

Curriculum Vitae

György Babnigg

EDUCATION AND EMPLOYMENT

B.S.

Department of Chemistry, Technical University of Budapest
Budapest, Hungary
1984

M.S.

Department of Biochemistry, Technical University of Budapest
Budapest, Hungary
1986

Continuing Education

Department of Engineering, Technical University of Budapest
A course on the programming of the 8086 microprocessor (assembler)
Budapest, Hungary
1986

Ph.D.

Department of Pharmacology and Physiology, University of Chicago
Chicago, IL
1997

Research Associate

Department of Cellular Oncopathology, Hungarian Cancer Research Institute
Budapest, Hungary
Regulation of PKC in human carcinoma cell lines.
1986 - 1989

Research Technician

Dept of Pharmacology and Physiology, University of Chicago
Characterization of human Na⁺/H⁺-exchanger and its regulation in human and rodent fibroblasts.
(Dr Mitchel L. Villereal)
1989 - 1991

Graduate Student

Department of Pharmacology and Physiology, University of Chicago
Bradykinin-induced tyrosine phosphorylation in fibroblasts expressing the human B2-bradykinin receptor.
(Dr Mitchel L. Villereal)
1991 - 1997

Research Associate

Department of Pharmacology and Physiology, University of Chicago
Regulation of Trp1 and Trp3 store-operated calcium channels.
(Dr Mitchel L. Villereal, Chair)
1997 - 2000

Postdoctoral Appointee
Biosciences Division, Argonne National Laboratory
(Dr Carol S. Giometti)
2000 – 2002

Assistant Bioinformatics Scientist / Biochemist
Biosciences Division, Argonne National Laboratory
(Dr Carol S. Giometti)
2002 – 2007

Fellow
Computational Institute, University of Chicago
2006 – present

Bioinformatics Specialist/Biochemist,
Biosciences, Argonne National Laboratory, IL
(Dr. Andrzej Joachimiak)
2007-present

Scientific Administrator, MCSG,
Argonne National Laboratory, IL
(Dr. Andrzej Joachimiak)
2007-present

Senior Fellow
Computational Institute, University of Chicago
2010 – present

Scientist, Bioinformatician/Molecular Biologist
Argonne National Laboratory, IL
(Dr. Andrzej Joachimiak)
2012-present

HONORS AND AWARDS

First Prize at Competition of Theses in Hungary 1984
Technical University of Budapest, Departmental Honors 1984
Technical University of Budapest, Departmental Honors 1986
Harry Ginsburg Memorial Prize, University of Chicago, 1997

OTHER EXPERIENCE AND PROFESSIONAL MEMBERSHIP

1991-	AAAS member
2006-	HUPO member
2010-	ACA member
2010-	Protein Society member

COMMITTEE MEMBERSHIP

2006-	LCRC allocation committee (ANL)
2007-	Library committee (ANL)
2009-2010	BIO seminar committee (ANL)

PUBLICATIONS (h-index: 12, based on Google Scholar)

Byron, K.L., **Babnigg, G.** and Villereal, M.L. (1992). Bradykinin-induced Ca²⁺-entry, release, and refilling of intracellular Ca²⁺ stores. Relationships revealed by image analysis of individual human fibroblasts. *J. Biol. Chem.* 267(1): 108-118

McSwine R.I., **Babnigg, G.**, Musch, M.W., Chang, E.B. and Villereal, M.L. (1994). Expression and phosphorylation of NHE1 in wild-type and transformed human and rodent fibroblasts. *J. Cell Physiol.*, 161(2): 351-357

Babnigg, G., Bowersox, S. R., and Villereal, M. L., (1997) The Role of pp60^{c-src} in the Regulation of Calcium Entry via Store-Operated Calcium Channels. *J. Biol. Chem.* 272(47): 29434-29437.

Wu, X., **Babnigg, G.**, Villereal, M.L. (1999). Functional significance of human trp1 and trp3 in store-operated calcium entry in HEK-293 cells. *APSTRACTS* 6:0271C

Babnigg, G., B. Heller, and M.L. Villereal (2000) Cell-to-cell variation in store-operated calcium entry in HEK-293 cells and its impact on the interpretation of data from stable clones expressing exogenous calcium channels. *Cell Calcium*, Vol. 27(2): p. 61-73

Wu, X., **G. Babnigg**, and M.L. Villereal (2000) Functional significance of human Trp1 and Trp3 in store-operated calcium entry in HEK293 cells. *Am J Physiol* Vol. 278:C526-536

Wu, X., **G. Babnigg**, M. L. Villereal (2000). Store-operated calcium entry in HEK293 cells: Are human transient receptor potential (Htrp1, Htrp3, and Htrp4) proteins functionally important? *FASEB J* 14(4):A577

Babnigg, G., M. L. Villereal (2000) A comparison of Thapsigargin-, bradykinin-, and carbachol-stimulated calcium responses in HEK-293 cells. *FASEB J* 14(4):A577

Giometti, C.S., Reich, C.I., Tollaksen, S.L., **Babnigg, G.**, Lim, H., Yates, J.R. 3rd, Olsen, G.J. (2001) Structural modifications of *Methanococcus jannaschii* flagellin proteins revealed by proteome analysis. *Proteomics* Aug;1(8):1033-42

Giometti, C.S., Reich, C.I., Tollaksen, S.L., **Babnigg, G.**, Lim, H., Yates, J.R. 3rd, Olsen, G.J. (2001) Structural modifications of *Methanococcus jannaschii* flagellin proteins revealed by proteome analysis. *Eur. Mass Spectrom.* 7, 207 – 217

Wu, X., **G. Babnigg**, T. Zagrnichnaya, M.L. Villereal (2002) The role of endogenous human TRP4 in regulating carbachol-induced calcium oscillations in HEK-293 cells. *J Biol Chem* 277(16), 13597-608

Giometti, C.S., Reich, C., Tollaksen, S., **Babnigg, G.**, Lim, H., Zhu, W., Yates, J., Olsen, G. (2002) Global analysis of a "simple" proteome: *Methanococcus jannaschii*. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2002 Dec 25;782(1-2):227-43.

