

Overview of Clone Collections

Invitrogen offers the most extensive selection of pre-cloned cDNA and genomic DNA available (Table 1). Having access to ready-cloned cDNA and genomic DNA saves you time and resources. You no longer need to screen libraries or perform RT-PCR to isolate your gene of interest or spend time cloning the isolated DNA. Clones are offered qualified at different stringencies to meet your application needs.

Table 1 - Description of clone collections

| Collection | Source | Description |
|----------------------|-----------------------|--|
| Ultimate™ ORF Clones | Human Mouse | Fully sequenced ORFs cloned into a Gateway® entry vector ready for screening or for transfer into a Gateway® expression vector of choice |
| Full-Length Clones | Human Mouse | Constructed using SuperScript™ II RT to ensure full-length; sequenced to verify identity |
| ESTs | Human Mouse Rat | Single-pass 5'- and/or 3'-end sequenced clones |
| BACs and PACs | Human Mouse Rat | Available in a variety of formats including clones, plates, and high-density colony membrane filters |
| Yeast Deletions | Yeast | Knockouts of the a and alpha homozygous and heterozygous strains |
| Yeast-GFP Strains | Yeast | A collection of <i>S. cerevisiae</i> GFP-tagged open reading frames from UCSF |

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Ultimate™ ORF Clone Collections



www.invitrogen.com/clones/catalog
Your online portal for accessing related resources, research tools, and news.

Full-insert Sequenced, Ready-for-Analysis Human and Mouse Clones

Description:

Ultimate™ ORF Clones are high-quality, full-insert sequenced human and mouse open reading frames (ORFs) cloned into the pENTR™221 Gateway® entry vector* (Figure 1) for limitless downstream analysis capabilities (Table 1). The amino acid sequence is guaranteed to match the corresponding clone reference sequence in GenBank. Ultimate™ ORF Clones eliminate time spent isolating RNA, synthesizing cDNA, amplifying DNA, cloning, and validating samples. For functional analysis, simply recombine the Ultimate™ ORF Clone with a Gateway® destination vector to create an expression clone.

Flexible Tagging Options

Each Ultimate™ ORF vector incorporates features that allow you to take advantage of Tag-On-Demand™ Technology, simplifying downstream expression and analysis studies. Tag-On-Demand™ Technology enables expression of both tagged and native proteins from a single construct by controlling translation with a recombinant adenoviral suppressor supernatant that consists of an amber (TAG) suppressor tRNA. To take advantage of flexible Tag-On-Demand™ tagging options, each ORF in the Ultimate™ Clone Collection is followed by a TAG stop codon.**

Access a Wealth of Knowledge

You can easily find your clone with the Ultimate™ ORF Browser at <http://orf.invitrogen.com>. There you can perform an advanced search for Ultimate™ ORF Clones and quickly order on-line. Browse the entire clone collection based on Gene Ontology classifications and by function. In addition, you can search the Ultimate™ ORF Clone collections using keywords, sequence blast, accession numbers, and clone IDs. All of this valuable information is then compiled and linked to each clone ID in the form of an Ultimate™ ORF Card. Each Ultimate™ ORF Clone comes with a wealth of information that's both current and easily accessible.

Figure 1 - The pENTR™221 vector

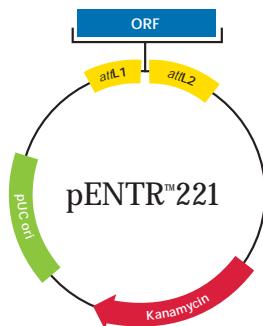


Table 1 - Important gene families in the Ultimate™ ORF Collection

G-Protein Coupled Receptors

Kinases

Protein Kinases

Nuclear Hormone Receptors

Protein Phosphatases

Phosphodiesterases

Proteases: Endopeptidase

Proteases: Exopeptidase

Ion Channels

Cytokines

Chemokine

Contents and Storage:

Ultimate™ ORF Clones are supplied transformed into T1 phage-resistant *E. coli* and shipped as individual glycerol stocks. Store at -80°C. Guaranteed stable for 6 months when properly stored.

Product

Ultimate™ Human ORF Clone

Ultimate™ Mouse ORF Clone

Please contact Invitrogen for volume discount price.

Cat. no.

HORF01‡

MORF01‡

*To learn more about Gateway® Technology, visit the on-line seminar at www.invitrogen.com/gateway.

