Table S1. Mass isotopomer abundances of proteinogenic amino acids from three ILEs

Fragments (↓) | Labels (→)				28% U-13C					100% 1-13C					98% U-13C				
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	R1	R2	R3	Avg	SD	R1	R2	R3	Avg	SD
Ala	[23]	232	0	66%	66%	66%	66%	0%	63%	64%	63%	63%	0%	ND	ND	ND	ND	ND
Ala	[23]	232	1	10%	11%	10%	11%	0%	36%	35%	35%	35%	0%	ND	ND	ND	ND	ND
Ala	[23]	232	2	23%	23%	23%	23%	0%	1%	1%	1%	1%	0%	ND	ND	ND	ND	ND
Ala	[123]	260	0	61%	60%	61%	61%	0%	61%	61%	61%	61%	0%	3%	3%	4%	3%	0%
Ala	[123]	260	1	13%	13%	13%	13%	0%	37%	36%	37%	37%	0%	2%	2%	2%	2%	0%
Ala	[123]	260	2	8%	8%	8%	8%	0%	3%	3%	3%	3%	0%	2%	2%	2%	2%	0%
Ala	[123]	260	3	19%	18%	18%	18%	0%	0%	0%	0%	0%	0%	93%	93%	93%	93%	0%
Asp	[12]	302	0	65%	66%	65%	65%	0%	73%	72%	72%	72%	0%	11%	10%	11%	11%	0%
Asp	[12]	302	1	19%	19%	19%	19%	0%	25%	26%	26%	26%	0%	9%	9%	9%	9%	0%
Asp	[12]	302	2	16%	16%	16%	16%	0%	2%	2%	2%	2%	0%	80%	81%	81%	81%	0%
Asp	[234]	316	0	54%	54%	54%	54%	0%	55%	55%	55%	55%	0%	7%	7%	7%	7%	0%
Asp	[234]	316	1	23%	24%	23%	23%	0%	37%	37%	37%	37%	0%	6%	6%	6%	6%	0%
Asp	[234]	316	2	15%	15%	15%	15%	0%	7%	7%	7%	7%	0%	12%	12%	12%	12%	0%
Asp	[234]	316	3	7%	7%	8%	7%	0%	1%	1%	1%	1%	0%	75%	76%	75%	75%	0%
Asp	[234]	390	0	54%	55%	55%	55%	0%	56%	56%	56%	56%	0%	7%	7%	7%	7%	0%
Asp	[234]	390	1	23%	23%	23%	23%	0%	36%	37%	37%	37%	0%	6%	5%	6%	6%	0%
Asp	[234]	390	2	15%	15%	15%	15%	0%	7%	7%	7%	7%	0%	12%	12%	12%	12%	0%
Asp	[234]	390	3	7%	7%	7%	7%	0%	0%	0%	0%	0%	0%	75%	76%	75%	75%	0%
Asp	[1234]	418	0	48%	47%	47%	47%	0%	49%	48%	48%	49%	1%	6%	6%	6%	6%	0%
Asp	[1234]	418	1	22%	22%	22%	22%	0%	39%	40%	40%	39%	0%	3%	3%	3%	3%	0%
Asp	[1234]	418	2	17%	17%	17%	17%	0%	11%	11%	11%	11%	0%	7%	7%	7%	7%	0%
Asp	[1234]	418	3	10%	10%	11%	10%	0%	1%	1%	1%	1%	0%	13%	12%	13%	13%	1%
Asp	[1234]	418	4	3%	3%	3%	3%	0%	0%	0%	0%	0%	0%	70%	72%	70%	71%	1%
Glu	[2345]	272	0	40%	40%	40%	40%	0%	39%	39%	39%	39%	0%	1%	1%	1%	1%	0%
Glu	[2345]	272	1	23%	24%	24%	24%	0%	43%	43%	43%	43%	0%	2%	1%	2%	2%	0%
Glu	[2345]	272	2	25%	25%	25%	25%	0%	16%	16%	16%	16%	0%	5%	5%	5%	5%	0%
Glu	[2345]	272	3	8%	8%	8%	8%	0%	2%	2%	2%	2%	0%	10%	10%	10%	10%	0%
Glu	[2345]	272	4	4%	4%	4%	4%	0%	0%	0%	0%	0%	0%	82%	82%	82%	82%	0%
Glu	[2345]	330	0	41%	41%	41%	41%	0%	40%	39%	39%	39%	0%	2%	2%	2%	2%	0%
Glu	[2345]	330	1	23%	24%	23%	23%	0%	43%	43%	43%	43%	0%	2%	1%	2%	2%	0%
Glu	[2345]	330	2	25%	25%	25%	25%	0%	15%	16%	16%	16%	0%	6%	6%	6%	6%	0%
Glu	[2345]	330	3	7%	7%	7%	7%	0%	2%	2%	2%	2%	0%	9%	9%	9%	9%	0%
Glu	[2345]	330	4	3%	3%	3%	3%	0%	0%	0%	0%	0%	0%	82%	83%	82%	82%	0%
Glu	[12345]	432	0	35%	35%	35%	35%	0%	35%	34%	34%	34%	1%	1%	1%	1%	1%	0%
Glu	[12345]	432	1	21%	22%	22%	22%	0%	43%	43%	43%	43%	0%	1%	1%	1%	1%	0%
Glu	[12345]	432	2	25%	25%	25%	25%	0%	18%	19%	19%	19%	0%	2%	2%	2%	2%	0%
Glu	[12345]	432	3	13%	13%	13%	13%	0%	3%	4%	4%	4%	0%	6%	6%	7%	6%	0%
Glu	[12345]	432	4	5%	5%	4%	5%	0%	0%	0%	0%	0%	0%	11%	11%	12%	11%	0%
Glu	[12345]	432	5	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	78%	78%	77%	78%	1%
Gly	[2]	218	0	73%	73%	73%	73%	0%	ND	ND	ND	ND	ND	11%	11%	11%	11%	0%
Gly	[2]	218	1	27%	27%	27%	27%	0%	ND	ND	ND	ND	ND	89%	89%	89%	89%	0%
Gly	[12]	246	0	64%	63%	64%	64%	0%	92%	91%	91%	91%	1%	7%	7%	7%	7%	0%
Gly	[12]	246	1	18%	18%	17%	18%	0%	8%	9%	9%	9%	0%	5%	4%	5%	5%	0%
Gly	[12]	246	2	18%	19%	19%	19%	0%	0%	1%	1%	0%	0%	88%	89%	88%	88%	0%
His	[2345]	196	0	36%	36%	35%	36%	1%	58%	58%	57%	58%	0%	9%	8%	8%	8%	0%
His	[2345]	196	1	31%	32%	32%	32%	1%	34%	34%	34%	34%	0%	1%	1%	1%	1%	0%
His	[2345]	196	2	20%	20%	20%	20%	0%	7%	7%	7%	7%	0%	1%	2%	2%	2%	0%
His	[2345]	196	3	10%	10%	10%	10%	0%	1%	1%	1%	1%	0%	12%	13%	12%	12%	0%
His	[2345]	196	4	2%	2%	2%	2%	0%	0%	0%	1%	1%	0%	77%	76%	76%	76%	0%
Ile	[23456]	200	0	45%	45%	45%	45%	0%	45%	44%	44%	44%	0%	ND	ND	ND	ND	ND
Ile	[23456]	200	1	18%	18%	18%	18%	0%	38%	38%	38%	38%	0%	ND	ND	ND	ND	ND
Ile	[23456]	200	2	22%	22%	22%	22%	0%	15%	15%	15%	15%	0%	ND	ND	ND	ND	ND
Ile	[23456]	200	3	10%	10%	10%	10%	0%	2%	2%	2%	2%	0%	ND	ND	ND	ND	ND
Ile	[23456]	200	4	3%	3%	3%	3%	0%	0%	0%	0%	0%	0%	ND	ND	ND	ND	ND
Ile	[23456]	200	5	2%	1%	1%	2%	0%	0%	0%	0%	0%	0%	ND	ND	ND	ND	ND

Table S1. Mass isotopomer abundances of proteinogenic amino acids from three ILEs

Fragments (↓) | Labels (→)				28% U-13C					100% 1-13C					98% U-13C				
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	R1	R2	R3	Avg	SD	R1	R2	R3	Avg	SD
Leu	[23456]	200	0	40%	41%	41%	41%	0%	38%	37%	37%	38%	0%	10%	9%	10%	10%	0%
Leu	[23456]	200	1	19%	19%	19%	19%	0%	39%	39%	39%	39%	0%	3%	2%	3%	3%	0%
Leu	[23456]	200	2	25%	24%	24%	25%	0%	19%	19%	19%	19%	0%	2%	2%	2%	2%	0%
Leu	[23456]	200	3	10%	10%	10%	10%	0%	4%	4%	4%	4%	0%	5%	5%	5%	5%	0%
Leu	[23456]	200	4	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	15%	14%	15%	14%	0%
Leu	[23456]	200	5	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	65%	67%	66%	66%	1%
Leu	[23456]	274	0	40%	41%	41%	40%	0%	38%	37%	37%	38%	0%	10%	9%	10%	10%	0%
Leu	[23456]	274	1	19%	19%	19%	19%	0%	39%	39%	39%	39%	0%	2%	2%	2%	2%	0%
Leu	[23456]	274	2	25%	24%	24%	24%	0%	19%	19%	19%	19%	0%	2%	2%	2%	2%	0%
Leu	[23456]	274	3	10%	10%	10%	10%	0%	4%	4%	4%	4%	0%	5%	5%	5%	5%	0%
Leu	[23456]	274	4	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	15%	14%	15%	15%	0%
Leu	[23456]	274	5	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	66%	67%	66%	66%	1%
Phe	[23456789]	234	0	26%	26%	26%	26%	0%	33%	33%	33%	33%	0%	6%	5%	6%	6%	0%
Phe	[23456789]	234	1	14%	14%	14%	14%	0%	40%	40%	41%	40%	0%	1%	0%	1%	0%	0%
Phe	[23456789]	234	2	20%	20%	20%	20%	0%	21%	21%	21%	21%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	3	16%	16%	16%	16%	0%	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	4	11%	11%	11%	11%	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	5	8%	8%	8%	8%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	0%
Phe	[23456789]	234	6	4%	4%	4%	4%	0%	0%	0%	0%	0%	0%	3%	3%	3%	3%	0%
Phe	[23456789]	234	7	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	9%	9%	9%	9%	0%
Phe	[23456789]	234	8	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	80%	80%	80%	80%	0%
Phe	[12]	302	0	68%	68%	68%	68%	0%	96%	96%	96%	96%	0%	8%	8%	8%	8%	0%
Phe	[12]	302	1	11%	12%	12%	12%	0%	4%	4%	4%	4%	0%	3%	3%	3%	3%	0%
Phe	[12]	302	2	20%	21%	21%	21%	0%	0%	0%	0%	0%	0%	89%	89%	89%	89%	0%
Phe	[123456789]	336	0	25%	25%	25%	25%	0%	33%	32%	32%	32%	0%	6%	6%	6%	6%	0%
Phe	[123456789]	336	1	14%	14%	14%	14%	0%	40%	41%	41%	41%	0%	1%	1%	1%	1%	0%
Phe	[123456789]	336	2	14%	14%	14%	14%	0%	21%	22%	22%	22%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	3	19%	19%	19%	19%	0%	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	4	11%	11%	11%	11%	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	5	8%	8%	8%	8%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Phe	[123456789]	336	6	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	0%
Phe	[123456789]	336	7	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	3%	3%	3%	3%	0%
Phe	[123456789]	336	8	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	10%	10%	10%	10%	0%
Phe	[123456789]	336	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	78%	78%	78%	78%	0%
Pro	[2345]	258	0	48%	48%	49%	48%	0%	48%	47%	47%	47%	0%	11%	10%	11%	10%	0%
Pro	[2345]	258	1	22%	22%	22%	22%	0%	38%	39%	38%	38%	0%	6%	6%	6%	6%	0%
Pro	[2345]	258	2	22%	22%	22%	22%	0%	13%	13%	13%	13%	0%	12%	12%	12%	12%	0%
Pro	[2345]	258	3	6%	6%	5%	6%	0%	1%	1%	2%	2%	0%	11%	11%	11%	11%	0%
Pro	[2345]	258	4	3%	3%	2%	3%	0%	0%	0%	0%	0%	0%	60%	61%	60%	60%	1%
Ser	[23]	288	0	61%	61%	61%	61%	0%	75%	75%	76%	76%	0%	5%	5%	5%	5%	0%
Ser	[23]	288	1	24%	24%	24%	24%	0%	24%	24%	24%	24%	0%	8%	8%	8%	8%	0%
Ser	[23]	288	2	15%	15%	15%	15%	0%	0%	0%	0%	0%	0%	87%	88%	87%	87%	0%
Ser	[12]	302	0	64%	65%	64%	64%	0%	95%		86%	90%	6%	6%	6%	6%	6%	0%
Ser	[12]	302	1	16%	15%	15%	16%	0%	5%		12%	8%	5%	8%	8%	8%	8%	0%
Ser	[12]	302	2	20%	20%	20%	20%	0%	0%		2%	1%	1%	86%	86%	86%	86%	0%
Ser	[23]	362	0	61%	60%	61%	61%	0%	75%	75%	76%	75%	0%	5%	4%	5%	5%	0%
Ser	[23]	362	1	24%	25%	24%	25%	0%	24%	24%	24%	24%	0%	8%	8%	8%	8%	0%
Ser	[23]	362	2	15%	15%	15%	15%	0%	0%	0%	0%	0%	0%	88%	88%	88%	88%	0%
Ser	[123]	390	0	55%	55%	56%	55%	0%	72%	72%	72%	72%	0%	4%	4%	4%	4%	0%
Ser	[123]	390	1	20%	21%	20%	20%	0%	27%	27%	27%	27%	0%	3%	3%	3%	3%	0%
Ser	[123]	390	2	13%	13%	13%	13%	0%	1%	1%	1%	1%	0%	9%	8%	9%	9%	0%
Ser	[123]	390	3	12%	12%	12%	12%	0%	0%	0%	0%	0%	0%	84%	85%	84%	85%	0%
Thr	[234]	376	0	57%	56%	56%	56%	0%	58%	58%	58%	58%	0%	10%	9%	9%	9%	0%
Thr	[234]	376	1	21%	22%	23%	22%	1%	35%	35%	35%	35%	0%	7%	7%	7%	7%	0%
Thr	[234]	376	2	15%	14%	14%	14%	0%	7%	7%	7%	7%	0%	13%	13%	13%	13%	0%

Table S1. Mass isotopomer abundances of proteinogenic amino acids from three ILEs

Fragments (↓) | Labels (→)				28% U-13C					100% 1-13C					98% U-13C				
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	R1	R2	R3	Avg	SD	R1	R2	R3	Avg	SD
Thr	[234]	376	3	7%	7%	7%	7%	0%	0%	0%	0%	0%	0%	70%	71%	70%	70%	1%
Thr	[1234]	404	0	48%	50%	49%	49%	1%	51%	51%	51%	51%	0%	8%	8%	8%	8%	0%
Thr	[1234]	404	1	22%	21%	22%	21%	1%	38%	38%	38%	38%	0%	4%	4%	4%	4%	0%
Thr	[1234]	404	2	17%	16%	16%	16%	0%	10%	10%	10%	10%	0%	8%	8%	8%	8%	0%
Thr	[1234]	404	3	9%	10%	10%	10%	0%	1%	1%	1%	1%	0%	14%	14%	14%	14%	0%
Thr	[1234]	404	4	3%	3%	3%	3%	0%	0%	0%	0%	0%	0%	65%	66%	66%	66%	1%
Tyr	[12]	302	0	68%	68%	69%	68%	0%	97%	97%	97%	97%	0%	10%	10%	10%	10%	0%
Tyr	[12]	302	1	11%	11%	11%	11%	0%	3%	3%	3%	3%	0%	3%	3%	3%	3%	0%
Tyr	[12]	302	2	21%	21%	21%	21%	0%	0%	0%	0%	0%	0%	87%	87%	87%	87%	0%
Val	[2345]	186	0	47%	48%	48%	48%	0%	45%	45%	45%	45%	0%	7%	7%	7%	7%	0%
Val	[2345]	186	1	11%	11%	11%	11%	0%	40%	40%	41%	40%	0%	1%	1%	1%	1%	0%
Val	[2345]	186	2	30%	30%	30%	30%	0%	12%	12%	12%	12%	0%	4%	4%	4%	4%	0%
Val	[2345]	186	3	6%	6%	6%	6%	0%	2%	2%	2%	2%	0%	9%	9%	9%	9%	0%
Val	[2345]	186	4	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	79%	80%	79%	79%	0%
Val	[2345]	260	0	48%	48%	48%	48%	0%	46%	46%	45%	46%	0%	7%	7%	7%	7%	0%
Val	[2345]	260	1	12%	12%	12%	12%	0%	41%	41%	42%	41%	0%	1%	1%	1%	1%	0%
Val	[2345]	260	2	30%	30%	30%	30%	0%	12%	12%	12%	12%	0%	4%	4%	4%	4%	0%
Val	[2345]	260	3	4%	4%	4%	4%	0%	1%	1%	1%	1%	0%	8%	8%	8%	8%	0%
Val	[2345]	260	4	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	79%	80%	79%	80%	0%
Val	[12345]	288	0	45%	46%	46%	46%	0%	45%	45%	44%	45%	0%	7%	7%	7%	7%	0%
Val	[12345]	288	1	12%	13%	13%	13%	0%	41%	41%	41%	41%	0%	1%	1%	1%	1%	0%
Val	[12345]	288	2	19%	19%	19%	19%	0%	13%	13%	13%	13%	0%	2%	2%	2%	2%	0%
Val	[12345]	288	3	16%	15%	16%	16%	0%	1%	1%	1%	1%	0%	4%	4%	4%	4%	0%
Val	[12345]	288	4	3%	3%	3%	3%	0%	0%	0%	0%	0%	0%	8%	8%	8%	8%	0%
Val	[12345]	288	5	5%	4%	4%	4%	0%	0%	0%	0%	0%	0%	78%	79%	78%	78%	1%
Val	[12]	302	0	65%	65%	65%	65%	0%	86%	86%	86%	86%	0%	11%	11%	11%	11%	0%
Val	[12]	302	1	12%	13%	12%	12%	0%	12%	12%	12%	12%	0%	4%	4%	4%	4%	0%
Val	[12]	302	2	23%	22%	23%	23%	0%	2%	2%	2%	2%	0%	85%	85%	85%	85%	0%

Table S2. Isotopomer abundances of proteinogenic amino acids from poplar cell suspensions grown under light for 7 d.

