

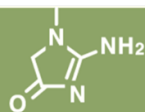


Welcome to
Japanese Multi Omics
Reference Panel.

jMorp
日本人多層オミックス参照パネル

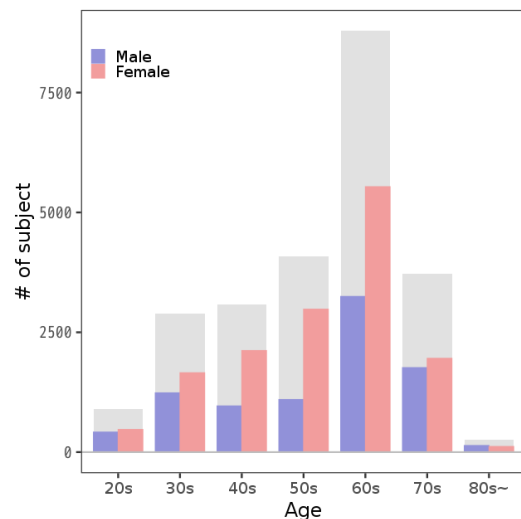
メタボローム解析データ利用ガイド (代謝物)

代謝物

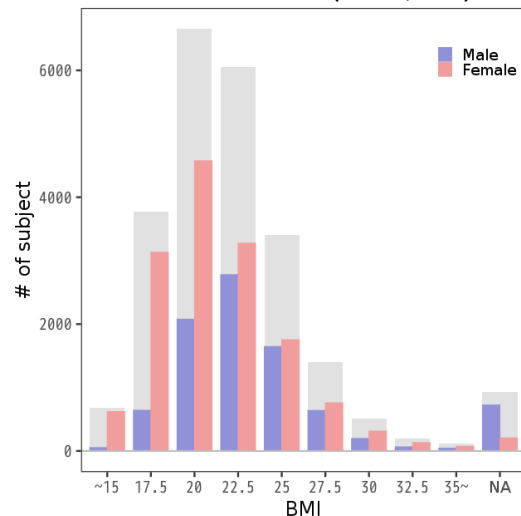


Metabolome

年齢性別分布(n=23,709)



BMI性別分布(n=23,709)

◎ ベースライン調査*¹ (三世代コホート調査*²の妊婦を除く)

手法	測定機	探索種別	mode	人数	項目
NMR		標的		23,709人	45代謝物
MS	LC-MS	網羅的	HILIC-neg v2	2,998人	165代謝物
			HILIC-neg v1	1,301人	152代謝物
			C18-pos	1,301人	117代謝物
		標的		2,411人	4尿毒症物質
			Kit 180	1,493人	110代謝物
			Kit 500	2,374人	421代謝物
	GC-MS	標的		2,939人	169代謝物

◎ 詳細二次調査*³ (三世代コホート調査の妊婦を除く)

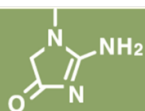
手法	測定機	探索種別	mode	人数	項目
NMR		標的		1,685人	44代謝物
MS	LC-MS	標的	Kit 180	581人	110代謝物
	GC-MS	標的		639人	165代謝物

◎ ベースライン調査 (三世代コホート調査の妊婦 妊娠中/産後一ヶ月)

手法	測定機	探索種別	mode	人数	項目
NMR		標的		2,074人	45代謝物

*¹ ベースライン調査・・・2013年～2015年に実施された1回目の詳細調査。*² 三世代コホート調査・・・妊婦さんと生まれたお子さんを中心にしたコホート調査。*³ 詳細二次調査・・・・・・ベースライン調査参加者に実施した2回目の詳細調査。

代謝物



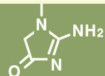
Metabolome

トップページ



Phenome

To be provided



Metabolome



Proteome



Transcriptome

Iwate Medical Megabank Organization; iMethyl



Methylome

Iwate Medical Megabank Organization; iMethyl



Genome Variation



Genome Sequence

jMorp release 202008

August 31st, 2020

代謝物 25K

Genome, 8.3KJPN allele frequency panel, and 25K Metabolome
updated the Japanese reference genome, JG2, which is constructed by integrating
ies from three Japanese male individuals.

タンパク質 500

of concentrations of 45 metabolites identified by NMR detected in
intensities of 169 characterized metabolites by GC-MS in 2,939
volunteers. We also released the quantified metabolome data from 2,374 volunteers by new Biocrates LC-MS
analysis. Moreover, information of metabolome data obtained from volunteers in repeat assessment survey by
GC-MS is released.
The normalization and quality filter protocol was updated from 2019 version in GC-MS data. Three metabolite's
name (TCO500085, TCO500226, and TCZ001256) were corrected.

More

ゲノムバリアント

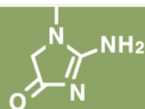
Takahara S, Sugawara D, Motomura H, Inoue S, Hoki Y, Shiota M, Koshiba S, Yamamoto M, Kinoshita K.
"JMorp: Japanese Multi Omics Reference Panel"

ゲノム配列

18 Jan 4;46(D1):D551-D557.

"3.5KJPNv2, An allele frequency panel of 3,552 Japanese Individuals including the X chromosome"
Human Genome Variation, 2019 Jun 18;6:28. doi: 10.1038/s41439-019-0059-5.

