



SIEBEL

INSTITUTE OF TECHNOLOGY
MICROBIOLOGY SERVICES



2012 YEAST SERVICES & LABORATORY MEDIA CATALOG

**Microbiology Services Division:
International Order Desk & Technical Support:**

Siebel Institute Microbiology Services
6100 Royalmount, Montréal, Québec, Canada H4P 2R2
Contact: Stéphanie Goineau, B.Sc - Microbiology Services Manager
Tél. (514)496-6125 Fax (514)496-1515
E-mail: microservices@siebelinstitute.com

Administration: Siebel Institute of Technology
1777 North Clybourn Avenue Chicago, IL. 60614-5520 U.S.A.
Phone 312-255-0705 Fax 312-255-1312
E-Mail: info@siebelinstitute.com Web: www.siebelinstitute.com

Revised Dec 2011

YEAST SERVICES

Since 1872, the Siebel Institute of Technology has been providing fresh liquid brewing yeast to professional brewers around the world, building a reputation for excellence in yeast quality and purity. What makes Siebel Institute yeast different from that of other manufacturers?

Assured performance

We don't carry hundreds of varieties of unproven yeast strains: We choose to offer a narrow range of strains with proven characteristics of reliable fermentation performance & accurate flavor production for your ales, lagers and specialty beers. Each of our Siebel Institute yeast strains is maintained using techniques that meet or exceed the standards used in the world's biggest & best-known breweries. We don't keep slurries on hand for shipment at the time of ordering. Instead, we begin production of your yeast order at the time the order is placed. During the production period of your culture slant or propagated slurry, our Microbiology Services team performs multiple tests using some of the most advanced techniques and equipment available to assure the purity & performance of your yeast. Your order is not shipped until we are 100% satisfied that it meets the highest possible standards of quality.

When the quality & consistency of your beer is dependent on the quality & consistency of your yeast, you can count on Siebel Institute, America's oldest brewing industry laboratory & service provider.

Pure Yeast Cultures

The Siebel Institute of Technology has selected our Siebel Institute BRY brewing yeast strains for their reliable performance in professional brewing applications.

- **Bry 96:** This is a flocculent top fermenting ale yeast from a brewery formerly operating on the East Coast of the United States. It produces a very clean ale flavor which has been well accepted in a number of breweries.
- **Bry 144:** This is a top fermenting Alt beer style yeast from Germany which produces a very full flavored but clean tasting beer, somewhat estery in flavor.
- **Bry 203:** This yeast is a very popular and very flocculent lager strain from Northern Europe. It produces a beer with a good balance of flavors, particularly between the esters and higher alcohols, which makes a very drinkable beer. This yeast produces less sulfur compounds than most other flocculent strains.
- **Bry 204:** This yeast originated from Northern Europe. It is a top fermenting Trappist type strain which ferments rapidly at relatively warm temperatures. It can be used to produce ales and wheat beers with a rather dry but estery flavor and a light clove-like spicy character.
- **Bry 235:** A traditional Bavarian weizen yeast. Top fermenting and normally used at room temperatures to give a very vigorous fermentation. Produces a very estery beer with a mild clove-like spiciness.
- **Bry 264:** A flocculent, bottom fermenting strain from England. Gives quick clarification of the beer after fermentation. Produces a clean ale type product, with an estery and slightly nutty character.
- **Bry 401:** This is the most widely used yeast strain for brewing Kolsch beer in Germany. It is a non-flocculent yeast that ferments well and settles very slowly. It is an ale yeast that ferments well at lower temperatures (55 – 59 deg F or 13 - 15deg C) and produces the mild flavors associated with Kolsch beer

Our laboratory also provides services for isolation and evaluation of pure cultures from your own source. We will maintain such cultures for your exclusive use, and will propagate the strain as described above when needed.

We have many other yeast strains available besides the ones described here. Many of these alternate strains are described on a separate Yeast Culture Information sheet, which is available upon request. We will be pleased to assist in matching one of these strains with your specific requirements. For further assistance with our special yeast strains please contact the Siebel Institute Microbiological Services division.

Ordering Yeast

PLEASE NOTE: Prices indicated are for single-unit purchases. For pricing information regarding purchase of Siebel Institute yeast on a regular basis, please contact Stéphanie Goineau at our Montreal order desk for a quote.

