

Curriculum Vitae

Scott P. Fulton

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EDUCATION

1977 M.S. Interdisciplinary Science (Biomedical Engineering)
Massachusetts Institute of Technology

1975 S.B. Applied Biology
S.B. Physics
Massachusetts Institute of Technology

PROFESSIONAL EXPERIENCE

2008 – Present Senior Consultant
BioProcess Technology Consultants, Inc., Acton, MA
CMC consultant to the biopharmaceutical industry providing strategic and technical services related to development, scale-up, manufacturing, and outsourcing for biopharmaceutical products.

2002 – Present Founder & CEO
BioSystem Development, LLC, Madison, WI
Early stage company developing the AssayMAP Biomolecule Analysis System, a combination workstation and consumable device for pharmaceutical development, which enables immunoassays to be fully automated with high throughput and precision, while using current reagents and assay formats. AssayMAP is also used for microliter-scale purifications and sample processing for applications such as mass spectrometry.

2002 – 2007 Principal Consultant
Ardea Bio Consulting, Middleton, WI
Consultant to biotechnology companies and companies producing tools for the biotechnology industry, providing technical assistance with process and analytical method development, product design, and business planning & development. Clients included several companies developing biopharmaceutical proteins in transgenic plants and animals, novel process-scale protein purification and viral inactivation technologies, a biopharmaceutical production cost modeling software tool, a novel protein polymer derivitization technology and a new biologics contract manufacturing company.

1997 – 2002: Vice President Program Management
GTC Biotherapeutics (formerly Genzyme Transgenics), Framingham, MA
Overall responsibility for management of programs to develop manufacturing of

pharmaceutical proteins in the milk of transgenic dairy animals for pharmaceutical and biotechnology company clients. Major projects included human serum albumin and three monoclonal antibodies. Developed a system of cost models for development, production, capital investments and financial returns for current and potential programs. Developed and evaluated novel downstream purification technologies aimed at dramatically reducing costs of transgenically produced biopharmaceuticals at scales ranging from 10 kg – 100 tons per year.

1996

Chief Technical Officer
SolmeteX, Inc., Walpole, MA

Principle in a startup company developing and marketing novel systems to remove and recover low levels of toxic metals from water. Developed and patented an adsorbent and chemical pretreatment system to remove mercury from wastewater down to part per trillion levels. Developed multiple applications for an inorganic adsorbent of multivalent anions such as arsenic, selenium, chromium, and metal complexes.

1989 - 95:

Vice President, Technical Affairs (1993 – 1995)

Vice President, Technical Support (1990 – 1993)

Vice President, Marketing (1989 – 1990)

PerSeptive Biosystems, Inc., Framingham, MA

Directed worldwide marketing and technology development for chromatography media, systems and monitoring instrumentation used biopharmaceutical manufacturing.

Managed corporate QC function and created first corporate quality policy and quality documentation system to achieve FDA cGMP compliance and initiated ISO 9000

certification. Created and managed the technical support function for the company.

Participated heavily in the development of key products, including POROS Perfusion Chromatography packings & columns, BioCAD systematic development workstation, ID immunoassay cartridge system and RPM real-time process monitor system. Launched company's first product line - POROS media and columns.

1977 - 89:

Marketing Manager, Chromatography Media (1987 – 1989)

Manager, Separations Technology (1983 – 1987)

Manager, Applications Laboratory (1977 – 1983)

Amicon Division, W.R. Grace & Co., Danvers, MA

Responsible for marketing strategy, product planning, sales training & support, advertising & promotion and customer technical services. Created and implemented a major sales technical training program. Responsible for product development and support activities for all chromatography and process & laboratory filtration product lines. Developed and implemented a company-wide product documentation and project management system. Department successfully developed and launched over 50 major products in 4 new and 5 existing product lines. Key member of a team which developed and implemented a strategic business plan for W.R. Grace in preparative liquid chromatography. Supervised a laboratory group responsible for new product testing, customer applications, technical training & support to sales/marketing, manufacturing and quality control for all chromatography and filtration products.