**To learn more about Tag-On-Demand™ Technology, visit www.invitrogen.com.

‡Visit www.invitrogen.com/clones for complete ordering information.



Search online by Cat. No. to order and find product-related information

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Full-length cDNA Clone Collections

Invitrogen™ Full-length Human Clone Collection



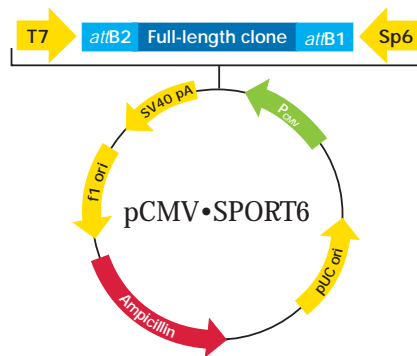
www.invitrogen.com/clones/catalog
Your online portal for accessing related resources, research tools, and news.

Description:

The Full-length Human cDNA Clone Collection contains over 107,000 clones, with 11,124 sequences representing unique genes and as many as 1,000 genes representing novel genes. cDNA libraries are constructed from human cell lines and tissues, including brain, neural blastoma, HeLa, and Jurkat(1). Clones in this collection are enriched for full-length cDNAs and contain the 5' and 3' untranslated regions. Clones have been 5'- and 3'-end sequenced by Genoscope, a French public research institute, to confirm identity. The clones are supplied in pCMV•SPORT6, a Gateway® expression vector, for rapid analysis in multiple expression systems. Several measures are taken to enrich for full-length cDNAs:

- SuperScript™ II RT is used to reverse transcribe the cDNA
- A normalization technique is used to reduce the representation of abundant genes and enrich for rare and novel genes
- A proprietary 5'-CAP trapper technique is used to enrich for full-length transcripts (70% true full-length)
- A proprietary cytoplasmic RNA purification technique and reagent is utilized for high-quality template generation

To search the Full-length Human cDNA Clone Collection, visit www.invitrogen.com/clones.



Contents and Storage:

Clones are shipped as glycerol stocks. Store at -80°C.

Product

Invitrogen™ Full-length Human cDNA Clone

Cat. no.

FL1001

Reference:

1. Porcel, B.M. *et al.* (2004) *Genome Res.* **14(3)**: 463-71.



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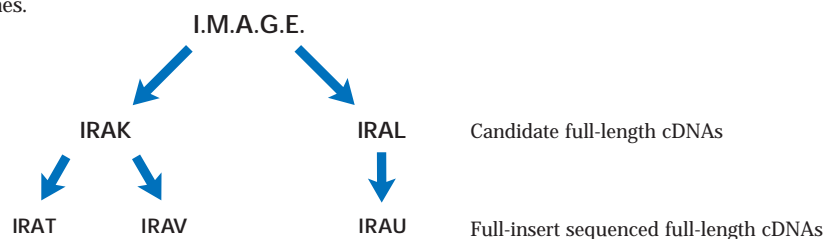
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NIH Mammalian Gene Collection (MGC)

Accelerate Gene Functional Studies

Description:

The MGC has produced over 80 cDNA libraries enriched for full-length cDNAs derived from human and mouse tissues and cell lines. The quality of each library is first assessed by 5' and 3' EST analysis of a limited number of clones. Several algorithms are applied to select putative full-length ORF clones (IRAK and IRAL collections). Once a putative full-length clone is identified, these clones are subjected to high-accuracy, full-insert sequencing and assessed for full open reading frames (IRAT, IRAU, and IRAV collections). Of the clones which have been fully sequenced, about 75% have proven to be full length. To search the MGC cDNA Clone Collection visit www.invitrogen.com/clones.



Contents and Storage:

Clones are shipped as glycerol stocks. Store at -80°C.

Product

NIH Mammalian Gene Collection (MGC)* IRAT/IRAU/IRAV Clones
 MGC Human IRAT 96-well plate
 MGC Human IRAU 96-well plate
 MGC Mouse IRAV 96-well plate

Cat. no.

FL1002
 FL1003
 FL1004
 FL1005

*When ordering, specify IRAT, IRAU, or IRAV collection.

Reference:

http://mgc.nci.nih.gov/index_html

BMAP Mouse cDNA Clones

Description:

The Brain Molecular Anatomy Project (BMAP) is a collaborative project aimed at understanding gene expression and function in the nervous system. This clone collection, containing more than 90,000 EST clones, was developed from 10 regions of the adult mouse brain, spinal cord, and retina. There is a set of 31,104 unique clones from these ESTs, called the BMAP Mouse UniGene cDNA Collection.

