

Protein Production

Xtal BioStructures, Inc. has the capability and experience to produce high quality proteins for use in pilot studies, assay development, HTS, and X-ray crystallography. We are able to produce challenging proteins and higher order complexes using bacterial, insect cell, and mammalian expression systems to produce well characterized proteins with high purity.

CONSTRUCT DESIGN AND EXPRESSION SYSTEM:

These specifications provided by and finalized with the client, can be based on:

- Tags needed for purification/use
- Existence of literature methods and need for optimization for expression or changes based on desired activity of protein
- Final use which defines purity requirements, assay design, and final buffer and storage conditions

PROTEIN PURIFICATION:

In addition to purifying recombinant proteins with high purity using all common types of chromatography, Xtal has successfully purified proteins isolated from shellfish, milk, and tissues at scale. We have close to 150 high quality, highly pure proteins for a variety of uses. Xtal's protein purification capabilities include:

FPLC or batch purification:

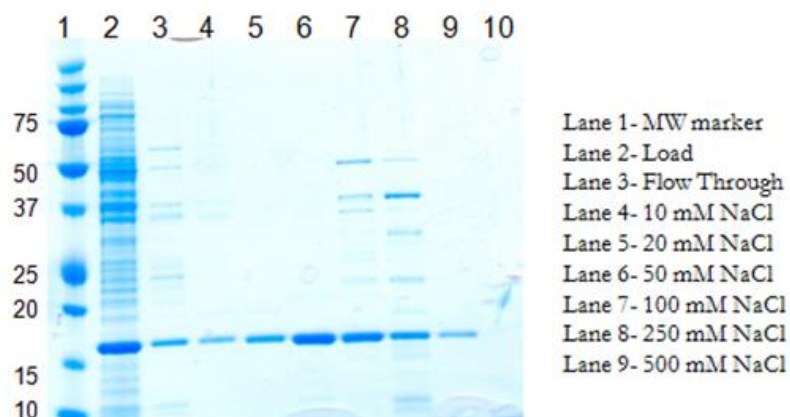
- Affinity tags
- Classical methods
- Ion exchange, HIC, salt cuts, affinity

Method development and optimization:

- Refolding
- Co-expressions
- Active/inactive

Quality control:

- SDS-PAGE, native gels, Western blots
- Densitometry
- SEC-FPLC run to examine for aggregation and quaternary structure
- Thermal Stability profile
 - FootPrint Screen
 - Broad-Cast Screen
- C- and N- terminal sequencing or MS identification if required



CHARACTERIZATION:

Characterization of the protein includes molecular weight, aggregation, purity, and a thermal shift trace, which is similar to a fingerprint for the protein. Further thermal shift assays can map the stability of the protein as a function of pH, salt concentration and counter ion. The characterization capabilities at Xtal include:

- Sequencing – Gene or protein (MALDI-MS)
- Identity- Western blot
- Molecular weight – SDS-PAGE, Size-exclusion chromatography, MALDI-TOF mass spectrometry
- Thermal shift – stability, ligand binding confirmation
- Activity assay (UV/Vis, fluorescence, luminescence)
- Isoelectric focusing (IEF)
- 2D Gels
- FPLC or HPLC
- Ion binding
- Post translational modifications (characterization or removal)
- X-ray crystallography



