homoacetic Fermentation of Lactate by *Clostridium formicoaceticum*, *Biotechnol. Bioeng.*, 32:797-802 (1988).
8. S.T. Yang and I.C. Tang, Lactose Hydrolysis and Oligosaccharide Formation Catalyzed by β -Galactosidase: Kinetics and Mathematical Modeling, *Ann. N.Y. Acad. Sci.*, 542:417-422 (1988).
9. S.T. Yang and M.R. Okos, Effects of Temperature on Lactose Hydrolysis by Immobilized β -Galactosidase in a Plug-Flow Reactor, *Biotechnol. Bioeng.*, 33:873-885 (1989).
10. S.T. Yang and M.R. Okos, A New Graphical Method for Determining Parameters in Michaelis-Menten-Type Kinetics for Enzymatic Lactose Hydrolysis, *Biotechnol. Bioeng.*, 34:763-773 (1989).
11. I.C. Tang, M.R. Okos, and S.T. Yang, Effects of pH and Acetic Acid on Homoacetic Fermentation of Lactate by *Clostridium formicoaceticum*, *Biotechnol. Bioeng.*, 34:1063-1074 (1989).
12. C.H. Shu and S.T. Yang, Effects of Temperature on Cell Growth and Xanthan Production in Batch Cultures of *Xanthomonas campestris*, *Biotechnol. Bioeng.*, 35:454-468 (1990).
13. S.T. Yang and M.N. Guo, Kinetics of Methanogenesis from Whey Permeate in Packed Bed Immobilized Cells Bioreactor, *Biotechnol. Bioeng.*, 36:427-436 (1990).
14. S.T. Yang and M.N. Guo, A Kinetic Model for Methanogenic Fermentation of Whey Permeate in a Packed Bed Immobilized Cell Bioreactor, *Biotechnol. Bioeng.*, 37:375-382 (1991).
15. C.H. Shu and S.T. Yang, Kinetics and Modeling of Temperature Effects on Batch Xanthan Gum Fermentation, *Biotechnol. Bioeng.*, 37:567-574 (1991).
16. S.T. Yang and I.C. Tang, Methanogenesis from Lactate by a Coculture of *Clostridium formicoaceticum* and *Methanosarcina mazei*, *Appl. Microbiol. Biotechnol.*, 35:119-123, (1991).

17. S.T. Yang, S.A. White, and S.T. Hsu, Organic Acid Extraction Using Tertiary and Quaternary Amines: Effect of pH, *Ind. Eng. Chem. Res.*, 30:1335-1342 (1991).
18. S.T. Hsu and S.T. Yang, Propionic Acid Fermentation of Lactose by *Propionibacterium acidipropionici*: Effects of pH, *Biotechnol. Bioeng.*, 38:571-578 (1991).
19. S.T. Yang and M.R. Okos, Methane Generation from Lactose by Using a Novel Mixed Culture: Kinetics, Modeling and Simulation, *J. Chinese Inst. Chemical Engineers*, 22:409-418 (1991).
20. S.T. Yang, I.C. Tang, and H. Zhu, A Novel Fermentation Process for Calcium Magnesium Acetate (CMA) Production from Cheese Whey, *Appl. Biochem. Biotechnol.*, 34/35:569-583 (1992).
21. S.T. Yang, H. Zhu, Vivian P. Lewis and I.C. Tang, Calcium Magnesium Acetate (CMA) Production from Whey Permeate: Process and Economic Analysis, *Resources Conservation and Recycling*, 7:181-200 (1992).
22. V.P. Lewis and S.T. Yang, A Novel Extractive Fermentation Process for Propionate Production from Whey Lactose, *Biotechnol. Progress*, 8:104-110 (1992).
23. V.P. Lewis and S.T. Yang, Propionic Acid Fermentation by *Propionibacterium acidipropionici*: Effects of Growth Substrate, *Appl. Microbiol. Biotechnol.*, 37:437-442 (1992).
24. V.P. Lewis and S.T. Yang, Continuous Propionic Acid Fermentation by Using Immobilized *Propionibacterium acidipropionici* in a Novel Packed-Bed Bioreactor, *Biotechnol Bioeng.*, 40:465-474 (1992).
25. M.S. Gandikota, S.T. Yang, J.F. Davis and J.L. Marchio, *Bioprocess Flowsheets Made Easy*, ChemTech, November 1992, pp.694-699 (1992).
26. S.T. Yang, H. Zhu, Y. Li, and G. Hong, Continuous Propionate Production from Whey Permeate Using a Novel Fibrous Bed Bioreactor, *Biotechnol. Bioeng.*, 43:1124-1130 (1994).
27. S.T. Yang, J.L. Marchio, and J.W. Yen, A Dynamic Light Scattering Study of β -Galactosidase: Environmental Effects on Protein Conformation and Enzyme Activity, *Biotechnol. Progress*, 10:525-531 (1994).
28. S.T. Yang, Y. Huang, and G. Hong, A Novel Recycle Batch Immobilized Cell Bioreactor for Propionate Production from Whey Lactose, *Biotechnol. Bioeng.*, 45:379-386 (1995).
29. E.M. Silva and S.T. Yang, Continuous Production of Lactic Acid from Acid Whey by *Lactobacillus helveticus* in a Fibrous-Bed Bioreactor, *J. Biotechnol.*, 41:59-70 (1995).
30. S.T. Yang and E.M. Silva, Novel Products and New Technologies for Use of a Familiar Carbohydrate, Milk Lactose, *J. Dairy Sci.*, 78:2563-2583 (1995).
31. C.Y. Cheng and S.T. Yang, Dynamics and Modeling of Gene Expression in Temperature-Sensitive Recombinant Yeast Fermentation in Response to Temperature Switch, *Biotechnol. Bioeng.*, 50:663-674 (1996).
32. H.Y. Cho, A.E. Yousef, and S.T. Yang, Continuous production of pediocin by immobilized *Pediococcus acidilactici* PO2 in a packed-bed bioreactor, *Appl. Microbiol. Biotechnol.*, 45:589-594