Fragments (↓) | Labels (→)				98% U-13C, under light							98% U-13C, under dark						
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	En.	SD	R1	R2	R3	Avg	SD	En.	SD
Ala	[23]	232	0	1%	1%	1%	1%	0%	97%	0%	3%	3%	2%	2%	0%	95%	0%
Ala	[23]	232	1	3%	4%	3%	3%	1%	0%	0%	5%	6%	6%	6%	0%	0%	0%
Ala	[23]	232	2	96%	95%	96%	96%	1%	0%	0%	92%	92%	92%	92%	0%	0%	0%
Ala	[123]	260	0	1%	1%	1%	1%	0%	97%	0%	2%	2%	2%	2%	0%	94%	0%
Ala	[123]	260	1	1%	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	0%	0%	0%
Ala	[123]	260	2	4%	5%	4%	4%	1%	0%	0%	7%	7%	7%	7%	0%	0%	0%
Ala	[123]	260	3	94%	93%	93%	93%	1%	0%	0%	89%	89%	89%	89%	0%	0%	0%
Asp	[12]	302	0	5%	5%	5%	5%	0%	91%	0%	6%	6%	5%	6%	1%	89%	1%
Asp	[12]	302	1	7%	8%	7%	7%	0%	0%	0%	10%	9%	10%	10%	1%	0%	0%
Asp	[12]	302	2	88%	88%	88%	88%	0%	0%	0%	84%	85%	86%	85%	1%	0%	0%
Asp	[234]	316	0	2%	2%	3%	2%	0%	92%	1%	2%	2%	0%	2%	1%	90%	2%
Asp	[234]	316	1	3%	3%	4%	4%	0%	0%	0%	5%	7%	5%	6%	1%	0%	0%
Asp	[234]	316	2	8%	10%	10%	9%	1%	0%	0%	14%	12%	11%	12%	1%	0%	0%
Asp	[234]	316	3	86%	84%	84%	85%	1%	0%	0%	79%	79%	83%	80%	2%	0%	0%
Asp	[234]	390	0	2%	2%	3%	3%	0%	92%	0%	2%	0%	2%	1%	1%	91%	2%
Asp	[234]	390	1	3%	3%	3%	3%	0%	0%	0%	5%	3%	4%	4%	1%	0%	0%
Asp	[234]	390	2	9%	10%	9%	10%	1%	0%	0%	13%	12%	11%	12%	1%	0%	0%
Asp	[234]	390	3	85%	84%	85%	85%	0%	0%	0%	79%	85%	84%	83%	3%	0%	0%
Asp	[1234]	418	0	2%	2%	2%	2%	0%	91%	0%	2%	1%	1%	2%	0%	91%	1%
Asp	[1234]	418	1	1%	1%	2%	1%	0%	0%	0%	2%	2%	1%	2%	0%	0%	0%
Asp	[1234]	418	2	5%	4%	4%	5%	0%	0%	0%	5%	7%	5%	6%	1%	0%	0%
Asp	[1234]	418	3	12%	12%	13%	12%	0%	0%	0%	14%	12%	14%	13%	1%	0%	0%
Asp	[1234]	418	4	80%	81%	79%	80%	1%	0%	0%	77%	77%	78%	78%	0%	0%	0%
Glu	[2345]	272	0	1%	1%	1%	1%	0%	93%	0%	2%	2%	3%	2%	1%	86%	3%
Glu	[2345]	272	1	1%	1%	2%	1%	0%	0%	0%	2%	2%	6%	3%	2%	0%	0%
Glu	[2345]	272	2	5%	5%	5%	5%	0%	0%	0%	9%	10%	11%	10%	1%	0%	0%
Glu	[2345]	272	3	9%	10%	9%	9%	1%	0%	0%	15%	17%	15%	16%	1%	0%	0%
Glu	[2345]	272	4	84%	83%	83%	83%	1%	0%	0%	72%	68%	65%	69%	4%	0%	0%
Glu	[2345]	330	0	1%	1%	1%	1%	0%	93%	0%	3%	3%	0%	2%	2%	86%	2%
Glu	[2345]	330	1	1%	1%	2%	1%	0%	0%	0%	2%	2%	6%	3%	2%	0%	0%
Glu	[2345]	330	2	6%	5%	6%	6%	0%	0%	0%	10%	15%	15%	13%	3%	0%	0%
Glu	[2345]	330	3	9%	10%	9%	9%	0%	0%	0%	13%	13%	15%	13%	1%	0%	0%
Glu	[2345]	330	4	83%	82%	82%	83%	1%	0%	0%	73%	68%	64%	68%	4%	0%	0%
Glu	[12345]	432	0	1%	1%	1%	1%	0%	93%	0%	1%	0%	3%	1%	1%	88%	3%
Glu	[12345]	432	1	1%	1%	1%	1%	0%	0%	0%	2%	1%	2%	2%	1%	0%	0%
Glu	[12345]	432	2	2%	2%	2%	2%	0%	0%	0%	4%	2%	5%	3%	1%	0%	0%
Glu	[12345]	432	3	6%	6%	6%	6%	0%	0%	0%	9%	11%	12%	11%	2%	0%	0%
Glu	[12345]	432	4	11%	12%	11%	11%	0%	0%	0%	15%	17%	15%	16%	1%	0%	0%
Glu	[12345]	432	5	80%	79%	79%	79%	1%	0%	0%	70%	69%	63%	67%	4%	0%	0%
Gly	[2]	218	0	7%	8%	8%	8%	0%	92%	0%	8%	7%	7%	7%	0%	93%	0%
Gly	[2]	218	1	93%	92%	92%	92%	0%	0%	0%	92%	93%	93%	93%	0%	0%	0%
Gly	[12]	246	0	6%	5%	6%	6%	0%	91%	0%	6%	5%	5%	5%	0%	91%	1%
Gly	[12]	246	1	6%	7%	6%	6%	0%	0%	0%	7%	7%	7%	7%	0%	0%	0%
Gly	[12]	246	2	88%	88%	88%	88%	0%	0%	0%	87%	88%	88%	88%	1%	0%	0%
His	[2345]	196	0	7%	7%	8%	8%	1%	88%	1%	6%	6%	7%	6%	0%	89%	1%
His	[2345]	196	1	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
His	[2345]	196	2	2%	2%	2%	2%	0%	0%	0%	3%	2%	2%	2%	0%	0%	0%
His	[2345]	196	3	11%	13%	11%	11%	1%	0%	0%	13%	13%	13%	13%	0%	0%	0%
His	[2345]	196	4	79%	77%	78%	78%	1%	0%	0%	77%	78%	77%	77%	1%	0%	0%
His	[23456]	338	0	8%	8%	9%	8%	1%	88%	1%	6%	7%	7%	7%	0%	89%	1%
His	[23456]	338	1	1%	1%	1%	1%	0%	0%	0%	-1%	1%	1%	0%	1%	0%	0%
His	[23456]	338	2	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%	0%	1%	0%	0%
His	[23456]	338	3	2%	3%	3%	3%	0%	0%	0%	2%	4%	5%	4%	2%	0%	0%
His	[23456]	338	4	10%	11%	9%	10%	1%	0%	0%	12%	10%	11%	11%	1%	0%	0%

Table S2. Isotopomer abundances of proteinogenic amino acids from poplar cell suspensions grown under light for 7 d.

Fragments (↓) | Labels (→)				98% U-13C, under light							98% U-13C, under dark						
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	En.	SD	R1	R2	R3	Avg	SD	En.	SD
His	[23456]	338	5	78%	77%	77%	78%	0%	0%	0%	80%	78%	77%	78%	1%	0%	0%
His	[123456]	440	0	7%	7%	8%	8%	1%	88%	1%	6%	7%	6%	6%	1%	90%	0%
His	[123456]	440	1	1%	1%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
His	[123456]	440	2	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
His	[123456]	440	3	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
His	[123456]	440	4	2%	2%	2%	2%	0%	0%	0%	2%	1%	2%	2%	1%	0%	0%
His	[123456]	440	5	11%	11%	11%	11%	0%	0%	0%	11%	12%	11%	12%	0%	0%	0%
His	[123456]	440	6	78%	78%	77%	77%	0%	0%	0%	79%	78%	79%	79%	1%	0%	0%
Ile	[23456]	200	0	9%	8%	9%	9%	0%	78%	1%	8%	8%	7%	7%	0%	78%	1%
Ile	[23456]	200	1	2%	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Ile	[23456]	200	2	8%	8%	9%	9%	0%	0%	0%	8%	8%	9%	8%	1%	0%	0%
Ile	[23456]	200	3	9%	9%	10%	10%	0%	0%	0%	11%	11%	12%	12%	1%	0%	0%
Ile	[23456]	200	4	14%	15%	14%	14%	1%	0%	0%	17%	18%	19%	18%	1%	0%	0%
Ile	[23456]	200	5	58%	57%	56%	57%	1%	0%	0%	54%	55%	51%	53%	2%	0%	0%
Ile	[23456]	274	0	8%	8%	9%	8%	0%	79%	1%	8%	7%	7%	7%	0%	78%	1%
Ile	[23456]	274	1	2%	2%	2%	2%	0%	0%	0%	1%	1%	2%	1%	0%	0%	0%
Ile	[23456]	274	2	8%	8%	9%	8%	0%	0%	0%	8%	8%	9%	8%	0%	0%	0%
Ile	[23456]	274	3	9%	9%	10%	9%	0%	0%	0%	11%	11%	12%	11%	1%	0%	0%
Ile	[23456]	274	4	14%	15%	14%	14%	1%	0%	0%	17%	17%	19%	18%	1%	0%	0%
Ile	[23456]	274	5	59%	58%	57%	58%	1%	0%	0%	54%	55%	52%	54%	2%	0%	0%
Ile	[12]	302	0	27%	27%	27%	27%	0%	68%	1%	27%	27%	27%	27%	0%	68%	0%
Ile	[12]	302	1	10%	10%	10%	10%	0%	0%	0%	10%	10%	11%	11%	1%	0%	0%
Ile	[12]	302	2	64%	63%	63%	63%	1%	0%	0%	63%	63%	62%	63%	1%	0%	0%
Leu	[23456]	200	0	7%	7%	7%	7%	0%	86%	0%	6%	6%	6%	6%	0%	85%	1%
Leu	[23456]	200	1	2%	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Leu	[23456]	200	2	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	0%	0%	0%
Leu	[23456]	200	3	4%	5%	4%	4%	0%	0%	0%	5%	5%	6%	5%	0%	0%	0%
Leu	[23456]	200	4	12%	14%	12%	13%	1%	0%	0%	21%	21%	24%	22%	2%	0%	0%
Leu	[23456]	200	5	73%	71%	71%	72%	1%	0%	0%	64%	64%	60%	63%	2%	0%	0%
Leu	[23456]	274	0	7%	7%	7%	7%	0%	86%	0%	6%	6%	6%	6%	0%	85%	1%
Leu	[23456]	274	1	2%	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Leu	[23456]	274	2	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	0%	0%	0%
Leu	[23456]	274	3	4%	4%	4%	4%	0%	0%	0%	5%	5%	5%	5%	0%	0%	0%
Leu	[23456]	274	4	12%	14%	13%	13%	1%	0%	0%	21%	21%	24%	22%	2%	0%	0%
Leu	[23456]	274	5	73%	71%	72%	72%	1%	0%	0%	65%	65%	61%	63%	2%	0%	0%
Lys	[23456]	329	0	7%	13%	10%	10%	3%	77%	0%	9%	4%	14%	9%	5%	77%	3%
Lys	[23456]	329	1	5%	3%	4%	4%	1%	0%	0%	3%	7%	0%	3%	4%	0%	0%
Lys	[23456]	329	2	7%	7%	2%	6%	3%	0%	0%	4%	5%	6%	5%	1%	0%	0%
Lys	[23456]	329	3	11%	13%	14%	13%	1%	0%	0%	18%	9%	12%	13%	5%	0%	0%
Lys	[23456]	329	4	14%	16%	16%	15%	1%	0%	0%	12%	16%	16%	15%	2%	0%	0%
Lys	[23456]	329	5	56%	47%	55%	53%	5%	0%	0%	54%	59%	52%	55%	3%	0%	0%
Lys	[123456]	431	0	7%	13%	11%	10%	3%	78%	2%	6%	6%	7%	6%	0%	76%	2%
Lys	[123456]	431	1	2%	2%	0%	1%	2%	0%	0%	2%	3%	0%	2%	1%	0%	0%
Lys	[123456]	431	2	2%	2%	3%	2%	0%	0%	0%	1%	3%	1%	1%	1%	0%	0%
Lys	[123456]	431	3	5%	6%	5%	6%	1%	0%	0%	4%	4%	7%	5%	2%	0%	0%
Lys	[123456]	431	4	14%	33%	18%	21%	10%	0%	0%	28%	31%	37%	32%	5%	0%	0%
Lys	[123456]	431	5	18%	9%	12%	13%	5%	0%	0%	13%	8%	15%	12%	4%	0%	0%
Lys	[123456]	431	6	52%	34%	51%	46%	10%	0%	0%	47%	45%	33%	42%	7%	0%	0%
Lys	[123456]	488	0	7%	10%	8%	9%	2%	81%	3%	9%	1%	9%	6%	5%	81%	4%
Lys	[123456]	488	1	1%	1%	0%	1%	1%	0%	0%	1%	6%	2%	3%	3%	0%	0%
Lys	[123456]	488	2	4%	-1%	2%	2%	3%	0%	0%	0%	9%	2%	3%	4%	0%	0%
Lys	[123456]	488	3	6%	7%	5%	6%	1%	0%	0%	6%	1%	10%	6%	5%	0%	0%
Lys	[123456]	488	4	11%	11%	7%	9%	3%	0%	0%	11%	5%	8%	8%	3%	0%	0%
Lys	[123456]	488	5	7%	18%	11%	12%	6%	0%	0%	13%	5%	21%	13%	8%	0%	0%

Table S2. Isotopomer abundances of proteinogenic amino acids from poplar cell suspensions grown under light for 7 d.

