



Cultivating diverse microbes for laboratory study and genetic engineering

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CULTIVARIUM

Develop open-source tools for life scientists

Expand access to novel microorganisms

Inspire new research avenues

Push the frontiers of biotechnology

We need the right microbe, with the right tools for each job.

1M+ species

All microbes in the environment

Microbes that
scientists can
actually engineer



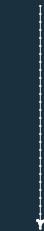
Today's
products
Chemicals,
Drugs

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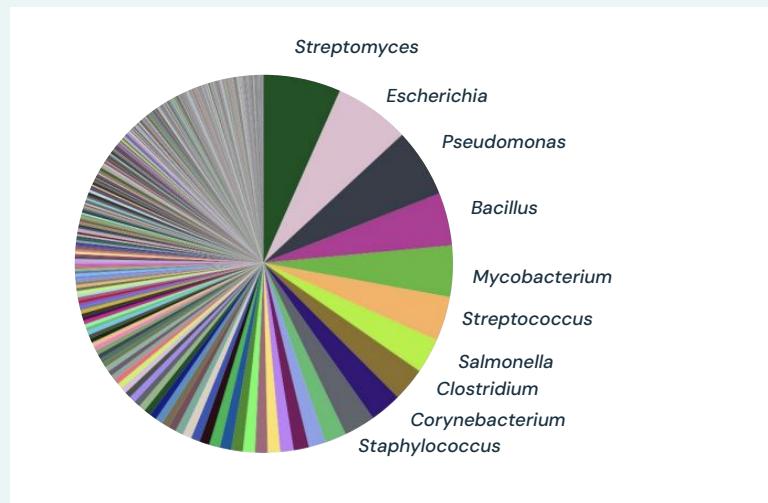


