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**EDUCATIONAL BACKGROUND:**

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1977	B.A.	Chemistry	Bowling Green State University

**PROFESSIONAL EXPERIENCE:**

1994-present Molecular Biologist; Biosciences Division,  
Argonne National Laboratory

2008-present Deputy Division Director, Biosciences Division, Argonne National  
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2008-present Research Coordinator, Scientific Focus Area Program: Genomics: GTL  
Fundamental Science Program, Argonne National Laboratory

2000-2007 Gene Cloning and Expression Group Leader, Midwest Center for  
Structural Genomics

1999-2007 Robotic Molecular Biology Facilities Manager, Biosciences Division,  
Argonne National Laboratory

1989-1994 Assistant Molecular Biologist; Division of Biological and  
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1984-1989 Postdoctoral Appointee, Supervisor: Dr Eliezer Huberman  
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**PUBLICATIONS**

**Submitted**

1. Kemin Tan, Changsoo Chang, Marianne Cuff, Jurek Osipiuk, Jamey C. Mack, Sarah Zerbs, Andrzej Joachimiak, **Frank R. Collart**. Structural and functional characterization of transport proteins for aromatic compounds derived from lignin: Phenylacetic acid, p-coumaric acid and related aromatic acids. Submitted to Proteins.

**Published/Accepted for Publication**

1. Michalska, K., Chang, C., Osipiuk, J., Mack, J.C., Zerbs, S., Joachimiak, A. and **Collart, F.R.** Structural and functional characterization of transport proteins for aromatic compounds derived from lignin: benzoate derivative binding proteins. Accepted for publication, *Journal of Molecular Biology*
2. Larsen, P.E., and **Collart, F.R.** Assigning statistical significance to expressed genes using short-read transcriptome data. *BMC Research Notes* 2012, 5:275.
3. Pietri, R, Zerbs, S., Corgliano, D.M., Alliare, M., **Collart, F.R.**, and Miller, L.M. Biophysical and structural characterization of a sequence-diverse set of solute binding proteins for aromatic compounds, *Journal of Biological Chemistry*, 6;287(28):23748-56, 2012.
4. Using Next Generation Transcriptome Sequencing to Predict a Mycorrhizal Metabolome. Larsen, P.E., Trivedi, G., Sreedasyam, A., Lu, V., Podila, G.K., Cseke, L.J., and **Collart, F.R.** *BMC Systems Biology* 5(1):70, 2011.
5. Predicted Relative Metabolomic Turnover (PRMT): determining metabolic turnover from a coastal marine metagenomic dataset. Larsen P.E., **Collart, F.R.**, Field, D., Meyer, F., Keegan, K.P., Henry, C.S., McGrath, J., Quinn, J., and Gilbert J.A. *Microbial Informatics and Experimentation* 2011, 1:4 (14 June 2011)
6. Environment Sensing and Response mediated by ABC Transporters. Giuliani, S.E., Frank, A.M., Corgliano, D.M., Seifert, C., Hauser, L., and **Collart, F.R.** *BMC Genomics* 2011, 12(Suppl 1):S8 (15 June 2011).
7. Design and Initial Characterization of the SC-200 Proteomics Standard Mixture. Bauman A, Higdon R, Rapson S, Loieue B, Hogan J, Stacy R, Napuli A, Guo W, van Voorhis W, Roach J, Lu V, Landorf E, Stewart E, Kolker N, **Collart F**, Myler P, van Belle G, Kolker E. *OMICS* 15:73-82, 2011.
8. Mining Knowledge Network Topology Improves Prediction of Protein Interactions from Transcriptomic data. Larsen, P.E., **Collart, F.R.**, and Dai, Y. *International Journal of Knowledge Discovery in Bioinformatics* 1(3), 1-19, 2010.
9. Using Deep RNA Sequencing for the Structural Annotation of the *Laccaria bicolor* Mycorrhizal Transcriptome, Larsen, P.E., Trivedi, G., Sreedasyam, A., Lu, V., Podila, G.K. and **Collart, F.R.** *PLoS ONE* Jul 6; 5(7):e9780, 2010.
10. Protein Expression in Bacterial Systems. Zerbs, S., Frank, A.M., and **Collart, F.R.** *Methods in Enzymology*, 463:149-68, 2009.
11. Jovanovic, I, Magnuson, J. K., **Collart, F.R.**, Robbertse, B., Adney, W.S., Himmel, M.E., and Baker, S.E. Fungal glycoside hydrolases for saccharification of lignocellulose; outlook for new discoveries fueled by genomics and functional studies. *Cellulose* 16:687–697, 2009.
12. Crystal Structure of YkuI in Complex with Second Messenger c-di-GMP Suggests Catalytic Mechanism of Phosphodiester Bond Cleavage by Eal Domains. Minasov, G., Padavattan, S., Shuvalova, L., Brunzelle, J.S., Miller, D.J., Baslé, A., **Collart, F.R.**, Schirmer, T., and Anderson, W.F. *J. Biol. Chem.* 284, 13174-84, 2009
13. Osipiuk J., Zhou M., Moy S., **Collart F**, and Joachimiak A. X-Ray crystal structure of GarR-tartronate semialdehyde reductase from *Salmonella typhimurium*. *J Struct Funct Genomics.* 10(3):249-53, 2009.
14. Pinchuk, G.E., Rodionov, D.A., Yang, C., Li, X., Osterman, A.L., Dervyn, E., Geydebekht, O.V., Reed, S.B., Romine, M.F., **Collart, F.R.**, Scott, J.H., Fredrickson, J.K., and Beliaev, A.S. Genomic Reconstruction of *Shewanella Oneidensis* MR-1 Metabolism Reveals a Novel Machinery for Lactate Utilization. *Proc. Natl. Acad. Sci. U S A.*, 106(8) 2874-2879, 2009.