Contents and Storage:

Clones are shipped as glycerol stocks. Store at -80°C.

Product

BMAP Mouse Unigene cDNA 96-well Plates (#1-116)
 BMAP Mouse UniGene cDNA 384-well Plates (#117-168)
 BMAP Mouse cDNA Clones
 BMAP Mouse UniGene cDNA Collection
 BMAP Mouse EST cDNA Collection

Cat. no.

BMAP001
 BMAP000
 BMAP002
 BMAP003
 BMAP004

Reference:

<http://brainest.eng.uiowa.edu/>

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Standard I.M.A.G.E. cDNA Clones



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Your online portal for accessing related resources, research tools, and news.

Description:

A vast collection of standard, non-sequence-verified human, mouse, and rat clones from the I.M.A.G.E. collection are available (1,2). These clones are available through the efforts of the I.M.A.G.E. consortium. The cDNA clones have been sequenced by Washington University and the information deposited with NCBI. To search for clones, visit www.invitrogen.com/clones. For vector maps for I.M.A.G.E. Clones, visit ftp://ftp.resgen.com/pub/image_vectors/.

Contents and Storage:

Clones are shipped as glycerol stocks. Store at -80°C.

Product

Cat. no.

| | |
|--|---------|
| Standard I.M.A.G.E. cDNA Clones (Hs, Mm, Rn) | 97002RG |
| Standard I.M.A.G.E. cDNA 384-well Plates | |
| LLAM collection (Hs, Mm, Rn) | 97001 |
| LLCM collection (Hs, Mm) | 97003 |
| LLKM collection (Hs, Mm) | 97004 |

References:

1. <http://image.llnl.gov>
2. Lennon, G. *et al.* (1996) *Genomics* **33**: 151-152.

UI Rat EST cDNA Clones

Description:

The UI Rat EST clone collection, developed by the University of Iowa (UI), contains over 150,000 rat EST clones, generated from both adult and embryonic tissues.

Contents and Storage:

Clones are shipped as glycerol stocks. Store at -80°C.

Product

Cat. no.

| | |
|--------------------------------|-------|
| UI Rat EST cDNA 96-well Plates | 99001 |
| UI Rat EST cDNA Clones | 99002 |

Reference:

<http://ratest.uiowa.edu/>



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BAC and PAC Clone Collections

Invitrogen offers several genomic libraries from a selection of tissues and sources to facilitate your research and discovery. These collections are available in a variety of formats including clones, plates, and high-density colony membrane filters. Visit www.invitrogen.com/clones to find your clone or library of interest.

References:

- Osoegawa, K. *et al.* (2000) *Genome Research* **1**: 116-128
 Shizuya, H. B. *et al.* (1992) *Proc. Natl. Acad. Sci. USA* **89**: 8794-8797
 Kim, U-J. *et al.* (1996) *Genomics* **34**: 213-218
 Swiatek, P. J. *et al.* (1993) *Genes and Development* **7**: 2071-2084
 Ioannou, P. *et al.* (1994) *Nature Genetics* **6**: 84-89