Any of the yeast strains described above can be provided as pure cultures. The following amounts are available:

YEAST CULTURE SLANTS

- ❖ Two duplicate cultures growing on agar medium in screw cap test tubes. Suitable for storage in a refrigerator to be propagated when desired.
- ❖ Suggestions for propagation will be sent along with the culture if requested.
- ❖ Allow at least 1 week for the culture to be grown and checked for purity in our laboratory.

Cost: US\$ 133 / set

PROPAGATED LIQUID YEAST

- ❖ Yeast which has been propagated in our laboratory under sterile and growth enhancing conditions to a final stage of 10 liters. Yeast is concentrated to 1 liter or less, refrigerated, and shipped overnight (U.S. and Canadian destinations only).
- ❖ This amount of yeast is sufficient for further propagation at the brewery starting with a volume of about 1 Hl (about 1 barrel).
- ❖ Allow at least 2 weeks for the culture to be grown and checked for purity in our laboratory.

Cost: US\$ 300 / 1L slurry

YEAST ORDER FORM

Siebel Institute - Microbiology Services Division

6100 Royalmount, Montreal, Quebec, Canada H4P 2R2

Contact: Stéphanie Goineau, B.Sc - Microbiology Services Manager

Tél. (514)496-6125 · Fax (514) 496-1515

E-mail: microservices@siebelinstitute.com

To improve our service to you, our valued customer, please complete our Yeast Order Form. This information will insure that all our records are correct before shipping you your Yeast Order. Please note we only accept written orders. Thank you for your understanding & for taking this time to help us serve you better.

Date: _____ PO # _____

BILL TO:

Company Name:			
Address:			
Attention:			
Phone		Fax	
E-Mail Address:			

SHIP TO:

Company Name:			
Address:			
Attention:			
Phone		Fax	
E-Mail Address:			

BRY #	QUANTITY - Set of 2 slant	QUANTITY - 1L slurry	Date required

Thank you for your order. You will receive an Order Confirmation via E-mail.

Yeast Maintenance & Evaluation Services

The Siebel Institute of Technology has been in the brewing yeast business since 1872, providing a full range of yeast banking & maintenance services to some of the greatest names in North American brewing. Now, with our expanded Microbiological Services division in Montreal (Canada), we are pleased to offer the industry's most advanced yeast management & evaluation services.

Our services employ the highest scientific standards, assuring the purity and performance of every culture under our care. We offer the most advanced range of testing available in the brewing industry, with yeast banking and maintenance packages that meet the needs of breweries of every size. You can choose from one of our pre-packaged programs, or we can work with your company to build an effective and affordable program custom-designed for your company. If you would like to learn more about which services are right for you, just contact us at our Montreal offices.

YEAST BANKING PACKAGES AVAILABLE INITIAL DEPOSIT (1st year only)	GOLD US\$ 1019	SILVER US\$ 246	BRONZE US\$ 203
3 preservation methods : <ul style="list-style-type: none"> • <i>Liquid nitrogen, cryostorage at -80C, microbank™</i> • <i>All electrical equipment on back-up power supply</i> • <i>Limited access to all strains and database</i> • <i>Security deposit at another facility</i> 	X	X	X
Purity check / Detection of contaminants : <i>By using various selective and differential media for the detection of bacteria and wild yeasts</i>	X	X	X
Ale and Lager differentiation: <ul style="list-style-type: none"> • <i>Melibiose utilization and fermentation</i> • <i>Growth test at 37°C</i> 	X	X	X
Genus & species identification : <i>Biochemical profile and genus & species identification using api ID32 galleries</i>	X	X	X
Phenolic Off Flavors (POF test)	X	X	X
Killer profile : <i>Evaluation of the strain sensitivity to known killer toxins and its ability to synthesize killer toxins</i>	X	X	X
Genetic stability evaluation by PFGE on 5 colonies: <i>PFGE allows strains differentiation, detection of chromosomal mutations as well as genetic stability evaluation</i>	X		
DNA profiling by RAPD-PCR <i>To create a DNA fingerprint at time 0 for future strain differentiation and culture yeast evaluation</i>	X	X	
Possible storage options to choose from :	GOLD, SILVER or BRONZE	SILVER or BRONZE	BRONZE
ANNUAL YEAST STORAGE PROGRAMS (annual fee for each subsequent year)	GOLD US\$ 485	SILVER US\$ 175	BRONZE US\$ 115
Yeast storage using the different methods mentioned above and subculturing if necessary	X	X	X
Annual verification of your culture yeast strain against its BRY reference by PFGE	X		
Annual verification of your culture yeast strain against its BRY reference by RAPD-PCR	X	X	