代謝物



Metabolome

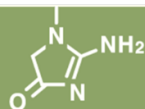
結果一覧

検索窓に代謝物名を入力 (eg. Glycine)

統計情報

Sequence Variation Methyloome Transcriptome Proteome Metabolome Repository GWAS Downloads Help Login												
jMorp ~Japanese Multi Omics Reference Panel~												
Metabolites [16 metabolites found]												
Glycine (e.g.) Glycine, Creatinin, TCN / NMR, MS / 100<mz<200 / MGWAS												
Statistics Downloads												
1												
ID	Name	Category	Mode	Units	m/z	RetentionTime	Mean (ALL)	SD (ALL)	CV (ALL)	N (ALL)	Repeat Assessment	Notes
TCI003792	Deoxycholic acid glycine conjugate	MS	LC-MS/GMet/HILIC/Neg/v2	arb. unit	448.30	1.48	3.84e+5	5.57e+5	1.45e+0	2966		Adduct Ion:M-H Adduct Ion m/z:448.30685
TCI005099	Glycylglycylglycine	MS	LC-MS/GMet/HILIC/Neg/v2	arb. unit	188.07	3.05	9.27e+4	1.17e+5	1.27e+0	2745		Adduct Ion:M-H Adduct Ion m/z:188.0676791
TCN000033	Glycine	NMR		μM			2.18e+2	5.75e+1	2.64e-1	23709	✓	
TCN000042	N,N-Dimethylglycine	NMR		μM			2.30e+0	1.04e+0	4.50e-1	23285	✓	
TCS000024	3-Methylcrotonoylglycine	MS	GC-MS/TMet	arb. unit			9.30e-3	6.00e-3	6.42e-1	2939	✓	
TCS000032	Acetylglycine	MS	GC-MS/TMet	arb. unit			2.40e-3	6.00e-3	2.55e+0	2927	✓	
TCS000057	Dimethylglycine	MS	GC-MS/TMet	arb. unit			2.36e-2	1.05e-2	4.43e-1	2839	✓	
TCS000081	Glycine	MS	GC-MS/TMet	arb. unit			4.89e+0	1.58e+0	3.23e-1	2939	✓	
TCS000083	Glycyl-Glycine	MS	GC-MS/TMet	arb. unit			3.10e-3	7.30e-3	2.38e+0	2667	✓	
TCS000096	Isovalerylglycine	MS	GC-MS/TMet	arb. unit			0.00e+0	5.70e-3	-1.20e+2	2899	✓	
TCS000121	N-Butyrylglycine	MS	GC-MS/TMet	arb. unit			3.40e-3	5.70e-3	1.69e+0	2927	✓	

代謝物



Metabolome

結果一覧

Sequence | Variation | Methylation | Transcriptome | Proteome | Metabolome | Repository | GWAS | Downloads | Help | Login

二次調査情報

Metabolites [16 m]
ID (e.g.) Gly

代謝物名

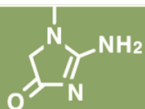
MR,

測定機器 モード 定量性 統計値 公共DBリンク

ノート

ID	Name	Category	Mode	Units	Mean (ALL)	N (ALL)	Links	Repeat Assessment	Notes
TCI003792	Deoxycholic acid glycine conjugate	MS	LC-MS/GMet/HILIC/Neg/v2	arb. unit	3.84e+5	2966	Human Metabolome Database (HMDB0000631) ↗		Adduct Ion:M-H Adduct Ion m/z448.30685
TCI005099	Glycylglycylglycine	MS	LC-MS/GMet/HILIC/Neg/v2	arb. unit	9.27e+4	2745	Human Metabolome Database (HMDB0029419) ↗		Adduct Ion:M-H Adduct Ion m/z188.0676791
TCN000033	Glycine	NMR		μM	2.18e+2	23709	Human Metabolome Database (HMDB0000123) ↗ KEGG Compound (C00037) ↗	✓	
TCN000042	N,N-Dimethylglycine	NMR		μM	2.30e+0	23285	Human Metabolome Database (HMDB0000092) ↗ KEGG Compound (C01026) ↗	✓	
TCS000024	3-Methylcrotonoylglycine	MS	GC-MS/TMet	arb. unit	9.30e-3	2939		✓	
TCS000032	Acetylglycine	MS	GC-MS/TMet	arb. unit	2.40e-3	2927		✓	
TCS000057	Dimethylglycine	MS	GC-MS/TMet	arb. unit	2.36e-2	2839		✓	
TCS000081	Glycine	MS	GC-MS/TMet	arb. unit	4.89e+0	2939		✓	
TCS000083	Glycyl-Glycine	MS	GC-MS/TMet	arb. unit	3.10e-3	2667		✓	
TCS000096	Isovalerylglycine	MS	GC-MS/TMet	arb. unit	0.00e+0	2899		✓	
TCS000121	N-Butyrylglycine	MS	GC-MS/TMet	arb. unit	3.40e-3	2927		✓	