15. Abdullah, J., Joachimiak, A, and **Collart, F.R.** “System 48” High Throughput Cloning and Protein Expression Analysis. *Methods Mol Biol.* 498 117-27, 2009
16. Giuliani, S.E., Frank, A.M., and **Collart, F.R.** Functional Assignment of Solute-Binding Proteins of ABC Transporters Using a Fluorescence-Based Thermal Shift Assay. *Biochemistry* 47(52) 13974-84, 2008.
17. Londer, Y.Y., Giuliani, S.E., Pepler, T., and **Collart, F.R.**. Addressing *Shewanella oneidensis* “cytochromome”: the first step towards high-throughput expression of cytochromes *c*. *Protein Expression and Purification* 62(1) 128-37, 2008
18. Younggyu, K., Ho, S.O., Gassman, N.R., Korlann, Y., Landorf, E.V., **Collart, F.R.**, and Weiss, S. Efficient site-specific labeling of proteins via cysteines. *Bioconjugate Chemistry* 3 786-91, 2008.
19. Structural Genomics Consortium; China Structural Genomics Consortium; Northeast Structural Genomics Consortium, Gräslund S., Nordlund P., Weigelt J., Bray J., Gileadi O., Knapp S., Oppermann U., Arrowsmith C., Hui R., Ming J., dhe-Paganon S., Park H.W., Savchenko A., Yee A., Edwards A., Vincentelli R., Cambillau C., Kim R., Kim S.H., Rao Z., Shi Y., Terwilliger T.C., Kim C.Y., Hung L.W., Waldo G.S., Peleg Y., Albeck S., Unger T., Dym O., Prilusky J., Sussman J.L., Stevens R.C., Lesley S.A., Wilson I.A., Joachimiak A., **Collart F.**, Dementieva I., Donnelly M.I., Eschenfeldt W.H., Kim Y., Stols L., Wu R., Zhou M., Burley S.K., Emtage J.S., Sauder J.M., Thompson D., Bain K., Luz J., Gheyi T., Zhang F., Atwell S., Almo S.C., Bonanno J.B., Fiser A., Swaminathan S., Studier F.W., Chance M.R., Sali A., Acton T.B., Xiao R., Zhao L., Ma L.C., Hunt J.F., Tong L., Cunningham K., Inouye M., Anderson S., Janjua H., Shastry R., Ho C.K., Wang D., Wang H., Jiang M., Montelione G.T., Stuart D.I., Owens R.J., Daenke S., Schütz A., Heinemann U., Yokoyama S., Büsow K., Gunsalus K.C. Protein production and purification. *Nat Methods.* 5(2) 135-46, 2008.
20. Nocek B., Mulligan, R., Bargassa, M., **Collart, F.**, and Joachimiak A. Crystal Structure of Aminopeptidase N from Human Pathogen *Neisseria meningitidis*. *Proteins.* 2008, 70 273-9.
21. Vorontsov I.I., Minasov G., Brunzelle J.S., Shuvalova L., Kiryukhina O., **Collart F.R.**, Anderson W.F. Crystal structure of an apo form of *Shigella flexneri* ArsH protein with an NADPH-dependent FMN reductase activity. *Protein Sci.* 11 2483-2490, 2007.
22. Kolker, E., Hogan, J.M., Higdon, R., Kolker, N., Landorf, E., Yakunin, A.F., **Collart, F.R.**, van Belle, G. Development of BIATECH-54 standard mixtures for assessment of protein identification and relative expression. *Proteomics.* 20 3693-8, 2007.
23. Godsey, M.H. Minasov, G., Shuvalova, L., Brunzelle, J.S. Vorontsov, I.I., **Collart, F.R.**, Anderson, W.F. The 2.2 Å Resolution Crystal Structure of *Bacillus cereus* Nif3-family protein YqfO, reveals a conserved dimetal-binding motif and a regulatory domain. *Protein Sci.* 7 1285-93, 2007.
24. Stols, L.;Zhou, M.; Eschenfeldt, W.H.; Sanville Millard, C.; Abdullah, J.; **Collart, F.R.**; Kim, Y., Donnelly, M.I. New vectors for co-expression of proteins: Structure of *Bacillus subtilis* ScoAB obtained by high throughput protocols. *Protein Expr Purif.* 53(2) 396-403, 2007.
25. Gerdt C.J., Tereshko V., Yadav M.K., Dementieva I., **Collart F.**, Joachimiak A., Stevens