Fragments (↓) | Labels (→)				98% U-13C, under light							98% U-13C, under dark						
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	En.	SD	R1	R2	R3	Avg	SD	En.	SD
Lys	[123456]	488	6	65%	53%	67%	61%	8%	0%	0%	60%	74%	48%	61%	13%	0%	0%
Met	[2345]	218	0	2%	2%	2%	2%	0%	88%	0%	3%	3%	3%	3%	0%	84%	1%
Met	[2345]	218	1	6%	6%	6%	6%	0%	0%	0%	7%	7%	8%	7%	1%	0%	0%
Met	[2345]	218	2	4%	5%	4%	4%	0%	0%	0%	6%	7%	8%	7%	1%	0%	0%
Met	[2345]	218	3	13%	14%	13%	13%	1%	0%	0%	15%	15%	16%	15%	1%	0%	0%
Met	[2345]	218	4	75%	73%	75%	74%	1%	0%	0%	69%	68%	66%	68%	2%	0%	0%
Met	[2345]	292	0	1%	2%	2%	2%	0%	89%	0%	1%	2%	1%	2%	0%	87%	1%
Met	[2345]	292	1	5%	5%	5%	5%	0%	0%	0%	6%	5%	7%	6%	1%	0%	0%
Met	[2345]	292	2	4%	4%	4%	4%	0%	0%	0%	6%	6%	8%	6%	1%	0%	0%
Met	[2345]	292	3	14%	15%	14%	14%	1%	0%	0%	15%	15%	16%	15%	1%	0%	0%
Met	[2345]	292	4	75%	75%	75%	75%	0%	0%	0%	73%	73%	68%	71%	3%	0%	0%
Met	[12345]	320	0	1%	2%	1%	1%	1%	89%	0%	1%	2%	2%	1%	0%	88%	2%
Met	[12345]	320	1	5%	4%	5%	4%	0%	0%	0%	4%	2%	5%	4%	1%	0%	0%
Met	[12345]	320	2	2%	2%	3%	2%	0%	0%	0%	2%	3%	5%	3%	2%	0%	0%
Met	[12345]	320	3	4%	5%	4%	5%	0%	0%	0%	5%	7%	8%	7%	2%	0%	0%
Met	[12345]	320	4	14%	16%	14%	14%	1%	0%	0%	17%	17%	16%	17%	0%	0%	0%
Met	[12345]	320	5	74%	72%	74%	73%	1%	0%	0%	72%	70%	64%	68%	4%	0%	0%
Phe	[23456789]	234	0	3%	4%	4%	4%	0%	94%	0%	2%	2%	2%	2%	0%	95%	0%
Phe	[23456789]	234	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[23456789]	234	5	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Phe	[23456789]	234	6	3%	3%	3%	3%	0%	0%	0%	4%	4%	4%	4%	0%	0%	0%
Phe	[23456789]	234	7	8%	9%	8%	8%	1%	0%	0%	10%	10%	10%	10%	0%	0%	0%
Phe	[23456789]	234	8	84%	82%	84%	83%	1%	0%	0%	82%	83%	82%	82%	0%	0%	0%
Phe	[12]	302	0	5%	5%	6%	5%	0%	93%	0%	4%	4%	4%	4%	0%	94%	0%
Phe	[12]	302	1	3%	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	0%	0%	0%
Phe	[12]	302	2	92%	91%	91%	92%	0%	0%	0%	93%	93%	92%	93%	0%	0%	0%
Phe	[123456789]	336	0	4%	4%	4%	4%	0%	93%	0%	2%	2%	2%	2%	0%	95%	0%
Phe	[123456789]	336	1	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	5	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Phe	[123456789]	336	6	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	0%	0%	0%
Phe	[123456789]	336	7	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%	3%	0%	0%	0%
Phe	[123456789]	336	8	9%	10%	9%	9%	1%	0%	0%	10%	10%	11%	10%	0%	0%	0%
Phe	[123456789]	336	9	82%	81%	82%	82%	1%	0%	0%	81%	82%	81%	81%	0%	0%	0%
Pro	[2345]	184	0	8%	8%	9%	8%	0%	79%	0%	8%	7%	8%	8%	0%	76%	2%
Pro	[2345]	184	1	5%	5%	6%	5%	0%	0%	0%	6%	6%	8%	7%	1%	0%	0%
Pro	[2345]	184	2	11%	11%	12%	12%	0%	0%	0%	14%	14%	16%	15%	1%	0%	0%
Pro	[2345]	184	3	11%	11%	10%	11%	0%	0%	0%	14%	14%	15%	15%	0%	0%	0%
Pro	[2345]	184	4	64%	64%	63%	64%	1%	0%	0%	58%	58%	53%	56%	3%	0%	0%
Pro	[2345]	258	0	5%	4%	5%	4%	0%	87%	0%	3%	4%	4%	4%	0%	84%	1%
Pro	[2345]	258	1	3%	3%	3%	3%	0%	0%	0%	4%	4%	5%	4%	1%	0%	0%
Pro	[2345]	258	2	8%	8%	8%	8%	0%	0%	0%	11%	11%	12%	11%	1%	0%	0%
Pro	[2345]	258	3	10%	10%	9%	10%	1%	0%	0%	13%	14%	14%	14%	0%	0%	0%
Pro	[2345]	258	4	74%	75%	75%	74%	0%	0%	0%	68%	68%	66%	67%	1%	0%	0%
Ser	[23]	288	0	2%	2%	2%	2%	0%	94%	0%	2%	2%	2%	2%	0%	95%	0%
Ser	[23]	288	1	7%	8%	7%	8%	0%	0%	0%	6%	7%	6%	6%	0%	0%	0%
Ser	[23]	288	2	91%	90%	91%	91%	0%	0%	0%	92%	91%	92%	92%	1%	0%	0%
Ser	[12]	302	0	3%	4%	4%	4%	0%	93%	1%	4%	3%	4%	4%	0%	92%	0%
Ser	[12]	302	1	6%	9%	7%	8%	2%	0%	0%	9%	10%	9%	9%	0%	0%	0%

Table S2. Isotopomer abundances of proteinogenic amino acids from poplar cell suspensions grown under light for 7 d.

Fragments (↓) | Labels (→)				98% U-13C, under light							98% U-13C, under dark						
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	En.	SD	R1	R2	R3	Avg	SD	En.	SD
Ser	[12]	302	2	90%	87%	89%	89%	2%	0%	0%	87%	87%	87%	87%	0%	0%	0%
Ser	[23]	362	0	2%	2%	2%	2%	0%	95%	0%	2%	2%	2%	2%	0%	95%	0%
Ser	[23]	362	1	7%	8%	7%	7%	0%	0%	0%	6%	6%	6%	6%	0%	0%	0%
Ser	[23]	362	2	92%	91%	91%	91%	0%	0%	0%	92%	92%	92%	92%	0%	0%	0%
Ser	[123]	390	0	1%	1%	2%	2%	0%	94%	0%	2%	2%	2%	2%	0%	94%	0%
Ser	[123]	390	1	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	0%	0%	0%
Ser	[123]	390	2	7%	9%	8%	8%	1%	0%	0%	8%	7%	7%	7%	1%	0%	0%
Ser	[123]	390	3	89%	88%	88%	88%	1%	0%	0%	88%	89%	90%	89%	1%	0%	0%
Thr	[234]	376	0	7%	7%	8%	7%	0%	84%	1%	7%	8%	7%	7%	1%	83%	3%
Thr	[234]	376	1	7%	7%	7%	7%	0%	0%	0%	9%	-1%	10%	6%	6%	0%	0%
Thr	[234]	376	2	12%	12%	12%	12%	0%	0%	0%	16%	17%	18%	17%	1%	0%	0%
Thr	[234]	376	3	74%	74%	72%	73%	1%	0%	0%	68%	75%	65%	69%	5%	0%	0%
Thr	[1234]	404	0	7%	6%	7%	7%	0%	83%	1%	6%	7%	7%	6%	0%	81%	2%
Thr	[1234]	404	1	3%	3%	3%	3%	0%	0%	0%	5%	4%	6%	5%	1%	0%	0%
Thr	[1234]	404	2	7%	7%	8%	7%	0%	0%	0%	10%	9%	12%	10%	1%	0%	0%
Thr	[1234]	404	3	13%	14%	14%	14%	0%	0%	0%	15%	17%	16%	16%	1%	0%	0%
Thr	[1234]	404	4	69%	69%	68%	69%	1%	0%	0%	65%	63%	59%	62%	3%	0%	0%
Tyr	[12]	302	0	8%	8%	8%	8%	0%	91%	0%	7%	7%	7%	7%	0%	91%	0%
Tyr	[12]	302	1	3%	3%	2%	3%	1%	0%	0%	4%	3%	3%	4%	0%	0%	0%
Tyr	[12]	302	2	90%	89%	90%	90%	0%	0%	0%	89%	89%	89%	89%	0%	0%	0%
Tyr	[23456789]	364	0	6%	6%		6%	0%	90%	0%	5%	5%	5%	5%	0%	92%	1%
Tyr	[23456789]	364	1	1%	1%		1%	0%	0%	0%	1%	0%	1%	1%	0%	0%	0%
Tyr	[23456789]	364	2	0%	0%		0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%
Tyr	[23456789]	364	3	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tyr	[23456789]	364	4	0%	0%		0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Tyr	[23456789]	364	5	1%	1%		1%	1%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Tyr	[23456789]	364	6	4%	4%		4%	0%	0%	0%	5%	2%	3%	3%	2%	0%	0%
Tyr	[23456789]	364	7	11%	9%		10%	1%	0%	0%	10%	12%	8%	10%	2%	0%	0%
Tyr	[23456789]	364	8	78%	78%		78%	0%	0%	0%	78%	78%	82%	79%	2%	0%	0%
Tyr	[123456789]	466	0	5%	5%		5%	0%	92%	0%	6%		4%	5%	1%	91%	1%
Tyr	[123456789]	466	1	1%	1%		1%	0%	0%	0%	1%		1%	1%	1%	0%	0%
Tyr	[123456789]	466	2	-1%	0%		0%	1%	0%	0%	0%		0%	0%	0%	0%	0%
Tyr	[123456789]	466	3	1%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%
Tyr	[123456789]	466	4	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%
Tyr	[123456789]	466	5	1%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%
Tyr	[123456789]	466	6	0%	1%		1%	1%	0%	0%	2%		2%	2%	0%	0%	0%
Tyr	[123456789]	466	7	3%	3%		3%	0%	0%	0%	3%		3%	3%	0%	0%	0%
Tyr	[123456789]	466	8	9%	9%		9%	0%	0%	0%	11%		9%	10%	1%	0%	0%
Tyr	[123456789]	466	9	81%	80%		80%	1%	0%	0%	78%		79%	78%	1%	0%	0%
Val	[2345]	186	0	4%	4%	5%	5%	0%	91%	0%	5%	5%	5%	5%	0%	90%	0%
Val	[2345]	186	1	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Val	[2345]	186	2	3%	3%	4%	3%	0%	0%	0%	4%	4%	4%	4%	0%	0%	0%
Val	[2345]	186	3	7%	10%	7%	8%	1%	0%	0%	10%	10%	11%	11%	1%	0%	0%
Val	[2345]	186	4	84%	82%	83%	83%	1%	0%	0%	80%	80%	79%	80%	1%	0%	0%
Val	[2345]	260	0	4%	5%	5%	5%	0%	91%	0%	5%	5%	5%	5%	0%	90%	0%
Val	[2345]	260	1	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	0%	0%	0%
Val	[2345]	260	2	3%	3%	4%	3%	0%	0%	0%	4%	4%	4%	4%	0%	0%	0%
Val	[2345]	260	3	6%	7%	7%	7%	1%	0%	0%	8%	8%	8%	8%	0%	0%	0%
Val	[2345]	260	4	85%	84%	84%	84%	1%	0%	0%	83%	82%	82%	82%	0%	0%	0%
Val	[12345]	288	0	5%	4%	5%	5%	0%	91%	0%	5%	5%	5%	5%	0%	90%	0%
Val	[12345]	288	1	1%	1%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Val	[12345]	288	2	1%	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	0%	0%	0%
Val	[12345]	288	3	3%	3%	3%	3%	0%	0%	0%	4%	3%	4%	4%	0%	0%	0%
Val	[12345]	288	4	6%	8%	7%	7%	1%	0%	0%	8%	8%	9%	8%	0%	0%	0%

Table S2. Isotopomer abundances of proteinogenic amino acids from poplar cell suspensions grown under light for 7 d.

Fragments (↓) | Labels (→)				98% U-13C, under light							98% U-13C, under dark						
AA	frag	MW	n(m+n)	R1	R2	R3	Avg	SD	En.	SD	R1	R2	R3	Avg	SD	En.	SD
Val	[12345]	288	5	84%	82%	83%	83%	1%	0%	0%	81%	81%	80%	81%	1%	0%	0%
Val	[12]	302	0	7%	7%	8%	8%	0%	91%	0%	9%	9%	9%	9%	0%	90%	1%
Val	[12]	302	1	3%	4%	3%	4%	0%	0%	0%	0%	3%	4%	2%	3%	0%	0%
Val	[12]	302	2	89%	89%	89%	89%	1%	0%	0%	91%	88%	87%	89%	2%	0%	0%

Table S3. Metabolic fluxes estimated through the four metabolic models.

Iso_corr(U)			Gluc_dilu			Iso_corr(V)			AA_in		
Reaction	**Avg**	**SD**	**Reaction**	**Avg**	**SD**	**Reaction**	**Avg**	**SD**	**Reaction**	**Avg**	**SD**
glci	0.5604	0.0080	glci	0.5508	0.0017	glci	0.5713	0.0123	glci	0.5698	0.0105
CO2in	0.1594	0.0046	CO2in	0.1283	0.0058	CO2in	0.9024	0.0687	CO2in	0.1862	0.1570
CO2out	1.9886	0.0697	CO2out	2.0405	0.0407	CO2out	3.0591	0.1274	CO2out	2.4669	0.1774
									CO2exf	-0.1429	0.1573
									CO2exb	0.7763	0.2601
						Alai	0.0002	0.0001	Alai	0.0018	0.0017
						aspi	0.0011	0.0001	aspi	0.0016	0.0004
						glui	0.0012	0.0001	glui	0.0011	0.0012
						Glyi	0.0001	0.0001	Glyi	0.0003	0.0003
						hisi	0.0001	0.0000	hisi	0.0001	0.0000
						Ile	0.0010	0.0001	Ile	0.0008	0.0001
						Meti	0.0001	0.0001	Meti	0.0001	0.0001
						seri	0.0007	0.0001	seri	0.0007	0.0003
						thri	0.0001	0.0001	thri	0.0003	0.0001
						Vali	0.0021	0.0002	Vali	0.0016	0.0004
						leu	0.0025	0.0001	leu	0.0019	0.0001
									pyrpi	0.0008	0.0002
									OAAmi	0.0025	0.0015
									pyr	0.0009	0.0004
									suci	0.0078	0.0013
									starchi	0.0044	0.0006
									T3Ppi	0.0024	0.0012
									E4Ppi	0.0014	0.0008
									ACApi	0.0094	0.0011
			glcina	0.0237	0.0002				ACAin	0.0083	0.0031
			glcc2	0.0237	0.0002				ACAtf	0.0083	0.0031
pgif	0.1709	0.0508	pgif	0.1625	0.0457	pgif	0.3924	0.0846	pgif	0.3577	0.1008
pgib	0.9334	0.0514	pgib	0.8852	0.0778	pgib	0.4740	0.2885	pgib	0.3712	0.3095
g6pdh	0.2430	0.0945	g6pdh	0.3683	0.0487	g6pdh	0.1092	0.0657	g6pdh	0.1651	0.0709
tktAf	0.0674	0.0217	tktAf	0.1051	0.0220	tktAf	-0.0459	0.0356	tktAf	-0.0130	0.0647
tktAb	0.5347	0.2868	tktAb	0.2864	0.2411	tktAb	0.0880	0.1443	tktAb	0.3276	0.3125
talf	0.0674	0.0217	talf	0.1051	0.0220	talf	-0.0459	0.0356	talf	-0.0130	0.0647
talb	0.5207	0.3118	talb	0.2933	0.2745	talb	0.6646	0.3356	talb	0.7689	0.2946
tktBf	0.0674	0.0217	tktBf	0.1051	0.0220	tktBf	-0.0532	0.0341	tktBf	-0.0184	0.0647
tktBb	0.3079	0.2150	tktBb	0.2863	0.2506	tktBb	0.9373	0.0405	tktBb	0.7768	0.2193
pfk	0.2865	0.0480	pfk	0.3531	0.0607	pfk	0.2667	0.0481	pfk	0.3071	0.0659
f16bp	0.9248	0.0681	f16bp	0.6208	0.2342	f16bp	0.7474	0.0849	f16bp	0.5756	0.1958
pyrf	0.6546	0.0373	pyrf	0.0000	0.0000	pyrf	0.8826	0.2968	pyrf	0.8414	0.2060
g6pt	0.1464	0.1138	g6pt	0.0436	0.0700	g6pt	0.0697	0.0901	g6pt	0.0470	0.0591
g6ptb	0.5937	0.2248	g6ptb	0.6100	0.3604	g6ptb	0.4748	0.2185	g6ptb	0.2965	0.2715
pgifp	-0.5388	0.1164	pgifp	-0.0267	0.0694	pgifp	-0.7036	0.1867	pgifp	-0.4002	0.2359
pgibp	0.3406	0.2888	pgibp	0.5990	0.3288	pgibp	0.8579	0.1119	pgibp	0.8545	0.2269
g6pdhp	0.6635	0.0967	g6pdhp	0.0473	0.0070	g6pdhp	0.7531	0.1938	g6pdhp	0.4301	0.2293
tktAfp	0.2367	0.0437	tktAfp	0.0355	0.0321	tktAfp	0.3354	0.0757	tktAfp	0.2128	0.1120
tktAbp	0.1546	0.1931	tktAbp	0.3758	0.2754	tktAbp	0.9889	0.0203	tktAbp	0.9950	0.0120
talfp	0.2367	0.0437	talfp	0.0355	0.0321	talfp	0.3354	0.0757	talfp	0.2128	0.1120
talbp	0.2584	0.2911	talbp	0.5037	0.3291	talbp	0.9687	0.0331	talbp	0.9847	0.0264
tktBfp	0.2297	0.0434	tktBfp	0.0279	0.0313	tktBfp	0.3354	0.0757	tktBfp	0.2128	0.1120
tktBbp	0.0960	0.1268	tktBbp	0.4942	0.3271	tktBbp	0.7960	0.2242	tktBbp	0.8536	0.2291
pfkp	-0.0724	0.0555	pfkp	0.0367	0.0593	pfkp	0.0254	0.0554	pfkp	0.0254	0.0554

Table S3. Metabolic fluxes estimated through the four metabolic models.