(1996).

33. C.H. Shu and S.T. Yang, Production of Recombinant GM-CSF by *Saccharomyces cerevisiae* in a Three-Phase Fluidized Bed Bioreactor, *Biotechnol. Bioeng.*, 51:229-236 (1996).
34. S.T. Yang and C.H. Shu, Kinetics and Stability of GM-CSF Production by Recombinant Yeast Cells Immobilized in a Fibrous-Bed Bioreactor, *Biotechnol. Prog.*, 12:449-456 (1996).
35. C.H. Shu and S.T. Yang, Kinetics of Continuous GM-CSF Production by Recombinant *Saccharomyces cerevisiae* in an Air-Lift Bioreactor, *J. Biotechnol.*, 48:107-116 (1996).
36. Y.M. Lo, S.T. Yang, and D.B. Min, Kinetics and Feasibility Studies of Ultrafiltration of Viscous Xanthan Gum Fermentation Broth, *J. Membrane Sci.*, 117:237-249 (1996).
37. S.T. Yang, Y.M. Lo, and D.B. Min, Xanthan Gum Fermentation by *Xanthomonas campestris* Immobilized in a Novel Centrifugal Fibrous-Bed Bioreactor, *Biotechnol. Progress*, 12: 630-637 (1996).
38. Y.L. Huang, C.H. Shu and S.T. Yang, Kinetics and Modeling of GM-CSF Production by Recombinant Yeast in a Three-Phase Fluidized Bed Bioreactor, *Biotechnol. Bioeng.*, 53:470-477 (1997).
39. Y.M. Lo, S.T. Yang, and D.B. Min, Ultrafiltration of Xanthan Gum Fermentation Broth: Process and Economic Analyses, *J. Food Eng.*, 31:219-236 (1997).
40. Y.M. Lo, S.T. Yang, and D.B. Min, Effects of Yeast Extract and Glucose on Xanthan Production and Cell Growth in Batch Culture of *Xanthomonas campestris*, *Appl. Microbiol. Biotechnol.*, 47:689-694 (1997).
41. C.Y. Cheng, Y.L. Huang, and S.T. Yang, A Novel Feeding Strategy for Enhanced Plasmid Stability and Protein Production in Recombinant Yeast Fedbatch Fermentation, *Biotechnol. Bioeng.*, 56:23-31 (1997).
42. Qi Zhou and S.T. Yang, *Biotechnological Control of Air Pollution*, *Shanghai Environmental Sciences*, 16(12):6-10 (1997).
43. S.T. Yang, Y.M. Lo, and D. Chattopadhyay, Production of Cell-Free Xanthan Fermentation Broth by cell Adsorption on Fibers, *Biotechnol. Progress*, 14:259-264 (1998).
44. Z. Jin and S.T. Yang, Extractive Fermentation for Enhanced Propionic Acid Production from Lactose by *Propionibacterium acidipropionici*, *Biotechnol. Progress*, 14:457-465 (1998).
45. Y. Huang and S.T. Yang, Acetate Production from Whey Lactose Using Co-immobilized Cells of Homolactic and Homoacetic Bacteria in a Fibrous-Bed Bioreactor, *Biotechnol. Bioeng.*, 60:498-507 (1998).
46. E.M. Silva and S.T. Yang, Production of Amylases from Rice by Solid State Fermentation in a Gas-Solid Spouted Bed Bioreactor, *Biotechnol. Progress*, 14:580-587 (1998).
47. Y.L. Huang, K. Mann, J.M. Novak, and S.T. Yang, Acetic Acid Production from Fructose by *Clostridium formicoaceticum* in a Fibrous-Bed Bioreactor, *Biotechnol. Prog.*, 14:800-806 (1998).
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