

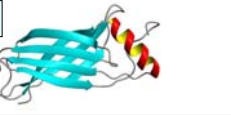
Novel Arabidopsis Protein Structures from the Center for Eukaryotic Structural Genomics (CESG)

G.N. Phillips, Jr., J.L. Markley, B.G. Fox, C.S. Newman, B.F. Volkman, M.R. Sussman, D.J. Aceti, S. Allard, M. Baggeley, C. Bingman, E. Bitto, P. Blommel, E. Brauer, B. Burns, J. Cao, C.C. Cornelius, G. Cornelius, J. Doreleijers, Z. Eggers, J. Elfleisen, R.O. Frederick, H. Geetha, B.W. Han, J. McCoy, W.B. Jeon, J. Kurner, M. Larson, M. Lee, P. Lee, J. Li, C.L. Loushin Newman, B. Lytle, J. McCombs, Z. Miller, R. Narayana, B. Nelson, A. Olson, F.C. Peterson, J.G. Primm, K. Raghunath, B. Ramirez, N. Ravoff, D. Repp, M. Ritters, N. Rosenberg, M. Rannels, G. Sabat, I.K. Sam, S. Sarlati, K. Seder, M.N. Shahan, S. Singh, J. Song, H.K. Sreethan, E. Steffen, Z. Sun, T. Tiradoni, D. Troestler, E.M. Tyler, R.C. Tyler, E.L. Ulrich, D.A. Vinarof, F.C. Vojtik, J. Waltnr, L. Wang, J. Warrick, G. Wesenberg, W.M. Westler, R.L. Wrobel, J. Zhang, Q. Zhao, and Z. Zolnai

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CESG has completed over 50 new protein structures as of April, 2005. Most of the protein structures are 30% sequence identity to proteins already deposited in the Protein Data Bank (PDB). Because of our initial focus on *Arabidopsis thaliana* as a target organism, many of our completed structures are from this eukaryote, and reveal new aspects of the biology and biochemistry of plants. Some of the Arabidopsis structures have been chosen for presentation to illustrate the range of results obtained to date. The proteins have been produced from CESG's *E. coli*-based or wheat germ cell-free platforms. The structures have been determined by X-ray crystallography or NMR spectroscopy. Some structures were requested by researchers outside of CESG, but most were selected by our internal target selection algorithm. These structures include a previously unknown enzyme in starch metabolism, a new RNA processing protein, spermidine synthase, a new sulfotransferase, a putative acetyltransferase, a cellular stress 'LEA' protein, and others, including some with hitherto unknown function. See posters #650 and #652 for more about CESG. CESG is supported by the National Institute of General Medical Sciences through the Protein Structure Initiative (P50 GM 64598).

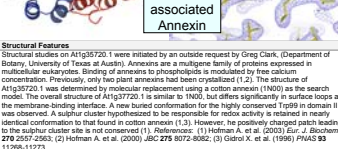
New class; low homology



Tropinone reductase?

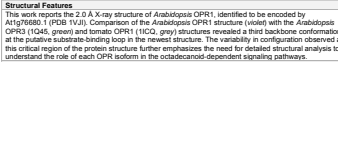
Spermidine synthase

Gene Designator: At1g77470.1
PDB Entry: 1XN2
BIOMR Entry: Unknown
Function: Membrane associated Annexin
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



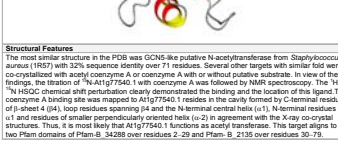
Membrane associated Annexin

Gene Designator: At1g76680.1
PDB Entry: 1XN3
BIOMR Entry: Unknown
Function: Oxophosphatidic acid reductase
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



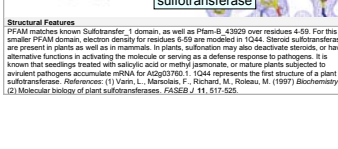
Oxophosphatidic acid reductase

Gene Designator: At1g77540.1
PDB Entry: 1XN4
BIOMR Entry: Unknown
Function: Putative acetyltransferase
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



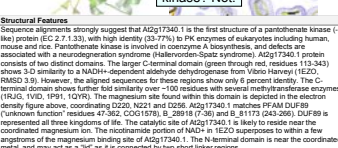
Solved by NaBr

Gene Designator: At1g7376.1
PDB Entry: 1J43
BIOMR Entry: Unknown
Function: Steroid sulfotransferase
Produced From: *E. coli* BL21 Rosetta



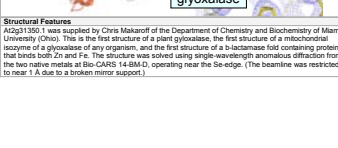
Steroid sulfotransferase

Gene Designator: At2g17340.1
PDB Entry: 1J21
BIOMR Entry: Unknown
Function: Pantheonate kinase-like
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



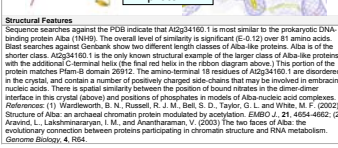
Pantheonate kinase? Not!