Iso_corr(U)			Gluc_dilu			Iso_corr(V)			AA_in		
Reaction	Avg	SD	Reaction	Avg	SD	Reaction	Avg	SD	Reaction	Avg	SD
f16bpp	0.7685	0.1209	f16bpp	0.5604	0.3289	f16bpp	0.1769	0.2562	f16bpp	0.3931	0.2452
pepfp	0.0749	0.0301	pepfp	0.9111	0.0585	pepfp	0.2422	0.2450	pepfp	0.1374	0.1409
pdhp	0.2296	0.0037	pdhp	0.2312	0.0026	pdhp	0.2266	0.0030	pdhp	0.2164	0.0033
t3pt	-0.0176	0.1039	t3pt	-0.8401	0.1548	t3pt	0.0168	0.2477	t3pt	0.1159	0.1636
t3pb	0.2802	0.2850	t3pb	0.0486	0.1576	t3pb	0.1761	0.2525	t3pb	0.0944	0.1899
P5Ptf	0.0410	0.1280	P5Ptf	0.0531	0.0973	P5Ptf	0.2542	0.0882	P5Ptf	0.2096	0.1437
P5Ptr	0.6841	0.3162	P5Ptr	0.5951	0.3308	P5Ptr	0.0422	0.0645	P5Ptr	0.0481	0.1297
pyrtpf	0.2223	0.0314	pyrtpf	-0.6121	0.0586	pyrtpf	0.0414	0.2440	pyrtpf	0.1601	0.1471
pyrtpr	0.4049	0.2644	pyrtpr	0.4663	0.3775	pyrtpr	0.8668	0.2177	pyrtpr	0.7409	0.3746
pdh	0.3211	0.0385	pdh	0.5022	0.0204	pdh	0.3685	0.0436	pdh	0.4844	0.0616
citdh	0.3211	0.0385	citdh	0.5022	0.0204	citdh	0.3685	0.0436	citdh	0.4927	0.0627
akgdh	0.2749	0.0394	akgdh	0.4553	0.0216	akgdh	0.3389	0.0427	akgdh	0.4623	0.0626
sdhf	0.2749	0.0394	sdhf	0.4553	0.0216	sdhf	0.3389	0.0427	sdhf	0.4735	0.0586
sdhr	0.9638	0.0257	sdhr	0.9366	0.0442	sdhr	0.9859	0.0154	sdhr	0.9596	0.0378
sdhs	0.6807	0.2441	sdhs	0.6774	0.2549	sdhs	0.6570	0.3330	sdhs	0.3905	0.3322
mdhf	0.3283	0.0444	mdhf	0.4920	0.0465	mdhf	0.6244	0.2189	mdhf	0.4902	0.1463
mdhr	0.9627	0.0227	mdhr	0.9493	0.0474	mdhr	0.9337	0.0887	mdhr	0.9339	0.1436
mef	-0.0534	0.0357	mef	-0.0367	0.0423	mef	-0.2856	0.1947	mef	-0.0167	0.1329
mer	0.2691	0.2769	mer	0.6386	0.2282	mer	0.2663	0.1885	mer	0.3278	0.2335
pyrc	0.0452	0.0268	pyrc	0.0602	0.0246	pyrc	0.1722	0.2276	pyrc	0.1676	0.1103
pepck	0.0340	0.0474	pepck	0.0310	0.0525	pepck	0.4012	0.1340	pepck	0.1410	0.0875
pepc	0.9710	0.0163	pepc	0.9218	0.0353	pepc	0.1748	0.2070	pepc	0.1850	0.2102
						mgdhf	0.0296	0.0023	mgdhf	0.0303	0.0026
									mgdhr	0.7068	0.3379
Serf	0.0115	0.0004	Serf	0.0116	0.0004	Serf	0.0104	0.0007	Serf	0.0104	0.0007
Serb	0.9704	0.0185	Serb	0.9277	0.0591				Serb	0.5454	0.2438
Glyf	0.0076	0.0004	Glyf	0.0077	0.0004	Glyf	0.0074	0.0005	Glyf	0.0072	0.0006
Glyr	0.9805	0.0123	Glyr	0.9456	0.0558	Glyr	0.6071	0.0221	Glyr	0.7329	0.0979
						alaf	0.0124	0.0008	alaf	0.0109	0.0017
									alar	0.8792	0.1874
						aspf	0.0148	0.0004	aspf	0.0144	0.0005
									aspr	0.3232	0.1765
						hisf	0.0011	0.0003	hisf	0.0012	0.0003
						ilef	0.0064	0.0001	ilef	0.0066	0.0001
						metf	0.0009	0.0001	metf	0.0009	0.0001
						thrf	0.0091	0.0001	thrf	0.0090	0.0001
						valf	0.0239	0.0002	valf	0.0363	0.0090
									valcat	0.0112	0.0094
						leu3f	0.0181	0.0001	leu3f	0.0187	0.0002
T3Ppo	0.0162	0.0042	T3Ppo	0.0188	0.0028						
T3Po	0.0021	0.0001	T3Po	0.0021	0.0001						
Sero	0.0039	0.0001	Sero	0.0039	0.0001	Sero	0.0040	0.0001	Sero	0.0039	0.0001
Glyo	0.0076	0.0004	Glyo	0.0077	0.0004	Glyo	0.0075	0.0005	Glyo	0.0075	0.0004
E4Ppo	0.0069	0.0025	E4Ppo	0.0076	0.0023	E4Po	0.0073	0.0025	E4Po	0.0067	0.0021
Pyro	0.0126	0.0007	pyro	0.0129	0.0006	pyro	0.0027	0.0002	pyro	0.0026	0.0002
pyrpo	0.0676	0.0005	pyrpo	0.0678	0.0004	pyrpo	0.0026	0.0001	pyrpo	0.0026	0.0001
ACApo	0.2296	0.0037	ACApo	0.2312	0.0026						
OAAmo	0.0185	0.0013	OAAmo	0.0191	0.0015	OAAmo	0.0112	0.0011	OAAmo	0.0113	0.0009
Gluco	0.0461	0.0037	2OGmo	0.0469	0.0036						
G6Ppout	0.0217	0.0021	G6Ppo	0.0230	0.0020						

Table S3. Metabolic fluxes estimated through the four metabolic models.

Iso_corr(U)			Gluc_dilu			Iso_corr(V)			AA_in		
Reaction	**Avg**	**SD**	**Reaction**	**Avg**	**SD**	**Reaction**	**Avg**	**SD**	**Reaction**	**Avg**	**SD**
P5Ppout	0.0014	0.0004	P5Ppo	0.0015	0.0004						
F6Po	0.0191	0.0009	F6Po	0.0195	0.0007						
CHOo	0.0076	0.0004	CHOo	0.0077	0.0004	CHOo	0.0054	0.0005	CHOo	0.0050	0.0007
						Alao	0.0127	0.0008	Alao	0.0127	0.0006
						Aspo	0.0068	0.0004	Aspo	0.0070	0.0003
						Gluo	0.0308	0.0024	Gluo	0.0314	0.0022
						Hiso	0.0012	0.0003	Hiso	0.0013	0.0003
						Ileo	0.0074	0.0000	Ileo	0.0075	0.0001
						Meto	0.0010	0.0001	Meto	0.0010	0.0001
						Thro	0.0027	0.0000	Thro	0.0026	0.0001
						Valo	0.0080	0.0001	Valo	0.0080	0.0001
						Leuo	0.0206	0.0001	Leuo	0.0206	0.0001
						suco	0.0266	0.0013	suco	0.0270	0.0014
						starcho	0.0203	0.0022	starcho	0.0215	0.0019
						lipid	0.2086	0.0031	lipid	0.2071	0.0030

Table S4. Metabolic network model incorporating uniform isotopomer correction (Iso_corr[U]).

Reaction		Net flux	Flux SD	Reversibility
glci	→ Glc	0.5604	0.0080	
CO2in	→ CO_2	0.1594	0.0046	
CO2out	CO_2 →	1.9886	0.0697	
pgif	G6P (123456) → F6P (123456)	0.1709	0.0508	0.9334
g6pdh	G6P (123456) → P5P (23456)	0.2430	0.0945	
tktAf	P5P (12345) + P5P (67890) → S7P (1267890) + T3P (345)	0.0674	0.0217	0.5347
talf	S7P (1234567) + T3P (890) → F6P (123890) + E4P (4567)	0.0674	0.0217	0.5207
tktBf	P5P (12345) + E4P (6789) → F6P (126789) + T3P (345)	0.0674	0.0217	0.3079
pfk	F6P (123456) → T3P (321) + T3P (456)	0.2865	0.0480	0.9248
pyrf	T3P (123) → Pyr (123)	0.6546	0.0373	
g6pt	G6P (123456) → $G6P_p$ (123456)	0.1464	0.1138	0.5937
pgifp	$G6P_p$ (123456) → $F6P_p$ (123456)	-0.5388	0.1164	0.3406
g6pdhp	$G6P_p$ (123456) → $P5P_p$ (23456) + CO_2 (1)	0.6635	0.0967	
tktAfp	$P5P_p$ (12345) + $P5P_p$ (67890) → $S7P_p$ (1267890) + $T3P_p$ (345)	0.2367	0.0437	0.1546
talfp	$S7P_p$ (1234567) + $T3P_p$ (890) → $F6P_p$ (123890) + $E4P_p$ (4567)	0.2367	0.0437	0.2584
tktBfp	$P5P_p$ (12345) + $E4P_p$ (6789) → $F6P_p$ (126789) + $T3P_p$ (345)	0.2297	0.0434	0.0960
pfkp	$F6P_p$ (123456) → $T3P_p$ (321) + $T3P_p$ (456)	-0.0724	0.0555	0.7685
pepfp	$T3P_p$ (123) → Pyr_p (123)	0.0749	0.0301	
pdhp	Pyr_p (123) → Aca_p (23)	0.2296	0.0037	
t3pt	$T3P_p$ (123) → T3P (123)	-0.0176	0.1039	0.2802
P5Ptf	P5P (12345) → $P5P_p$ (12345)	0.0410	0.1280	0.6841
pyrtpf	Pyr (123) → Pyr_p (123)	0.2223	0.0314	0.4039
pdh	Pyr (123) → Aca_m (23)	0.3211	0.0385	
citdh	Aca_m (12) + Oaa_m (3456) → Akg_m (65421) + CO_2 (3)	0.3211	0.0385	
akgdh	Akg_m (12345) → Suc_m (2345) + CO_2 (1)	0.2749	0.0394	
sdhf	Suc_m (1234) → Mal_m (1234)	0.2749	0.0394	0.9638
sdhs	Suc_m (1234) → Mal_m (4321)	0.6807	0.2441	
mdhf	Mal_m (1234) → Oaa_m (1234)	0.3283	0.0444	0.9627
mef	Mal_m (1234) → Pyr (123) + CO_2 (4)	-0.0534	0.0357	0.2691
pyrc	Pyr (123) + CO_2 (4) → Oaa_m (1234)	0.0452	0.0268	
pepck	Oaa_m (1234) → T3P (123) + CO_2 (4)	0.0340	0.0474	0.9710
Serf	$T3P_p$ (123) → Ser (123)	0.0115	0.0004	0.9704
Glyf	Ser (123) → Gly (12) + CHO (3)	0.0076	0.0004	0.9805
T3Ppo	$T3P_p$ →	0.0162	0.0042	
T3Po	T3P →	0.0021	0.0001	
Sero	Ser →	0.0039	0.0001	
Glyo	Gly →	0.0076	0.0004	
E4Ppo	$E4P_p$ →	0.0069	0.0025	
Pyro	Pyr →	0.0126	0.0007	
pyrpo	Pyr_p →	0.0676	0.0005	
ACApo	Aca_p →	0.2296	0.0037	
OAAmo	Oaa_m →	0.0185	0.0013	
Gluco	Akg →	0.0461	0.0037	
G6Ppout	$G6P_p$ →	0.0217	0.0021	

Table S4. Metabolic network model incorporating uniform isotopomer correction (Iso_corr[U]).

Reaction		Net flux	Flux SD	Reversibility
P5Ppout	$P5P_p \rightarrow$	0.0014	0.0004	
F6Po	$F6P \rightarrow$	0.0191	0.0009	
CHOout	$CHO \rightarrow$	0.0076	0.0004	

Table S5. Metabolic network model incorporating glucose dilution (Gluc_dilu).

Reaction		Net flux	Flux SD	Reversibility
glci	→ G6P	0.5508	0.0017	
CO2in	→ CO_2	0.1283	0.0058	
CO2out	CO_2 →	2.0405	0.0407	
glcina	→ G6Pn	0.0237	0.0002	
glcc2	G6Pn → G6P	0.0237	0.0002	
pgif	G6P (123456) → F6P (123456)	0.1625	0.0457	0.8852
g6pdh	G6P (123456) → P5P (23456)	0.3683	0.0487	
tktAf	P5P (12345) + P5P (67890) → S7P (1267890) + T3P (345)	0.1051	0.0220	0.2864
talf	S7P (1234567) + T3P (890) → F6P (123890) + E4P (4567)	0.1051	0.0220	0.2933
tktBf	P5P (12345) + E4P (6789) → F6P (126789) + T3P (345)	0.1051	0.0220	0.2863
pfk	F6P (123456) → T3P (321) + T3P (456)	0.3531	0.0607	0.6208
pyrf	T3P (123) → Pyr (123)	0.0000	0.0000	
g6pt	G6P (123456) → $G6P_p$ (123456)	0.0436	0.0700	0.6100
pgifp	$G6P_p$ (123456) → $F6P_p$ (123456)	-0.0267	0.0694	0.5990
g6pdhp	$G6P_p$ (123456) → $P5P_p$ (23456) + CO_2 (1)	0.0473	0.0070	
tktAfp	$P5P_p$ (12345) + $P5P_p$ (67890) → $S7P_p$ (1267890) + $T3P_p$ (345)	0.0355	0.0321	0.3758
talfp	$S7P_p$ (1234567) + $T3P_p$ (890) → $F6P_p$ (123890) + $E4P_p$ (4567)	0.0355	0.0321	0.5037
tktBfp	$P5P_p$ (12345) + $E4P_p$ (6789) → $F6P_p$ (126789) + $T3P_p$ (345)	0.0279	0.0313	0.4942
pfkp	$F6P_p$ (123456) → $T3P_p$ (321) + $T3P_p$ (456)	0.0367	0.0593	0.5604
pepfp	$T3P_p$ (123) → Pyr_p (123)	0.9111	0.0585	
pdhp	Pyr_p (123) → Aca_p (23)	0.2312	0.0026	
t3pt	$T3P_p$ (123) → T3P (123)	-0.8401	0.1548	0.0486
P5Ptf	P5P (12345) → $P5P_p$ (12345)	0.0531	0.0973	0.5951
pyrtpf	Pyr (123) → Pyr_p (123)	-0.6121	0.0586	0.4663
pdh	Pyr (123) → Aca_m (23)	0.5022	0.0204	
citdh	Aca_m (12) + Oaa_m (3456) → Akg_m (65421) + CO_2 (3)	0.5022	0.0204	
akgdh	Akg_m (12345) → Suc_m (2345) + CO_2 (1)	0.4553	0.0216	
sdhf	Suc_m (1234) → Mal_m (1234)	0.4553	0.0216	0.9366
sdhs	Suc_m (1234) → Mal_m (4321)	0.6774	0.2549	
mdhf	Mal_m (1234) → Oaa_m (1234)	0.4920	0.0465	0.9493
mef	Mal_m (1234) → Pyr (123) + CO_2 (4)	-0.0367	0.0423	0.6386
pyrc	Pyr (123) + CO_2 (4) → Oaa_m (1234)	0.0602	0.0246	
pepck	Oaa_m (1234) → T3P (123) + CO_2 (4)	0.0310	0.0525	0.9218
Serf	$T3P_p$ (123) → Ser (123)	0.0116	0.0004	0.9277
Glyf	Ser (123) → Gly (12) + CHO (3)	0.0077	0.0004	0.9456
T3Ppo	$T3P_p$ →	0.0188	0.0028	
T3Po	T3P →	0.0021	0.0001	
Sero	Ser →	0.0039	0.0001	
Glyo	Gly →	0.0077	0.0004	
E4Ppo	$E4P_p$ →	0.0076	0.0023	
Pyro	Pyr →	0.0129	0.0006	
pyrpo	Pyr_p →	0.0678	0.0004	
ACApo	Aca_p →	0.2312	0.0026	
OAAmo	Oaa_m →	0.0191	0.0015	

Table S5. Metabolic network model incorporating glucose dilution (Gluc_dilu).

Reaction		Net flux	Flux SD	Reversibility
Gluco	Akg →	0.0469	0.0036	
G6Ppout	$G6P_p$ →	0.0230	0.0020	
P5Ppout	$P5P_p$ →	0.0015	0.0004	
F6Po	F6P →	0.0195	0.0007	
CHOout	CHO →	0.0077	0.0004	

Table S6. Metabolic network model incorporating isotopomer correction for different amino acids (Iso_corr[V]).

Reaction		Net flux	Flux SD	Reversibility
glci	→ Glc	0.5713	0.0123	
CO2in	→ CO_{2b}	0.9024	0.0687	
CO2out	CO_2 →	3.0591	0.1274	
Alai	→ Ala	0.0002	0.0001	
Aspi	→ Asp	0.0011	0.0001	
Glui	→ Glu	0.0012	0.0001	
Glyi	→ Gly	0.0001	0.0001	
Hisi	→ His	0.0001	0.0000	
Ilei	→ Ile	0.0010	0.0001	
Meti	→ Met	0.0001	0.0001	
Seri	→ Ser	0.0007	0.0001	
Thri	→ Thr	0.0001	0.0001	
Vali	→ Val	0.0021	0.0002	
leui	→ Leu	0.0025	0.0001	
pgif	G6P (123456) → F6P (123456)	0.3924	0.0846	0.4740
g6pdh	G6P (123456) → P5P (23456)	0.1092	0.0657	
tktAf	P5P (12345) + P5P (67890) → S7P (1267890) + T3P (345)	-0.0459	0.0356	0.0880
talf	S7P (1234567) + T3P (890) → F6P (123890) + E4P (4567)	-0.0459	0.0356	0.6646
tktBf	P5P (12345) + E4P (6789) → F6P (126789) + T3P (345)	-0.0532	0.0341	0.9373
pfk	F6P (123456) → T3P (321) + T3P (456)	0.2667	0.0481	0.7474
pyrf	PEP (123) → Pyr (123)	0.8826	0.2968	
g6pt	G6P (123456) → $G6P_p$ (123456)	0.0697	0.0901	0.4748
pgifp	$G6P_p$ (123456) → $F6P_p$ (123456)	-0.7036	0.1867	0.8579
g6pdhp	$G6P_p$ (123456) → $P5P_p$ (23456) + CO_2 (1)	0.7531	0.1938	
tktAfp	$P5P_p$ (12345) + $P5P_p$ (67890) → $S7P_p$ (1267890) + $T3P_p$ (345)	0.3354	0.0757	0.9889
talfp	$S7P_p$ (1234567) + $T3P_p$ (890) → $F6P_p$ (123890) + $E4P_p$ (4567)	0.3354	0.0757	0.9687
tktBfp	$P5P_p$ (12345) + $E4P_p$ (6789) → $F6P_p$ (126789) + $T3P_p$ (345)	0.3354	0.0757	0.7960
pfkp	$F6P_p$ (123456) → $T3P_p$ (321) + $T3P_p$ (456)	0.0254	0.0554	0.1769
pepfp	$T3P_p$ (123) → Pyr_p (123)	0.2422	0.2450	
pdhp	Pyr_p (123) → Aca_p (23)	0.2266	0.0030	
t3pt	$T3P_p$ (123) → T3P (123)	0.0168	0.2477	0.1761
P5Ptf	P5P (12345) → $P5P_p$ (12345)	0.2542	0.0882	0.0422
pyrtpf	Pyr (123) → Pyr_p (123)	0.0414	0.2440	0.8668
pdh	Pyr (123) → Aca_m (23)	0.3685	0.0436	
citdh	Aca_m (12) + Oaa_m (3456) → Akg_m (65421) + CO_2 (3)	0.3685	0.0436	
akgdh	Akg_m (12345) → Suc_m (2345) + CO_2 (1)	0.3389	0.0427	
sdhf	Suc_m (1234) → Mal_m (1234)	0.3389	0.0427	0.9859
sdhs	Suc_m (1234) → Mal_m (4321)	0.6570	0.3330	
mdhf	Mal_m (1234) → Oaa_m (1234)	0.6244	0.2189	0.9337
mef	Mal_m (1234) → Pyr (123) + CO_2 (4)	-0.2856	0.1947	0.2663
pyrc	Pyr (123) + CO_2 (4) → Oaa_m (1234)	0.1722	0.2276	
pepck	Oaa_m (1234) → PEP (123) + CO_2 (4)	0.4012	0.1340	0.1748
mgdhf	Akg_m (12345) → Glu_c (12345)	0.0296	0.0023	

Table S6. Metabolic network model incorporating isotopomer correction for different amino acids (Iso_corr[V]).