Babnigg, G., Zagranichnaya, T., Wu, X., Villereal ML. (2003) Differential tyrosine phosphorylation of plasma membrane Ca²⁺-ATPase and regulation of calcium pump activity by carbachol and bradykinin. *J Biol Chem.* 2003 Apr 25;278(17):14872-82

Babnigg G, Giometti CS. (2003) ProteomeWeb: a web-based interface for the display and interrogation of proteomes. *Proteomics.* 2003 May;3(5):584-600.

Babnigg G, Giometti CS. (2004) GELBANK: a database of annotated two-dimensional gel electrophoresis patterns of biological systems with completed genomes. *Nucleic Acids Res.* 2004 Jan 1;32 Database issue:D582-5

Pirun M, **Babnigg G**, Stevens FJ. (2004) Template-based recognition of protein fold within the midnight and twilight zones of protein sequence similarity. *J Mol Recognit.* 2004 Nov 12;

Stevens FJ, Kuemmel C, **Babnigg G**, Collart FR. (2004) Efficient recognition of protein fold at low sequence identity by conservative application of Psi-BLAST: application. *J Mol Recognit.* Mar-Apr;18(2):150-157

Kolker E, Picone AF, Galperin MY, Romine MF, Higdon R, Makarova KS, Kolker N, Anderson GA, Qiu X, Auberry KJ, **Babnigg G**, Beliaev AS, Edlefsen P, Elias DA, Gorby YA, Holzman T, Klappenbach JA, Konstantinidis KT, Land ML, Lipton MS, McCue LA, Monroe M, Pasa-Tolic L, Pinchuk G, Purvine S, Serres MH, Tsapin S, Zakrajsek BA, Zhu W, Zhou J, Larimer FW, Lawrence CE, Riley M, Collart FR, Yates JR 3rd, Smith RD, Giometti CS, Nealson KH, Fredrickson JK, Tiedje JM. (2005) Global profiling of *Shewanella oneidensis* MR-1: expression of hypothetical genes and improved functional annotations. *Proc Natl Acad Sci U S A.* 2005 Feb 8;102(6):2099-2104

Chen, Y., 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. (2006) Primary structure-based function characterization of BRCT domain replicates in BRCA1. *Biochem Biophys Res Commun.* 345(1):188-96.

Babnigg G., Giometti, C.S. (2006) A database of unique protein sequence identifiers for proteome studies. *Proteomics.* 6(16):4514-22.

Lee, K.M., Son, S.W., **Babnigg, G.**, Villereal, M.L. (2006) Tyrosine phosphatase and cytochrome P450 activity are critical in regulating store-operated calcium channels in human fibroblasts. *Exp Mol Med.* 38(6):703-717.

Ahrendt, A.J., Tollaksen, S.L., Lindberg, C., Zhu, W., Yates, J.R. 3rd, Nevin, K.P., **Babnigg, G.**, Lovley, D.R., Giometti, C.S. (2007). Steady state protein levels in *Geobacter metallireducens* grown with iron (III) citrate or nitrate as terminal electron acceptor. *Proteomics* 7(22): 4148-4157

Gibson, F., Anderson, L., **Babnigg, G.**, Baker, M., Berth, M., Binz, P.A., Borthwick, A., Cash, P., Day, B.W., Friedman, D.B., Garland, D., Gutstein, H.B., Hoogland, C., Jones, N.A., Khan, A., Klose, J., Lamond, A.I., Lemkin, P.F., Lilley, K.S., Minden, J., Morris, N.J., Paton, N.W., Pisano, M.R., Prime, J.E., Rabilloud, T., Stead, D.A., Taylor, C.F., Voshol, H., Wipat, A., Jones, A.R. (2008). Guidelines for reporting the use of gel electrophoresis in proteomics. *Nat. Biotechnol.* 26(8):863-864

Henne, K.L., Turse, J.E., Nicora, C.D., Lipton, M.S., Tollaksen, S.L., Lindberg, C., **Babnigg, G.**, Giometti, C.S., Nakatsu, C.H., Thompson, D.K., Konopka, A.E. (2009). Global Proteomic Analysis of the Chromate Response in *Arthrobacter sp.* Strain FB24. *J. Proteome Res.* 8(4):1704-1716.

Chang, C., Tesar, C., Gu, M., **Babnigg, G.**, Joachimiak, A., Pokkuluri, P.R., Szurmant, H., Schiffer, M. (2010) Extracytoplasmic PAS-like domains are common in signal transduction proteins. *J Bacteriol.* 192(4):1156-1159.

Babnigg, G., Joachimiak, A. (2010) Predicting protein crystallization propensity from protein sequence. *J Struct Funct Genomics.* 11(1):71-80.

Tan, K., Tesar, C., Wilton, R., Keigher, L., **Babnigg, G.**, Joachimiak, A. (2010) Novel {alpha}-glucosidase from human gut microbiome: substrate specificities and their switch. *FASEB J.* 2010 Jun 25. [Epub ahead of print] PubMed PMID: 20581222.

Gibson, F., Hoogland, C., Martinez-Bartolomé, S., Medina-Aunon, J.A., Albar, J.P., **Babnigg, G.**, Wipat, A., Hermjakob, H., Almeida, J.S., Stanislaus, R., Paton, N.W., Jones, A.R. (2010) The Gel Electrophoresis Markup Language (GelML) from the Proteomics Standards Initiative. *Proteomics.* 2010 Jul 19. [Epub ahead of print] PubMed PMID: 20677327.

Nocek, B., Tikhonov, A., **Babnigg, G.**, Gu, M., Zhou, M., Makarova, K.S., Vondenhoff, G., Van Aerschoot, A., Kwon, K., Anderson, W.F., Severinov, K., Joachimiak, A. (2012) Structural and functional characterization of microcin C resistance peptidase MccF from *Bacillus anthracis*. *J Mol Biol.* 2012 Jul 20;420(4-5):366-83. PubMed PMID: 22516613

SCIENTIFIC PRESENTATIONS

Giometti, C.S., **G. Babnigg**, Tollaksen, S.L., Lim, H., Yate, J.R., Holden, J. Menon, A.L., Schut, G., Adams, M.W.W., Reich, C., and Olsen, G.: Protein expression in *Methanococcus jannaschii* and *Pyrococcus furiosus*. Poster presentation at the 8th DOE Genome Contractors and Grantees Workshop, February 2000.