Today's products
Chemicals,
Drugs

We are excited to work with ATCC and their extensive catalog

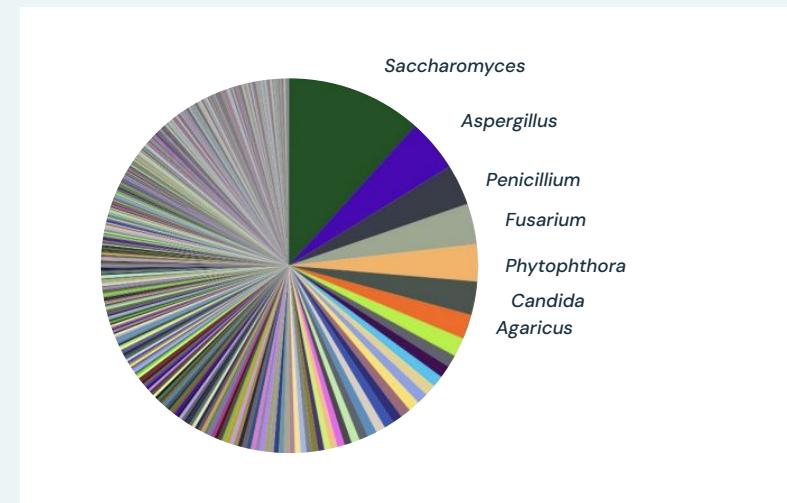
Bacteriology Collection

1,226 Genera

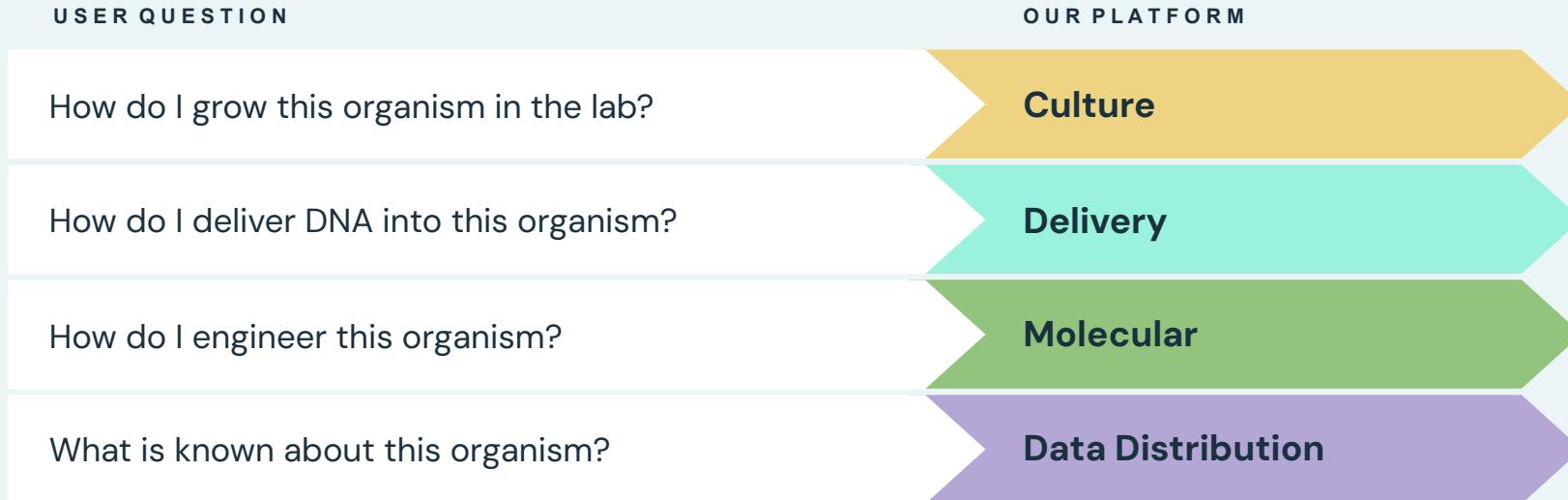


Mycology Collection

1,864 Genera



Cultivarium's organism development pipeline: Recipes for experimentalists



Get access to all organisms in one comprehensive portal

We aggregate data and publications for microbes.

One-stop shop focused on actionable information for experimentalists.

CULTIVARIUM PORTAL

Data Feed About

Hello Neha

Find species or strains by name or ID

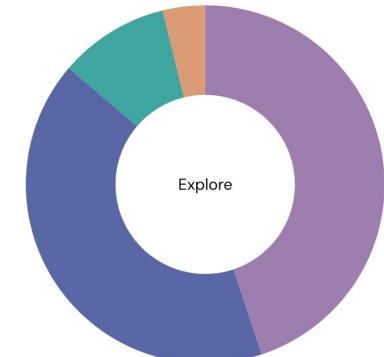
In our labs

Our team of scientists profiles strains across three platforms: Culture, Delivery, and Molecular. Learn more about our rigorous process and see where we are in our work.

On our portal

	SPECIES	STRAINS
Bacteria	77,470	103,518
Fungi	71,341	48,712
Protists	17,117	3,825
Archaea	6,595	1,237
Total	172,523	157,292

Explore our database →



Simple queries for complex datasets

You can easily query our experimental database using natural language search

The screenshot shows the Cultivarium Portal's Advanced Search interface. At the top, there is a navigation bar with the portal logo, "CULTIVARIUM PORTAL", and links for "Data", "Feed", "About", and user icons. Below the navigation bar, the title "Advanced Search" is displayed. A text input field contains the query: "Provide growth information for the list of organisms Halalkalibacterium halodurans, Bogoriella caseilytica, Bacillus licheniformis, Exiguobacterium aurantiacum, Salinicoccus alkaliphilus". The results section below the input field displays the following table:

NAME	OXYGEN	PH	SALINITY	TEMPERATURE
Bacillus licheniformis	Aerobe	7.431	3.233	35.831
Bogoriella caseilytica	Aerobe	9.026	4.45	30.847
Exiguobacterium aurantiacum	Aerobe	8.126	3.939	36.192
Halalkalibacterium halodurans	Aerobe	9.236	5.534	43.089
Lacicoccus alkaliphilus	Aerobe	9.755	9.809	32.548
Shouchella clausii	Aerobe	8.926	4.892	36.144

Extremophiles >

Organisms that thrive in extreme environmental conditions that include extremes in temperature, pH, salinity, pressure, or radiation.