	Reaction	Net flux	Flux SD	Reversibility
Serf	$T3P_p$ (123) → Ser (123)	0.0104	0.0007	
Glyf	Ser (123) → Gly (12) + CHO (3)	0.0074	0.0005	0.6071
Alaf	Pyr (123) → Ala (123)	0.0124	0.0008	
Aspf	Oaa_m (1234) → Asp (1234)	0.0148	0.0004	
Hisf	$P5P_p$ (12345) + CHO (6) → His (123456)	0.0011	0.0003	
Ilef	Thr (1234) + Pyr_p (567) → Ile (123467) + CO_2 (5)	0.0064	0.0001	
Metf	Oaa_m (1234) + CHO (5) → Met (12345)	0.0009	0.0001	
Thrf	Asp (1234) → Thr (1234)	0.0091	0.0001	
Valf	Pyr_p (123) + Pyr_p (456) → Val (12356) + CO_2 (4)	0.0239	0.0002	
Leu3f	Aca_p (12) + Val (34567) → Leu (124567) + CO_2 (3)	0.0181	0.0001	
sero	Ser →	0.0040	0.0001	
Glyo	Gly →	0.0075	0.0005	
E4Po	E4P →	0.0073	0.0025	
pyro	Pyr →	0.0027	0.0002	
pyrpo	Pyr_p →	0.0026	0.0001	
OAAmo	Oaa_m →	0.0112	0.0011	
CHOo	CHO →	0.0054	0.0005	
Alao	Ala →	0.0127	0.0008	
Aspo	Asp →	0.0068	0.0004	
gluo	Glu →	0.0308	0.0024	
hiso	His →	0.0012	0.0003	
Ileo	Ile →	0.0074	0.0000	
Meto	Met →	0.0010	0.0001	
Thro	Thr →	0.0027	0.0000	
Valo	Val →	0.0080	0.0001	
Leuo	Leu →	0.0206	0.0001	
suco	Suc →	0.0266	0.0013	
starcho	$G6P_p$ →	0.0203	0.0022	
lipid	Aca_p →	0.2086	0.0031	

Table S7. Metabolic network model incorporating amino acid reflux (AA_in).

Reaction		Net flux	Flux SD	Reversibility
glci	→ Glc	0.5698	0.0105	
CO2in	→ CO_{2b}	0.1862	0.1570	
CO2out	CO_2 →	2.4669	0.1774	
CO2exf	CO_2 → CO_b	-0.1429	0.1573	0.7763
Alai	→ Ala	0.0018	0.0017	
Aspi	→ Asp	0.0016	0.0004	
Glui	→ Glu	0.0011	0.0012	
Glyi	→ Gly	0.0003	0.0003	
Hisi	→ His	0.0001	0.0000	
Ilei	→ Ile	0.0008	0.0001	
Meti	→ Met	0.0001	0.0001	
Seri	→ Ser	0.0007	0.0003	
Thri	→ Thr	0.0003	0.0001	
Vali	→ Val	0.0016	0.0004	
leui	→ Leu	0.0019	0.0001	
Pyrpi	→ Pyr_p	0.0008	0.0002	
Oaami	→ Oaa_m	0.0025	0.0015	
Pyri	→ Pyr	0.0009	0.0004	
Suci	→ Suc_m	0.0078	0.0013	
Starchi	→ $G6P_p$	0.0044	0.0006	
T3Ppi	→ $T3P_p$	0.0024	0.0012	
E4Ppi	→ $E4P_p$	0.0014	0.0008	
Acapi	→ Aca_p	0.0094	0.0011	
Acain	→ Aca_1	0.0083	0.0031	
Acatf	Aca_1 (123)→ Aca_m (123)	0.0083	0.0031	
pgif	G6P (123456) → F6P (123456)	0.3577	0.1008	0.3712
g6pdh	G6P (123456) → P5P (23456)	0.1651	0.0709	
tktAf	P5P (12345) + P5P (67890) → S7P (1267890) + T3P (345)	-0.0130	0.0647	0.3276
talf	S7P (1234567) + T3P (890) → F6P (123890) + E4P (4567)	-0.0130	0.0647	0.7689
tktBf	P5P (12345) + E4P (6789) → F6P (126789) + T3P (345)	-0.0184	0.0647	0.7768
pfk	F6P (123456) → T3P (321) + T3P (456)	0.3071	0.0659	0.5756
pyrf	PEP (123) → Pyr (123)	0.8414	0.2060	
g6pt	G6P (123456) → $G6P_p$ (123456)	0.0470	0.0591	0.2965
pgifp	$G6P_p$ (123456) → $F6P_p$ (123456)	-0.4002	0.2359	0.8545
g6pdhp	$G6P_p$ (123456) → $P5P_p$ (23456) + CO_2 (1)	0.4301	0.2293	
tktAfp	$P5P_p$ (12345) + $P5P_p$ (67890) → $S7P_p$ (1267890) + $T3P_p$ (345)	0.2128	0.1120	0.9950
talfp	$S7P_p$ (1234567) + $T3P_p$ (890) → $F6P_p$ (123890) + $E4P_p$ (4567)	0.2128	0.1120	0.9847
tktBfp	$P5P_p$ (12345) + $E4P_p$ (6789) → $F6P_p$ (126789) + $T3P_p$ (345)	0.2128	0.1120	0.8536
pfkp	$F6P_p$ (123456) → $T3P_p$ (321) + $T3P_p$ (456)	0.0254	0.0554	0.3931
pepfp	$T3P_p$ (123) → Pyr_p (123)	0.1374	0.1409	
pdhp	Pyr_p (123) → Aca_p (23)	0.2164	0.0033	
t3pt	$T3P_p$ (123) → T3P (123)	0.1159	0.1636	0.0944
P5Ptf	P5P (12345) → $P5P_p$ (12345)	0.2096	0.1437	0.0481
pyrtpf	Pyr (123) → Pyr_p (123)	0.1601	0.1471	0.7409

Table S7. Metabolic network model incorporating amino acid reflux (AA_in).

Reaction		Net flux	Flux SD	Reversibility
pdh	$Pyr\ (123) \rightarrow Aca_m\ (23)$	0.4844	0.0616	
citdh	$Aca_m\ (12) + Oaa_m\ (3456) \rightarrow Akg_m\ (65421) + CO_2\ (3)$	0.4927	0.0627	
akgdh	$Akg_m\ (12345) \rightarrow Suc_m\ (2345) + CO_2\ (1)$	0.4623	0.0626	
sdhf	$Suc_m\ (1234) \rightarrow Mal_m\ (1234)$	0.4735	0.0586	0.9596
sdhs	$Suc_m\ (1234) \rightarrow Mal_m\ (4321)$	0.3905	0.3322	
mdhf	$Mal_m\ (1234) \rightarrow Oaa_m\ (1234)$	0.4902	0.1463	0.9339
mef	$Mal_m\ (1234) \rightarrow Pyr\ (123) + CO_2\ (4)$	-0.0167	0.1329	0.3278
pyrc	$Pyr\ (123) + CO_2\ (4) \rightarrow Oaa_m\ (1234)$	0.1676	0.1103	
pepck	$Oaa_m\ (1234) \rightarrow PEP\ (123) + CO_2\ (4)$	0.1410	0.0875	0.1850
mgdhf	$Akg_m\ (12345) \rightarrow Glu_c\ (12345)$	0.0303	0.0026	0.7068
Serf	$T3P_p\ (123) \rightarrow Ser\ (123)$	0.0104	0.0007	0.5454
Glyf	$Ser\ (123) \rightarrow Gly\ (12) + CHO\ (3)$	0.0072	0.0006	0.7329
Alaf	$Pyr\ (123) \rightarrow Ala\ (123)$	0.0109	0.0017	0.8792
Aspf	$Oaa_m\ (1234) \rightarrow Asp\ (1234)$	0.0144	0.0005	0.3232
Hisf	$P5P_p\ (12345) + CHO\ (6) \rightarrow His\ (123456)$	0.0012	0.0003	
Ilef	$Thr\ (1234) + Pyr_p\ (567) \rightarrow Ile\ (123467) + CO_2\ (5)$	0.0066	0.0001	
Metf	$Oaa_m\ (1234) + CHO\ (5) \rightarrow Met\ (12345)$	0.0009	0.0001	
Thrf	$Asp\ (1234) \rightarrow Thr\ (1234)$	0.0090	0.0001	
Valf	$Pyr_p\ (123) + Pyr_p\ (456) \rightarrow Val\ (12356) + CO_2\ (4)$	0.0363	0.0090	
Valcat	$Val\ (12345) \rightarrow Suc_m\ (2345) + CO_2\ (1)$	0.0112	0.0094	
Leu3f	$Aca_p\ (12) + Val\ (34567) \rightarrow Leu\ (124567) + CO_2\ (3)$	0.0187	0.0002	
sero	$Ser \rightarrow$	0.0039	0.0001	
Glyo	$Gly \rightarrow$	0.0075	0.0004	
E4Po	$E4P \rightarrow$	0.0067	0.0021	
pyro	$Pyr \rightarrow$	0.0026	0.0002	
pyrpo	$Pyr_p \rightarrow$	0.0026	0.0001	
OAAmo	$Oaa_m \rightarrow$	0.0113	0.0009	
CHOo	$CHO \rightarrow$	0.0050	0.0007	
Alao	$Ala \rightarrow$	0.0127	0.0006	
Aspo	$Asp \rightarrow$	0.0070	0.0003	
gluo	$Glu \rightarrow$	0.0314	0.0022	
hiso	$His \rightarrow$	0.0013	0.0003	
Ileo	$Ile \rightarrow$	0.0075	0.0001	
Meto	$Met \rightarrow$	0.0010	0.0001	
Thro	$Thr \rightarrow$	0.0026	0.0001	
Valo	$Val \rightarrow$	0.0080	0.0001	
Leuo	$Leu \rightarrow$	0.0206	0.0001	
suco	$Suc \rightarrow$	0.0270	0.0014	
starcho	$G6P_p \rightarrow$	0.0215	0.0019	
lipid	$Aca_p \rightarrow$	0.2071	0.0030	

Table S8. Isotopomer abundances of soluble amino acids from poplar cells in 98% 1-13C ILE

Condition ►				CN					cN					Cn					cn				
				MID					MID					MID					MID				
AA frag		m/z	Mass	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD
Ala	[23]	232	0	0.62	0.62	0.63	0.62	0.00	0.61	0.62	0.64	0.62	0.01	0.62	0.62	0.62	0.62	0.00		0.63	0.63	0.63	0.01
Ala	[23]	232	1	0.36	0.36	0.36	0.36	0.00	0.37	0.35	0.34	0.35	0.01	0.35	0.35	0.35	0.35	0.00		0.36	0.36	0.36	0.00
Ala	[23]	232	2	0.02	0.02	0.01	0.02	0.00	0.02	0.03	0.02	0.02	0.00	0.02	0.03	0.02	0.02	0.00		0.02	0.01	0.02	0.01
Ala	[123]	260	0	0.60	0.60	0.61	0.60	0.00	0.57	0.57	0.57	0.57	0.00	0.58	0.58	0.58	0.58	0.00	0.62	0.59	0.60	0.60	0.01
Ala	[123]	260	1	0.37	0.37	0.37	0.37	0.00	0.38	0.38	0.38	0.38	0.00	0.38	0.37	0.38	0.38	0.00	0.34	0.37	0.37	0.36	0.02
Ala	[123]	260	2	0.02	0.03	0.02	0.02	0.00	0.05	0.05	0.05	0.05	0.00	0.04	0.04	0.04	0.04	0.00	0.03	0.03	0.03	0.03	0.00
Ala	[123]	260	3	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asp	[12]	302	0	0.70	0.70	0.71	0.71	0.00	0.72	0.69	0.69	0.70	0.02	0.71	0.73	0.70	0.72	0.01	0.75	0.73	0.75	0.74	0.01
Asp	[12]	302	1	0.28	0.27	0.28	0.28	0.00	0.26	0.28	0.29	0.28	0.01	0.28	0.26	0.27	0.27	0.01	0.23	0.25	0.25	0.24	0.01
Asp	[12]	302	2	0.02	0.02	0.01	0.02	0.01	0.02	0.03	0.02	0.02	0.00	0.01	0.01	0.03	0.02	0.01	0.02	0.01	0.00	0.01	0.01
Asp	[234]	316	0	0.54	0.53	0.53	0.53	0.00	0.54	0.53	0.52	0.53	0.01	0.55	0.57	0.55	0.55	0.01	0.61	0.61	0.58	0.60	0.01
Asp	[234]	316	1	0.38	0.39	0.40	0.39	0.01	0.39	0.39	0.40	0.39	0.01	0.37	0.37	0.37	0.37	0.00	0.33	0.36	0.36	0.35	0.02
Asp	[234]	316	2	0.07	0.07	0.07	0.07	0.00	0.06	0.08	0.07	0.07	0.01	0.08	0.06	0.06	0.07	0.01	0.06	0.02	0.05	0.04	0.02
Asp	[234]	316	3	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01
Asp	[234]	390	0	0.54	0.53	0.55	0.54	0.01	0.55	0.55	0.52	0.54	0.02	0.55	0.56	0.56	0.56	0.00	0.60		0.61	0.60	0.01
Asp	[234]	390	1	0.39	0.39	0.39	0.39	0.00	0.38	0.39	0.39	0.39	0.01	0.38	0.39	0.37	0.38	0.01	0.36		0.33	0.34	0.02
Asp	[234]	390	2	0.06	0.07	0.07	0.07	0.00	0.07	0.06	0.08	0.07	0.01	0.07	0.06	0.06	0.06	0.00	0.05		0.06	0.05	0.01
Asp	[234]	390	3	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	####	0.01	0.00	0.01	0.00		0.00	0.00	0.01
Asp	[1234]	418	0	0.48	0.47	0.47	0.47	0.00	0.48	0.46	0.46	0.47	0.01	0.49	0.50	0.48	0.49	0.01	0.54	0.54	0.54	0.54	0.00
Asp	[1234]	418	1	0.42	0.42	0.43	0.42	0.01	0.41	0.42	0.42	0.42	0.00	0.42	0.41	0.42	0.41	0.01	0.39	0.37	0.39	0.39	0.01
Asp	[1234]	418	2	0.09	0.10	0.10	0.10	0.01	0.11	0.11	0.12	0.11	0.00	0.09	0.08	0.09	0.09	0.00	0.07	0.08	0.08	0.08	0.01
Asp	[1234]	418	3	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	####	0.00	0.01
Asp	[1234]	418	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	####	0.00	0.00	0.01
Glr	[123]	377	0	0.63	0.63	0.63	0.63	0.00	0.62	0.62	0.62	0.62	0.00	0.61	0.61	0.59	0.60	0.01		0.62	0.60	0.61	0.01
Glr	[123]	377	1	0.37	0.36	0.38	0.37	0.01	0.37	0.37	0.38	0.37	0.01	0.38	0.39	0.40	0.39	0.01		0.37	0.38	0.37	0.01
Glr	[123]	377	2	####	0.00	####	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01		0.03	0.02	0.02	0.01
Glr	[123]	377	3	0.00	0.00	####	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		####	0.00	####	0.01
Glu	[2345]	330	0	0.43	0.41	0.42	0.42	0.01	0.45	0.42	0.43	0.43	0.01	0.42	0.44	0.44	0.43	0.01		0.52	0.55	0.53	0.02
Glu	[2345]	330	1	0.40	0.43	0.42	0.41	0.02	0.40	0.41	0.39	0.40	0.01	0.35	0.37	0.40	0.37	0.03		0.37	0.35	0.36	0.01
Glu	[2345]	330	2	0.15	0.14	0.14	0.14	0.00	0.13	0.14	0.15	0.14	0.01	0.17	0.14	0.13	0.15	0.02		0.09	0.08	0.09	0.01
Glu	[2345]	330	3	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.03	0.02	0.01	0.05	0.04	0.03	0.04	0.01		0.03	0.03	0.03	0.00
Glu	[2345]	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.01		0.00	####	0.00	0.01
Glu	[12345]	432	0	0.37	0.38	0.38	0.37	0.00	0.40	0.38	0.38	0.39	0.01	0.42	0.41	0.42	0.42	0.00		0.47	0.48	0.47	0.01
Glu	[12345]	432	1	0.45	0.43	0.42	0.43	0.01	0.41	0.43	0.41	0.42	0.01	0.41	0.43	0.43	0.42	0.01		0.38	0.38	0.38	0.00
Glu	[12345]	432	2	0.15	0.17	0.18	0.17	0.01	0.16	0.17	0.17	0.17	0.00	0.15	0.14	0.14	0.14	0.01		0.14	0.11	0.12	0.02
Glu	[12345]	432	3	0.04	0.02	0.02	0.03	0.01	0.02	0.03	0.03	0.03	0.00	0.01	0.01	0.02	0.01	0.00		0.01	0.03	0.02	0.01
Glu	[12345]	432	4	####	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00		0.01	0.00	0.00	0.01
Glu	[12345]	432	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Gly	[2]	218	0	0.99	0.99	0.98	0.99	0.00	0.99	0.96	0.96	0.97	0.01	0.98	0.98	0.98	0.98	0.00	0.96	0.98	0.99	0.98	0.01
Gly	[2]	218	1	0.01	0.01	0.02	0.01	0.00	0.01	0.04	0.04	0.03	0.01	0.02	0.02	0.02	0.02	0.00	0.04	0.02	0.01	0.02	0.01
Gly	[12]	246	0	0.96	0.95	0.95	0.95	0.01	0.95	0.91	0.91	0.93	0.02	0.93	0.92	0.92	0.92	0.01	0.87	0.91	0.91	0.91	0.00
Gly	[12]	246	1	0.04	0.05	0.04	0.04	0.01	0.05	0.08	0.08	0.07	0.02	0.07	0.08	0.07	0.07	0.00	0.13	0.08	0.08	0.08	0.00
Gly	[12]	246	2	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
His	[2345]	196	0	0.60	0.60	0.60	0.60	0.00	0.57	0.59	0.60	0.59	0.01	0.53	0.52	0.53	0.53	0.00	0.51	0.53	0.53	0.52	0.01
His	[2345]	196	1	0.33	0.33	0.33	0.33	0.00	0.36	0.35	0.35	0.35	0.01	0.38	0.38	0.38	0.38	0.00	0.38	0.38	0.37	0.38	0.01
His	[2345]	196	2	0.05	0.05	0.05	0.05	0.00	0.05	0.06	0.05	0.05	0.00	0.08	0.09	0.08	0.08	0.00	0.09	0.09	0.09	0.09	0.00
His	[2345]	196	3	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.01	0.01
His	[2345]	196	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
His	[23456]	338	0	0.61	0.61	0.61	0.61	0.00	0.61	0.60	0.64	0.62	0.02	0.54	0.54	0.53	0.54	0.01	0.54	0.53	0.52	0.53	0.01
His	[23456]	338	1	0.32	0.33	0.33	0.33	0.00	0.35	0.31	0.33	0.33	0.02	0.35	0.36	0.34	0.35	0.01	0.37	0.37	0.37	0.37	0.00
His	[23456]	338	2	0.05	0.04	0.05	0.05	0.00	0.03	0.03	0.03	0.03	0.00	0.08	0.08	0.08	0.08	0.00	0.08	0.09	0.09	0.08	0.01
His	[23456]	338	3	0.01	0.01	0.01	0.01	0.01	0.01	0.04	####	0.01	0.03	0.02	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.01	0.01
His	[23456]	338	4	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
His	[23456]	338	5	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.03	0.01	0.02	0.00	0.01	0.00	0.00	0.01
His	[123456]	440	0	0.47	0.46	0.46	0.47	0.00	0.45	0.46	0.44	0.45	0.01	0.40	0.41	0.39	0.40	0.01	0.39	0.39	0.39	0.39	0.00
His	[123456]	440	1	0.39	0.40	0.39	0.39	0.00	0.40	0.41	0.41	0.41	0.01	0.40	0.41	0.40	0.40	0.00	0.41	0.41	0.42	0.41	0.01
His	[123456]	440	2	0.12	0.12	0.12	0.12	0.00	0.13	0.09	0.12	0.11	0.02	0.16	0.16	0.16	0.16	0.00	0.16	0.18	0.16	0.17	0.01
His	[123456]	440	3	0.02	0.01	0.02	0.02	0.00	0.02	0.03	0.02	0.02	0.01	0.03	0.02	0.02	0.02	0.00	0.03	0.02	0.03	0.03	0.00
His	[123456]	440	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00
His	[123456]	440	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
His	[123456]	440	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ile	[23456]	200	0	0.35	0.35	0.35	0.35	0.00	0.36	0.36	0.36	0.36	0.00	0.37	0.38	0.37	0.37	0.00	0.40	0.39	0.38	0.39	0.01
Ile	[23456]	200	1	0.43	0.44	0.44	0.43	0.00	0.43	0.43	0.43	0.43	0.00	0.43	0.42	0.43	0.43	0.00	0.42	0.43	0.43	0.43	0.00