SELECTED PUBLICATIONS

- Weaver, J., Cooney, C., Fulton, S., Schuler, P. and Tannenbaum, S., Experiments and calculations concerning a thermal enzyme probe, *Biochemica et Biophysica Acta* 452:285 (1976).
- Cooney, C., Weaver, J., Fulton, S. & Tannenbaum, S., Studies on the thermal enzyme probe, in *Enzyme Engineering*, v. III, Pye. E. & Weetal, H. eds. New York: Plenum Press (1978) p. 431.
- Fulton, S., Cooney, C. & Weaver, J., Thermal enzyme probe with differential temperature measurements in a laminar flow-through cell, *Analytical Chemistry* 52:505 (1980).
- Fulton, S. & Carlson, E., Dye-ligand chromatography, *American Laboratory*, October, 1980.
- Fulton, S. & Carlson, E., Use of synthetic chemical ligands for affinity chromatography of proteins, in *Polymeric Separations Media*, Cooper, A. ed. New York: Plenum Press (1982) p. 93.
- Fulton, S., Cooney, C. & Weaver, J., High resolution differential thermometry in flowing solutions, *Review of Scientific Instruments* 55:597 (1984).
- Bowers, W., Fulton, S. & Thompson, J., Ultrafiltration vs. equilibrium dialysis for determination of free fraction, *Clinical Pharmacokinetics* 9:49 (1984).
- Kopaciewicz, W., Fulton, S. & Lee, S., Influence of pore and particle size on the frontal uptake of proteins, *Journal of Chromatography* 409:111 (1987).
- Afeyan, N., Fulton, S., Gordon, N., Maszaroff, I., Varady, L. & Regnier, F., Perfusion chromatography: an approach to purifying biomolecules, *Biotechnology* 8:203 (1989).
- Afeyan, N., Gordon, N., Maszaroff, I., Fulton, S., Yang, Y.. & Regnier, F., Flow-through particles for the high performance liquid chromatographic separation of biomolecules: perfusion chromatography, *Journal of Chromatography* 519:1 (1990).
- Afeyan, N., Fulton, S., Varady, L. & Regnier, F., Perfusion chromatography packing materials for proteins and peptides, *Journal of Chromatography* 544:267 (1991).
- Fulton, S., Afeyan, N., Gordon, N. & Regnier, F., Very high speed separation of proteins by perfusion chromatography, *Journal of Chromatography* 547:452 (1991).
- Fulton, S., Meys, M., Varady, L., Jansen, R. & Afeyan, N., Antibody quantitation in seconds using affinity perfusion chromatography, *BioTechniques* 11:226 (1991).
- Afeyan, N., Gordon, N., Fulton, S. & Regnier, F., Perfusion chromatography: a novel tool for protein purification and analysis, in *Techniques in Protein Chemistry III*, Angeletti, R. ed. New York: Academic Press (1992) p. 135.
- Fulton, S., Meys, M., Protentis, J., Afeyan, N., Carlton, J. & Haycock, J., Preparative peptide purification by cation exchange and reversed-phase perfusion chromatography, *BioTechniques* 12:742 (1992).
- Fulton, S., Shahidi, A., Gordon, N., & Afeyan, N., Large-scale processing and high throughput perfusion chromatography, *Biotechnology* 12:742 (1992).
- Kassel, D., Luther, M., Willard, D., Fulton, S. & Salzman, J., Rapid purification, separation and identification of proteins and enzyme digests using packed capillary perfusion column LC and LC/MS, in *Techniques in Protein Chemistry IV*, Angeletti, R. ed. New York: Academic Press (1993) p. 55.
- Fulton, S., Large scale processing of macromolecules, *Current Opinion in Biotechnology* 5:201 (1994).
- Fulton, S. *Dye-ligand Chromatography* (80-page handbook) Lexington, MA: Amicon (1980). Fulton, S. *Boronate Ligands in Biochemical Separations* (60 page handbook) Danvers, MA: Amicon (1981).

Fulton, S. *The Art of Antibody Purification* (85 page handbook) Danvers, MA: Amicon (1989).

Fulton, S. *The Busy Researcher's Guide to Biomolecule Chromatography* (230 page handbook) Framingham, MA PerSeptive Biosystems (1996)

SELECTED PATENTS

US Patent 4,562,251 Fulton, S., Yankopoulos, B. & Zediana, L. AGAROSE DERIVATIVES OF AMINO PHENYL BORONIC ACID

US Patent 4,734,190 Fulton, S. & Tiffany, D. SAMPLE DISPENSING SYSTEM FOR LIQUID CHROMATOGRAPHY

US Patent 4,778,888 Fulton, S., Yankopoulos, B. & Zediana, L. BORON-CONTAINING 1,3,5-TRIAZINES

US Patent 4,810,392 Fulton, S. & Tiffany, D. SAMPLE DISPENSING SYSTEM FOR LIQUID CHROMATOGRAPHY

US Patent 5,108,704 Bowers, W., Fulton, S. et al MICROFILTRATION APPARATUS PATENT WITH RADIALY SPACED NOZZLES

US Patent 6,521,131 Hamilton, R, Fulton, S & Shields, T. COMBINED OXIDATION AND CHELATING ADSORPTION SYSTEM FOR REMOVAL OF MERCURY FROM WATER

US Patent 7,087,719 Visuri, K., Uotila, S., Fulton, S. and Couto, D. METHOD FOR CRYSTALLIZATION OF HUMAN SERUM ALBUMIN