ATCC has 1,400+ extremophiles!

Alkaliphiles

Production of industrial enzymes

ATCC ID	Organism
27557	<i>Halalkalibacterium halodurans</i>
700413	<i>Bogoriella caseilytica</i>
14580	<i>Bacillus licheniformis</i>
BAA-333	<i>Exiguobacterium aurantiacum</i>
BAA-722	<i>Salinicoccus alkaliphilus</i>
700160	<i>Shouchella clausii</i>

Radiation resistant

Radiation-protection,
understanding life in space

ATCC ID	Organism
13939	<i>Deinococcus radiodurans</i>
27329	<i>Methylobacterium radiotolerans</i>
51242	<i>Rubrobacter radiotolerans</i>

Halophiles

Alternative bioproduction hosts

ATCC ID	Organism
33173	<i>Halomonas elongata</i>
BAA-805	<i>Halomonas neptunia</i>
BAA-333	<i>Halomonas alkaliphilica</i>
43984	<i>Chromohalobacter canadensis</i>
BAA-722	<i>Salinivibrio costicola</i>
43984	<i>Marinococcus halophilus</i>

Halalkalibacterium halodurans

Why we chose this organism?

- Enzymes
- Biofuel production
- Waste treatment

CULTIVARIUM PORTAL Data Feed About

D: Bacteria > P: Bacillota > C: Bacilli > O: Bacillales > F: Bacillaceae > G: *Halalkalibacterium* (ex Joshi et al. 2022)

Halalkalibacterium halodurans

TAXONOMY ID 86665

+ Add to favorites

SPECIES INFORMATION STRAIN INFORMATION

SUMMARY

- OVERVIEW
- LAB LORE

CULTURE

- CULTURE PREDICTIONS

SEQUENCING

- METHYLATION

OTHER

- PUBLICATIONS

SYNOMYNS

- Alkalihalobacillus halodurans
- Alkalihalobacillus okuhidensis
- Bacillus halodurans (ex Boyer 1973) Nielsen et al. 1995
- Bacillus okuhidensis
- Bacillus okuhidensis
- Halalkalibacterium halodurans (Nielsen et al. 1995) Joshi et al. 2022

CULTURE

CULTURE PREDICTIONS

GROWTH CONDITIONS ⓘ

Optimal growth conditions are predicted based on genome-wide amino acid frequencies using our GenomeSPOT algorithm. The predictions below are an average of 3 NCBI genomes for this strain.

PARAMETER	OPTIMUM	RANGE	CONFIDENCE
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Choosing a strain

The Cultivarium portal shows all strain sources in one place.

Choose a strain for *Halalkalibacterium halodurans*

Strains available for this species: 21

Strains available for this species: 21					
Search for a strain...		SOURCE		REFERENCE DATABASES	
NAME		ATCC	DSMZ	NCBI	BACDIVE
<input type="radio"/> Halalkalibacterium halodurans A-59		21591	2513	-	1113 017
<input type="radio"/> Halalkalibacterium halodurans NRRL B-3881		27557	497	-	1112 025
<input type="radio"/> Halalkalibacterium halodurans JCM 9153		baa-125	18197	-	1119 -
<input type="radio"/> Alkalihalobacillus halodurans (Nielsen et al. 1995) Pa		-	-	-	166010 -
<input type="radio"/> Halalkalibacterium halodurans BB 16		-	6944	-	1116 -

< 1 2 3 4 5 > 1 - 5 of 21

CULTIVARIUM PORTAL Data Feed About Lit Search

D: Bacteria > P: Bacillota > C: Bacilli > O: Bacillales > F: Bacillaceae > G: *Halalkalibacterium* (ex Joshi et al. 2022)