Ile	[23456]	200	2	0.18	0.18	0.19	0.18	0.00	0.17	0.18	0.17	0.17	0.00	0.17	0.17	0.17	0.17	0.00	0.16	0.16	0.16	0.16	0.00
Ile	[23456]	200	3	0.03	0.03	0.03	0.03	0.00	0.03	0.03	0.03	0.03	0.00	0.02	0.03	0.02	0.03	0.00	0.02	0.02	0.02	0.02	0.00
Ile	[23456]	200	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ile	[23456]	200	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ile	[23456]	274	0	0.35	0.35	0.35	0.35	0.00	0.36	0.35	0.35	0.35	0.01	0.36	0.36	0.37	0.36	0.01	0.41	0.39	0.38	0.39	0.01
Ile	[23456]	274	1	0.43	0.43	0.43	0.43	0.00	0.43	0.44	0.44	0.43	0.00	0.44	0.43	0.42	0.43	0.01	0.42	0.43	0.43	0.43	0.00
Ile	[23456]	274	2	0.19	0.19	0.18	0.19	0.00	0.18	0.18	0.19	0.18	0.00	0.17	0.18	0.18	0.18	0.00	0.15	0.16	0.17	0.16	0.01
Ile	[23456]	274	3	0.03	0.03	0.03	0.03	0.00	0.03	0.03	0.03	0.03	0.00	0.03	0.03	0.03	0.03	0.00	0.02	0.02	0.02	0.02	0.00
Ile	[23456]	274	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ile	[23456]	274	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leu	[23456]	200	0	0.31	0.31	0.31	0.31	0.00	0.32	0.31	0.31	0.31	0.00	0.34	0.35	0.35	0.35	0.00	0.36	0.36	0.37	0.37	0.00
Leu	[23456]	200	1	0.43	0.43	0.43	0.43	0.00	0.44	0.44	0.44	0.44	0.00	0.44	0.44	0.43	0.44	0.00	0.43	0.44	0.44	0.44	0.00
Leu	[23456]	200	2	0.21	0.21	0.21	0.21	0.00	0.20	0.21	0.21	0.21	0.00	0.19	0.18	0.19	0.18	0.00	0.17	0.18	0.17	0.17	0.00
Leu	[23456]	200	3	0.04	0.04	0.04	0.04	0.00	0.04	0.04	0.04	0.04	0.00	0.03	0.03	0.03	0.03	0.00	0.02	0.03	0.02	0.02	0.00
Leu	[23456]	200	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leu	[23456]	200	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leu	[23456]	274	0	0.32	0.32	0.32	0.32	0.00	0.32	0.32	0.31	0.32	0.01	0.34	0.35	0.34	0.35	0.00	0.38	0.37	0.37	0.37	0.01
Leu	[23456]	274	1	0.44	0.43	0.43	0.43	0.00	0.44	0.44	0.44	0.44	0.00	0.44	0.44	0.43	0.44	0.00	0.43	0.44	0.44	0.44	0.01
Leu	[23456]	274	2	0.20	0.21	0.21	0.21	0.01	0.20	0.21	0.21	0.20	0.00	0.18	0.18	0.19	0.18	0.01	0.17	0.16	0.17	0.17	0.00
Leu	[23456]	274	3	0.04	0.04	0.04	0.04	0.00	0.04	0.04	0.04	0.04	0.00	0.03	0.03	0.03	0.03	0.00	0.02	0.02	0.02	0.02	0.00
Leu	[23456]	274	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leu	[23456]	274	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lys	[23456]	329	0		0.35	0.36	0.36	0.01	0.38	0.36		0.37	0.02	0.36	0.36		0.36	0.00		0.40	0.40	0.40	0.00
Lys	[23456]	329	1		0.46	0.43	0.44	0.02	0.42	0.43		0.42	0.01	0.44	0.43		0.43	0.01		0.48	0.45	0.47	0.02
Lys	[23456]	329	2		0.17	0.17	0.17	0.00	0.16	0.17		0.17	0.01	0.18	0.18		0.18	0.00		0.12	0.13	0.12	0.01
Lys	[23456]	329	3		0.03	0.03	0.03	0.00	0.04	0.03		0.03	0.00	0.03	0.03		0.03	0.00		0.02	0.01	0.01	0.01
Lys	[23456]	329	4		####	0.00	0.00	0.01	0.00	0.01		0.00	0.00	0.00	0.01		0.00	0.00		####	0.01	####	0.02
Lys	[23456]	329	5		0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00		0.01	0.00	0.00	0.01
Lys	[123456]	431	0		0.28	0.32	0.30	0.03	0.32	0.30		0.31	0.01	0.30	0.31		0.30	0.00		0.36	0.34	0.35	0.01
Lys	[123456]	431	1		0.45	0.45	0.45	0.00	0.44	0.44		0.44	0.00	0.45	0.44		0.44	0.01		0.38	0.41	0.40	0.02
Lys	[123456]	431	2		0.22	0.21	0.21	0.01	0.20	0.24		0.22	0.02	0.17	0.18		0.18	0.01		0.21	0.22	0.21	0.01
Lys	[123456]	431	3		0.05	0.02	0.03	0.02	0.04	0.02		0.03	0.01	0.06	0.04		0.05	0.01		0.02	0.02	0.02	0.01
Lys	[123456]	431	4		0.00	0.01	0.01	0.01	0.00	0.00		0.00	0.00	0.01	0.04		0.02	0.02		0.00	0.01	0.00	0.00
Lys	[123456]	431	5		####	####	####	0.01	0.00	####		####	0.01	0.00	0.00		0.00	0.00		0.02	0.00	0.01	0.02
Lys	[123456]	431	6		0.00	0.01	0.01	0.01	0.00	0.01		0.00	0.01	0.00	####		0.00	0.01		0.02	0.00	0.01	0.01
Lys	[123456]	488	0		0.35	0.33	0.34	0.01	0.36	0.34		0.35	0.01	0.34	0.36		0.35	0.01		0.33	0.37	0.35	0.03
Lys	[123456]	488	1		0.46	0.43	0.44	0.02	0.44	0.46		0.45	0.01	0.45	0.45		0.45	0.00		0.49	0.39	0.44	0.07
Lys	[123456]	488	2		0.21	0.20	0.20	0.01	0.15	0.15		0.15	0.00	0.19	0.16		0.17	0.02		0.17	0.26	0.21	0.06
Lys	[123456]	488	3		####	0.05	0.01	0.06	0.05	0.05		0.05	0.00	0.04	0.02		0.03	0.01		0.06	0.05	0.05	0.01
Lys	[123456]	488	4		0.00	0.00	0.00	0.00	####	0.00		####	0.02	####	0.00		####	0.02		####	####	####	0.01
Lys	[123456]	488	5		0.02	0.00	0.01	0.01	0.01	0.00		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.01	0.00	0.00
Lys	[123456]	488	6		0.00	0.00	0.00	0.00	0.01	0.00		0.01	0.01	0.01	0.00		0.00	0.01		0.00	0.00	0.00	0.00
Mal	[1234]	419	0	0.45	0.45	0.47	0.46	0.01	0.47	0.46	0.45	0.46	0.01	0.47	0.49	0.45	0.47	0.02		0.55	0.53	0.54	0.02
Mal	[1234]	419	1	0.42	0.43	0.42	0.42	0.01	0.42	0.42	0.42	0.42	0.00	0.42	0.41	0.42	0.41	0.01		0.40	0.38	0.39	0.02
Mal	[1234]	419	2	0.11	0.11	0.11	0.11	0.00	0.11	0.13	0.12	0.12	0.01	0.11	0.10	0.12	0.11	0.01		0.05	0.08	0.07	0.03
Mal	[1234]	419	3	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00		####	0.02	0.00	0.03
Mal	[1234]	419	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.02	####	0.00	0.02
Mal	[1234]	287	0	0.44	0.44	0.44	0.44	0.00	0.44	0.45	0.45	0.45		0.46	0.48	0.43	0.46	0.02		0.56	0.50	0.53	0.04
Mal	[1234]	287	1	0.42	0.42	0.42	0.42	0.00	0.38	0.42	0.41	0.40		0.41	0.40	0.42	0.41	0.01		0.28	0.25	0.26	0.02
Mal	[1234]	287	2	0.12	0.12	0.12	0.12	0.00	0.11	0.12	0.12	0.12		0.11	0.11	0.13	0.12	0.01		####	0.04	####	0.07
Mal	[1234]	287	3	0.01	0.02	0.01	0.01	0.00	0.03	0.00	0.02	0.02		0.02	0.01	0.02	0.02	0.00		0.01	0.07	0.04	0.04
Mal	[1234]	287	4	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01		0.00	0.00	0.00	0.00	0.00		0.21	0.14	0.17	0.04
Met	[2345]	218	0	0.48	0.48	0.47	0.48	0.00	0.46	0.45	0.45	0.45	0.01	0.48	0.48	0.48	0.48	0.00	0.50	0.49	0.50	0.50	0.01
Met	[2345]	218	1	0.39	0.41	0.41	0.40	0.01	0.41	0.41	0.42	0.41	0.00	0.41	0.40	0.41	0.41	0.01	0.38	0.38	0.39	0.39	0.00
Met	[2345]	218	2	0.11	0.11	0.11	0.11	0.00	0.11	0.13	0.13	0.12	0.01	0.10	0.11	0.11	0.11	0.00	0.11	0.14	0.11	0.12	0.02
Met	[2345]	218	3	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Met	[2345]	218	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	####	0.00	0.00	0.00
Met	[2345]	292	0	0.46	0.46	0.46	0.46	0.00	0.47	0.46	0.47	0.47	0.00	0.49	0.48	0.48	0.48	0.01	0.47	0.50	0.51	0.49	0.02
Met	[2345]	292	1	0.41	0.40	0.41	0.41	0.01	0.42	0.41	0.39	0.41	0.01	0.39	0.41	0.41	0.40	0.01	0.43	0.41	0.39	0.41	0.02
Met	[2345]	292	2	0.11	0.12	0.12	0.12	0.01	0.11	0.12	0.13	0.12	0.01	0.11	0.10	0.11	0.11	0.01	0.10	0.08	0.10	0.09	0.01
Met	[2345]	292	3	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Met	[2345]	292	4	####	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Met	[12345]	320	0	0.42	0.43	0.43	0.43	0.01	0.43	0.43	0.44	0.43	0.01	0.45	0.44	0.45	0.45	0.01	0.46	0.47	0.45	0.46	0.01
Met	[12345]	320	1	0.42	0.41	0.41	0.42	0.01	0.41	0.43	0.41	0.42	0.01	0.41	0.41	0.41	0.41	0.00	0.41	0.39	0.42	0.41	0.01
Met	[12345]	320	2	0.14	0.14	0.13	0.14	0.01	0.14	0.13	0.14	0.14	0.01	0.12	0.13	0.13	0.13	0.01	0.12	0.13	0.11	0.12	0.01
Met	[12345]	320	3	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Met	[12345]	320	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Met	[12345]	320	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	####	0.00	0.00	0.01
Phe	[23455667]	234	0	0.29	0.28	0.29	0.29	0.01	0.29	0.29	0.29	0.29	0.00	0.28	0.27	0.27	0.27	0.00	0.27	0.26	0.26	0.26	0.01
Phe	[23455667]	234	1	0.43	0.41	0.44	0.43	0.01	0.43	0.43	0.42	0.43	0.00	0.42	0.43	0.42	0.42	0.00	0.41	0.42	0.42	0.42	0.00