代謝物



Metabolome

結果一覧

表示項目設定

Metabolites

[17 metabolites found]

Glycine

(e.g.) Glycine, Creatinin, TCN / NMR, MS / 100<mz<200

Statistics

ID	Name
TCB000008	Glycine (Gly)
TCI003792	Deoxycholic acid glycine conjugate
TCI005099	Glycylglycylglycine
TCN000033	Glycine
TCN000042	N,N-Dimethylglycine

Table configuration

of rows

50

Show/Hide columns

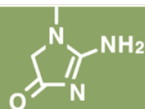
- ☒ ID
- ☒ Name
- ☒ Category
- ☒ Mode
- ☒ Units
- ☐ Automatic Quantification Precision
- ☒ m/z
- ☒ RetentionTime
- ☒ Mean (ALL)
- ☒ SD (ALL)
- ☒ CV (ALL)
- ☒ N (ALL)
- ☐ Mean (Male)
- ☐ SD (Male)
- ☐ CV (Male)
- ☐ N (Male)
- ☐ Mean (Female)
- ☐ SD (Female)
- ☐ CV (Female)
- ☐ N (Female)
- ☐ MGWAS
- ☐ Links
- ☒ Repeat Assessment
- ☒ Notes

表示行数

NMR自動定量精度
MS peak詳細

表示項目をカスタマイズ可能

代謝物



Metabolome

結果一覧

Sequence | Variation | Methylome | Transcriptome | Proteome | Metabolome | Repository | GWAS | Downloads | Help | Login

表示テーブルダウンロード

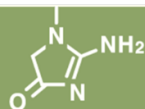
Metabolites [16 metabolites found]

[Statistics](#) [Downloads](#) (e.g.) Glycine, Creatinin, TCN / NMR, MS / 100<mz<200 / MGWAS[↓](#) [⚙](#) [◀](#) [▶](#) [1](#) [▶](#)

ID	Name	Category	Mode	Units	Mean (ALL)	N (ALL)	Links	Repeat Assessment	Notes
TCI003792	Deoxycholic acid glycine conjugate	MS	LC-MS/GMet/HILIC/Neg/v2	arb. unit	3.84e+5	2966	Human Metabolome Database (HMDB0000631) ↗		Adduct Ion:M-H Adduct Ion m/z448.30685
TCI005099	Glycylglycylglycine	MS	LC-MS/GMet/HILIC/Neg/v2	arb. unit	9.27e+4	2745	Human Metabolome Database (HMDB0029419) ↗		Adduct Ion:M-H Adduct Ion m/z188.0676791
TCN000033	Glycine	NMR		μM	2.18e+2	23709	Human Metabolome Database (HMDB0000123) ↗ KEGG Compound (C00037) ↗	✓	
TCN000042	N,N-Dimethylglycine	NMR		μM	2.30e+0	23285	Human Metabolome Database (HMDB0000092) ↗ KEGG Compound (C01026) ↗	✓	
TCS000024	3-Methylcrotonoylglycine	MS	GC-MS/TMet	arb. unit	9.30e-3	2939		✓	
TCS000032	Acetylglycine	MS	GC-MS/TMet	arb. unit	2.40e-3	2927		✓	
TCS000057	Dimethylglycine	MS	GC-MS/TMet	arb. unit	2.36e-2	2839		✓	
TCS000081	Glycine	MS	GC-MS/TMet	arb. unit	4.89e+0	2939		✓	
TCS000083	Glycyl-Glycine	MS	GC-MS/TMet	arb. unit	3.10e-3	2667		✓	
TCS000096	Isovalerylglycine	MS	GC-MS/TMet	arb. unit	0.00e+0	2899		✓	
TCS000121	N-Butyrylglycine	MS	GC-MS/TMet	arb. unit	3.40e-3	2927		✓	