- R.C., Kuhn P., Kossiakoff A., Ismagilov R.F. Time-Controlled Microfluidic Seeding in nL-Volume Droplets to Separate Nucleation and Growth Stages of Protein Crystallization. *Angew Chem Int Ed Engl.* 45(48) 8156-60, 2006.
26. Osipiuk J., Maltseva N., Dementieva I., Clancy S., **Collart F.**, and Joachimiak A. Structure of YidB protein from *Shigella flexneri* shows a new fold with homeodomain motif. *Proteins.* 65(2) 509-13, 2006.
  27. Rajan, S.S, Yang, X., Shuvalova, L., **Collart, F.**, Anderson, W.F. Crystal structure of YfiR, an unusual TetR/CamR-type putative transcriptional regulator from *Bacillus subtilis*. *Proteins.* 65(1) 255-257, 2006.
  28. Dieckman, L.J., Zhang, W., Rodi, D.J., Donnelly, M.I., and **Collart, F.R.** Bacterial Expression Strategies for Human Angiogenesis Proteins. *J Struct Funct Genomics.* 7(1) 23-30, 2006.
  29. Borowicz, S., Fackenthal, J., **Collart, F.R.**; Myatt, E., Moy, S., Babnigg, G., Wilton, R., Boernke, W.E., Schiffer, M., Stevens, F.J., Olopade, O.I. Primary structure-based function characterization of BRCT domain replicates in BRCA1. *Biochem Biophys Res Commun.* 345(1) 188-196, 2006.
  30. Zhang, R., Joachimiak, G., Jiang, S., Cipriani, A., **Collart, F.**, and Joachimiak, A. Structure of Phage Protein BC1872 from *Bacillus cereus*, a singleton with new fold. *Proteins* 64(1) 280-283, 2006.
  31. Kim, Y., Maltseva, N., Dementieva, I., **Collart, F.**, Holzle, D., Joachimiak A. Crystal structure of hypothetical protein YfiH from *Shigella flexneri* at 2 Å resolution. *Proteins* 1;63(4) 1097-101, 2006.
  32. Donnelly, M.I., Zhou, M., Sanville Millard, C., Clancy, S., Stols, L., Eschenfeldt, W.H., **Collart, F.**, Joachimiak, A. An expression vector tailored for large-scale high throughput purification of recombinant proteins. *Protein Expr Purif.* 47(2) 446-54, 2006.
  33. Lin, C-T., Moore, P.A., Auberry, D.L., Landorf, E.V, Pepler, T., Victry, K.D., **Collart, F.R.**, and Kery, V. Automated Purification of Recombinant Proteins: Combining High-Throughput with High Yield. *Protein Expr Purif.* 47 (1) 16-24, 2006.
  34. Dieckman, L.J., Hanly, W.C., and **Collart, F.R.** Strategies for High Throughput Gene Cloning and Expression. *Genetic Engineering: Principles and Methods.* Vol. 42 (5) 590-596, 2006.
  35. Qiu Y., Tereshko V., Kim Y., Zhang R, **Collart F.**, Yousef M., Kossiakoff A., Joachimiak A. The crystal structure of Aq\_328 from the hyperthermophilic bacteria *Aquifex aeolicus* shows an ancestral histone fold. *Proteins.* 62(1) 8-16, 2006.
  36. Zhang, R., Minh, T., Lezondra, L., Korolev, S., Moy, S.F., **Collart, F.**, and Joachimiak, A. 1.6 Å Crystal Structure of YteR Protein from *Bacillus subtilis*, a Predicted Lyase. *Proteins: Structure Function and Genetics.* 60(3) 561-5, 2005.
  37. Nocek B., Chang C., Li H., Lezondra L., Holzle D., **Collart F.**, Joachimiak A. Crystal Structures of Delta(1)-Pyrroline-5-carboxylate Reductase from Human Pathogens *Neisseria meningitidis* and *Streptococcus pyogenes*. *J Mol Biol.* 354(1) 91-106, 2005.
  38. Bond D.R., Mester T., Nesbo C.L., Izquierdo-Lopez A.V., **Collart F.R.**, Lovley D.R.