Babnigg, G., M. L. Villereal : A comparison of Thapsigargin-, bradykinin-, and carbachol-stimulated calcium responses in HEK-293 cells. Poster presentation at the FASEB Meeting, May 2000

Giometti, C.S. and **G. Babnigg**: Database Management and Interrogation for Proteome Projects. Poster presentation at the Human Proteome Project Meeting, April, 2001.

Wu, X., **G. Babnigg**, M.L. Villereal: Functional significance of human transient receptor potential protein 4 (Htrp4) in calcium entry in HEK-293 cells. Poster Presentation at Chicago Signal Transduction Symposium, May 24, 2001.

Zagranichnaya, T., **G. Babnigg**, C.S. Giometti, M.L. Villereal: Proteomic approach to study calcium signalling. Poster Presentation at Chicago Signal Transduction Symposium, May 24, 2001.

Giometti, C.S., **G. Babnigg**, S. L. Tollaksen, W. Zhu, J. R. Yates III, C. I. Reich, and G. J. Olsen: Differential Expression in the Proteome of *Methanococcus jannaschii*. Poster presentation at 9th International Conference on Microbial Genomes, November, 2001.

Carol S. Giometti, Sandra L. Tollaksen, Tripti Khare, Gyorgy **Babnigg**, Wenhong Zhu, and John R. Yates III Proteome Analysis in Microbes from Diverse Environments 19th Annual Joint Meeting of the Electrophoresis Society and the American Institute of Chemical Engineers. Indianapolis, IN, November 2002

Giometti CS, Lipton MS, **Babnigg G**, Tollaksen SL, Khare T, Fredrickson JK, Smith RD, Gorby YA, Yates III JR. Analysis of the *Shewanella oneidensis* Proteome in Cells Grown in Continuous Culture. Genomes to Life Grantee / Contractor Workshop, Arlington, VA, February 10th 12th, 2003

Giometti CS, Gyorgy **Babnigg**, Sandra L. Tollaksen, Tripti Khare, Derek R. Lovley, James K. Fredrickson, Kenneth H. Nealson, Claudia I. Reich, Gary J. Olsen, Michael W.W. Adams, and John R. Yates III. The Microbial Proteome Project: A Database of Microbial Protein Expression in the Context of Genome Analysis, Arlington, VA, February 10th 12th, 2003

Giometti CS and **Babnigg G**. The Microbial Proteome Project: A Database of Microbial Protein Expression in the Context of Genome Analysis, 10th DOE Genome Conference, Santa Fe, NM, March 30th April 2nd, 2003

Carol S. Giometti, Sandra L. Tollaksen, Tripti Khare, Gyorgy **Babnigg**, Megan Hickman, Mary Rothermich, Franz Kaufmann, Abraham Esteve-Nunez, Wenhong Zhu, John R. Yates III, and Derek Lovley. Analysis of Protein Expression in *Geobacter sulfurreducens*. 103rd General Meeting of the American Society for Microbiology, Washington, DC May 18th 22nd, 2003

Babnigg, G., Functional Proteomics: The Phosphoproteome. Argonne National Laboratory, Biosciences Division Seminar, October 4th, 2004

Babnigg, G., Data Integration in Proteomics. Argonne National Laboratory, MCS seminar. November 2nd, 2004

Giometti, CS., **Babnigg, G.**, Tollaksen, S.L., Khare, T., Ahrendt, A., Zhu, W., Lovley, D.R., Fredrickson, J.K., Yates III, J.R., The Microbial Proteome Project: A Database of Microbial Protein Expression in the Context of Genome Analysis. Genomes To Life Conference, Washington, February, 2005

Babnigg, G., Sanville-Millard, C., Tollaksen, S.L., Lindberg, C., Zhu, W., Yates III, J.R., Fredrickson, J., and Giometti, C.S., The Phosphoproteome of *Shewanella oneidensis* MR-1. American Society of Microbiology Meeting, Atlanta, GA, June, 2005

Babnigg, G., Data Integration in Proteomics. University of Chicago Computational Institute seminar, October, 27th, 2005

Babnigg, G. and Giometti, C.S., A Database of Unique Protein Sequence Identifiers for Proteome Studies. HUPO Conference, Boston, MA, March, 2006

Babnigg, G., Fredrickson, J.K., Lovley, D.R., and Giometti, C.S., The Use of a Database of Unique Protein Sequence Identifiers in Microbial Proteomics. American Society of Microbiology, Orlando, FL, May, 2006

Babnigg, G., Bioinformatics Using .NET, SOAP, and AJAX for the Scouring of the Protein Space. ANL Biosciences Division Seminar, May, 2006

Babnigg, G and Joachimiak, A. Prediction of Protein Solubility and Crystallization Propensity Using High-Throughput Structural Genomics Data. PROTEIN STRUCTURE INITIATIVE "BOTTLENECKS" WORKSHOP 2008, Bethesda, DC

Giometti, C.S., Krieger, J., Smotrys, J., Lindberg, B.C., **Babnigg, G.**, Analysis of Bacterial Phosphoproteins, 108th General Meeting of the American Society for Microbiology, Boston, MA

Babnigg G., Joachimiak, A., Knowledge-based Approach at MCSG to Improve Protein Crystallizability. 2009 NIGMS Workshop: Enabling Technologies for Structural Biology

An, H., **Babnigg, G.**, Kim, Y., Joachimiak, A. The Upgrade of the MCSG LIMS. 2009 NIGMS Workshop: Enabling Technologies for Structural Biology

Babnigg, G., Kerfeld, C. A., Joachimiak, A. Targeting Bioenergy, Environment and New Protein Families: Community Nominated JGI/MCSG Structural Genomics Pilot Project. Genomics:GTL Contractor-Grantee Workshop VII, February 8-11, 2009

Babnigg, G., Kerfeld, C. A., Joachimiak, A. Targeting Bioenergy, Environment and New Protein Families: Community Nominated JGI/MCSG Structural Genomics Pilot Project. U.S. Department of Energy Joint Genome Institute (JGI) Fourth Annual User Meeting, Marriott Hotel in Walnut Creek, California, March 25-27, 2009

G. Babnigg, R. Jedrzejczak, B. Nocek, A. Stein, W. Eschenfeldt, N. Marshall, A. Sather, L. Stols, K. Buck, A. Binkowski, and A. Joachimiak. Comparison of high-throughput techniques for the expression of protein complexes. Structural Genomics: Expanding the Horizons of Structural Biology, Keystone, CO, January 8-13, 2010