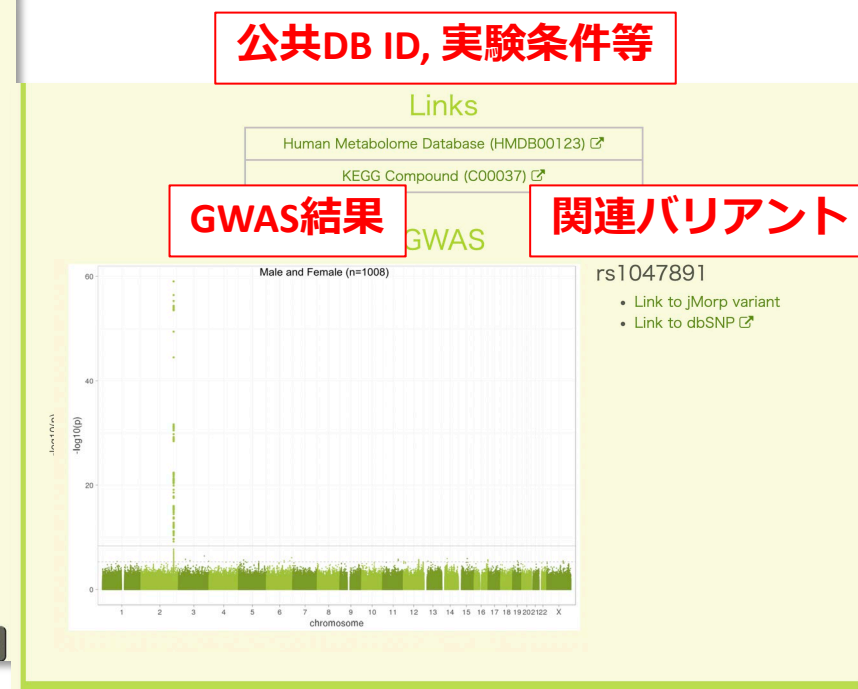
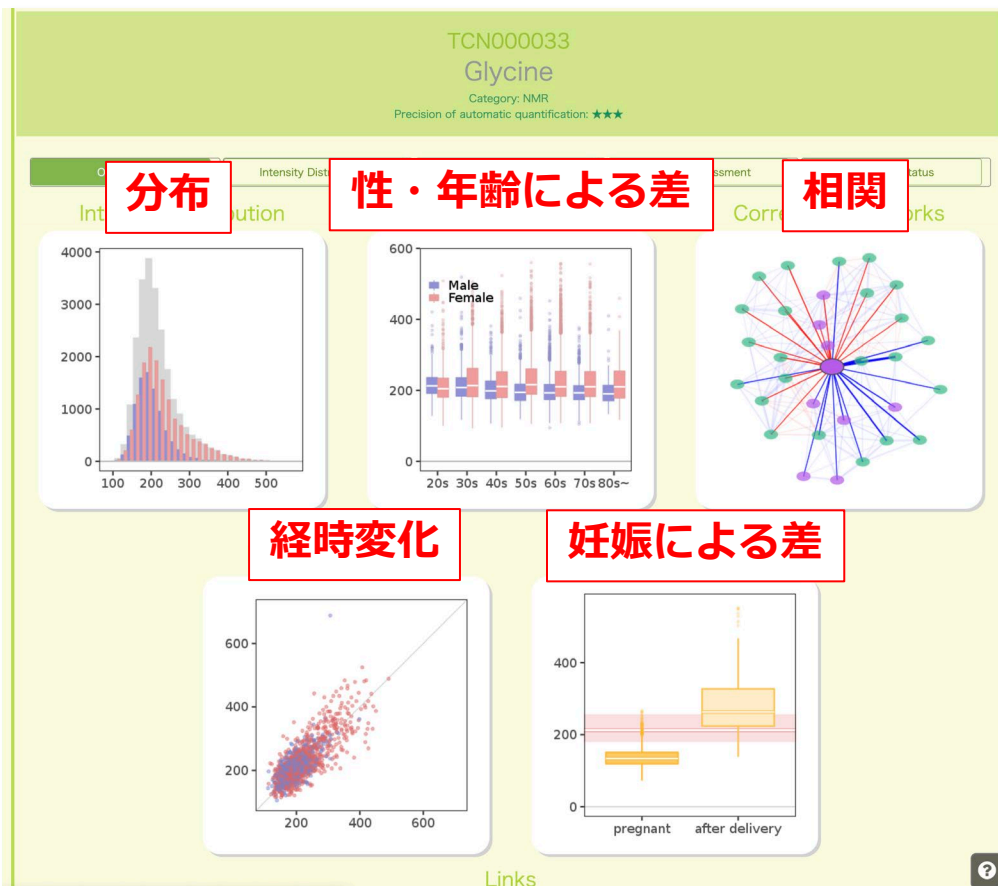
クリックして詳細を表示

代謝物

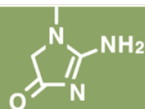


Metabolome

結果一覧→個別ページ (overview)



代謝物



Metabolome

結果一覧→個別ページ(分布)