YEAST BANKING & MAINTENANCE ORDER FORM

Siebel Institute - Microbiology Services Division

6100 Royalmount, Montreal, Quebec, Canada H4P 2R2

Contact: Stéphanie Goineau, B.Sc - Microbiology Services Manager

Tél. (514)496-6125 · Fax (514) 496-1515

E-mail: microservices@siebelinstitute.com

To improve our service to you, our valued customer, please complete this Yeast Banking & Maintenance Order Form and send it along with your yeast samples. This information will insure that all our records are correct. Please note that we only accept written orders. Thank you for your understanding & for taking this time to help us serve you better.

Date: _____ PO # _____

BILL TO:

Company Name:			
Address:			
Attention:			
Phone		Fax	
E-Mail Address:			

SHIP TO:

Company Name:			
Address:			
Requested by:			
Phone		Fax	
E-Mail Address:			

Your yeast sample internal reference	Ale / Lager	Yeast Banking package	Yeast storage package

The strain will be given a unique BRY number, which will be communicated on receipt of the strain and a Yeast Banking & Characterization Report will be sent once all results are available.

Siebel Institute of Technology undertakes to take every care in maintaining the above strain, but does not accept any liability in the event of loss or damage of the strain. Siebel Institute will maintain this strain exclusively for the use of the above company and will not give / lend / sell the strain to any other party.

Signature: _____

Date: _____

For (company name): _____



Siebel Institute

Yeast Genetic Services

While many of our advanced Microbiological Services use cutting-edge analytical technologies employed by some of the world's largest breweries, their applications can be utilized by breweries and brewing-related companies of every size. Our DNA fingerprinting and rapid analysis services can give you critical information about your yeast, improving your understanding of its characteristics, performance and purity. Have a look below for some of the most important applications of our yeast services as well as our range of testing services and their underlying technologies. If you have any questions as to how your brewery can make the most of these services, contact Stephanie Goineau at Siebel Institute Microbiology Services at microservices@siebelinstitute.com.

Yeast strain identification by PCR fingerprinting

Applications: PCR fingerprinting can identify and differentiate production yeast strains. This is a valuable tool for checking yeast slopes, detecting cross contamination, monitoring production yeast cultures and in some instances to detect mutations.

Technology: While differentiation of brewing strains is notoriously difficult to perform using traditional lab techniques, PCR fingerprinting offers a quick and accurate means of differentiating brewing yeast strains based on analysis of multiple regions of the genome. This "ASBC recommended" method utilizes PCR (Polymerase Chain Reaction) technology to amplify inter-delta regions of the genome, which are known to be highly variable in terms of number, distribution and size between strains. Through this process a unique DNA fingerprint can be obtained for each individual yeast strain.

Yeast strain identification using microsatellite PCR

Applications: Closely-related production yeast strains present a greater challenge to identify and differentiate the strains, requiring a more "sensitive" testing method. Microsatellite PCR offers such accuracy & sensitivity, even allowing for the detection of yeast strain mutations.

Technology: Microsatellite PCR is an extremely sensitive and versatile PCR-based technique for strain identification which involves analysis of "microsatellite" DNA regions, known to be highly variable between different yeast strains. This technique provides information on the size and number of microsatellites and is recommended to differentiate strains which are known to be closely related, or derived from the same mother strain.

Alternate method for yeast strain identification by analysis of mtDNA

Applications: mtDNA analysis is used for the identification and differentiation of production yeast strains, and it can also be used to indicate mitochondrial mutations.

Technology: It has been reported that there are more variable regions in the yeast mitochondrial DNA than in the nuclear DNA. These variations can be exploited to produce a DNA fingerprint which can be used to differentiate strains that are closely related, or to complement analysis of nuclear DNA as described above.

Identification of bacteria species by DNA sequencing

Applications: Identification of isolated bacterial contaminants can give breweries important information about the nature and origins of bacteria found in their yeast and in their products. Traditional methods to identify bacteria can be time consuming and often lack sensitivity, particularly when trying to differentiate closely related species of brewing microbes. DNA sequencing allows the rapid and precise identification of bacteria to the species level, based on differences within ribosomal DNA sequences.