G. Babnigg, H. An, J. Bearden, L. Bigelow, A. Binkowski, K. Buck, C. Chang, G. Chhor, S. Clancy, M. Cuff, M. Donnelly, W. Eschenfeldt, Y. Fan, B. Feldman, M. Gu, C. Hatzos, R. Jedrzejczak, G. Joachimiak, Y. Kim, H. Li, E. Marland, N. Marshall, B. Nocek, J. Osipiuk, E. Rakowski, M. Schiffer, A. Stein, L. Stols, K. Tan, C. Tesar, A. Weger, R. Wu, R. Zhang, J. Thornton, R. Laskowski, J. Watson, W. Anderson, O. Kiryukhima, D. Miller, G. Minasov, L. Shuvalova, Y. Tang, X. Yang, C. Orengo, D. Lee, R. Marsden, Z. Otwinowski, D. Borek, A. Kudlicki, A. Q. Mei, M. Rowicka, A. Edwards, E. Evdolkimova, J. Guthrie, A. Khachatryan, M. Kudrytska, A. Savchenko, T. Skarina, X. Xu, W. Minor, M. Chruszcz, M. Cymborowski, M. Grabowski, P. Lasota, P. Miles, M. Zimmerman, H. Zheng, D. Fremont, T. Brett, C. Nelson, C. A. Kerfeld and A. Joachimiak. Structural Characterization of New Protein Families Identified from the Environment, Metagenomes, and the GEBA Project. U.S. Department of Energy Joint Genome Institute (JGI) Fifth Annual User Meeting, Walnut Creek, California, March 24 - 26, 2010

Babnigg, G., Robert Jedrzejczak, Boguslaw Nocek, Adam Stein, William Eschenfeldt, Norman Marshall, Alicia Weger, Lucy Stols, Kimberly Buck, and Andrzej Joachimiak. A high-throughput pipeline for the expression of protein complexes. 2010 NIGMS Workshop: Enabling Technologies in Structure and Function. April 19 - 21, 2010, Bethesda, Maryland

Babnigg, G., Robert Jedrzejczak, Boguslaw Nocek, Adam Stein, William Eschenfeldt, Norman Marshall, Lance Bigelow, Changsoo Chang, Gekleng Chhor, Marianne Cuff, Yao Fan, Grazyna Joachimiak, Youngchang Kim, Hui Li, Jurek Osipiuk, Ella Rakowski, Kemin Tan, Christine Tesar, Alicia Weger, Ruiying Wu, Andrzej Joachimiak. Recombinant techniques for the production of protein-protein complexes for structural characterization. 2010 Annual Meeting - American Crystallographic Association, Inc., Chicago, IL, July 24-29, 2010

Babnigg, G., Robert Jedrzejczak, Boguslaw Nocek, Adam Stein, William Eschenfeldt, Norman Marshall, Alicia Weger, Ruiying Wu, Lucy Stols, Kimberly Buck, Andrzej Joachimiak. The production of protein-protein complexes in high-throughput manner for functional and structural characterization. The 24th Symposium of the protein society. August 1 - 5, 2010, San Diego, CA

Babnigg, G., Tan, K., Chang, C., Michalska, K., Cuff, M., and Joachimiak, A. Structural studies of proteins overrepresented in the human gut microbiome. International human microbiome congress. March 9-11, 2011, Vancouver

Babnigg, G., An, H., Eschenfeldt, P., and Joachimiak, A. SG-LIMS: coping with the complexities of HTP cloning, protein purification, and protein crystallization. 2011 Meeting of the American Crystallographic Association. May 28 - June 3, 2011, New Orleans, LA

Babnigg, G., Joachimiak, A., and MCSG Team. 21st Century Structural Genomics: the Integration of Genomics, Proteomics, and Synthetic Biology. University of Chicago Review. September 10, 2011, Argonne, IL

Joachimiak, A., An, H., **Babnigg, G.**, et al. The Midwest Center for Structural Genomics Pipeline. Keystone Symposium, High-Throughput Structural Biology. January 22-27, 2012, Keystone, Colorado

Kim, Y., Tesar, C., Jedrzejczak, R., Mire, J., Binkowski, A., **Babnigg, G.**, Sacchetti, J., and Joachimiak, A. Structural Analysis of Two NDM-1 Point-mutants, A121F and D223A. Keystone Symposium, High-Throughput Structural Biology. January 22-27, 2012, Keystone, Colorado

Jedrzejczak, R., **Babnigg, G.**, Eschenfeldt, W., Clancy, S., Bearden, J., and Joachimiak, A. Delayed expression of TVMV protease eliminates the co-purification of a solubility enhancer. Keystone Symposium, High-Throughput Structural Biology. January 22-27, 2012, Keystone, Colorado

Babnigg, G., et al., and Joachimiak, A. The Details of Microbial Carbohydrate Utilization as Revealed by Structural Biology. U.S. Department of Energy Joint Genome Institute (JGI) Seventh Annual User Meeting, Walnut Creek, California, March 22 - 24, 2012

INVITED TALKS:

G. Babnigg, Giometti, C.S., ProteomeWeb: Web based interface for the display and interrogation of proteomes. Southern Great Lakes Local Section of the Society for Industrial Biology, Notre Dame, IN, October 19th, 2002

G. Babnigg, Giometti, C.S., Proteome Data Management and Integration. 19th Annual Joint Meeting of the Electrophoresis, Society and the American Institute of Chemical Engineers Indianapolis, IN, November 3rd, 2002

G. Babnigg, Giometti, C.S., The integration of proteomics data with genomic and metabolic information. Bioinformatics in Systems Biology (Marcus Evans), New York, NY, December 4th, 2002

G. Babnigg, Giometti, C.S., Bioinformatics/Proteomics. Bioinformatics workshop (GTL Facility II) La Jolla, CA, May 12th-14th, 2003

G. Babnigg, Giometti, C.S., The Use of ORACLE in Discovery of Distant Protein Sequence Similarities, ORACLE Life Sciences Users Meeting, Reston, VA, June 23rd-24th, 2004