TCN000033

Glycine

Category: NMR

Precision of automatic quantification: ★★★

Overview

Intensity Distribution

Correlation Networks

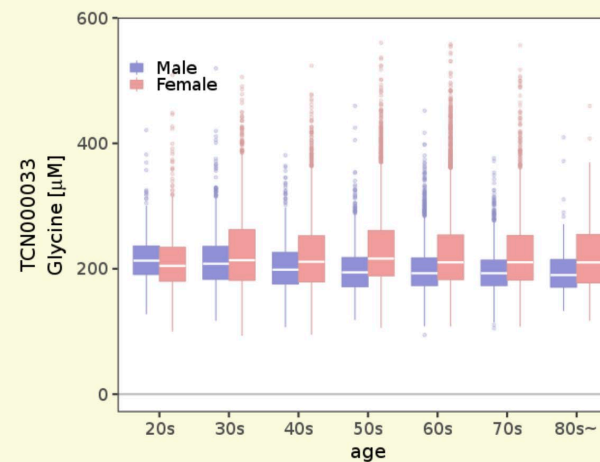
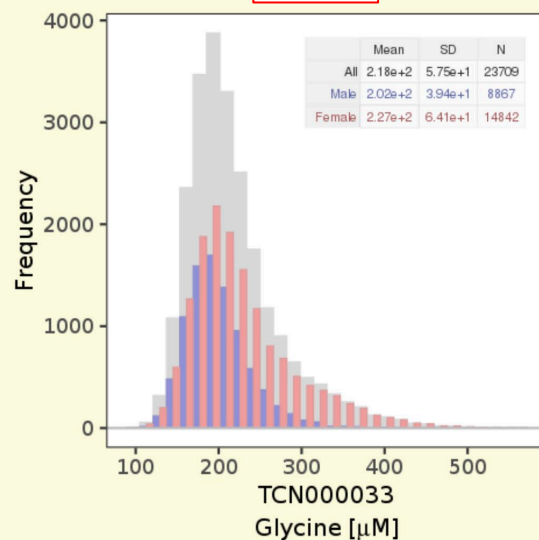
Repeat Assessment

Pregnant Status

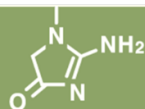
分布

Intensity Distribution

性・年齢による差

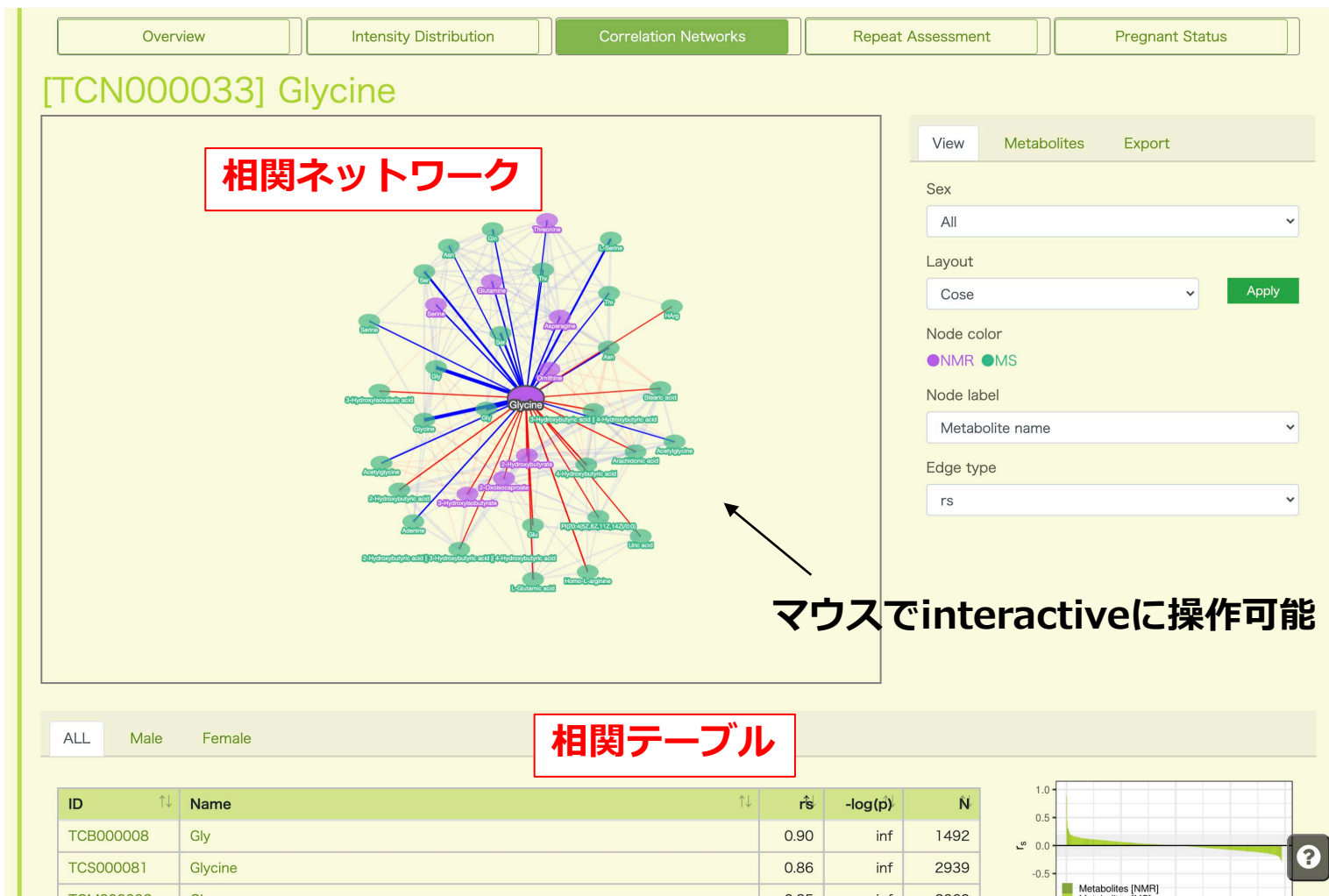


代謝物

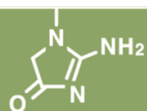


Metabolome

結果一覧→個別ページ(相関)



