

Curriculum Vitae

Francisco J. Castillo, Ph.D

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EDUCATION

1975-1976 Research Fellow
Department of Biochemistry, University of Birmingham, U.K.

1975 Ph.D. in Microbiology
Graduate School of Biomedical Sciences, College of Medicine
And Dentistry of New Jersey, Newark, N.J.

1971 Licenciado en Biología (BS in Biology)
Faculty of Sciences, School of Biology, Universidad Central
de Venezuela, Caracas, Venezuela.

PROFESSIONAL EXPERIENCE

2007 – 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.

2006-2007 Chairman CMC Scientific Leadership Team (SLT)
1998-2006 Scientific Director, Head of Fermentation and Cell Culture Development
1995-1998 Head Fermentation Development and Systems
Berlex Biosciences (Subsidiary of Schering, AG), Richmond, CA.
Responsible for addressing technical and scientific CMC issues of projects.
Member of Berlex and Schering International Project Management Teams, Berlex Biosciences Scientific Advisory Committee and Portfolio Management Committee.
Headed the corporate CMC team for a gene therapy project taken to Phase III in 16 countries.
Headed multiple CMC teams for cell-based, recombinant protein and monoclonal antibody based biotherapeutic projects.

- 1992-1995 Director Cell Culture Development and Fermentation
1986-1992 Director Cell Culture Development
1985-1986 Senior Process Scientist
Xoma Corporation, Berkeley, CA
Responsible for development, transfer and validation of upstream processes for GMP manufacture of biologics in microbial and mammalian cell culture systems.
- 1985 Principal Investigator
1984-1985 Research Associate
1083-1984 Full time Consultant
Engenics, Inc., Menlo Park, CA
Carried out and directed experimentation in microbial physiology, fermentation media and fermentation process optimization for the production of primary metabolites by lactic acid bacteria, recombinant E.coli, Zymomonas mobilis and yeasts.
- 1982-1983 Visiting Scholar.
Lecturer in Course: Introduction to Biochemical Engineering.
Dept. of Chemical Engineering, University of California, Berkeley, CA
Carried out and directed research on continuous culture of Trichoderma reesei for production of cellulases and B-galactosidase.
- 1974-1985 Head of Fermentation Laboratory
Venezuelan Institute of Scientific Research (IVIC), Caracas, Venezuela
Created Fermentation Laboratory at IVIC. Designed the facility for research in microbial physiology including: Structure and function of Pseudomonas aeruginosa's phage receptors. Screening, mutagenesis, selection and growth of microorganisms for single-cell protein production, B-galactosidase, ethanol, and amylases. Regulatory controls of synthesis and function of B-galactosidase and lactose transport of lactose-utilizing yeasts. Batch and continuous culture of Trypanosoma cruzi and Leishmania sp. to optimize growth conditions for production of the parasites and their antigens in vitro. Identification and characterization of Clostridia bacteriophages and bacteriocins.
Taught at undergraduate and graduate levels at IVIC and several Universities in Venezuela. Thesis advisor to eleven students. Member of the Board of Directors of the Venezuelan Center for Industrial Experimental Research for Exports (CIEPE).

SELECTED PRESENTATIONS

- “Addressing the challenges and complexities of interacting with regulatory authorities in 16 countries to support Phase II/III studies in viral gene therapy”, presented at Phacilitate Cell & Gene Therapy Forum 2005. Washington. DC (January 2005).
- “Manufacture of Adenovectors for pivotal clinical trials and commercial entry”, presented at 4th Eurogenethy International Conference, Clinical Gene Therapy 2005. Paris, France (June 2005).