G. Babnigg, Giometti, C.S., Data Integration in Proteomics, Global Pharma R&D Summit, Scottsdale, AZ, September 12th - 14th, 2004

G. Babnigg, Giometti, C.S., Clustering of Protein Space Using Oracle10g, ORACLE Life Sciences Users Meeting, Boston, MA, May 16th-17th, 2005

Babnigg, G., and Giometti, C.S., Data Integration at ANL. Shewanella Federation Meeting, Argonne, IL, October 10-12th, 2005

Babnigg, G., and Giometti, C.S., The Shewanella oneidensis MR-1 Phosphoproteome. Shewanella Federation Meeting, Argonne, IL, October 10-12th, 2005

G. Babnigg, Giometti, C.S.: Unique Bioinformatics Capabilities Using ORACLE 10g, ORACLE Life Sciences Users Meeting, Boston, MA, April 3rd, 2006

Babnigg, G and Joachimiak, A., Oracle's Platform for Life Sciences and Healthcare and a Midwest Center for Structural Genomics Case Study. Oracle OpenWorld 2007, 2007-10-15. San Francisco, CA

Babnigg, G., Oracle Data Mining and in-Database Analytics for the Selection of Protein Targets at the Midwest Center for Structural Genomics, OLSUG-2008 (Bio-IT2008), 2008-04-28, Boston, MA

Babnigg, G., Strategies for the Expression of Difficult Protein Targets at the Midwest Center for Structural Genomics, PEGS-2008, 2008-05-01, Boston, MA

Babnigg, G., Data Integration: Overcoming Challenges for Structural Genomics Data, Oracle OpenWorld 2008, 2007-09-21. San Francisco, CA

Babnigg, G. Rescue Pathways: Designing of Constructs and Prioritization of Failed Targets. CSGID 2nd Annual Meeting, Northwestern University, Chicago, April 15th, 2009

Babnigg, G., Designing proteins for structural studies and for expression of protein complexes , MCSG Annual Meeting, 2009-04-16, Argonne, IL

G. Babnigg, R. Jedrzejczak, B. Nocek, A. Stein, W. Eschenfeldt, N. Marshall, A. Sather, L. Stols, K. Buck, A. Binkowski, and A. Joachimiak. Comparison of high-throughput techniques for the expression of protein complexes. Structural Genomics: Expanding the Horizons of Structural Biology, Keystone, CO, January 8-13, 2010

Babnigg, G. Targets Selected Internally at CSGID. CSGID 3rd Annual Meeting, Northwestern University, Chicago, March 18th, 2010

Babnigg, G., Robert Jedrzejczak, Boguslaw Nocek, Adam Stein, William Eschenfeldt, Norman Marshall, Alicia Weger, Lucy Stols, Kimberly Buck, and Andrzej Joachimiak. A high-throughput pipeline for the expression of protein complexes. 2010 NIGMS Workshop: Enabling Technologies in Structure and Function. April 19 - 21, 2010, Bethesda, Maryland

Babnigg, G., Robert Jedrzejczak, Boguslaw Nocek, Adam Stein, William Eschenfeldt, Norman Marshall, Alicia Weger, Lucy Stols, Kimberly Buck, and Andrzej Joachimiak. The Comparison of High-Throughput Techniques for the Expression of Protein Complexes. PEGS: the Essential Protein Engineering Summit: Difficult to Express Proteins. May 17-18, 2010, Boston, MA

Babnigg, G., Robert Jedrzejczak, Boguslaw Nocek, Adam Stein, William Eschenfeldt, Norman Marshall, Alicia Weger, Lucy Stols, Kimberly Buck, and Andrzej Joachimiak. Challenges in target design for structural studies and for the expression of protein complexes. 10th Annual MCSG Meeting, July 1, 2010, Chicago, IL

Babnigg, G. and Joachimiak, A. The microbiome project. 11th Annual MCSG Meeting, March 28, 2011, Chicago, IL

Babnigg, G. and Joachimiak, A. Designing Protein Constructs for Crystallography. 12th Annual MCSG Meeting, April 4-5, 2012, Chicago, IL

Babnigg, G. and Joachimiak, A. Biology Partnership Data and Databases. 12th Annual MCSG Meeting, April 4-5, 2012, Chicago, IL

Pearson, L., Hatzos-Skintges, C., **Babnigg, G.**, Chang, C., Tan, K., Giometti, C., and Joachimiak, A. Analysis of chemically alkylated lysines in proteins using specific proteases and tandem mass spectrometry. General Meeting of American Society of Microbiology. 2012, San Francisco

Babnigg, G., Jedrzejczak, R., Eschenfeldt, W., and Joachimiak, A. Target Selection and Cloning Salvage Pathways in the MCSG Pipeline American Crystallographic Association Meeting, July 28th – August 1st, 2012, Boston, MA

Babnigg, G., Target selection strategies at the Midwest Center for Structural Genomics (MCSG). CBB Seminar Series, October 19th, 2012, Northern Illinois University, DeKalb, IL

BIOINFORMATICS EXPERIENCE

- Proteomics web applications (2000 – present) at Argonne National Laboratory
- Design of bioinformatics databases (2000 – present) at Argonne National Laboratory
- Design of Laboratory Information Management Systems (LIMS, 2000 – present) at Argonne National Laboratory
- Design of data mining models in proteomics (2007-present) at Argonne National Laboratory
- Design of bioinformatics web services (2003 – present) at Argonne National Laboratory
- Interface design for bioinformatics tools and databases (2000 – present) at Argonne National Laboratory
- Cluster computing (2001 – present) at Argonne National Laboratory
- Database maintenance (Oracle8i – Oracle11g) (2000 – present) at Argonne National Laboratory
- Use of bioinformatics tools (1994 – present)
- Use of Wisconsin Package (GCG) (1994 – 2001)
- Technical Help for the Wisconsin Package (GCG) at the University of Chicago (1998 – 2000)
- Teaching the use of Wisconsin Package (GCG) on the following graduate level courses
 - Fall, 1996
Molecular Pharmacology. Teaching assistant. Department of Pharmacology and Physiology,
University of Chicago
 - Spring, 1994
Growth Control and Cell Transformation. Teaching assistant. Department of Pharmacology and Physiology,
University of Chicago