代謝物



Metabolome

結果一覧→個別ページ(経時変化) ※検査間隔：平均3.4年

TCN000033

Glycine

Category: NMR

Precision of automatic quantification: ★★★

Overview

Intensity Distribution

Correlation Networks

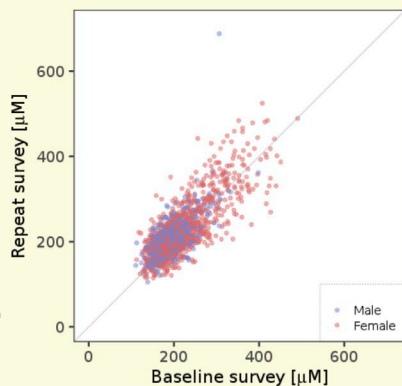
Repeat Assessment

Pregnant Status

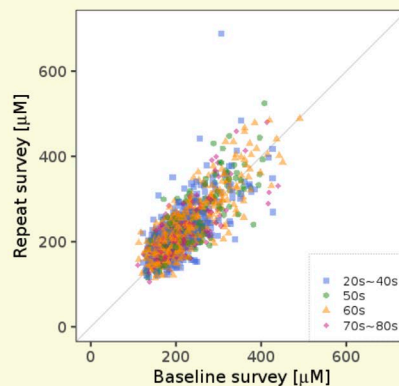
経時変化 [性別]

経時変化 [年齢]

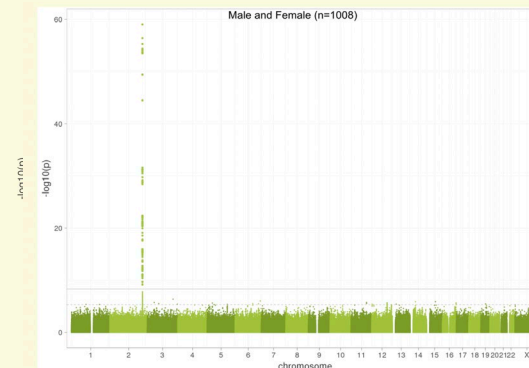
詳細二次調査



ベースライン調査

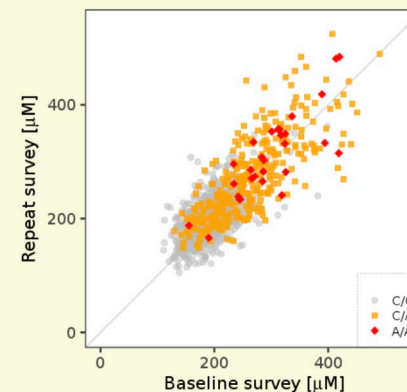


GWAS

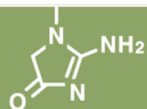


経時変化 [genotype]

Colored by Genotype



代謝物



Metabolome

結果一覧→個別ページ(妊娠)

TCN000033

Glycine

Category: NMR

Precision of automatic quantification: ★★★

Overview

Intensity Distribution

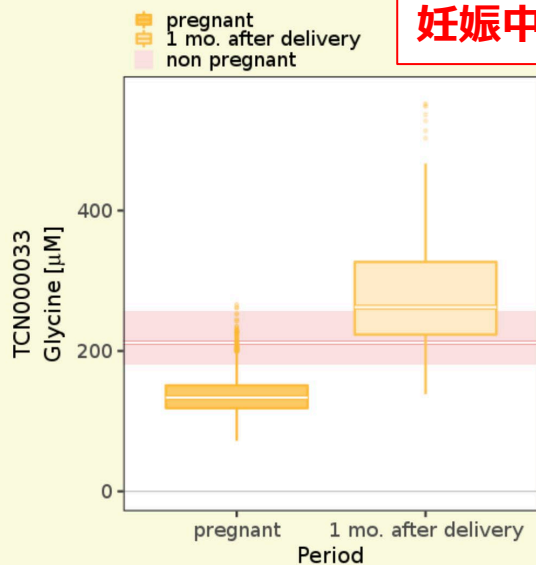
Correlation Networks

Repeat Assessment

Pregnant Status

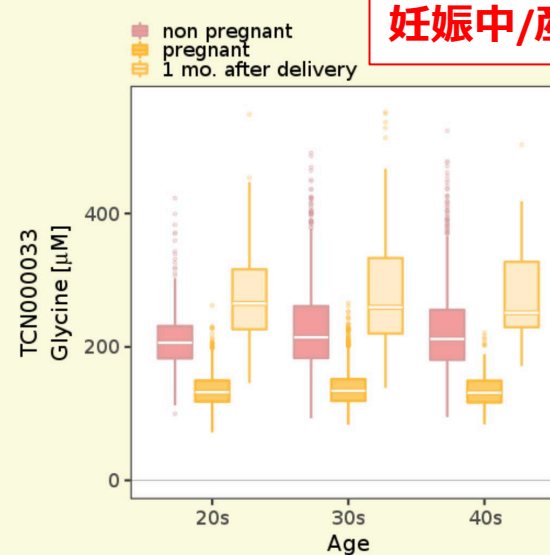
Pregnant Status [n=1674]