- Characterization of citrate synthase from *Geobacter sulfurreducens* and evidence for a family of citrate synthases similar to those of eukaryotes throughout the Geobacteraceae. *Appl Environ Microbiol.* 71(7) 3858-65, 2005.
39. Zhang, R., Minh, T., Lezondra, L., Korolev, S., Moy, S.F., **Collart, F.**, A. Joachimiak. 1.6 Å Crystal Structure of YteR Protein from *Bacillus subtilis*, a Predicted Lyase. *Proteins: Structure Function and Genetics.* 60(3) 561-5, 2005.
  40. Stevens, F.J., Kuemmel, C., Babnigg, G., and **Collart, F.R.** Efficient Recognition of Protein Fold in the Twilight and Midnight Zones by Conservative Application of Psi-BLAST. *J Mol Recognit.* 18 150-157, 2005.
  41. Kolker E., Picone A.F., Galperin M.Y., Romine M.F., Higdon R., Makarova K.S., Kolker N., Anderson G.A., Qiu X., Auberry K.J., Babnigg G., Beliaev A.S., Edlefsen P., Elias D.A., Gorby Y.A., Holzman T., Klappenbach J.A., Konstantinidis K.T., Land M.L., Lipton M.S., McCue L.A., Monroe M., Pasa-Tolic L., Pinchuk G., Purvine S., Serres M.H., Tsapin S., Zakrajsek B.A., Zhu W., Zhou J., Larimer F.W., Lawrence C.E., Riley M., **Collart F.R.**, Yates J.R. 3rd, Smith R.D., Giometti C.S., Neilson K.H., Fredrickson J.K., Tiedje J.M. Global profiling of *Shewanella oneidensis* MR-1: Expression of hypothetical genes and improved functional annotations. *Proc. Natl. Acad. Sci. U S A.* 102 2099-2104, 2005.
  42. Brunzelle J.S., Wu, R., Korolev, S., **Collart, F.**, Joachimiak, A. and Anderson W.F. Crystal structure of *Bacillus subtilis* ydaF protein: a putative ribosomal N-acetyltransferase. *Proteins: Structure Function and Genetics.* 57(4) 850-853, 2004.
  43. Rajan S S , Yang X , Shuvalova L , **Collart F** , Anderson W F. YfiT from *Bacillus subtilis* is a probable metal-dependent hydrolase with an unusual four-helix bundle topology. *Biochemistry.* 43(49) 15472-9, 2004.
  44. Whitehead, J.P., Simpson, F, Hill, M.H., Thomas, E.C., Connolly, L.M., Collart, F., Simpson, R.J. and James, D.E. Insulin and Oleate Promote Translocation of Inosine-5' Monophosphate Dehydrogenase (IMPDH) to Lipid Bodies. *Traffic.* 5(10):739-49, 2004.
  45. Sanishvili, R., Wu, R., Kim, D.E., Watson, J.D., **Collart, F.**, and Joachimiak, A. Crystal Structure of *Bacillus subtilis* YckF: Structural and Functional Evolution. *J Struct Biol.* 148(1) 98-109, 2004.
  46. Rajan S.S., Yang X., **Collart F.**, Yip V.L., Withers S.G., Varrot A., Thompson J., Davies G.J., Anderson W.F.. Novel Catalytic Mechanism of Glycoside Hydrolysis Based on the Structure of an NAD(+)/Mn(2+)-Dependant Phospho-alpha-Glucosidase from *Bacillus subtilis*. *Structure (Camb).* 12(9) 1619-29, 2004.
  47. Moy, S., Dieckman, L., Schiffer, M., Maltzev, N., Yu, G.X., and **Collart, F.R.** Genome-scale expression of proteins from *Bacillus subtilis*. *J Struct Funct Genomics.* 5(1-2) 103-9, 2004.
  48. Scholle, M.D., Collart, F.R. and Kay, B.K. *In vivo* Biotinylated Proteins as Targets for Phage Display Selection Experiments. *Protein Expr Purif.* 37(1) 243-52, 2004.
  49. Taneja B., Maar S., Shuvalova L., **Collart F.**, Anderson W., Mondragon, A. Structure of the *Bacillus subtilis* YYCN protein: a putative N-acetyltransferase. *Proteins.* 53, 950-952, 2003.

50. Yoon, J., Laible, P. D., Gu, M., Scott, H.N., and **Collart, F.R.** Express Primer Tool for High-Throughput Gene Cloning and Expression. *BioTechniques* 33, 1328-33, 2002.
51. Zhang, R.-G.;Vinokour, E.;Grembecka, J., **Collart, F.**, Dementieva, I.;Minor, W.;Joachimciak, A. Structure of *Bacillus subtilis* YXKO - a member of UPF0031 family - a putative kinase. *J. Structural Biology* 139, 161-70, 2002.
52. S. Korolev, S., Koroleva, O., Petterson, K., Gu, M., **Collart, F.**, Dementieva, I and Joachimciak, A. Autotracing of *E. coli* acetate CoA transferase  $\alpha$ -subunit structure using 3.4 Å MAD and 1.9 Å native data. *Acta Crystal D58*, 2116-2121, 2002.
53. Zhang, R-g., Dementieva, I., Duke, N., **Collart, F.R.**, Quate-Randall, E., Alkire, L., Dieckman, L., Maltsev, N., Korolev, O., and Jochimiak, J. Crystal structure of *Bacillus subtilis* IolI shows Endonuclease IV fold with altered Zn-binding. *Proteins* **48**, 423-426, 2002.
54. Dieckman, L., Gu, M., Stols, L., Donnelley, M.I. and **Collart, F.R.** High throughput methods for gene cloning and expression. *Protein Expression and Purification* **25**, 1-7, 2002.
55. Stols, L., Gu, M., Dieckman, L., Raffin, R. **Collart, F.R.** and Donnelley, M.I. A new vector for high throughput, ligation independent cloning encoding a TEV protease cleavage site. *Protein Expression and Purification* **25** 8-15, 2002.
56. Zhang R., Evans G., Rotella F., Westbrook E., Huberman E., Joachimciak A., **Collart F.R.** Discriminatory signature of bacterial and mammalian IMPDH enzymes. *Current Med Chem.* **6**, 537-43, 1999.
57. Laouar, A., Chubb, C.B.H., **Collart, F.R.**, and Huberman, E. Human macrophage differentiation requires an interaction between integrins and fibronectin. *J. Immunol.* **162**, 407-414, 1999.
58. Zhang, R., Evans, G., Rotella, F.J., Westbrook, E.M., Beno, D., Huberman, E., Joachimciak, A., and **Collart, F.R.** Characteristics and crystal structure of bacterial inosine 5-monophosphate dehydrogenase. *Biochemistry* **38**, 4691-4700, 1998.
59. Franchetti, P., Cappellacci, L., Jayaram, H.N., Butler, A., Schneider, B.P., **Collart, F.R.**, Huberman, E., Grifantini, M. Isosteric analogues of nicotinamide adenine dinucleotide derived from furanfurin, thiophenfurin, and selenophenfurin as mammalian inosine monophosphate dehydrogenase (type I and type II) inhibitors. *J. Med. Chem.* **41**, 1702-1707, 1998.
60. Franchetti, P., Cappellacci, L., AbuSeikha, G., Jayaram, H.N., Schneider, B.P., Sint, T., Gurudutt, V.V., **Collart, F.R.**, Huberman, E., Grifantini, M. Synthesis and IMP dehydrogenase (type I and type II) inhibitory activity of isosteric NAD analogs derived from thiophenfurin and furanfurin. *Nucleosides and Nucleoides* 16, 1415-1418, 1997.
61. **Collart, F.R.**, Osipiuk, J., Trent, J., Olsen, G.J. and Huberman, E. Cloning and characterization of the gene encoding IMP dehydrogenase from *Arabidopsus thaliana*. *Gene*, 174, 217-220, 1996.
62. **Collart, F.R.**, Osipiuk, J., Trent, J., Olsen, G.J. and Huberman, E. Cloning, characterization, and sequence comparison of the gene coding for IMP dehydrogenase from *Pyrococcus furiosus*. *Gene*, 174, 206-216, 1996.