BIOINFORMATICS PROJECTS

BIOINFORMATICS APPLICATIONS	
https://www.sg.bio.anl.gov/intranet (C# Web service, Oracle 11g, Windows 2008, AJAX, DHTML, .NET 4, ASP.NET)	Intranet <ul style="list-style-type: none"> Secure web-services Oracle-based CMS
https://www.csgid.bio.anl.gov/intranet (C# Web service, Oracle 11g, Windows 2008, AJAX, DHTML, .NET 2, ASP.NET)	Intranet <ul style="list-style-type: none"> Secure web-services Oracle-based CMS
http://bioinformatics.anl.gov/seguid/ (C# Web service, Oracle 10g, Windows 2003, 20-node Linux cluster, Perl, AJAX, DHTML, ASP.NET)	SOAP-Match <ul style="list-style-type: none"> On-line cluster computation Regular Expression-based search Web-service implementation
http://bioinformatics.anl.gov/seguid (Win2003 server, C# ASP.NET, Perl, Oracle10g, Javascript, DHTML, AJAX)	SEGUID <ul style="list-style-type: none"> Website design Database design Advanced client interactions Web services
https://bioinformatics.anl.gov/pmgs (Win2003 server, ASP, Perl, Oracle10g, Javascript)	PMG Intranet site <ul style="list-style-type: none"> Dynamic content management Advanced visualization Proteomics DB update control panel Oracle10g based authentication solution Interface to database updates
https://bioinformatics.anl.gov/sws (Win2003 server, C# ASP.NET, Web services, Oracle10g)	Secure Web Services <ul style="list-style-type: none"> Token-based authenticated web services Complex objects Services for thin clients (.NET applications) BioBLAST web services Distributed computing monitor Barcode web service SHA-1 digest web services
http://bioinformatics.anl.gov/ws (Win2003 server, C# ASP.NET, Web services, Oracle10g)	Web services <ul style="list-style-type: none"> Protein Sequence web services Regular Expression web services Tandem Mass Spectrometry web services
http://bioinformatics.anl.gov/gtllm (ASP, Access)	Portal for GTL Markup Language development <ul style="list-style-type: none"> XML builder (distributed XSD construction)
http://proteomeweb.anl.gov (Win2003 server, Active Server Pages, Perl, Oracle10g database, Access database, COM components, Javascript, DHTML)	ProteomeWeb <ul style="list-style-type: none"> Website design Database design Proteomics result display Interactive interrogation of results On-the-fly image generation Image manipulation
http://proteomeweb.anl.gov/imageweb-service (Win2003 server, C#, ASP.NET, Web services, Oracle10g)	Image Web Services <ul style="list-style-type: none"> Access to PMG image library Format in PNG, TIFF, VAX Image metadata interface
http://proteomeweb.anl.gov/pathway (Win2003, ASP.NET, Access)	Biochemical pathway visualization <ul style="list-style-type: none"> Pathway map navigation
http://proteomes2.bio.anl.gov (Win2003 server, Active Server Pages, Perl, Oracle10g database, Access database, COM components, Javascript, DHTML, Web services)	Protein Mapping Group Intranet <ul style="list-style-type: none"> Extranet for collaborators Intranet applications (image conversion, display, interactive data entry) Automated scripts Interface for tandem MS data display
http://proteomes5.bio.anl.gov/netapps/ (C#, Windows Forms, .NET Web services)	Windows .NET Applications <ul style="list-style-type: none"> Image Manipulation Web service-based auto-updates BLAST Interface

	<ul style="list-style-type: none"> • Web service implementation of FTP • On-line help on website
http://proteomes5.bio.anl.gov/bioms/ (Win2003, ASP 2.0, C#, Web services)	Mass spectrometry intranet <ul style="list-style-type: none"> • Access to mass spectrometry data • User control based on Active Directory • Interface to Mascot and Sequest Results
http://gelbank.anl.gov (Win2003 server, Active Server Pages, Perl, Oracle10g database, Access database, COM components, Javascript, DHTML)	GelBank <ul style="list-style-type: none"> • Website design • Database design • User accounting • Gel upload • Search of gels • Search of completed genome database • On-the-fly image generation • Image manipulation
http://gelbank.anl.gov/ws (C# web services, ASP.NET, Oracle ODM)	Oracle ODM web services <ul style="list-style-type: none"> • Interface to BLAST packages (bl2seq, blastp) • Integration with SEGUID database • Web service for BioOracle package
http://proteomicsdb2.bio.anl.gov (Win2003 server, Active Server Pages, Perl, Oracle10g database)	Interface for Progenesis software <ul style="list-style-type: none"> • Experiment design front-end • Report-generation back-end
http://pmgmascot.bio.anl.gov/mascot (Perl, C# web services)	Modification of Mascot <ul style="list-style-type: none"> • Integration with web services • Specialized Sequence DB integration • Mascot maintenance
http://pmgseq.bio.anl.gov/msws (C#, .NET2.0, XP)	Web service for Sequest search <ul style="list-style-type: none"> • C# library for Sequest 2.7 components • Sequest maintenance
http://pmgsequest.bio.anl.gov/sequest/ (XP)	Sequest maintenance
http://pmg3.bio.anl.gov/cgi-bin/dataexchange (Win2003 server, Active Server Pages, Perl, Oracle10g database, Access database, COM components, Javascript, DHTML)	COM+ components <ul style="list-style-type: none"> • Protein sequence retrieval • DNA sequence retrieval • NCBI record retrieval • Swiss-Prot record retrieval • Port for Chiba city applications
http://matrix.bio.anl.gov (RHEL3.1 Linux server, Perl, Oracle10g)	Image and database manipulation <ul style="list-style-type: none"> • Automated image conversion • PSI-BLAST service • Mass spec data retrieval • Application interface for Chiba city
http://omics.bio.anl.gov (RHEL 4.3, Perl)	Database update scripts <ul style="list-style-type: none"> • Interface to external databases • Data interpretation scripts • Image conversion services
http://omicsdb.bio.anl.gov (Oracle10g)	Oracle 10gR2 database (standard) <ul style="list-style-type: none"> • Database maintenance • SQL package design (e.g. BioORACLE) • Backup management
http://rcbio.bio.anl.gov (Oracle10g)	Oracle 10gR2 (enterprise) <ul style="list-style-type: none"> • Database maintenance • ODM interfaces • Backup management
http://pmgms.bio.anl.gov (Win2003 server, RAID5)	Data storage <ul style="list-style-type: none"> • Tandem MS data storage • Progenesis data storage • Image data storage
http://pmg.bio.anl.gov (Win2003 server, RAID5)	Data storage <ul style="list-style-type: none"> • Collaborators data storage • External bioinformatics databases
http://rcn0.bio.anl.gov (Linux server cluster head node)	20 node RC Linux cluster <ul style="list-style-type: none"> • Design and Maintenance • Distributed computing