Technology: This method involves the amplification of rDNA by PCR followed by sequencing of the resulting rDNA fragment. Identification to *the species level* is performed by comparison to a Basic Local Alignment Search Tool (BLAST) database comprising >1 million entries for bacteria.



Identification of wild yeast species by DNA sequencing

Applications: Wild yeast can be difficult to identify as traditional methods for yeast identification are often labor intensive and lack precision. Our DNA sequencing process allows for the accurate identification of isolated yeast contaminants *to the species level* including an expansive range of wild yeast strains associated with the food and beverage industry.

Technology: Sequencing of the D1-D2 domain within yeast ribosomal DNA can be used to rapidly and accurately identify yeast species. This method involves the amplification of rDNA by PCR followed by sequencing of the resulting fragment. Identification of yeast species is performed by comparison to a Basic Local Alignment Search Tool (BLAST) database of wild yeast strains common in the food and beverage industries.

Identification of yeast species by ITS analysis

Applications: The identification of isolated yeast contaminants.

Technology: Yeast species can be identified by analysis of the ITS region within yeast ribosomal DNA. This method, which is cheaper to perform than DNA sequencing (See above), involves PCR amplification of the ITS region of the genome followed by digestion using restriction enzymes. The ITS region of DNA is known to vary in size and composition between yeast species. Consequently, the size and number of the resulting DNA fragments can be compared to a database comprising more than 200 species of yeast, leading to identification.

Identification of yeast mutants by RFLP analysis of Ty elements

Applications: Brewing yeast cultures can change over time due to genetic drift, leading to the accumulation of mutants. These changes typically have a negative influence on fermentation performance and can lead to altered flavor profiles, inappropriate flocculation and fermentation inconsistencies. This service analyses yeast cultures for the presence of mutants. This is an especially important tool for monitoring production yeast cultures for genetic drift, checking yeast samples for the presence of mutants, optimizing serial repitching and associated yeast handling processes.

Technology: Mutations can be detected by analyzing cultures using RFLP of yeast transposons (Ty elements). Ty elements are regions of the genome which are known to be highly susceptible to movement and this can indicate more widespread changes throughout the DNA. Here we use a molecular probe to produce a fingerprint of yeast DNA according to the size and location of Ty elements. Fingerprints can be seen to vary compared to the original strain when a mutant yeast is present.

Analysis of yeast genetic stability by karyotyping

Applications: Brewing yeast strains are often susceptible to mutation, characterized by changes to the DNA. Karyotyping offers a tool for the analysis of genetic stability in new or current production strains, analysis of large scale mutations, and for strain differentiation.

Technology: The in-built capacity of a yeast strain to mutate can be assessed by analysis of chromosomes, since large scale genetic changes are frequently observed in polyploid and allopolyploid yeast. To determine genetic stability, a number of isolated colonies are analyzed using Pulsed Field Gel Electrophoresis (PFGE) to create a chromosomal fingerprint, or karyotype. If variation is seen between the karyotypes of different colonies, the yeast strain can be considered to be genetically unstable.

For more information regarding Yeast Maintenance & Evaluation Services and our yeast genetic services including pricing, contact:

Siebel Institute - Microbiology Services Division

6100 Royalmount, Montreal, Quebec, Canada H4P 2R2

Contact: Stéphanie Goineau, B.Sc - Microbiology Services Manager

Tél. (514)496-6125 · Fax (514) 496-1515

E-mail: microservices@siebelinstitute.com

DNA FINGERPRINTING ANALYSIS ORDER FORM

Siebel Institute - Microbiology Services Division

6100 Royalmount, Montreal, Quebec, Canada H4P 2R2

Contact: Stéphanie Goineau, B.Sc - Microbiology Services Manager

Tél. (514)496-6125 · Fax (514) 496-1515

E-mail: microservices@siebelinstitute.com

To improve our service to you, our valued customer, please complete this DNA Fingerprinting Analysis Order Form and send it along with your yeast samples. This information will insure that all our records are correct. Please note we only accept written orders. Thank you for your understanding & for taking this time to help us serve you better.