Phe	[23455667]	234	2	0.22	0.21	0.22	0.22	0.01	0.22	0.23	0.23	0.23	0.00	0.24	0.24	0.24	0.24	0.00	0.26	0.25	0.25	0.25	0.00
Phe	[23455667]	234	3	0.04	0.04	0.04	0.04	0.00	0.05	0.05	0.05	0.05	0.00	0.06	0.06	0.06	0.06	0.00	0.05	0.06	0.06	0.06	0.01
Phe	[23455667]	234	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Phe	[23455667]	234	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	7	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	8	0.01	0.05	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[12]	302	0	0.96	0.95	0.96	0.96	0.01	0.97	0.95	0.91	0.94	0.03	0.95	0.95	0.96	0.96	0.01	0.89	0.94	0.94	0.92	0.03
Phe	[12]	302	1	0.03	0.05	0.03	0.04	0.01	0.03	0.04	0.08	0.05	0.03	0.04	0.04	0.03	0.04	0.01	0.10	0.06	0.06	0.07	0.03
Phe	[12]	302	2	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Phe	[123455667]	336	0	0.29	0.29	0.30	0.29	0.01	0.28	0.28	0.29	0.28	0.01	0.27	0.27	0.27	0.27	0.00	0.25	0.27	0.25	0.26	0.01
Phe	[123455667]	336	1	0.43	0.43	0.42	0.43	0.00	0.43	0.43	0.43	0.43	0.00	0.42	0.42	0.42	0.42	0.00	0.42	0.41	0.42	0.41	0.01
Phe	[123455667]	336	2	0.23	0.22	0.23	0.22	0.00	0.24	0.24	0.23	0.24	0.01	0.24	0.25	0.24	0.24	0.00	0.26	0.25	0.26	0.26	0.01
Phe	[123455667]	336	3	0.05	0.05	0.05	0.05	0.00	0.05	0.04	0.05	0.05	0.00	0.06	0.06	0.06	0.06	0.00	0.07	0.07	0.07	0.07	0.00
Phe	[123455667]	336	4	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	####	0.01	0.00	0.00	0.01
Phe	[123455667]	336	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ser	[23]	288	0	0.74	0.75	0.74	0.74	0.00	0.73	0.73	0.73	0.73	0.00	0.74	0.76	0.75	0.75	0.01	0.77	0.74	0.74	0.75	0.02
Ser	[23]	288	1	0.26	0.25	0.25	0.25	0.00	0.27	0.26	0.26	0.26	0.00	0.25	0.25	0.24	0.25	0.00	0.24	0.26	0.26	0.25	0.01
Ser	[23]	288	2	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	####	0.00	0.00	0.01	####	0.00	0.01	0.00	0.01
Ser	[12]	302	0	0.97	0.97	0.97	0.97	0.00	0.97	0.96	0.96	0.96	0.00	0.94	0.94	0.93	0.94	0.01	0.92	0.93	0.94	0.93	0.01
Ser	[12]	302	1	0.03	0.03	0.03	0.03	0.00	0.03	0.04	0.04	0.03	0.00	0.05	0.05	0.06	0.06	0.01	0.07	0.07	0.07	0.07	0.00
Ser	[12]	302	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	####	0.00	0.01
Ser	[23]	362	0	0.76	0.76	0.76	0.76	0.00	0.74	0.76	0.73	0.74	0.01	0.77	0.76	0.76	0.76	0.01	0.75	0.75	0.75	0.75	0.00
Ser	[23]	362	1	0.24	0.25	0.24	0.24	0.00	0.26	0.26	0.27	0.26	0.00	0.25	0.25	0.23	0.24	0.01	0.25	0.26	0.25	0.26	0.00
Ser	[23]	362	2	####	0.00	0.00	0.00	0.00	0.00	####	0.00	####	0.01	####	####	0.00	####	0.01	0.00	####	0.00	0.00	0.00
Ser	[123]	390	0	0.73	0.73	0.74	0.73	0.00	0.72	0.73	0.72	0.73	0.00	0.73	0.71	0.72	0.72	0.01	0.74	0.70	0.70	0.71	0.02
Ser	[123]	390	1	0.26	0.26	0.26	0.26	0.00	0.27	0.27	0.27	0.27	0.00	0.27	0.28	0.27	0.27	0.01	0.26	0.29	0.29	0.28	0.02
Ser	[123]	390	2	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	####	0.02	0.00	0.00	0.01
Ser	[123]	390	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Thr	[234]	376	0	0.56	0.53	0.55	0.55	0.01	0.56	0.56	0.55	0.56	0.01	0.56	0.59	0.59	0.58	0.02	0.58	0.61	0.64	0.61	0.03
Thr	[234]	376	1	0.39	0.40	0.39	0.39	0.01	0.36	0.38	0.40	0.38	0.02	0.38	0.35	0.32	0.35	0.03	0.37	0.35	0.34	0.35	0.01
Thr	[234]	376	2	0.05	0.07	0.07	0.06	0.01	0.08	0.07	0.06	0.07	0.01	0.06	0.06	0.10	0.07	0.02	0.06	0.06	0.02	0.05	0.02
Thr	[234]	376	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	####	0.00	0.01	0.00	####	####	####	0.01
Thr	[1234]	404	0	0.49	0.48	0.48	0.49	0.01	0.53	0.49	0.49	0.50	0.02	0.49	0.53	0.49	0.50	0.02	0.56	0.57	0.53	0.55	0.02
Thr	[1234]	404	1	0.41	0.42	0.42	0.42	0.00	0.37	0.41	0.42	0.40	0.02	0.41	0.39	0.41	0.41	0.01	0.38	0.34	0.36	0.36	0.02
Thr	[1234]	404	2	0.08	0.09	0.09	0.09	0.01	0.10	0.09	0.08	0.09	0.01	0.10	0.08	0.12	0.10	0.02	0.07	0.09	0.10	0.09	0.01
Thr	[1234]	404	3	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.01	0.00	0.00	0.01	####	0.00	0.02	####	0.00	0.00	####	0.01
Thr	[1234]	404	4	0.00	0.00	0.00	0.00	0.00	####	0.00	####	####	0.00	0.00	####	####	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Tyr	[12]	302	0	0.97	0.98	0.97	0.97	0.00	0.97	0.96	0.95			0.96	0.96	0.96	0.96	0.00	0.92		0.92	0.92	0.00
Tyr	[12]	302	1	0.02	0.02	0.02	0.02	0.00	0.03	0.03	0.05			0.04	0.04	0.04	0.04	0.00	0.07		0.07	0.07	0.00
Tyr	[12]	302	2	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.01		0.01	0.01	0.00
Tyr	[23455667]	364	0	0.28	0.31	0.29	0.29	0.01	0.32	0.29	0.27			0.27	0.28	0.28	0.28	0.00	0.27		0.28	0.28	0.00
Tyr	[23455667]	364	1	0.43	0.42	0.43	0.43	0.01	0.38	0.44	0.35			0.42	0.41	0.41	0.41	0.01	0.39		0.40	0.40	0.00
Tyr	[23455667]	364	2	0.22	0.22	0.22	0.22	0.01	0.24	0.20	0.27			0.23	0.25	0.25	0.24	0.01	0.21		0.24	0.22	0.02
Tyr	[23455667]	364	3	0.06	0.04	0.05	0.05	0.01	0.06	0.05	0.06			0.06	0.06	0.06	0.06	0.00	0.09		0.06	0.08	0.02
Tyr	[23455667]	364	4	0.00	0.01	0.01	0.01	0.00	####	0.01	0.01			0.01	0.01	0.01	0.01	0.00	0.01		0.00	0.01	0.01
Tyr	[23455667]	364	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02			0.00	0.00	####	0.00	0.00	0.01		0.00	0.01	0.01
Tyr	[23455667]	364	6	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00			0.00	0.00	0.01	0.00	0.01	0.00		0.00	0.00	0.00
Tyr	[23455667]	364	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.01		0.00	0.01	0.01
Tyr	[23455667]	364	8	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03			0.00	0.00	0.00	0.00	0.00	0.01		0.01	0.01	0.00
Tyr	[23455667]	438	0	0.30	0.30	0.30	0.30	0.00	0.26	0.29	0.26			0.28	0.28	0.27	0.28	0.01	0.22		0.25	0.24	0.02
Tyr	[23455667]	438	1	0.41	0.43	0.43	0.42	0.01	0.43	0.42	0.42			0.42	0.43	0.44	0.43	0.01	0.40		0.45	0.43	0.04
Tyr	[23455667]	438	2	0.23	0.22	0.22	0.22	0.01	0.20	0.25	0.22			0.24	0.23	0.23	0.24	0.00	0.30		0.23	0.27	0.06
Tyr	[23455667]	438	3	0.07	0.06	0.04	0.05	0.01	0.05	0.04	0.07			0.05	0.05	0.03	0.05	0.01	0.05		0.04	0.05	0.01
Tyr	[23455667]	438	4	####	0.00	0.00	0.00	0.01	0.01	0.00	0.02			0.01	0.00	0.02	0.01	0.01	####		0.03	0.01	0.03
Tyr	[23455667]	438	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.01		####	####	0.02
Tyr	[23455667]	438	6	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00		0.01	0.01	0.01
Tyr	[23455667]	438	7	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00			0.00	0.01	0.01	0.00	0.00	0.03		0.01	0.02	0.01
Tyr	[23455667]	438	8	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.01			0.00	0.00	0.00	0.00	0.00	0.01		0.00	0.00	0.00
Tyr	[123455667]	466	0	0.30	0.28	0.30	0.30	0.01	0.31	0.27	0.27			0.28	0.27	0.29	0.28	0.01	0.26		0.27	0.27	0.00
Tyr	[123455667]	466	1	0.41	0.43	0.43	0.42	0.01	0.42	0.43	0.47			0.42	0.41	0.42	0.42	0.01	0.42		0.41	0.41	0.01
Tyr	[123455667]	466	2	0.23	0.24	0.23	0.23	0.01	0.20	0.23	0.23			0.23	0.24	0.23	0.24	0.00	0.23		0.24	0.24	0.00
Tyr	[123455667]	466	3	0.05	0.05	0.04	0.04	0.01	0.05	0.05	0.02			0.06	0.05	0.05	0.05	0.00	0.07		0.07	0.07	0.00
Tyr	[123455667]	466	4	0.00	0.01	0.00	0.00	0.00	0.00	0.01	####			0.01	0.00	0.01	0.01	0.00	0.01		0.01	0.01	0.00
Tyr	[123455667]	466	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01			####	0.00	0.00	0.00	0.00	####		0.00	0.00	0.00
Tyr	[123455667]	466	6	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00

Tyr	[123455667]	466	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.01		0.00	0.00	0.00
Tyr	[123455667]	466	8	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Tyr	[123455667]	466	9	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00			0.00	0.02	0.00	0.01	0.01	0.00		0.00	0.00	0.00
Val	[2345]	186	0	0.41	0.41	0.41	0.41	0.00	0.41	0.41	0.40	0.41	0.01	0.41	0.41	0.41	0.41	0.00	0.44	0.42	0.43	0.43	0.01
Val	[2345]	186	1	0.44	0.44	0.44	0.44	0.00	0.44	0.43	0.44	0.44	0.00	0.43	0.43	0.43	0.43	0.00	0.41	0.44	0.43	0.42	0.02
Val	[2345]	186	2	0.13	0.13	0.13	0.13	0.00	0.13	0.13	0.14	0.14	0.00	0.13	0.13	0.14	0.14	0.00	0.13	0.12	0.12	0.12	0.01
Val	[2345]	186	3	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00
Val	[2345]	186	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Val	[2345]	260	0	0.42	0.42	0.41	0.42	0.00	0.40	0.41	0.40	0.40	0.01	0.41	0.42	0.41	0.41	0.00	0.44	0.42	0.42	0.43	0.01
Val	[2345]	260	1	0.43	0.44	0.44	0.44	0.00	0.45	0.44	0.45	0.45	0.01	0.44	0.44	0.45	0.44	0.01	0.43	0.44	0.44	0.44	0.00
Val	[2345]	260	2	0.14	0.14	0.14	0.14	0.00	0.14	0.14	0.14	0.14	0.00	0.14	0.14	0.13	0.14	0.00	0.12	0.13	0.13	0.13	0.01
Val	[2345]	260	3	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00
Val	[2345]	260	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Val	[12345]	288	0	0.40	0.40	0.40	0.40	0.00	0.40	0.39	0.38	0.39	0.01	0.40	0.39	0.40	0.40	0.01	0.39	0.41	0.40	0.40	0.01
Val	[12345]	288	1	0.44	0.44	0.44	0.44	0.00	0.45	0.45	0.45	0.45	0.00	0.44	0.46	0.44	0.45	0.01	0.44	0.44	0.45	0.44	0.01
Val	[12345]	288	2	0.14	0.15	0.14	0.14	0.00	0.14	0.15	0.15	0.15	0.00	0.15	0.14	0.14	0.14	0.00	0.16	0.14	0.14	0.15	0.01
Val	[12345]	288	3	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.02	0.01	0.01
Val	[12345]	288	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Val	[12345]	288	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Val	[12]	302	0	0.86	0.87	0.87	0.87	0.00	0.87	0.85	0.84	0.85	0.02	0.86	0.85	0.88	0.86	0.02	0.84	0.85	0.85	0.85	0.00
Val	[12]	302	1	0.13	0.12	0.11	0.12	0.01	0.12	0.12	0.13	0.12	0.01	0.13	0.14	0.13	0.13	0.01	0.16	0.14	0.13	0.14	0.02
Val	[12]	302	2	0.01	0.01	0.02	0.01	0.00	0.01	0.03	0.03	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.02	0.01	0.01

Table S9. Isotopomer abundances of soluble amino acids from poplar cell in 28% U-13C ILE