Table 1 - Genomic DNA resources

| Library | Source | Vector | Average insert size | Coverage | Cat. no. | | |
|---|-----------------------|------------|---------------------|----------|---------------------|--|---|
| | | | | | Clones | 384-well Plates | Membranes or Pools |
| BACs | | | | | | | |
| Human | | | | | | | |
| California Insitute of Technology | | | | | | | |
| CTB | 9875K cell line | pBeloBAC11 | 120 kb | 15x | 96012 \$53.00 | 96013 (plates 1-194) \$90.00 | 96055 (12 membranes) \$3,672.00 96011 (pools and superpools) \$1,887.00 96011SP (superpools) \$434.00 |
| CTC | human sperm (HSP) | pBeloBAC11 | 125 kb | 15x | 96012 \$53.00 | 96013 (plates 195-876) \$90.00 | 96057 (6 membranes) \$1,836.00 |
| CTD1 | human sperm (HSP) | pBeloBAC11 | 129 kb | 17x | 96012 \$53.00 | 96013 (plates 2001-2423) \$90.00 | n/a |
| CTD2 | human sperm (HSP) | | 173 kb | 17x | 96012 \$53.00 | 96013 (plates 2501-2671, 3000-3253) \$90.00 | |
| Roswell Park Cancer Institute | | | | | | | |
| RP11 | male white blood cell | pBACe3.6 | 174 kb | 25x | RPCI11.C \$53.00 | RPCI11.P (plates 1-1152) \$90.00 | RPCI11.M (16 membranes) \$4,896.00 |
| Mouse | | | | | | | |
| California Insitute of Technology | | | | | | | |
| CT7 | CJ7/129SV | pBeloBAC11 | 130 kb | 8x | 96022 \$53.00 | 96023 (plates 1-613) \$90.00 | 96050RG (9 membranes) \$2,754.00 96021RG (pools and superpools) \$1,508.00 96021SP (superpools) \$434.00 |
| Roswell Park Cancer Institute | | | | | | | |
| RP22 | female spleen | pBACe3.6 | 154 kb | 10.9x | RPCI22.C \$53.00 | RPCI22.P (plates 1-576) \$90.00 | RPCI22.M (8 membranes) \$2,448.00 |
| RP23 | female kidney/brain | pBACe3.6 | 197 kb | 11.2x | RPCI23.C \$53.00 | RPCI23.P (plates 1-480) \$90.00 | RPCI23.M (7 membranes) \$2,142.00 |
| Custom BAC, 384-colony membrane (from a single plate) | | | | | | | 96051 \$918.00 |
| BAC high-density positive control | | | | | | HDPC.01 \$34.00 | |

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BAC and PAC Clone Collections, continued

Table 1 - Genomic DNA resources, continued

| Library | Source | Vector | Average insert size | Coverage | Cat. no. | | |
|--------------------------------------|---------------|---------|---------------------|----------|---------------------|---|---------------------------------------|
| | | | | | Clones | 384-well Plates | Membranes or Pools |
| PACs | | | | | | | |
| Human | | | | | | | |
| Roswell Park Cancer Institute | | | | | | | |
| RP1 | male blood | pCYPAC2 | 110 kb | 3x | RPCI1.C \$53.00 | RPCI1.P (plates 1-321) \$90.00 | n/a |
| RP3 | male blood | pCYPAC2 | 115 kb | 3x | RPCI3.C \$53.00 | RPCI3.P (plates 322-528) \$90.00 | n/a |
| RP4 | male blood | pCYPAC2 | 116 kb | 4x | RPCI4.C \$53.00 | RPCI4.P (plates 529-816) \$90.00 | n/a |
| RP5 | male blood | pCYPAC2 | 115 kb | 6x | RPCI5.C \$53.00 | RPCI5.P (plates 817-1200 except 827) \$90.00 | n/a |
| RP6 | female blood | pPAC4 | 135 kb | 4x | RPCI6.C \$53.00 | RPCI6.P (plates 1-240 except 135) \$90.00 | n/a |
| Mouse | | | | | | | |
| RP21 | female spleen | pPAC4 | 137 kb | 12x | RPCI21.C \$53.00 | RPCI21.P (plates 1-672) \$90.00 | RPCI21.M (10 membranes) \$3,060.00 |
| Rat | | | | | | | |
| RP31 | female brain | pPAC4 | 142 kb | 10x | RPCI31.C \$53.00 | RPCI31.P (plates 1-614) \$90.00 | RPCI31.M (9 membranes) \$2,754.00 |

Table 2 - BAC and PAC DNA resources

| BAC and PAC Resource | Description |
|-------------------------------|--|
| Clones | Individual clones are available as glycerol stocks. Clone address (plate, row, column) must be specified at time of order. |
| Plate | 384-well microtiter plates containing BAC or PAC clone cultures. Suitable for the completion of clone screening by PCR. Please specify plate number when ordering. |
| DNA Pools | Suitable for PCR screening. DNA provided is sufficient for 50 PCR screenings. |
| High Density Colony Membranes | Libraries are double spotted on nylon membranes for hybridization. Each membrane carries BAC or PAC DNA clones. Please see www.invitrogen.com for more information on High Density Colony Membranes for specific BAC or PAC libraries. |
| 384 Colony DNA Membrane | Any plate from a BAC or PAC library may be spotted onto a nylon membrane. Ideal for identifying a clone address by hybridization rather than by PCR. When ordering, please specify plate number to be spotted. |

Unless otherwise noted, all BACs are provided in HS996 *E. coli* (GeneHogs®).