Date: _____

PO # _____

BILL TO:

Company Name:			
Address:			
Attention:			
Phone		Fax	
E-Mail Address:			

SHIP TO:

Company Name:			
Address:			
Requested by :			
Phone		Fax	
E-Mail Address:			

Samples submitted for analysis	BRY control strain (if applicable)

Description of the analysis required	DNA profiling only	
	Strain comparison	
	Stability control *	
	Purity evaluation *	
	Genus & Species identification	

* More than one colony is needed to perform these analyses (min 5 – ideally 10).

DNA Analysis Required	RAPD-PCR	
	PFGE	
	RFLP	
	ITS-PCR	

A complete DNA Analysis Report will be sent to you by email once results are available.

LABORATORY MEDIA

The Siebel Institute offers a complete range of media that is required to detect wild yeast and the most common bacteria encountered in breweries. We can assist you in selecting media that will help you with your breweries QA/QC program. Just contact our Technical Support department in Montreal by phone at 514-496-6125 or by e-mail at microservices@siebelinstitute.com.

Bacterial Detection Media

HLP Medium (Hsu's *Lactobacillus/Pediococcus* Medium)

Enables selective counting of lactic acid bacteria. Many lactic acid bacteria can be detected in as little as 48 hours. Differentiation of *Lactobacillus* and *Pediococcus* can be made after 5 days of incubation. HLP is a simple test for the most common beer spoiling bacteria, requiring minimal lab equipment. Anaerobic incubation equipment and an autoclave are **not** required.

<u>Cat #</u>	<u>Size</u>	<u>Price</u>
9030	carton 10 x 500 g	US\$ 985.00

LMDA/SDA (Lee's Multi Differential Agar/Schwarz Differential Agar)

A nutrient medium that will detect most organisms commonly encountered in a brewery. Acid producing bacteria are identified by the development of a clear zone around the colonies. Further identification is facilitated by the characteristic color reactions. Actidione may be added to the medium to suppress growth of culture yeast.

<u>Cat #</u>	<u>Size</u>	<u>Price</u>
9130	carton 10 x 500 g	US\$ 1680.00

Wild Yeast Detection Media

LWYM (Lin's Wild Yeast Medium)

For detection and quantitative determination of wild yeast populations in brewing culture yeast. Approximately 1 million culture yeast is plated on LWYM. The growth of culture yeast is suppressed. Wild yeast grow as larger distinct colonies. This medium is designed to encourage the growth of *Saccharomyces* wild yeast. A number of non-*Saccharomyces* yeast will also grow on this medium.

<u>Cat #</u>	<u>Size</u>	<u>Price</u>
9210	carton 15 x 200 g	US\$ 1442.00

LCSM (Lin's Cupric Sulfate Medium)

For detection and quantitative determination of wild yeast populations in brewing culture yeast. Approximately 1 million culture yeast is plated on LCSM. This medium is designed to encourage the growth of non-*Saccharomyces* yeast. A few *Saccharomyces* yeast may show some growth on this medium.

<u>Cat #</u>	<u>Size</u>	<u>Price</u>
9310	carton 15 x 200 g	US\$ 1442.00

LABORATORY MEDIA ORDER FORM

Siebel Institute Microbiology Services - International Order Desk:

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Contact: Stéphanie Goineau, B.Sc - Microbiology Services Manager

Tél. (514) 496-6125 · Fax (514) 496-1515

E-mail: microservices@siebelinstitute.com

Single-unit bottles of Siebel Institute laboratory media are available for direct purchase *in Canada only*. To order individual bottles of our media for delivery outside of Canada, please contact Siebel Institute of Technology at microservices@siebelinstitute.com for the name of an Authorized Distributor in your area.

To place your order quickly, please complete this MEDIA Order Form. This information will insure that all our records are correct. Please take the time to review this information before returning it to us via fax. We only accept written orders. Thank you for your understanding and for taking this time to help us serve you better.

Date: _____ PO # _____

BILL TO:

Company Name:			
Address:			
Attention:			
Phone		Fax	
E-Mail Address:			
Payment method			

SHIP TO:

Company Name:			
Address:			
Attention:			
Phone			

MEDIA	Product Code	SIZE	QTY
HLP	M9020	500g	
	M9030	10 X 500g	
SDA	M9120	500g	
	M9130	10 X 500g	
LWYM	M9200	200g	
	M9210	15 X 200g	
LCSM	M9300	200g	
	M9310	15 X 200g	

Thank you for your order. You will receive an Order Confirmation via E-mail.