Period Dependency



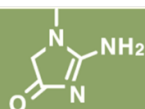
妊娠中/産後

Age Dependency



妊娠中/産後+年代

代謝物



Metabolome

階層をつなぐ


Phenome
To be provided

Metabolome

Proteome

Transcriptome

Iwate Medical Megabank Organization; iMethyl


Methylome

Iwate Medical Megabank Organization; iMethyl


Genome Variation

Genome Sequence

jMorp release 202008

August 31st, 2020

JG2 Japanese Reference Genome, 8.3KJPN allele frequency panel, and 25K Metabolome
[Genome Sequence] We updated the Japanese reference genome, JG2, which is constructed by integrating six de novo phased assemblies from three Japanese male individuals.

[Genome Variation] 8.3KJPN, allele and genotype frequency panels from 8,380 Japanese individuals were released.

[Metabolome] We released distributions of concentrations of 45 metabolites identified by NMR detected in 25,783 volunteers, distributions of peak intensities of 169 characterized metabolites by GC-MS in 2,939 volunteers. We also released the quantified metabolome data from 2,374 volunteers by new Biocrates LC-MS analysis. Moreover, information of metabolome data obtained from volunteers in repeat assessment survey by GC-MS is released.

The normalization and quality filter protocol was updated from 2019 version in GC-MS data. Three metabolite's name (TC0500085, TC0500226, and TCZ001256) were corrected.

[More](#)

jMorp Publication

Tadaka S, Saigusa D, Motoike IN, Inoue J, Aoki Y, Shiota M, Koshiba S, Yamamoto M, Kinoshita K.
"jMorp: Japanese Multi Omics Reference Panel"
Nucleic Acids Research. 2018 Jan 4;46(D1):D551-D557. [↗](#)

Tadaka S, Katsuoka F, et al.,
"3.5KJPNv2, An allele frequency panel of 3,552 Japanese Individuals including the X chromosome"
Human Genome Variation, 2019 Jun 18;6:28. doi: 10.1038/s41439-019-0059-5. [↗](#)

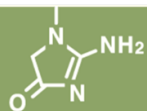
代謝物

タンパク質

ゲノム
バリエーション

ゲノム配列

階層をつなぐ



Metabolome



Genome Variation

Metabolome階層

TCN000033

Glycine

Category: NMR

Precision of automatic quantification: ★★★

Overview

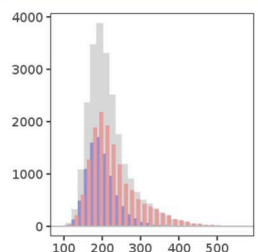
Intensity Distribution

Correlation Networks

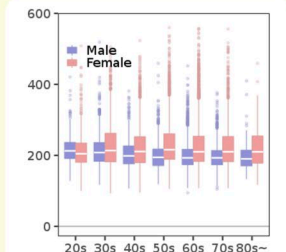
Repeat Assessment

Pregnant Status

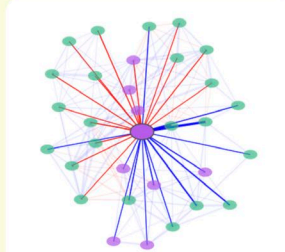
Intensity Distribution



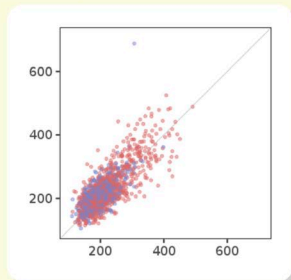
Age Difference



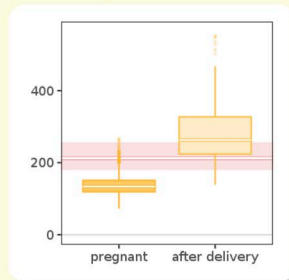
Correlation Networks



Repeat Assessment



Pregnant Status



Links

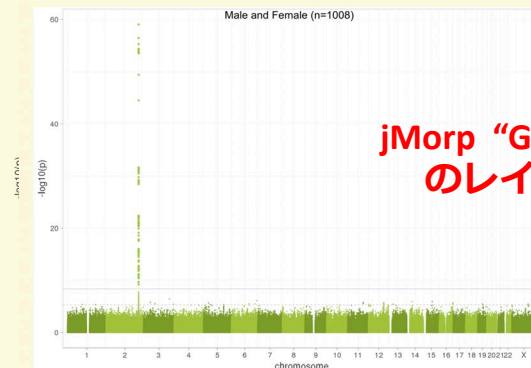
Glycineの血中量は何か
genotypeとの関連があるらしい？

Metabolome階層

Links

[Human Metabolome Database \(HMDB001123\) ㊞](#)[KEGG Compound \(C00037\) ㊞](#)