SELECTED PUBLICATIONS

- Jones, S.D., Castillo, F.J., and Levine, H.L. Advances in the Development of Therapeutic Monoclonal Antibodies. *BioPharm Internat.* 20:96-114, 2007.
- McCaman, M., Castillo, F.J., Fawaz, F., Ogawa, Y., Whiteley, E., Lehmborg, E., Tan, M., Mann, B., Pungor, E., and Rubanyi, G.M. Adenovirus-based Gene Therapy: Therapeutic Angiogenesis with Adenovirus 5 Fibroblast Growth Factor-4 (Ad5FGF-4) in Patients with Chronic Myocardial Ischemia. Chapter 6, Vol. 1 In *Modern Biopharmaceuticals*. J. Knablein (Ed.). pp 151-181. Wiley-VCH Verlag, Weinheim, 2005.
- Roth, G., Smith, C.E., Schoofs, G.M, Montgomery, T., Ayala, J.L., Monica, T.J., Castillo F.J., and Horwitz, J.I. Vortex Flow Filtration for Cell Separations in Bioreactor Operations. Chapter No. 2 In *Membrane Separations in Biotechnology*, W.K.Wang (Ed.). pp. 63-83. Marcel Dekker, Inc. New York. 2001.
- Monica, T.J., Montgomery, T., Ayala, J.L., Schoofs, G.M., Whiteley, E.M., Roth, G., Garbutt, J.J., Harvey, S., and Castillo, F.J. Monitoring Adenovirus Infections with On-Line and Off-Line Methods. *Biotechnol. Prog.* 16:866-871, 2000.
- Castillo, F.J. Hybridoma: Antibody Production. Chapter in *Encyclopedia of Bioprocess Technology: Fermentation, Biocatalysis and Bioseparations*. M.C. Flickinger and S.W. Drew (Eds.). pp1405-1418. John Wiley & Sons, Inc. 1999.
- Schoofs, G., Monica, T.J., Ayala, J., Horwitz, J., Montgomery, T., Roth, G., and Castillo, F.J. A high-yielding serum-free, suspension cell culture process to manufacture recombinant adenovirus vectors for gene therapy. *Cytotechnology.* 28:81-89, 1998.
- Levine, H.L., and Castillo, F.J. Validation of Biopharmaceutical Processes. Chapter No. 5 in *Biotechnology Issues in Pharmaceutical Process Engineering*. K.E. Avis, CM Wagner and VL Wu (Eds.), pp 111-165, Interpharm Press, Inc.,Buffalo Grove, Ill. 1998.
- Ertola, R.J, Giulietti, A.M. and Castillo F.J. Design, formulation and optimization of media. Chapter No.4 in *Bioreactor System Design*. J.A.Asenjo and J.C.Merchuk (Eds.), pp 89-137. Marcel Dekker, New York. 1994.
- Castillo, F.J. Organism Selection. Chapter No.2 in *Bioreactor System Design*. J.A.Asenjo and J.C.Merchuk (Eds.), pp 13-45. Marcel Dekker, New York. 1994.
- Castillo, F.J., Mullen, L.J., Grant, B.C., DeLeon, J., Thrift, J.C., Chang, L.W., Irving, J.M. and Burke, D.J. Hybridoma Stability. *Develop. Biol. Standard.* 83: 55-64. 1994.
- Irving, J.M., Chang, L.W.S. and Castillo F.J. A reverse transcriptase-polymerase chain reaction assay for the detection and quantitation of murine retroviruses. *Biotechnology* 11: 1042-1046. 1993.

- Castillo, F.J. Mullen, L., Thrift, J. and Grant, B. Perfusion cultures of hybridoma cells for monoclonal antibody production. *Annals N.Y. Acad. Sci.* 665:72-80. 1992.
- Castillo, F.J. Lactose metabolism in yeasts. Chapter No.10 in *Yeasts: Biotechnology-Biocatalysis*. H.Verachtert and R.De Mot (Eds.), pp 297-320. Marcel Dekker, New York. 1989.
- Castillo, F.J. and O'Daly, J.A. Increase in growth rates and yields by agitation of Trypanosoma cruzi cultures in liquid medium. *Acta Cientifica Venezolana.* 38:382-383. 1987.
- Pestana, F. and Castillo, F. J. Glucoamylase production by Aspergillus awamori on rice flour medium and partial characterization of the enzyme. *MIRCEN J.Appl.Microbiol.Biotechnol.* 1:225-237. 1985.
- Michelena, V. and Castillo, F.J. Production of amylase by Aspergillus foetidus on rice flour medium and characterization of the enzyme. *J.Appl.Bacteriol.* 56:395-407. 1984.
- Maiorella, B. and Castillo, F.J. Ethanol, biomass and enzyme production for whey waste abatement. *Process Biochem.* 19:157-161. 1984.
- Castillo, F.J., Blanch, H. and Wilke, C.R. Lactase production in continuous culture by Trichoderma reesi Rut-C30. *Biotechnol. Letters.* 6:593-596. 1984.
- Castillo, F.J. and Moreno, B. Properties of lactase produced by Candida pseudotropicalis. *J.Dairy Sci.* 66:1616-1621. 1983.
- Gomez, A. and Castillo, F.J. Production of biomass and B-D-galactosidase by Candida pseudotropicalis in continuous culture on whey. *Biotechnol. Bioeng.* 25:1341-1357. 1983.
- Pedrique, M. and Castillo, F.J. Regulation of B-D-galactosidase synthesis in Candida pseudotropicalis. *Appl.Environ.Microbiol.* 43:303-310. 1982.
- Goncalves, J.A. and Castillo, F.J. Partial purification and characterization of B-D-galactosidase from Kluyveromyces marxianus. *J.Dairy.Sci.* 64:2088-2094. 1982.
- Izaguirre, M. and Castillo, F.J. Selection of lactose fermenting yeast for ethanol production from whey. *Biotechnol. Letters.* 4:257-262. 1982.
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- Nieves, B.M., Gil, F. and Castillo, F.J. Growth inhibition activity and bacteriophage and bacteriocin-like particles associated with different species of *Clostridium*. *Can.J.Microbiol.* 27:216-225. 1981.
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Castillo, F.J. and Bartell, P.F. Localization and functional role of the Pseudomonas phage 2 depolymerase. *J. of Virol.* 18:701-708. 1976.

Whitescarver, J., Castillo, F.J. and Furness, G. The preparation of membranes of some human T mycoplasmas and the analysis of their carbohydrate content. *Proc. Soc. Exp. Biol. Med.* 150:20-22. 1975.

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