XTAL[™]
BioStructures

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Protein Catalog

ACC1	Acetyl-CoA carboxylase (96-617), biotin carboxylation domain	HK2	Hexokinase-2 (17-916)
ACC1	Acetyl-CoA carboxylase (1574-2340), carboxyltransferase domain	IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic (C terminal His-tag)
Adnectin 2	Adnectin-2 monobody	IDH1 (R132H)	Isocitrate dehydrogenase [NADP] cytoplasmic (R132H mutant) (His tag)
AGO2	Protein argonaute-2	IDH1 (R132C)	Isocitrate dehydrogenase [NADP] cytoplasmic (R132C mutant) (C terminal His tag)
AKT1	Serine/threonine-protein kinase akt-1	IGF1RK-DJM	Insulin receptor kinase (- juxtamembrane sequence)
Aurora A kinase	Aurora A kinase	IGF1RK-JM+	Insulin receptor kinase (+ juxtamembrane sequence)
Ataxin3	Ataxin 3 (1-182) (His tag)	iGluR7	Glutamate receptor, ionotropic ainite 3
β -catenin	β -catenin (1-781) GST tag)	IL-6	Interleukin-6
β -catenin	β -catenin (138-686) (His tag)	IL-13	Interleukin 13 (33-146) (Avi tag)
β common receptor	Cytokine receptor common subunit beta	iPFK2	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3, inducible form, (1-520)
BCL9	B cell lymphoma 9 protein (214-493) (His tag)	IRK-DJM	Insulin-like growth factor 1 receptor kinase (- juxtamembrane sequence)
BirA	Biotin Ligase (His tag)	IRK-JM+	Insulin-like growth factor 1 receptor kinase (+ juxtamembrane sequence)
BMPR-1B	Bone morphogenetic protein receptor type-1B	IRS1	Insulin receptor substrate 1
BMPR-II	Bone morphogenetic protein receptor type-2	JMJD2C	Lysine-specific demethylase 4C(1-420)
BRD2	Bromodomain containing protein 2	JunD	Transcription factor jun-D
BRD2(1)	Bromodomain-containing protein 2 (domain 1)	KGA	Glutaminase K domain, (221-533; full length is 17-669)
BRD2(2)	Bromodomain-containing protein 2 (domain 2)	KRASG12D	(Kristen rat sarcoma homologue) GTP ase (1-169)
BRD3	Bromodomain containing protein 3	T7 pol	Enterobacteria phage T7 polymerase
BRD3(1)	Bromodomain containing protein 3 (domain 1)	LDHA	Lactate dehydrogenase A
BRD3(2)	Bromodomain containing protein 3 (domain 2)	LGA	Glutaminase liver isoform, mitochondrial (61-602)
BRD4(T)	Bromodomain containing protein 4	LipA	Lipoyl synthase
BRD4(1)	Bromodomain-containing protein 4 (domain 1)	LipB	Lipoyl transferase LipB
BRD4(2)	Bromodomain-containing protein 4 (domain 2)	Mcl-1	Induced myeloid leukemia cell differentiation protein Mcl-1
BRD8(1)	Bromodomain containing protein 8 (domain 1)	m-CD80	Mouse CD80
BRD8(2)	Bromodomain containing protein 8 (domain 2)	MDM2	E3 ubiquitin-protein ligase Mdm2
BRDT(1)	Bromodomain containing protein T (domain 1)	MDM4	Protein Mdm4
BRDT(2)	Bromodomain containing protein T (domain 2)	NAMPT	Nicotinamide phosphoribosyltransferase
BRDT(T)	Bromodomain containing protein T	NCP	nucleosome core particle
BtGH84	O-GlcNAcase (from B. thetaiotaomicron)	Neuraminidase	Neuraminidase
C1QBP	C1q binding protein (75-282)	NMNAT	Nicotinamide mononucleotide adenyl transferase (1-279)
Cal-PDZ	CAL PDZ domain (278-362)	NMNAT	Nicotinamide mononucleotide adenyl transferase (1-279) (His tag)
CACNB1	Voltage-dependent L-type calcium channel subunit beta-1	NS3	NS3 protease