[+ Add to favorites](#)

Halalkalibacterium halodurans

Strain ID: 86665

[SPECIES INFORMATION](#) [STRAIN INFORMATION](#)

SYNONYMS

- halihalobacillus halodurans*
- halihalobacillus okuhidensis*
- illus halodurans* (ex Boyer 1973) Nielsen et al. 1995
- illus okuhidensis*
- illus okuhidensis*
- alkalibacterium halodurans* (Nielsen et al. 1995) Joshi et al. 2022

CULTURE

PREDICTIONS Insights for working with this organism that are typically unpublished. Share your experiences and lessons with the community here.

GROWTH CONDITIONS

Optimal growth conditions are predicted based on genome-wide amino acid frequencies using our Genome algorithm. The predictions below are an average of 3 NCBI genomes for this strain.

* These are user-contributed observations in the Lab Lore section, provided on an honor system basis. Cultivarium does not verify or replicate these claims in its database. **PARAMETER** **OPTIMUM** **RANGE** **CONFIDENCE**

Growth Media

Cultivarium determines optimal growth media using our growth media screen.

12 base media tested (6 positive, 6 negative)				
BASE MEDIUM	BEST FORMULATION	TEMPERATURE (°C)	MAX OD ↓	
BASE MEDIUM	BEST FORMULATION	TEMPERATURE (°C)	MAX OD ↓	
> HMI	HMI.pH.10	30	1.001	
> BHI	BHI	30	0.905	
> MB	MB	30	0.846	
SHOW MORE +				

Growth Conditions

Optimal growth conditions are predicted based on genome-wide amino acid frequencies using our [GenomeSPOT](#) algorithm.

PARAMETER	OPTIMUM	RANGE	CONFIDENCE
			Low
Oxygen	Aerobe (Obligate or Facultative)	-	Low
pH	9.2 pH	7.2 – 10.5	Medium
Salinity	5.5% w/v NaCl	0.3 – 16.4	Low
Temperature	44.9°C	26 – 55	Low

ORI Screen

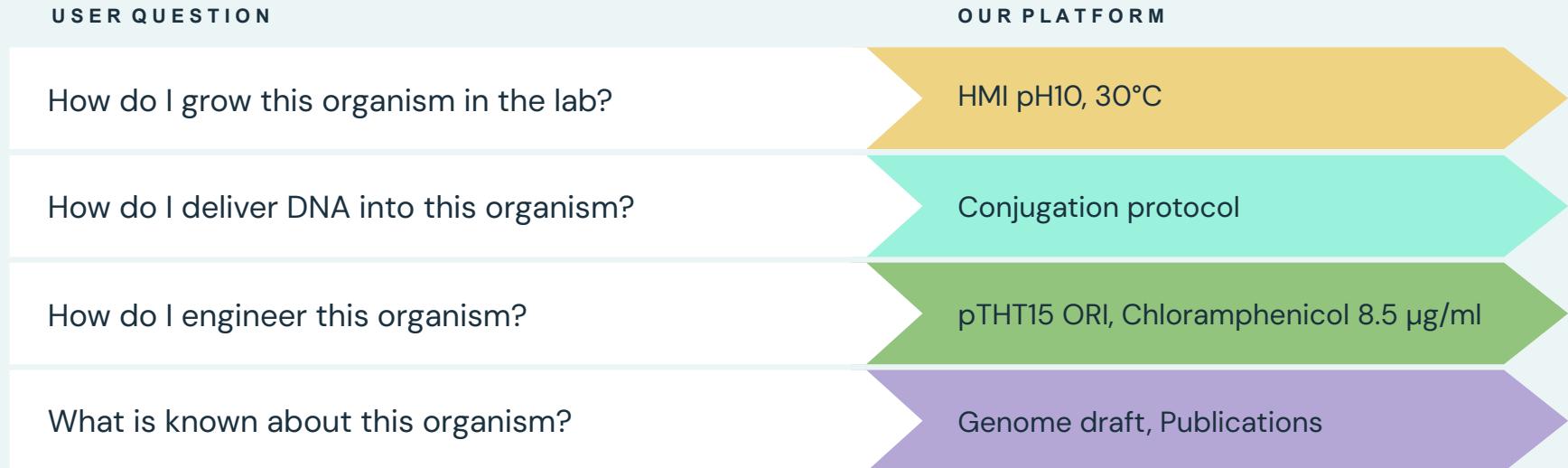
Cultivarium screens for functional plasmid origins of replication (ORIs), resistance markers, and antibiotic selection concentrations using a high-throughput version of our [ORI-marker screen](#).