63. Salzberg, S., Heller, A., Zou, J-P., **Collart, F.R.**, Huberman, E. Interferon-independent activation of (2'-5')oligoadenylate synthetase in Friend erythroleukemia cell variants exposed to HMBA. *J. Cell Science*, 109, 1517-1526, 1996.
64. Hager, P.W., **Collart, F.R.**, Huberman, E., and Mitchell, B.S. Recombinant human inosine monophosphate dehydrogenase type I and type II proteins: Purification and characterization of inhibitor binding. *Biochem. Pharmacol.*, 49, 1323-1329, 1995.
65. **Collart, F.R.**, Horio, M., and Huberman, E. Heterogeneity in *c-jun* gene expression in normal and malignant cells exposed either to ionizing radiation or hydrogen peroxide. *Radiation Res.*, 142, 188-196, 1995.
66. Jiang, H., Lin, J., Su, Z., **Collart, F.R.**, Huberman, E., and Fisher, P.B. Induction of differentiation in human promyelocytic HL-60 leukemia cells activates p21, WAF1/CIP1, expression in the absence of p53. *Oncogene* 9, 3397-3406, 1994.
67. Huberman E, Glesne D, **Collart F**. Regulation and role of inosine-5'-monophosphate dehydrogenase in cell replication, malignant transformation, and differentiation. *Adv Exp Med Biol.* 370:741-6, 1994.
68. Gharehbaghi, K., Burgess, G.S., **Collart, F.R.**, Litz-Jackson, S., Huberman, E., Jayaram, H.N. p210 Bcr-Abl confers overexpression of inosine monophosphate dehydrogenase: an intrinsic pathway to drug resistance mediated by an oncogene. *Leukemia* 8, 1259-1263, 1994.
69. Warner-Bartnicki, A.L., Murao, S., **Collart, F.R.** and Huberman, E. Regulated expression of the *MRP8* and *MRP14* genes in human promyelocytic leukemic HL-60 cells treated with the differentiation-inducing agents mycophenolic acid and  $1\alpha, 25$ -dihydroxyvitamin  $D_3$ . *Experimental Cell Res.* 204, 241-246, 1993.
70. Glesne, D., **Collart, F.**, Varkony, T., Drabkin, H., and Huberman, E. Chromosomal localization and structure of the human Type II IMP dehydrogenase gene. *Genomics* 16, 274-277, 1993.
71. Tonetti, D.A., Horio, M., **Collart, F.R.**, and Huberman, E. Protein kinase C  $\beta$  gene expression is associated with susceptibility of human promyelocytic leukemia cells to phorbol ester-induced differentiation. *Cell Growth Differen.* 3, 739-745, 1992.
72. **Collart, F.R.**, Horio, M., Schlenker, R., Kathren, R.L., and Huberman, E. Alteration of the *c-fms* gene in a blood sample from a Thorotrast individual. *Health Physics* 63, 27-32, 1992.
73. **Collart, F.R.**, Chubb, C.B., Mirkin, B.L., Huberman, E. Increased inosine-5'-phosphate dehydrogenase gene expression in solid tumor tissues and tumor cell lines. *Cancer Res.* 52, 5826-5828, 1992.
74. Glesne, D., **Collart, F.R.**, and Huberman, E. Human IMP dehydrogenase expression regulated by end products, guanine nucleotides. *Mol. Cell. Biol.* 11, 5417-5425, 1991.
75. Wilson, K., **Collart, F.R.**, Huberman, E., Stringer, J.R., and Ullman, B. Amplification and molecular cloning of the IMP dehydrogenase gene of *Leishmania donovani*. *J. Biol. Chem.* 266, 1665-1671, 1991.