Pmgpro.bio.anl.gov	Progenesis image analysis software maintenance
Proteome.bio.anl.gov	Progenesis licensing server maintenance
Pmgscanner.bio.anl.gov	ProExpress scanner software maintenance and interface design
Monte-Carlo simulation (Pentium PC, Perl)	Analysis of single-cell analysis data using Monte-Carlo simulation and specialized statistical analysis of simulation (used for publication: see Babnigg, Heller, and Villereal 2000)
University of Chicago (PC 286, BASIC)	Receptor-ligand binding analysis
University of Chicago (Pentium PC, Visual Basic)	Interactive display of Image Analysis Data Color display using user-defined rainbow patterns <ul style="list-style-type: none"> • (used for a publication)
University of Chicago (Pentium PC, Visual Basic)	Interactive program for the calculation of free concentration of 2 interacting compounds with differing Kd <ul style="list-style-type: none"> • (used in figuring out the starting concentration of an inhibitor in imaging experiment)
http://gcgusers.bsd.uchicago.edu (Solaris server)	Help for GCG users at University of Chicago <ul style="list-style-type: none"> • GCG-related technical help • Website design • Site administrator
WEB APPLICATIONS I	
http://www.netconnections.info/ (Win2000 server, Active Server Pages, Perl, Access database, Javascript)	Web client management/e-mail application <ul style="list-style-type: none"> • 150 users • 100000 clients • 2000000 e-mails sent • Nationwide use
http://www.netconnections.info/qblb/ (Win2000 server, ASP, Perl, Access, Javascript)	On-line moving estimate forms <ul style="list-style-type: none"> • 100 moving companies • Linked with ENet • Nationwide use
http://www.netconnections.info/global-oc (Win2000 server, ASP, Perl, Access, Javascript)	CRM system for international moving company <ul style="list-style-type: none"> • Graphical interfaces • E-mail management • Advanced query
http://www.netconnections.info/moving_soon (Win2000 server, Active Server Pages, Perl, Access database, Javascript)	Client info management <ul style="list-style-type: none"> • System for moving companies • Hub for client information distribution • Nationwide use
http://www.netconnections.info/enet (movers) (Win2000 server, Active Server Pages, Perl, Access database, Javascript)	Add-in for moving companies <ul style="list-style-type: none"> • Client management • Truck/Trailer tracking • HR database • Nationwide use
http://www.chicagocar.com (Linux server, Perl, simple database, Javascript)	Free listing of automobiles <ul style="list-style-type: none"> • Contributor to Yahoo classifieds • Posting/searching for cars • Bulletin boards • 3000 cars advertised • 300000 hits • Site of the day in Oct 1997 (MIDI player)
http://www.chicagobar.org (Linux/Win2000 server, Active Server Pages, Perl, Access database, SQL2000 database, simple database, Javascript, Realaudio, WebTV)	Chicago Bar Association <ul style="list-style-type: none"> • Search engine • Lawyer Referral Service (service, reports) • Continuing Legal Education (calendar, db) • Young Lawyers Section (section generation) • Committees (database design, query) • Career Passport (resume posting) • Moot court (mail handling) • 20000 member authentication • Special log file generation • Report Generation

	<ul style="list-style-type: none"> • On-line audio presentations • Bookstore • Video store • Intranet Utilities
http://www.jenner.com (Win2000 server, Active Server Pages, Access database, Javascript)	Jenner & Block (law firm) <ul style="list-style-type: none"> • Attorney database design • Database search • Automatic site content generation
http://www.tci.com (Linux server, Perl, simple database)	TCI Cable Company <ul style="list-style-type: none"> • Data collection for evaluation of new premium channels • Intranet reporting on sampling
http://www.dcds.edu (Linux server, Perl, simple database)	Detroit County Day School <ul style="list-style-type: none"> • Calendar generation • News page • Intranet interface
http://www.commonhealth.com (IBM mainframe, Linux server, Perl, Access database)	Lawyer Database <ul style="list-style-type: none"> • Conversion of IBM mainframe database for 10000 lawyers into a web-friendly format
http://www.raonline.com (Javascript)	Ritchey Associates <ul style="list-style-type: none"> • Javascripts for the site (browser detection, etc)
http://www.giantvanlines.com (Win2000 server, Active Server Pages)	Giant Vanlines <ul style="list-style-type: none"> • Customer shipment tracking system (similar to FEDEX)
http://www.greatshapes.org (Win2000 server, Perl, Active Server Pages, Access database)	Swimwear, summer apparel <ul style="list-style-type: none"> • Shopping cart • Intranet for data entry (including image uploads) • Accounting
http://www.interactivemortgage.com (Linux server, Perl, simple database)	Interactive Mortgage <ul style="list-style-type: none"> • Intranet backend for uploads of mortgage rates • Live mortgage quote for 4 states (at the county level)
http://www.doctorgordon.com (Linux server, Perl, simple database)	Dentist (W. Gordon) website <ul style="list-style-type: none"> • Website design • Guest book • Intranet
http://www.homewoodharley.com (Win2000 server, Perl, Active Server Pages, Access database, Javascript)	Homewood Harley and Davidson <ul style="list-style-type: none"> • Product database design • Database search • Image upload
http://www.uslegaljobs.com (Linux server, Perl, simple database)	Resume and Job Posting for Lawyers <ul style="list-style-type: none"> • Design of database • Search database • Intranet
http://www.juristech.com (Linux server, Perl)	Lawyer Job & Resume Center <ul style="list-style-type: none"> • Website design • Forms
http://www.alvp.com (Win2000 server, Active Server Pages)	<ul style="list-style-type: none"> • Property search function
http://www.asca.net (Linux server, Perl, Authentication)	Association of State Correctional Administrators <ul style="list-style-type: none"> • Authentication at 3 levels (only one member per state at the highest level) • Specific billboard design • Intranet (member administration) • Nationwide use
http://www.tribune.com (Linux server, Perl, simple database)	Tribune Company <ul style="list-style-type: none"> • Special billboard for several intranet groups with permissions
http://www.digjobs.com (Linux server, Perl, Berkeley DB)	Digital Jobs (job and resume posting for engineers) <ul style="list-style-type: none"> • Website design • Job and resume posting • Job and resume search • Intranet applications