22 ORIs tested (● 5 positive, ● 17 negative)

ORI	CONFIDENCE ↓
> pTHT15	Medium
> RSFI010	Medium
> pUB110	Medium
> pIM13	Low
> p15A	Low

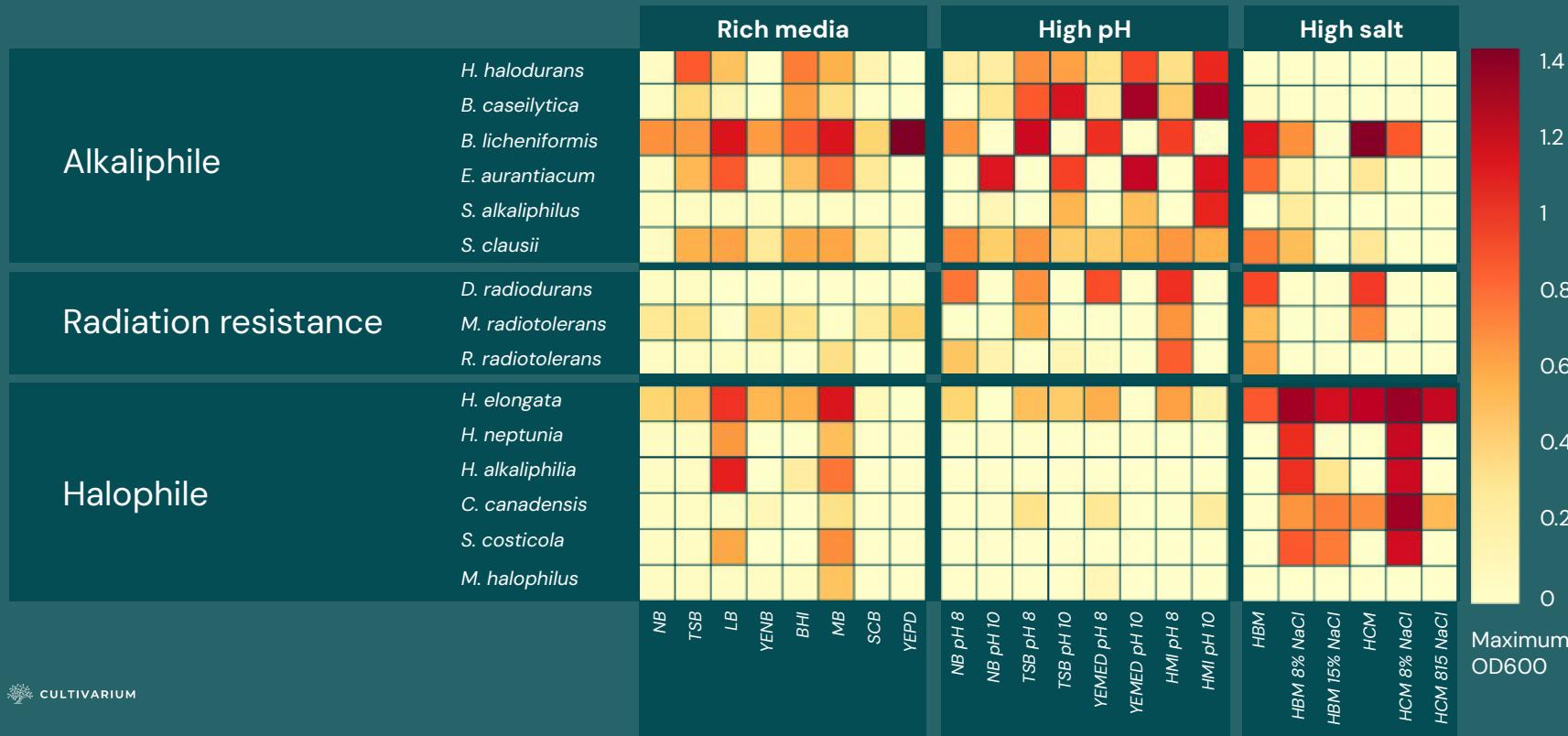
ORI	CONFIDENCE ↓		ORI PART PLASMID
✓ pTHT15	Medium		GenBank Addgene
ANTIBIOTIC	CONJUGATION MEDIUM	SELECTIVE MEDIUM	CONFIDENCE ↓
Chloramphenicol (8.5 µg/mL)	LB.DAP	ABM	Medium
Spectinomycin (12.5 µg/mL)	LB.DAP	LB	Low
Spectinomycin (50 µg/mL)	TSB.DAP	HMI.pH.10	Low
Spectinomycin (200 µg/mL)	LB.DAP	ABM	-
Chloramphenicol (8.5 µg/mL)	TSB.DAP	HMI.pH.10	-
Chloramphenicol (8.5 µg/mL)	LB.DAP	LB	-