CBR1	Carbonyl reductase [NADPH] 1	octamer	histone octamer
CEBPbeta	Cytoplasmic polyadenylation element-binding protein 1	OTCase	Ornithine carbamoyltransferase, mitochondrial
Chymase	Chymase	OTU7B	Cellular zinc finger anti-NF-KappaB Cezanne (His tag)
c-Met	Met proto-oncogene (hepatocyte growth factor receptor) protein	PCAF	P300/CBP associated factor (719-831)
c-myc	Myc proto-oncogene protein (Avi-tag)	PCAF	P300/CBP associated factor (719-831) (His tag)
c-myc	Myc proto-oncogene protein (Avi-tag, His-tag)	PDE1B	Calcium/calmodulin-dependent 3',5'-cyclic nucleotide phosphodiesterase 1B
c-Raf	Cysteine rich region of Raf-1 (57-131)	PDE9a	cGMP-specific phosphodiesterase type-9
CRBN	Protein cereblon	PDHK1	Pyruvate dehydrogenase kinase isoform 1, (30-436)
CREBBP	cAMP-response element-binding protein (1081-1197)(His tag)	PDL1	Programmed death-1 ligand 1
CSF-1R	Macrophage colony-stimulating factor 1 receptor	PHDGH	Phosphoglycerate dehydrogenase (1-313)
DAAO	D-Amino Acid Oxidase	PHDGH	Phosphoglycerate dehydrogenase (1-313) (His tag)
delta-FosB	Protein fosB	Pin1	Peptidyl-prolyl cis-trans isomerase NIMA-interacting 1
DOT1	Histone-lysine N-methyltransferase, H3 lysine-79 specific	PKC β II	Protein kinase C beta type II
EED	Polycomb protein EED	PKL	Pyruvate kinase isozyme L (50-574)
EGFR	Epidermal growth factor receptor	PKM1	Pyruvate kinase isozyme M1 (2-531)
eIF4GA	Eukaryotic translation initiation factor (682-1105)	PKM2	pyruvate kinase isozymes M1/M2
Endo F2	Endo-beta-N-acetylglucosaminidase F2	PLK3	Serine/threonine-protein kinase PLK3
Endo F3	Endo-beta-N-acetylglucosaminidase F3	PSAT1	Phosphoserine aminotransferase 1 (1-370)
endo H	Endo-beta-N-acetylglucosaminidase H	PSAT1	Phosphoserine aminotransferase 1 (1-370) (His tag)
EP300	E1A binding protein p300 (1040-1161)	rat ArgI	rat Arginase I
EP300	E1A binding protein p300 (1040-1161)(His tag)	rat ArgII	rat Arginase II
EPOR	Erythropoietin receptor	S8	30S ribosomal protein S8
ERG	Transcriptional regulator ERG	SAHH	S-Adenosylhomocysteinase
FAAH	Fatty-acid amide hydrolase 1	SDF1-alpha	Stromal cell-derived factor 1 (alpha)
FASN-TE	Fatty acid synthase thioesterase domain (2200-2511)	Shh (C24II)	sonic hedgehog protein
FKBP52	Peptidyl-prolyl cis-trans isomerase FKBP4	SOScat	Son of sevenless catalytic domain (564-1049)
Gbr2	Growth factor receptor-bound protein 2	SOScat	Son of sevenless catalytic domain (564-1049) (His tag)
GSK-3B	glycogen synthase kinase 3	Sufe	Cysteine desulfuration protein sufe
H2A	Histone H2A	TAF9	Transcription initiation factor TFIID subunit 9
H2B	Histone H2B	TFPI	Tissue factor pathway inhibitor
H3	Histone H3	Topo-I	Topoisomerase I from Yersinia pestis
H4 (his-tag)	Histone H4	TNF	tumor necrosis factor
hArgI	human Arginase I	TNFR	tumor necrosis factor receptor
hArgII	human Arginase II	UCHL1	Ubiquitin carbonyl-terminal hydrolase L1 (1-223)(His tag)
h-CD80	Human CD80	VEGF165	Vascular endothelial growth factor A
HDAC1	Histone deacetylase 1	WDR5	WD repeat-containing protein 5
HDAC2	Histone deacetylase 2	YBX1	YBX1 Nuclease-sensitive element-binding protein 1protein
HDAC8	Histone deacetylase 8		