76. Murao, S., **Collart, F.R.**, and Huberman, E. A protein complex expressed during terminal differentiation of monomyelocytic cells is an inhibitor of cell growth. *Cell Growth Differen.* 1, 447-454, 1990.
77. Kiguchi, K., **Collart, F.R.**, Henning-Chubb, C., and Huberman, E. Induction of cell differentiation in melanoma cells by inhibitors of IMP dehydrogenase: Altered patterns of IMP dehydrogenase expression and activity. *Cell Growth and Differen.* 1, 259-270, 1990.
78. Kiguchi, K., **Collart, F.R.**, Henning-Chubb, C., and Huberman, E. Cell differentiation and altered IMP dehydrogenase expression induced in T-lymphoblastoid leukemia cells. *Experimental Cell Res.* 187, 47-53, 1990.
79. **Collart, F.R.** and Huberman, E. Expression of IMP dehydrogenase in differentiating HL-60 cells. *Blood* 75, 570-576, 1990.
80. Murao, S., **Collart, F.R.**, and Huberman, E. A protein containing the cystic fibrosis antigen is an inhibitor of specific protein kinases. *J. Biol. Chem.* 264, 8356-8360, 1989.
81. **Collart, F.R.** and Huberman, E. Cloning and sequence analysis of the human and Chinese hamster inosine-5'-monophosphate dehydrogenase cDNAs. *J. Biol. Chem.* 263, 15769-15722, 1989.
82. **Collart, F.R.** and Huberman, E. Amplification of the IMP dehydrogenase gene in Chinese hamster cells resistant to mycophenolic acid. *Mol. Cell. Biol.* 7, 3328-3331, 1987.
83. Scovell, W.M. and **Collart, F.R.** The Unwinding angle for cis- and trans-(NH<sub>3</sub>)<sub>2</sub>PtCl<sub>2</sub> on supercoiled  $\phi$ X174 RF DNA. *Nucleic Acid Res.* 13, 2881-2895, 1985.

### **Book Chapters/Technical Reports**

1. Leland J. Cseke, Stan D. Wullschleger, Avinash Shreedasyam, Geetika Trivedi, Peter Larsen, **Frank Collart**. Carbon Sequestration. In: *Genomics & Breeding for Climate-Resilient Crops*, Editor: Prof. Chittaranjan Kole, Clemson University, Springer – Heidelberg, Dordrecht, London, New York
2. Larsen, P.E., Cseke, L.J., and **Collart, F.R.** Prediction of an Ectomycorrhizal Metabolome from Transcriptomic Data: In *Molecular Microbial Ecology of the Rhizosphere*, F. J. de Bruijn (Ed.). John Wiley and Sons, Inc. In Press, 2012.
3. Giuliani, S. E., Landorf, E. V., and **Collart, F. R.** Protein production for biotechnology. In: *Encyclopedia of Life Sciences*. Wiley Press, 2007
4. **Collart, F.R.** and Huberman, E. Identification of Specific Inhibitors of IMP Dehydrogenase. In: "Inosine Monophosphate Dehydrogenase; A Major Therapeutic Target," K. W. Pankiewicz and B.M. Goldstein, Eds. *ACS Symposium Series* Vol. 839, 283-293, 2002.
5. **Collart, F.R.** Automated Cloning Methods. ANL Technical Report, ANL-BIO01. September 2001.
6. Laouar, A., **Collart, F.R.**, and Huberman, E. Induction of differentiation in human myeloid HL-60 leukemia cells. In: "Cell Biology: A Laboratory Handbook" J.E. Celis, Ed. Academic Press, San Diego, CA, pp. 233-238, 1997.
7. **Collart, F.R.**, Tonetti, D.A. and Huberman, E. The control of multiplication and differentiation in human myelomonocytic leukemia cells. In: "Regulation of Cell Growth,



Differentiation and Genetics in Cancer", N. D'Alessandro, E. Mihich, L. Rausa, H. Tapiero, T. R. Tritton, eds., *NATO ASI Series*, Springer-Verlag, Berlin, Vol H99, 113-128, 1996.

8. Huberman, E., Glesne, D., and **Collart, F.R.** Regulation and Role of Inosine 5'-monophosphate dehydrogenase in cell replication, malignant transformation, and differentiation. In: "Purine and Pyrimidine Metabolism in Man, VIII", A. Sahota and M. Taylor, Eds. Plenum Press, New York, 1995, pp. 741-746.
9. Huberman, E., Tonetti, D.A., Horio, M., Murao, S., and **Collart, F.R.** The control of cell multiplication and differentiation in human myelomonocytic cells. In: "Specific Approaches to Cancer Therapy; Differentiation, Immunomodulation and Angiogenesis", N. D'Alessandro, E. Mihich, L. Rausa, H. Tapiero, T. R. Tritton, eds., *NATO ASI Series*, Vol. H75, pp. 17-23 1993.
10. **Collart, F.R.** and Huberman, E. Amplification of the IMP dehydrogenase gene in mammalian cells. In: "Gene Amplification in Mammalian Cells", R. Kellems, Ed., Marcel Dekker, Inc., (New York), pp 149-158, 1992.
11. Murao, S., **Collart, F.R.**, and Huberman, E. A protein complex expressed during terminal differentiation of monomyelocytic cells is an inhibitor of growth. In: "The Status of Differentiation Therapy of Cancer", Vol. II, Waxman & Rossi, Eds., Raven Press, (New York, Rome) 1991.
12. Huberman, E. and **Collart F.R.** Somatic mutation and cell differentiation in neoplastic transformation. Proceedings of the 8th International Congress of Radiation Research, Edinburgh, 519-525, July, 1987.