Cultivarium's organism development pipeline: Recipes for experimentalists

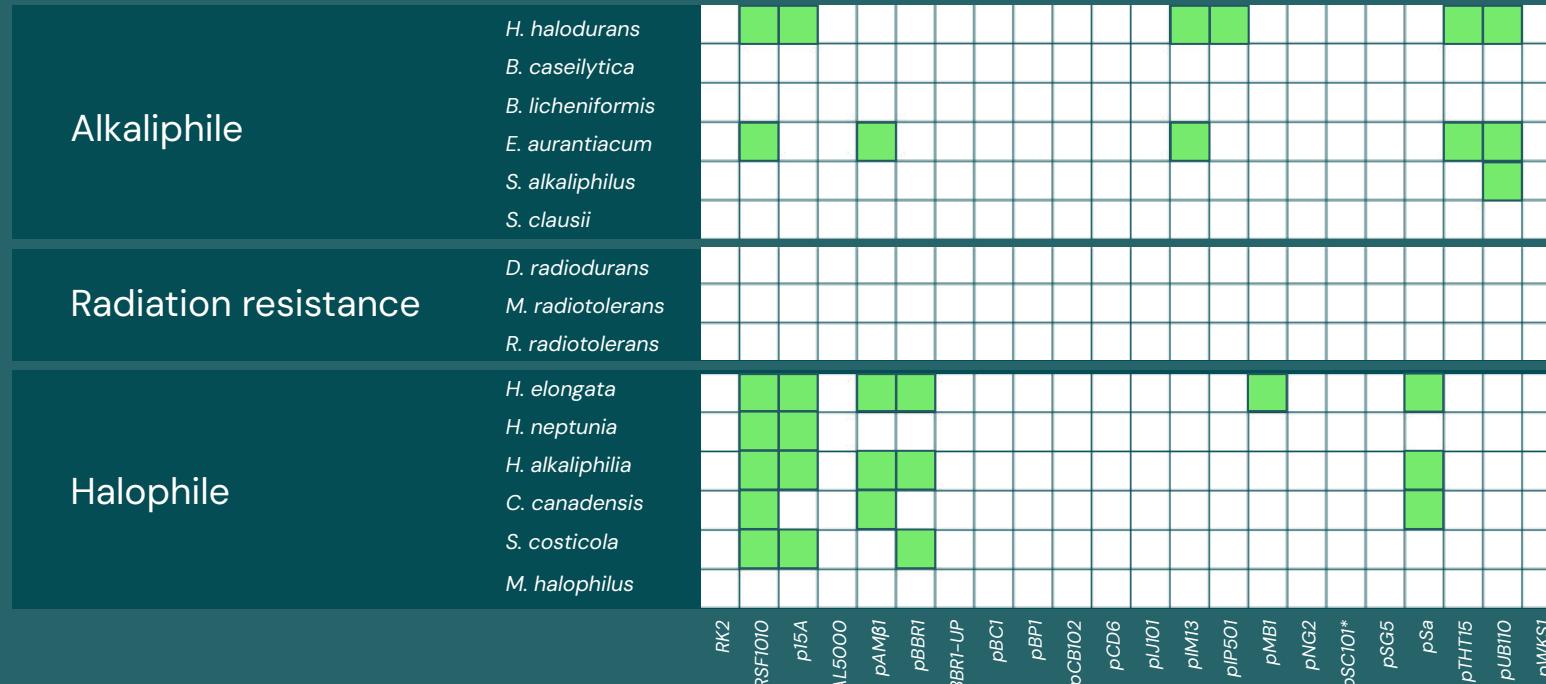


Summary of Extremophiles

Extremophiles - Culture Data



Extremophiles - ORI Data



Extremophiles - Improved Culturing

More productive media	Lower lag time	More accessible media	Growth in liquid and solid media
<i>Deinococcus radiodurans</i> HMI pH8, HCM, HBM, YEMED pH8	<i>Deinococcus radiodurans</i> HMI pH8, HCM	<i>Exiguobacterium aurantiacum</i> LB	<i>Salinicoccus alkaliphilus</i> HMI pH10, TSB pH10, YEMED pH10, HBM 8%NaCl
<i>Methylobacterium radiotolerans</i> YENB, YEPD, HBM, HCM, TSB pH8, HMI pH8	<i>Shouchella clausii</i> TSB pH8, HBM	<i>Salinivibrio costicola</i> LB	<i>Halomonas alkaliphila</i> LB
			<i>Methylorubrum extorquens</i> YENB, BHI, MB

Extremophiles – Challenges

Aggregation

Bogoriella caseilytica

SOLUTION

Use alternative media, disrupt aggregates (filter, bead beating, sonication).

Slow Growth

Methylobacterium radiotolerance

SOLUTION

Use alternative media, non-OD measurements (imaging).

Single Viable Media

Marinococcus halophilus

SOLUTION

Use metabolic models for media compatible with conjugal hosts.

Scientific recipes for experimentalists

Culture	Delivery	Molecular	Distribute
1,612 growth profiles	62 Delivery protocols	2,550 Screened plasmids	146,002 Organism pages

Let's work together

Access our tools

Molecular tools

POSSUM Toolkit

Identify functional plasmids

MACKEREL Toolkit

Identify functional promoter-RBS

Computational tools

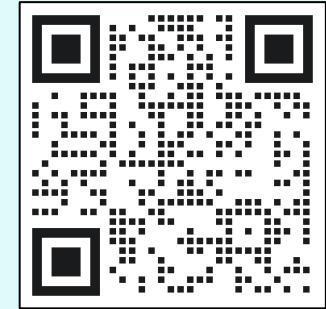
GenomeSPOT

Predict growth conditions based on amino acid composition

MicrobeMod

Identify methylation to avoid Restriction Modification

cultivarium.org



Get our tools on
cultivarium.org!

Let's work together

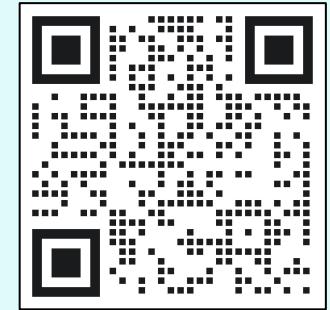
How we can support your work

1. See and share organism information on our Portal

2. Nominate your favorite organisms for genetic tools

3. Co-develop your applications with us

cultivarium.org



Portal Access