http://www.intermax2000.com (Linux server, Perl, simple database)	Create your own website <ul style="list-style-type: none"> • Interface for creating your own website • Intranet member management
http://www.fairmeasures.com (Linux server, Perl)	<ul style="list-style-type: none"> • Special live site search engine
http://www.southern-mart.com (Linux server, Perl, simple database)	<ul style="list-style-type: none"> • Special guestbook design • Contact form (mail)
http://www.midlododge.com (Win2000 server)	Midlothian Dodge Dealership <ul style="list-style-type: none"> • Website design
http://www.cliffordlaw.com (Win2000 server, Perl)	Clifford Law Offices <ul style="list-style-type: none"> • Intranet application for automated daily report generation • Report archive
http://www.nacolah.com (Win2000 server, C++, Visual Basic, Active Server Pages, Perl, Access database)	North American Company <ul style="list-style-type: none"> • Instant life insurance quotes • Integration of existing VB application
http://www.safco.com (Win2000 server, Perl, simple database)	SAFCO <ul style="list-style-type: none"> • Installation of IIS server • Creation of Intranet • Trivia • Registration
http://www.abcdiamonds.com (Solaris server, Perl, simple database)	ABC Diamonds <ul style="list-style-type: none"> • Database design • Intranet for editing diamond database • Search database (client)
http://bsd.uchicago.edu/~babn/ray/index.cgi (Solaris server, Perl, Javascript, Sound, Multimedia-rich content)	Website for W. H. Ray Elementary school <ul style="list-style-type: none"> • Interactive math teaching (4 levels, scores) • Interactive skeleton project (3 levels, image, sound) • Vocabulary (sound, score)
http://www.immall.com (Solaris server, Perl, simple database)	Web hosting <ul style="list-style-type: none"> • Client management • Whois implementation • Traffic tracking
WEB APPLICATIONS II	
http://www.surety2000.com (Win2000 server, Active Server Pages, SQL server)	Surety Bond Approval <ul style="list-style-type: none"> • Search engine
http://www.aci-plus.com (Linux server, Perl)	<ul style="list-style-type: none"> • Report generation • Mail form
http://www.denarisoft.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.gsleasing.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.herbalife.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.dallascorp.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.pcleasing.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.matrix4video.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.tmc-enterprises.com (Linux server, Perl)	<ul style="list-style-type: none"> • Contact form (mail)
http://www.claretjugs.com (Win2000 server)	<ul style="list-style-type: none"> • HTML
VISUAL BASIC APPLICATIONS	
Chicago Auto Show 1998 (Pentium PC, Visual Basic, Touch Screen)	Touch-screen application for demo application for Chevrolet dealerships

	(keyboard- and mouse-less application integrating internet connection)
Fulton Matthews (Access database, Visual Basic, VBA)	Access database design (using VBA)
BASIC, ALGOL, FORTRAN, ASSEMBLER APPLICATIONS	
Water Department of Hungary 1982 (Commodore 64, BASIC)	Simple 'database' design Database search / entry
Technical University of Budapest Software Group, 1987 (Commodore 64, PC 8086, BASIC)	Math Educational Programs (German) <ul style="list-style-type: none"> • Graphical display for user-defined functions
Technical University of Budapest 1985 (Commodore 64, BASIC)	Programming of music (MIDI) Rotation of cube in 3D
Technical University of Budapest 1982 (TRS-80, FORTRAN)	Solution for Eigen-vectors using symmetric rotation of matrices
Technical University of Budapest 1984 (ODRA mainframe, ALGOL)	Optimization of chemical reactions according to the yield vector space using n-variables
Technical University of Budapest 1987 (Commodore 64, BASIC)	Assembler programming Screen manipulation program (scrolling in 4 directions)

COMPUTER SKILLS

Language	Usage
C#	2004 – present
Perl	1995 – present
ASP.NET	2004 – present
Active Server Pages -VBScript	1997 – 2010
Visual Basic	1998 – 2002
JAVA	1997 – 2001
Python	2008 - present
Javascript	1996 – present
C	1998
Visual C++	1999
BASIC	1982 – 1987
FORTRAN	1982 – 1983
ALGOL	1981 – 1983
PHP	2000
Visual Basic for Applications	1998 – 2000

Database	Usage
ORACLE	1999 – present
Microsoft Access	1997 – present
SQL server	1997 – present
mSQL	1997 – 1999
mySql	1997
ColdFusion	1997
Berkeley DB	1996 – 1998
Custom text-based	1996 – 2000

Technology	Usage
AJAX	2005 – present
HTML	1995 – present
DHTML	1999 – present
XML	2000 – present
COM components (Win2000)	2001 – 2002
Applets (JAVA)	1997 – 1999
Active X components	1998 – 2000
VRML	1996 – 1998
Realaudio (encoding, serving)	1997
Windows Media Server	2000 – present
UDDI	2001 – present
SOAP	2001 – present
Image manipulation	1999 – present

Operating system	Usage
Win2012	2012 - present
Win2008	2009 – present
Win2003	2003 – present
Win2000	2000 – present
Linux (RH)	1997 – present

Linux (CentOS)	2007 – present
Solaris	1997 – 1998
VAX	2000 – present

Software

Usage

Adobe Photoshop	1996 – present
Microsoft Office	1995 – present
Visual Studio	1997 – present
JDeveloper (ORACLE)	2001 – present
ORACLE applications	2000 – present

Administration

Usage

Win2012	2012 – present
Win2008	2009 – present
Win2003	2003 – present
Win2000	2000 – present
Windows NT	1997 – 1999
Linux (CentOS 4.x -)	2008 – present
Linux (RedHat 4.x – RHEL4.0)	1996 – present
Linux (SuSe 7.x)	2001 – 2003

Hardware skills

Usage

Assembly of computers	1994 – present
Logical circuits	1981 -1986