Gene Designator: At3g1350.1
PDB Entry: 1XW6
BIOMR Entry: Unknown
Function: Phosphate kinase-1
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



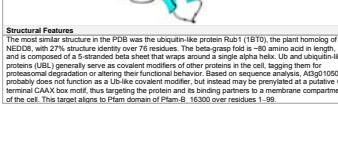
First plant glyoxalase

Gene Designator: At3g1160.1
PDB Entry: 1J4M
BIOMR Entry: Unknown
Function: DNA-binding protein
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



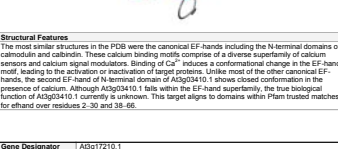
DNA-binding protein

Gene Designator: At3g1050.1
PDB Entry: 1J5A
BIOMR Entry: Unknown
Function: Cell-free production structure
Produced From: Cell-free wheat germ extract



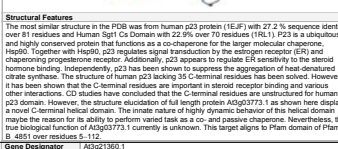
Cell-free production structure

Gene Designator: At3g1410.1
PDB Entry: 1J20
BIOMR Entry: Unknown
Function: Calmodulin-like?
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



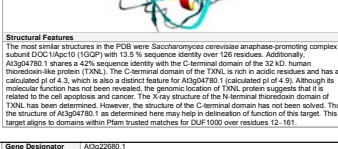
Calmodulin-like?

Gene Designator: At3g0773.1
PDB Entry: 1XVJ
BIOMR Entry: Unknown
Function: Co-chaperone?
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



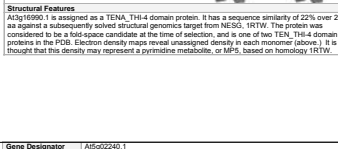
Co-chaperone?

Gene Designator: At3g1470.1
PDB Entry: 1J4V
BIOMR Entry: Unknown
Function: Theoredoxin-like?
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



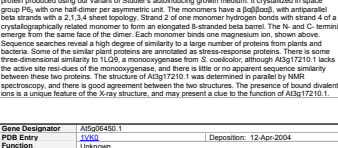
Theoredoxin-like?

Gene Designator: At3g16990.1
PDB Entry: 1J4W
BIOMR Entry: Unknown
Function: Mystery density in structure?
Produced From: *E. coli* BL21 Rosetta



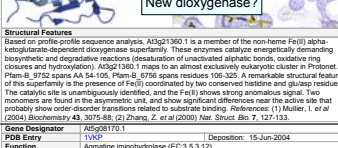
Mystery density in structure?

Gene Designator: At3g17210.1
PDB Entry: 1J4Z
BIOMR Entry: Unknown
Function: Low homology, dimer
Produced From: *E. coli* BB34(ΔDE3)



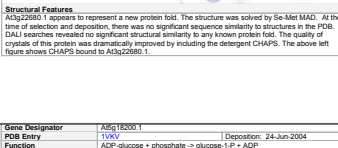
Low homology, dimer

Gene Designator: At3g1360.1
PDB Entry: 1XVY
BIOMR Entry: Unknown
Function: New dioxygenase?
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



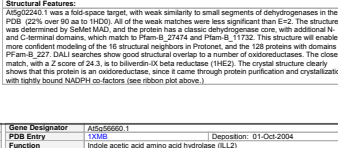
New dioxygenase?

Gene Designator: At3g2080.1
PDB Entry: 1J4V
BIOMR Entry: Unknown
Function: External request; low homology
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



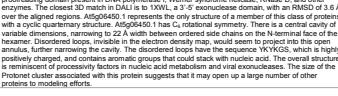
External request; low homology

Gene Designator: At3g2260.1
PDB Entry: 1J4W and 1J4X
BIOMR Entry: Unknown
Function: Bound NADP; low homology
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



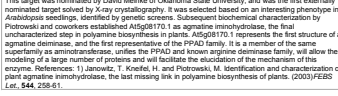
Bound NADP; low homology

Gene Designator: At3g0450.1
PDB Entry: 1J4Z
BIOMR Entry: Unknown
Function: DNA through the center?
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



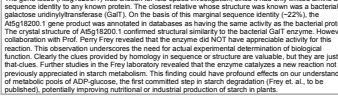
DNA through the center?

Gene Designator: At3g0710.1
PDB Entry: 1XVY
BIOMR Entry: Unknown
Function: Plant hormone metabolism
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



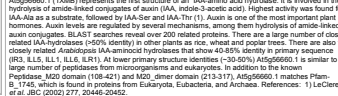
Plant hormone metabolism

Gene Designator: At3g1200.1
PDB Entry: 1XVY
BIOMR Entry: Unknown
Function: New enzyme and annotation
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



New enzyme and annotation

Gene Designator: At3g0560.1
PDB Entry: 1J4W
BIOMR Entry: Unknown
Function: Plant hormone metabolism
Produced From: *E. coli* BB34(ΔDE3) pLacI(+RARE)



Plant hormone metabolism