GWAS

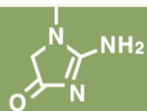


rs1047891

[Link to jMorp variant](#)[Link to dbSNP](#)

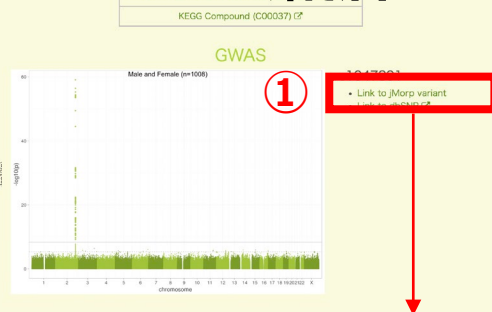
jMorp “Genome Variation”
のレイヤーにリンク

階層をつなぐ



Metabolome

Metabolome階層



Genome Variation

e!GRCh37 BLAST/BLAT | VEP | Tools | BioMart | Downloads | Help & Docs | Blog

Human (GRCh37.p13) ▼

Gene: CPS1 ENSG00000021826

Description carbamoyl-phosphate synthase 1, mitochondrial [Source:HGNC Symbol;Acc:2323]

Genome Variation階層

Search by rs#: rs1047891 (8.3KJPN)

GRCh37 hg19

The following variant(s) have association(s) with compound(s).

- rs1047891 => TCN000033 Glycine (metabolite)
- rs1047891 => TCZ000858 Acetylglycine (metabolite)
- rs1047891 => TCZ001722 Homo-L-arginine (metabolite)

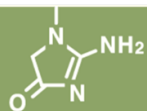
1 variants found

Filter by keyword

Type	Position ↑↓	Ref/Alt	rs#	⑥ Annotation ↑↓	Gene ↓	MeanDepth (162PE)	③ JPA ↑↓	④ ClinVar Annotation	⑤ ToMMo 8.3KJPN	gnomAD AFR	gnomAD AMR	gnomAD ASJ	gnomAD EAS	gnomAD NFE
SNV	2:211540507	C/A	rs1047891	⑥ missense_variant (p.Thr1412Asn)	CPS1	35.0/35.0	V1&V2&NEO	Benign	0.1545	0.3728	0.3101	0.3172	0.1581	0.3173

- ① バリエントを持っている方が血中濃度値は高い
- ② 遺伝子“CPS1”のアミノ酸非同義置換と関連している
- ③ Japonica Array v1, v2, NEOどれも搭載されている
- ④ Clinvar ではBenign扱い
- ⑤ 日本人のアレル頻度は他の集団に比べて低い
- ⑥ 構造情報を調べられる

階層をつなぐ



Metabolome



Genome Variation

Genome Variation 階層

Search by rs#: rs1047891 (8.3KJPN)

GRCh37/hg19

Statistics

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→タンパク質の機能に
影響がありそうな変異・
場所だろうか？ ... などなど

階層をつなぐことが可能です

2:211540507 C/A - Structure Mapping

Blast#11 Blast#12

Blast result

mRNA info Homo sapiens carbamoyl-phosphate synthase 1 (CPS1), transcript variant 1, mRNA

mRNA change NM_001122633.2:c.4235C>A NP_001116105.1:p.1412T>N

Query CPS1 (GeneID: 1373) | NM_001122633.2 | NP_001116105.1

Subject 5dotC2, 5douC2

e-value 0.0000

Sequence identity 100.00

5dot_entity_1 (1/2)

ChainA (1/2)

Single

- Secondary Structure: E
- Relative ASA: 0.329

BioUnit:1

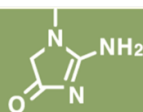
- delta Relative ASA: 0

Mapped Position

- auth_asym_id: A
- auth_seq_id: 1406
- label_asym_id: A
- label_seq_id: 1395

jMorp 2020

代謝物



Metabolome

NMR [定量] MS [定量/半定量] ~23,700人分 約1200種: ベースライン調査
NMR [定量] MS [定量] ~1,700人分 約 320種: ベースライン+詳細二次調査
NMR [定量] ~2,000人分 約 40種: ベースライン 妊娠中/産後

濃度分布(性・年代別有)・代謝物間相関ネットワーク・ゲノムとの関連(一部)

タンパク質



Proteome

MS [半定量] ~500人分 約250種: ベースライン調査

性別毎の検出率・ペプチド情報(検出部位・配列・変異・質量電荷比・電荷・修飾)

ゲノム バリエーション



Genome Variation

約8,300人 常染色体+X染色体+MT: ゲノムバリエーション アレル頻度/genotype頻度

変異ID・gene symbol・アミノ酸置換・タンパク構造・JPA搭載の有無
日本人以外の他の集団との比較(gnomAD)プロット・ゲノムブラウザ・genome accessibility

ゲノム配列



Genome Sequence

3名の日本人男性からなる de novo assemblyによる日本人参照配列: ゲノムブラウザ表示

ToMMo JG2 beta, GRCh37, GRCh38の比較可能
GENCODEのlift over情報, Repeat Mask情報等併載