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Custom BAC Hybridization Screening Service



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Description:

Invitrogen's custom hybridization screening service locates genomic clones from a variety of libraries:

- Human BAC Library usually yields 3-5 clones
- Mouse BAC library usually yields 3-5 clones

Probes

DNA in various forms may be used as probes: cDNAs, PCR fragments, ESTs, genomic fragments, YACs, BACs, cosmids, alu-PCR fragments, and long oligonucleotides (> 40mers).

Service Details

Barring technical difficulty, our average turnaround time is 20 working days. We begin hybridization projects every Monday, using the probes received by the previous Friday. If an oligo is ordered, the oligo synthesis may take up to five working days. As the size of these libraries increases, pricing will change accordingly. Please check with us before placing an order.

Yeast Deletion Clones

Description:

Each Yeast Deletion represents a unique gene-knockout of the *S. cerevisiae* genome. Each open reading frame (ORF) is knocked out using a PCR-based gene deletion strategy that takes advantage of the high degree of homologous recombination in yeast. Each yeast deletion contains a pair of 20-bp tags, or barcode oligos, that serve as gene-specific hybridization tags and allow the phenotypes of the mutant strains to be analyzed in parallel. Yeast Deletion clones are available individually or as a complete set.

| Product | 96-well Plate nos. | Quantity | Cat. no. |
|---------------------------------------|---------------------------|----------|------------|
| Homozygous Diploid | | | |
| Release 1 plate set | 301-337, 370-371, 380 | 40 | 95401.H1 |
| Release 2 plate set | 338-349, 372, 381 | 14 | 95401.H1R2 |
| Complete set | 301-349, 370-372, 380-381 | 54 | 95401.H1R3 |
| Individual plate | 301-349, 370-372, 380-381 | 1 | 95401.H1P |
| Mat-A Haploid | | | |
| Complete set | 1-51, 70-71 | 53 | 95401.H2 |
| Individual plate | 1-51, 70-71 | 1 | 95401.H2P |
| Mat-Alpha Haploid | | | |
| Complete set | 101-150, 170-171 | 52 | 95401.H3 |
| Individual plate | 101-150, 170-171 | 1 | 95401.H3P |
| Heterozygous Diploid A | | | |
| Release 1 plate set | 201-229, 270, 280 | 31 | 95401.H4 |
| Release 2 plate set | 230-263, 271, 281 | 36 | 95401.H4R2 |
| Complete set | 201-263, 270-271, 280-281 | 67 | 95401.H4R3 |
| Individual plate | 201-263, 270-271, 280-281 | 1 | 95401.H4P |
| Heterozygous Diploid Essential | | | |
| Release 1 plate set | 401-408, 480 | 9 | 95401.H5 |
| Release 2 plate set | 409-413, 470, 481 | 7 | 95401.H5R2 |
| Complete set | 401-413, 470, 480-481 | 16 | 95401.H5R3 |
| Individual plate | 401-413, 470, 480-481 | 1 | 95401.H5P |
| Individual yeast deletion clone | | - | 95400 |

Reference:

Baudin, A. *et al.* (1993) *Nuc. Acids Res.* **21**: 3329-3330



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Yeast Deletion Pools

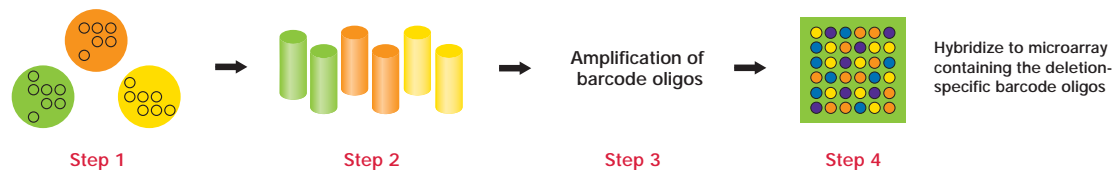


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Description:

The Yeast Deletion Pools allow simultaneous analysis of large numbers of deletion strains through selective growth conditions. Identification and quantitation of the deletions surviving selection can be determined by hybridizing the deletions to a microarray containing all the barcode oligos (Figure 1). The barcode oligos are unique to each deletion, allowing rapid, high-throughput identification of the deletions. Each Yeast Deletion Pool contains all the deletions within the strain, equally represented within the pool. The set of Yeast Deletion Pools is supplied in five tubes, each containing 200 µl of the pooled deletions.