### Co-author structures deposited in Protein Data Bank (182)

1I60 1I6N 1K6D 1KYH 1M3S 1MK4 1NC5 1NG6 1NNI 1NPY 1NRW 1NSL 1PZX  
1Q77 1R1D 1R4V 1R61 1R7L 1R8K 1RKT 1RLJ 1RXQ 1S3J 1S4K 1S9U 1SF9  
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1U84 1U8X 1U9C 1UFH 1VPD 1VR4 1X7F 1X87 1XA0 1XAF 1XDZ 1XG8 1XHD  
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2A5Z 2A67 2AE6 2AE8 2AEE 2AG8 2AH5 2AHR 2AI4 2AMF 2AN1 2AO9 2AP1  
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2CSG 2D7V 2D9R 2EW2 2EWC 2F06 2F7W 2F7Y 2F9H 2FB0 2FB1 2FB5 2FB6  
2FCJ 2FG1 2FI0 2FI1 2FI9 2FIA 2FOR 2FUV 2FZV 2GJV 2GTQ 2GX8 2H1I  
2H1J 2H1N 2I0Z 2O6I 2OEQ 2OKQ 2OL5 2OMK 2OSU 2POK 3PR1 2W27 3BV6  
2J4B 2J49 3KRV 3N55 3NJF 3NJH 3NJG 3NJN 3NJM 3NJL 3NJK 3NJJ 3NJI  
3QWU 3RPW 3SGO 3SNR 3TON 3TX6 3UKJ 3UK0 4DQD 4EVS 4EVR 4EVQ 4FCL

## PROFESSIONAL ACTIVITIES

### External Committees

- DOE's Biological Systems Science Division's 2011 Committee of Visitors Review Panel
- Reviewer for DOE Early Career Research Program, 2011 FY
- Steering Committee member for the CAFAE project organized by DOE-BER.

- American Cancer Society, Illinois Division Research Advisory Committee 1998-Present
- Reviewer for DOE SBIR proposals in FY08
- Molecular Biology and Genetics-2 (MBG-2). Peer review panel of the 2008 Prostate Cancer Research Program (PCRP), of the Congressionally Directed Medical Research Programs (CDMRP), Department of Defense (DOD)
- SER-CAT Sector Review Panel, Advanced Photon Source July 11, 2006.
- GMCA-CAT Sector Review Panel, Advanced Photon Source July 12, 2006.
- Medical Advisory Board of the Leukemia Research Foundation 1996-2004
- U.S. Department of Energy, Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program 2004, 2006, and 2008.

### Recent Laboratory Committees

Institutional Biosafety Committee	2011-present
Directors Grand Challenge Review Committee	2009-present
Bioscience Promotion Committee, Chair	2008-present
Safety committee	1996-present
BIO Strategic Planning Working Group	2009-present
Reviewer -Laboratory Strategic LDRD Program	2011 FY
Planning Committee - for the Environmental Molecular Microbiology Workshop	2011 FY

### Manuscript review

Editor for BMC Genomics: Functional Annotation Supplement. This supplement seeks to consolidate the methods development and experimental outcomes originating from the DOE-BER sponsored Annotation Validation Program into a formal publication.

Manuscript reviewer for Analytical Biochemistry, Applied and Environmental Microbiology, Biochemistry, Biotechniques, Cancer Letters, Chemical Reviews, Journal of Biological Chemistry, Journal of Structural and Functional Genomics, Nucleic Acids Research, Proceedings of the National Academy of Science, Protein Science, Protein Expression and Purification.

### Invited Lectures (last 5 years)

1. Binding Profiles and Crystal Structures of Bacterial Solute Binding Proteins for Transport of Aromatic Products of Lignin Degradation. Genomic Sciences Contractor-Grantee Meeting. Breakout Session C : Biological Structure Research in the Genomic Science Program, February 26-29 2012, Bethesda, Maryland
2. Transporter proteins: Illuminating the cellular interface with the environment. Northern Illinois University, DeKalb, IL November 4, 2011.
3. Functional Characterization by Mapping Protein:Ligand Interactions. Genomic Sciences Contractor-Grantee Meeting. Breakout Session C Databases and Functional Annotation, April 1-13 2011, Crystal City, VA.