Figure 1 - High-throughput parallel analysis using yeast deletion pools



Step 1: Deletion strain pools are grown in the presence or absence of a drug. Step 2: Aliquots of cells are taken from the pool over time. Step 3: Genomic DNA is isolated and used as a template for PCR amplification of the barcode oligos by two common primers (one incorporating a 5' fluorescent label in the process). Step 4: Hybridization of the PCR product from step 3 to an oligonucleotide array containing the barcode oligos.

Product

Yeast Deletion Pools–Homozygous Diploid
Yeast Deletion Pools–Heterozygous Diploid

Cat. no.

95401.H1Pool
95401.H4Pool

Yeast Deletion Parental Strains

Description:

The *S. cerevisiae* Hansen strains are the parental yeast strains from which the deletions were derived.

Product

Yeast Deletion Parental Strains

S. cerevisiae Hansen BY4730

S. cerevisiae Hansen BY4739

S. cerevisiae Hansen BY4741

S. cerevisiae Hansen BY4742

S. cerevisiae Hansen BY4743

Genotype

MATa leu2Δ0 met15Δ0 ura3Δ0

MATα leu2Δ0 lys2Δ0 ura3Δ0

MATa his3Δ1 leu2Δ0 met15Δ0 ura3Δ0

MATα his3Δ1 leu2Δ0 lys2Δ0 ura3Δ0

MATa/α 4741/4742

Cat. no.

95400.BY4730

95400.BY4739

95400.BY4741

95400.BY4742

95400.BY4743

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Yeast Genomic DNA and S288C Strain

Description:

Yeast Genomic DNA and Yeast S288C strain provide high-quality yeast DNA for use as templates in PCR experiments. The genomic DNA is prepared from the *S. cerevisiae* S288C strain. The genotype of the strain is *MAT α . SUC2 mal mel gal2 CUP1 flo1 flo8-1*.

Product

Yeast Genomic DNA (in solution, 100 μ l at 100 ng/ μ l)
Yeast S288C Strain–glycerol stock

Cat. no.

40802
95500

Yeast-GFP Clone Collection

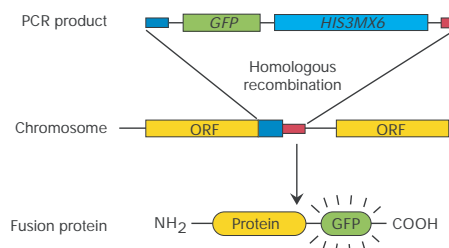
Description:

Each Yeast-GFP clone represents an individual *S. cerevisiae* strain containing an open reading frame with a C-terminal *Aequorea Victoria* GFP (S65T) fusion tag. This collection, generated by Dr. Erin O'Shea and Dr. Jonathan Weissman at UCSF, covers three-quarters of the *S. cerevisiae* proteome and over two-thirds of previously unlocalized proteins. The Yeast-GFP Clone Collection provides a tool for analyzing the response to specific external stimuli or growth conditions and can also be used to assay the effects of deletion or mutation of a protein of interest on the localization of a particular protein. Complex regulatory networks responsible for targeting proteins to specific cellular compartments can also be more readily understood. The localization data from this GFP-tagged collection can also strengthen functional data of proteins grouped together. This is particularly useful in the case of proteins for which little functional data exists.

Construction of the Yeast-GFP Collection

Each ORF was systematically tagged in its chromosomal location through oligonucleotide-directed homologous recombination (Figure 1). This endogenous expression is closer to wild-type expression and leads to more biologically relevant results. To search the Yeast-GFP Clone Collection, visit <http://clones.invitrogen.com> and click on Yeast GFP Clones.

Figure 1 - Strategy for library construction



PCR products containing the GFP tag and a selectable marker gene were inserted at the C-terminus of each ORF through homologous recombination, yielding a C-terminally GFP-tagged protein.

Contents and Storage:

The individual Yeast-GFP Clones are supplied as stab cultures in LB agar. Store the stab at +4°C for up to 2 weeks. Each 96-well plate of the Yeast-GFP Clones contains glycerol stocks of individual clones in 150 μ l Yeast Peptone Dextrose (YPD) medium with 15% glycerol. Store plates at -80°C.

Product

Yeast-GFP Clones
Yeast-GFP 96-well Plates
Yeast-GFP Collection

Quantity

1 clone
1 plate
44 plates

Cat. no.

95700
95701
95702

References:

Yeast-GFP Collection database at <http://yeastgfp.ucsf.edu>
Huh, W. *et al.* (2003) *Nature* **425**: 686-691



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