4. Deep Sequencing of Symbionts. Basidiomycetes Genomics Jamboree, Walnut Creek, CA, March 21, 2011.
5. Tools for Functional Characterization of Complex Systems. Foundational Scientific Focus Area Project Kick-Off Meeting, Environmental Molecular Sciences Facility at PNNL, Richland, WA, June 8-9, 2010
6. Experimental Validation of Annotations. Collart, F.R. Critical Assessment of Functional Annotation Experiment (CAFAE). Crystal City, Virginia, May 18-19, 2010. Invited Speaker.
7. Bridging the Gap between Genomes and Systems Biology. Biological Sciences Division, PNNL, Richland, WA, November 12, 2009
8. Molecular Approaches for Elucidation of Sensory and Response Pathways in Cells. Pacific Northwest National Lab, April 2, 2009
9. Biochemical Approaches for Functional Annotation of Proteins. Genomics: GTL Contractor-Grantee Workshop VII. February 8-11, 2009, Washington DC
10. Mapping Ligands And Binding Proteins To Improve Protein Stability And Identify Functional Characteristics. CHI Protein Expression Conference, San Diego, CA, January 13-16, 2009
11. High Throughput Biochemical Approaches for Functional Annotation of Proteins. University of Alabama at Huntsville. September 12, 2008.
12. Zebrafish Protein and Antibody Core. 8th International Meeting on Zebrafish Development and Genetics. University of Wisconsin, Madison, WI, June 25-29, 2008.
13. Functional Annotation Strategies, 2008 Genomics: GTL Workshop, February 11-14th, 2007, Bethesda, Maryland.
14. Domain Boundary Approaches to Improve Protein Solubility, The 2007 Protein Structure Initiative "Bottlenecks" Workshop, Natcher Conference Center, NIH Campus – 45 Center Drive, Bethesda, Maryland 20892, March 19-20.
15. Development of Genome-Scale Expression Methods, 2007 Genomics: GTL Workshop, February 11-14th, 2007, Bethesda, Maryland.

#### **Workshops (last 2 years)**

- Workshop Invitee - Basidiomycetes Genomics Jamboree, Walnut Creek, CA, March 21, 2011.
- Workshop Invitee - 2010 Genomics: GTL Workshop. February 7-10, 2010, Bethesda, MD.
- Workshop Invitee - DOE Office of Science Graduate Fellowship Research Meeting. Argonne national Lab, Lemont, IL, August 8-10, 2010
- Workshop Invitee - Knowledgebase Systems Development Workshop, Arlington, VA, June 1-3, 2010.
- Workshop Invitee - Challenges in Environmental Molecular Microbiology (CEMM) Workshop. Argonne National Laboratory. February 26-17, 2010

#### **PROFESSIONAL SOCIETIES:**

Sigma Xi

American Association for Cancer Research  
American Society for Microbiology

## HONORS AND AWARDS

- Argonne Pacesetter award, 2009
- Argonne Pacesetter award, 2005
- Argonne Pacesetter award, 2003
- Department of Chemistry Alumnus of the Year, 1999, Bowling Green State University

## PATENTS

1. US Patent **5,665,583**: issue date September 9, 1997. Methods and Materials Relating to IMPDH and GMP Production. . F.R Collart and E. Huberman.
2. US Patent **6,147,194**: issue date November 14, 2000. Eukaryotic IMPDH polynucleotide and antibody compositions. F.R Collart and E. Huberman.
3. US Patent **6,153,398**: issue date November 28, 2000. Method to identify specific inhibitors of IMP dehydrogenase. F.R Collart and E. Huberman.
4. US Patent **6,479,628**: issue date November 12, 2002. Methods and Materials Relating to IMPDH and GMP Production (Continuation). Inventors, F.R. Collart and E. Huberman. Inventors: F.R. Collart, E. Huberman.
5. US Patent **6,826,488**, issue date November 30, 2004, Crystals, molecular complexes, and methods of developing lead compounds for inhibitors of bacterial IMPDH. Inventors: F.R. Collart, E. Huberman, A. Joachimiak, E.M. Westbrook, and R. Zhang

## LICENSE AGREEMENTS

- Aginimoto
- Bristol-Myers Squibb
- Roche Diagnostics Corporation
- Novadrug, LLC

## INVENTION REPORTS/SOFTWARE DISCLOSURES:

ANL-IN-86-72	Plant or Animal Organism with Increased Amounts of GMP. F.R. Collart and E. Huberman
ANL-IN-88-18	Synthetic DNA Construct, Cells, and Artificial Animals F.R. Collart and E. Huberman
ANL-IN-90-66	Method for Detecting Tumor Cells. F.R. Collart and E. Huberman
ANL-IN-94-032	New Material Relating to IMPDH and GMP Production. F.R. Collart, E. Huberman, J. Osipiuk, and J. D. Trent
ANL-IN-94-068	DNA sequence from Arabidopsis thaliana.

ANL-IN-97-053 F.R. Collart, E. Huberman, J. Osipiuk, and J. D. Trent  
A Method to Identify Specific Inhibitors of IMP Dehydrogenases.  
F.R. Collart and E. Huberman

ANL-IN-98-058 A Method to Design Drugs for the Inhibition of Microbial Growth.  
F.R. Collart, E. Huberman, A. Joachimiak, E.M. Westbrook, and R. Zhang

ANL-IN-00-014 Universal Genomic Detector: A Generic Method for Identification and  
Comparison of Genomic Material. F. Stevens and F.R Collart.

ANL-IN-00-02 Inhibitors of microbial IMPDH enzymes  
F.R. Collart, E. Huberman, A. Joachimiak, E.M. Westbrook, and R.  
Zhang

ANL-IN-00-083 Method to optimize recombinant protein expression  
F.R. Collart, M. Donnelly, and L. Stols.

ANL-SF-03-22 Express Primer Tool for High-throughput Gene Cloning and Expression  
F.R. Collart, Gu, M., Laible, P. D., Scott, H.N, Stevens, F.J., and Yoon, J

ANL-SF-09-089 Hermaion ZenoBridge, ZenoArrow and GeneShaper.  
P.E. Larsen and F.R. Collart.