Condition ►				CN					cN					Cn					cn				
				MID					MID					MID					MID				
AA	fragment	m/z	Mass	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD
Ala	[23]	232	0	0.64	0.65	0.65	0.65	0.01	0.63	0.64	0.63	0.63	0.01	0.63	0.63	0.61	0.62	0.01	0.64		0.63	0.63	0.01
Ala	[23]	232	1	0.11	0.10	0.10	0.10	0.00	0.17	0.18	0.18	0.18	0.00	0.15	0.16	0.18	0.16	0.02	0.18		0.18	0.18	0.00
Ala	[23]	232	2	0.25	0.25	0.25	0.25	0.00	0.19	0.18	0.19	0.19	0.00	0.22	0.20	0.21	0.21	0.01	0.18		0.19	0.18	0.00
Ala	[123]	260	0	0.61	0.61	0.61	0.61	0.00	0.58	0.57	0.57	0.57	0.00	0.59	0.58	0.58	0.59	0.01	0.57		0.55	0.56	0.02
Ala	[123]	260	1	0.11	0.11	0.11	0.11	0.00	0.17	0.16	0.17	0.17	0.00	0.14	0.16	0.17	0.16	0.01	0.18		0.18	0.18	0.00
Ala	[123]	260	2	0.07	0.08	0.08	0.08	0.00	0.10	0.11	0.11	0.11	0.00	0.08	0.10	0.08	0.09	0.01	0.11		0.13	0.12	0.01
Ala	[123]	260	3	0.21	0.21	0.21	0.21	0.00	0.15	0.15	0.15	0.15	0.00	0.18	0.16	0.17	0.17	0.01	0.14		0.14	0.14	0.00
Asp	[12]	302	0	0.63	0.62	0.62	0.62	0.01	0.65	0.65		0.65	0.00		0.65	0.65	0.65	0.00	0.67	0.66		0.67	0.01
Asp	[12]	302	1	0.19	0.19	0.21	0.20	0.01	0.19	0.18		0.19	0.01		0.21	0.21	0.21	0.00	0.18	0.19		0.19	0.01
Asp	[12]	302	2	0.19	0.18	0.18	0.18	0.00	0.16	0.17		0.16	0.01		0.14	0.14	0.14	0.00	0.14	0.15		0.14	0.00
Asp	[234]	316	0	0.52	0.52	0.51	0.52	0.01	0.59	0.57		0.58	0.02		0.56	0.57	0.56	0.00	0.57	0.55		0.56	0.01
Asp	[234]	316	1	0.22	0.23	0.24	0.23	0.01	0.17	0.21		0.19	0.03		0.20	0.21	0.20	0.00	0.22	0.26		0.24	0.03
Asp	[234]	316	2	0.16	0.16	0.16	0.16	0.00	0.17	0.12		0.15	0.03		0.16	0.17	0.17	0.00	0.14	0.13		0.14	0.01
Asp	[234]	316	3	0.10	0.09	0.09	0.09	0.01	0.07	0.10		0.08	0.03		0.07	0.06	0.07	0.01	0.06	0.06		0.06	0.00
Asp	[234]	390	0	0.53	0.53	0.52	0.53	0.01	0.57	0.53		0.55	0.02		0.53	0.52	0.53	0.00	0.56	0.55		0.56	0.01
Asp	[234]	390	1	0.21	0.23	0.23	0.22	0.01	0.24	0.25		0.25	0.00		0.28	0.28	0.28	0.00	0.24	0.25		0.25	0.00
Asp	[234]	390	2	0.17	0.15	0.16	0.16	0.01	0.17	0.17		0.17	0.00		0.14	0.14	0.14	0.00	0.13	0.14		0.13	0.01
Asp	[234]	390	3	0.09	0.09	0.09	0.09	0.00	0.02	0.05		0.03	0.02		0.05	0.05	0.05	0.00	0.07	0.07		0.07	0.00
Asp	[1234]	418	0	0.45	0.45	0.45	0.45	0.01	0.54	0.45		0.50	0.06		0.50	0.50	0.50	0.00	0.48	0.48		0.48	0.00
Asp	[1234]	418	1	0.23	0.22	0.22	0.22	0.01	0.19	0.30		0.24	0.08		0.23	0.22	0.23	0.00	0.23	0.24		0.23	0.00
Asp	[1234]	418	2	0.17	0.16	0.17	0.17	0.00	0.14	0.10		0.12	0.03		0.17	0.17	0.17	0.00	0.14	0.17		0.16	0.02
Asp	[1234]	418	3	0.11	0.13	0.11	0.12	0.01	0.10	0.10		0.10	0.00		0.06	0.06	0.06	0.00	0.11	0.09		0.10	0.01
Asp	[1234]	418	4	0.05	0.04	0.05	0.05	0.00	0.02	0.05		0.04	0.02		0.04	0.05	0.05	0.00	0.04	0.02		0.03	0.01
Glr	[123]	377	0	0.66	0.67	0.66	0.67	0.00	0.65	0.64	0.65	0.65	0.01		0.64	0.66	0.65	0.01	0.64	0.63	0.63	0.63	0.00
Glr	[123]	377	1	0.05	0.09	0.07	0.07	0.02	0.07	0.08	0.07	0.07	0.01		0.07	0.10	0.09	0.02	0.10	0.10	0.10	0.10	0.00
Glr	[123]	377	2	0.05	0.04	0.04	0.04	0.01	0.05	0.05	0.06	0.05	0.01		0.07	0.02	0.04	0.03	0.04	0.06	0.05	0.05	0.01
Glr	[123]	377	3	0.24	0.21	0.23	0.23	0.02	0.23	0.23	0.23	0.23	0.00		0.22	0.22	0.22	0.00	0.22	0.21	0.21	0.21	0.00
Glu	[2345]	330	0	0.44	0.44	0.50	0.46	0.04	0.43		0.45	0.44	0.02	0.41	0.40		0.40	0.01	0.35	0.35		0.35	0.00
Glu	[2345]	330	1	0.20	0.21	0.19	0.20	0.01	0.21		0.22	0.22	0.01	0.20	0.27		0.23	0.05	0.19	0.16		0.18	0.02
Glu	[2345]	330	2	0.28	0.26	0.21	0.25	0.04	0.25		0.23	0.24	0.02	0.25	0.22		0.23	0.02	0.29	0.27		0.28	0.01
Glu	[2345]	330	3	0.05	0.05	0.06	0.05	0.01	0.07		0.06	0.07	0.01	0.11	0.07		0.09	0.03	0.09	0.14		0.12	0.03
Glu	[2345]	330	4	0.04	0.03	0.04	0.04	0.01	0.03		0.03	0.03	0.00	0.04	0.05		0.04	0.01	0.07	0.07		0.07	0.00
Glu	[12345]	432	0	0.39	0.39	0.36	0.38	0.02	0.40		0.41	0.40	0.01	0.32	0.35		0.34	0.02	0.38	0.36		0.37	0.01
Glu	[12345]	432	1	0.19	0.22	0.19	0.20	0.01	0.22		0.22	0.22	0.00	0.25	0.20		0.23	0.03	0.25	0.25		0.25	0.00
Glu	[12345]	432	2	0.24	0.24	0.27	0.25	0.02	0.23		0.22	0.23	0.00	0.24	0.23		0.23	0.00	0.22	0.24		0.23	0.02
Glu	[12345]	432	3	0.11	0.08	0.11	0.10	0.02	0.10		0.11	0.11	0.00	0.14	0.16		0.15	0.01	0.13	0.10		0.11	0.02
Glu	[12345]	432	4	0.05	0.05	0.04	0.05	0.01	0.03		0.03	0.03	0.00	0.03	0.03		0.03	0.00	0.02	0.01		0.02	0.00
Glu	[12345]	432	5	0.02	0.02	0.03	0.02	0.00	0.01		0.02	0.01	0.00	0.02	0.03		0.03	0.01	0.01	0.03		0.02	0.01
Gly	[2]	218	0	0.71	0.71	0.71	0.71	0.00	0.71	0.72	0.71	0.71	0.01	0.73	0.71	0.71	0.72	0.01	0.71	0.69	0.69	0.70	0.01
Gly	[2]	218	1	0.29	0.29	0.29	0.29	0.00	0.29	0.28	0.29	0.29	0.01	0.27	0.29	0.29	0.28	0.01	0.29	0.31	0.31	0.30	0.01
Gly	[12]	246	0	0.63	0.65	0.65	0.64	0.01	0.66	0.65	0.66	0.66	0.01		0.61	0.64	0.62	0.02	0.65	0.65		0.65	0.00
Gly	[12]	246	1	0.13	0.12	0.12	0.12	0.01	0.11	0.11	0.11	0.11	0.00		0.19	0.17	0.18	0.01	0.17	0.16		0.16	0.01
Gly	[12]	246	2	0.24	0.23	0.23	0.23	0.00	0.24	0.24	0.23	0.24	0.00		0.21	0.19	0.20	0.01	0.19	0.19		0.19	0.00
His	[2345]	196	0	0.32	0.32	0.32	0.32	0.00	0.32	0.31	0.31	0.31	0.01	0.31	0.30	0.29	0.30	0.01	0.29	0.31	0.31	0.30	0.01
His	[2345]	196	1	0.35	0.34	0.34	0.34	0.01	0.34	0.32	0.32	0.33	0.01	0.34	0.36	0.36	0.35	0.01	0.34	0.34	0.34	0.34	0.00
His	[2345]	196	2	0.19	0.20	0.20	0.20	0.00	0.20	0.21	0.21	0.21	0.01	0.22	0.22	0.22	0.22	0.00	0.22	0.22	0.22	0.22	0.00
His	[2345]	196	3	0.11	0.11	0.11	0.11	0.00	0.12	0.12	0.13	0.12	0.00	0.10	0.10	0.10	0.10	0.00	0.12	0.11	0.11	0.11	0.00
His	[2345]	196	4	0.03	0.03	0.03	0.03	0.00	0.03	0.03	0.03	0.03	0.00	0.03	0.02	0.03	0.03	0.00	0.03	0.01	0.01	0.02	0.01
His	[23456]	338	0	0.30	0.31	0.31	0.30	0.01	0.31	0.29	0.29	0.30	0.01	0.30	0.26	0.26	0.27	0.02	0.32	0.31	0.31	0.31	0.01
His	[23456]	338	1	0.26	0.25	0.24	0.25	0.01	0.26	0.24	0.24	0.25	0.01	0.26	0.28	0.28	0.27	0.01	0.27	0.27	0.27	0.27	0.00
His	[23456]	338	2	0.22	0.23	0.23	0.23	0.01	0.21	0.22	0.22	0.22	0.01	0.21	0.22	0.23	0.22	0.01	0.19	0.22	0.22	0.21	0.02
His	[23456]	338	3	0.13	0.12	0.12	0.12	0.01	0.12	0.12	0.12	0.12	0.00	0.14	0.15	0.15	0.14	0.01	0.13	0.13	0.13	0.13	0.00
His	[23456]	338	4	0.07	0.06	0.08	0.07	0.01	0.07	0.09	0.09	0.08	0.01	0.07	0.08	0.07	0.07	0.00	0.08	0.06	0.06	0.06	0.01
His	[23456]	338	5	0.02	0.03	0.02	0.02	0.01	0.02	0.04	0.04	0.03	0.01	0.02	0.02	0.02	0.02	0.00	0.01	0.02	0.02	0.01	0.01
His	[123456]	440	0	0.29	0.30	0.30	0.30	0.00	0.33	0.30	0.30	0.31	0.02	0.29	0.30	0.29	0.29	0.00	0.31	0.28	0.28	0.29	0.02
His	[123456]	440	1	0.24	0.23	0.23	0.24	0.00	0.22	0.23	0.23	0.23	0.01	0.24	0.25	0.25	0.25	0.01	0.23	0.24	0.24	0.24	0.00
His	[123456]	440	2	0.15	0.15	0.15	0.15	0.00	0.16	0.14	0.14	0.15	0.01	0.16	0.18	0.18	0.17	0.01	0.17	0.17	0.17	0.17	0.00
His	[123456]	440	3	0.14	0.14	0.15	0.14	0.01	0.12	0.14	0.14	0.13	0.01	0.15	0.10	0.11	0.12	0.02	0.13	0.14	0.14	0.14	0.01
His	[123456]	440	4	0.08	0.08	0.08	0.08	0.00	0.09	0.09	0.09	0.09	0.00	0.09	0.07	0.08	0.08	0.01	0.10	0.10	0.10	0.10	0.00
His	[123456]	440	5	0.07	0.07	0.07	0.07	0.00	0.05	0.07	0.07	0.06	0.01	0.06	0.09	0.10	0.08	0.02	0.06	0.07	0.07	0.07	0.00
His	[123456]	440	6	0.02	0.02	0.02	0.02	0.00	0.03	0.02	0.02	0.02	0.00	0.02	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Ile	[23456]	200	0	0.36	0.36	0.36	0.36	0.00	0.36	0.35	0.35	0.35	0.00	0.38	0.38	0.38	0.38	0.00	0.38	0.38	0.37	0.38	0.01
Ile	[23456]	200	1	0.19	0.20	0.20	0.19	0.00	0.21	0.22	0.21	0.22	0.01	0.22	0.21	0.22	0.22	0.00	0.22	0.22	0.23	0.22	0.01

Ile	[23456]	200	2	0.25	0.25	0.25	0.25	0.00	0.25	0.25	0.25	0.25	0.00	0.23	0.24	0.24	0.24	0.01	0.25	0.26	0.23	0.25	0.02
Ile	[23456]	200	3	0.13	0.12	0.12	0.13	0.00	0.12	0.12	0.12	0.12	0.00	0.11	0.11	0.12	0.11	0.00	0.11	0.11	0.12	0.11	0.01
Ile	[23456]	200	4	0.05	0.05	0.05	0.05	0.00	0.04	0.04	0.04	0.04	0.00	0.05	0.04	0.04	0.04	0.01	0.04	0.01	0.03	0.03	0.02
Ile	[23456]	200	5	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.03	0.01	0.02	0.01
Ile	[23456]	274	0	0.36	0.36	0.36	0.36	0.00	0.36	0.35	0.35	0.35	0.01	0.36	0.37	0.37	0.37	0.01	0.39	0.38	0.38	0.38	0.00
Ile	[23456]	274	1	0.18	0.20	0.20	0.19	0.01	0.21	0.21	0.21	0.21	0.00	0.24	0.21	0.20	0.22	0.02	0.23	0.24	0.23	0.23	0.01
Ile	[23456]	274	2	0.26	0.25	0.24	0.25	0.01	0.25	0.25	0.25	0.25	0.00	0.25	0.26	0.27	0.26	0.01	0.23	0.25	0.27	0.25	0.02
Ile	[23456]	274	3	0.13	0.12	0.13	0.13	0.00	0.13	0.13	0.12	0.13	0.00	0.12	0.11	0.11	0.11	0.01	0.11	0.09	0.09	0.10	0.01
Ile	[23456]	274	4	0.05	0.04	0.04	0.04	0.00	0.04	0.04	0.04	0.04	0.00	0.02	0.03	0.04	0.03	0.01	0.04	0.03	0.03	0.03	0.01
Ile	[23456]	274	5	0.03	0.02	0.02	0.02	0.00	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00
Leu	[23456]	200	0	0.34	0.35	0.34	0.35	0.01	0.36	0.36	0.36	0.36	0.00	0.38	0.39	0.38	0.38	0.01	0.38	0.38	0.39	0.38	0.01
Leu	[23456]	200	1	0.18	0.18	0.19	0.19	0.00	0.18	0.18	0.18	0.18	0.00	0.16	0.17	0.18	0.17	0.01	0.18	0.19	0.18	0.18	0.00
Leu	[23456]	200	2	0.29	0.28	0.29	0.29	0.00	0.29	0.29	0.29	0.29	0.00	0.29	0.29	0.29	0.29	0.00	0.29	0.28	0.30	0.29	0.01
Leu	[23456]	200	3	0.11	0.11	0.11	0.11	0.00	0.10	0.09	0.10	0.10	0.00	0.10	0.09	0.08	0.09	0.01	0.09	0.09	0.07	0.08	0.01
Leu	[23456]	200	4	0.06	0.06	0.06	0.06	0.00	0.06	0.06	0.06	0.06	0.00	0.06	0.05	0.05	0.05	0.00	0.06	0.05	0.05	0.05	0.00
Leu	[23456]	200	5	0.02	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.01	0.00
Leu	[23456]	274	0	0.35	0.35	0.34	0.34	0.00	0.36	0.36	0.36	0.36	0.00	0.43	0.38	0.38	0.40	0.03	0.38	0.39	0.38	0.38	0.01
Leu	[23456]	274	1	0.19	0.19	0.19	0.19	0.00	0.18	0.17	0.19	0.18	0.01	0.13	0.18	0.18	0.17	0.03	0.18	0.18	0.16	0.17	0.01
Leu	[23456]	274	2	0.29	0.29	0.29	0.29	0.00	0.29	0.29	0.28	0.29	0.01	0.32	0.28	0.29	0.29	0.02	0.29	0.29	0.27	0.28	0.01
Leu	[23456]	274	3	0.11	0.11	0.11	0.11	0.00	0.10	0.10	0.10	0.10	0.00	0.07	0.09	0.09	0.08	0.01	0.09	0.08	0.10	0.09	0.01
Leu	[23456]	274	4	0.06	0.06	0.06	0.06	0.00	0.06	0.06	0.06	0.06	0.00	0.03	0.06	0.05	0.05	0.01	0.06	0.06	0.08	0.06	0.01
Leu	[23456]	274	5	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00
Lys	[23456]	329	0	0.36		0.35	0.36	0.01	0.35	0.36	0.37	0.36	0.01	0.39		0.39	0.39	0.00	0.34	0.42	0.43	0.39	0.05
Lys	[23456]	329	1	0.22		0.19	0.20	0.02	0.22	0.23	0.21	0.22	0.01	0.21		0.18	0.19	0.02	0.23	0.20	0.17	0.20	0.03
Lys	[23456]	329	2	0.24		0.28	0.26	0.03	0.25	0.25	0.26	0.25	0.01	0.22		0.27	0.24	0.04	0.26	0.23	0.26	0.25	0.02
Lys	[23456]	329	3	0.13		0.15	0.14	0.01	0.12	0.13	0.12	0.12	0.01	0.15		0.11	0.13	0.03	0.12	0.09	0.10	0.10	0.01
Lys	[23456]	329	4	0.04		0.02	0.03	0.01	0.05	0.00	0.04	0.03	0.02	0.02		0.04	0.03	0.01	0.04	0.05	0.04	0.04	0.01
Lys	[23456]	329	5	0.02		0.01	0.01	0.01	0.02	0.03	0.01	0.02	0.01	0.01		0.01	0.01	0.00	0.02	0.00	0.01	0.01	0.01
Lys	[123456]	431	0	0.37		0.37	0.37	0.00	0.33	0.36	0.32	0.33	0.02	0.32		0.33	0.33	0.01	0.44	0.34	0.39	0.39	0.05
Lys	[123456]	431	1	0.14		0.20	0.17	0.04	0.21	0.18	0.20	0.20	0.01	0.19		0.28	0.23	0.06	0.24	0.28	0.21	0.25	0.03
Lys	[123456]	431	2	0.21		0.14	0.17	0.05	0.19	0.22	0.20	0.21	0.01	0.21		0.18	0.19	0.02	0.19	0.13	0.20	0.17	0.03
Lys	[123456]	431	3	0.18		0.20	0.19	0.02	0.17	0.15	0.15	0.15	0.01	0.16		0.13	0.15	0.02	0.07	0.17	0.04	0.09	0.06
Lys	[123456]	431	4	0.05		0.06	0.05	0.00	0.08	0.06	0.09	0.07	0.01	0.10		0.08	0.09	0.02	0.04	0.07	0.13	0.08	0.05
Lys	[123456]	431	5	0.03		0.02	0.03	0.01	0.02	0.02	0.03	0.02	0.01	0.02		0.01	0.01	0.00	0.02	0.02	####	0.01	0.02
Lys	[123456]	431	6	0.01		0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00		####	####	0.01	0.00	####	0.03	0.01	0.02
Lys	[123456]	488	0	0.36		0.35	0.35	0.01	0.36	0.37	0.34	0.35	0.01	0.40		0.36	0.38	0.03	0.38	0.44	0.41	0.41	0.03
Lys	[123456]	488	1	0.19		0.26	0.22	0.05	0.19	0.20	0.23	0.20	0.02	0.18		0.22	0.20	0.03	0.23	0.13	0.17	0.18	0.05
Lys	[123456]	488	2	0.16		0.11	0.13	0.04	0.19	0.20	0.16	0.18	0.02	0.16		0.22	0.19	0.05	0.11	0.17	0.17	0.15	0.04
Lys	[123456]	488	3	0.20		0.17	0.19	0.02	0.18	0.18	0.17	0.18	0.01	0.11		0.17	0.14	0.04	0.22	0.17	0.17	0.19	0.03
Lys	[123456]	488	4	0.05		0.09	0.07	0.03	0.05	0.03	0.07	0.05	0.02	0.13		0.02	0.08	0.08	0.07	0.14	0.08	0.10	0.04
Lys	[123456]	488	5	0.04		0.05	0.04	0.01	0.02	0.04	0.03	0.03	0.01	0.04		0.00	0.02	0.03	0.02	####	####	####	0.03
Lys	[123456]	488	6	0.00		####	####	0.02	0.01	####	0.00	0.00	0.01	####		0.00	####	0.01	####	####	0.01	####	0.02
Mal	[1234]	419	0	0.44	0.45	0.45	0.44	0.01	0.48	0.48	0.47	0.48	0.01	0.42	0.42		0.42	0.00	0.43		0.42	0.42	0.01
Mal	[1234]	419	1	0.22	0.22	0.22	0.22	0.00	0.22	0.21	0.22	0.22	0.01	0.25	0.25		0.25	0.00	0.25		0.26	0.26	0.01
Mal	[1234]	419	2	0.17	0.17	0.18	0.17	0.00	0.17	0.17	0.18	0.17	0.00	0.19	0.19		0.19	0.00	0.17		0.18	0.17	0.01
Mal	[1234]	419	3	0.12	0.12	0.12	0.12	0.00	0.10	0.10	0.10	0.10	0.00	0.11	0.10		0.11	0.00	0.12		0.11	0.12	0.00
Mal	[1234]	419	4	0.05	0.04	0.04	0.04	0.01	0.03	0.04	0.03	0.03	0.00	0.03	0.03		0.03	0.00	0.03		0.04	0.04	0.00
Mal	[1234]	287	0	0.43	0.43	0.42	0.42	0.01	0.42			0.42		0.37	0.37		0.37	0.00	0.41		0.40	0.41	0.00
Mal	[1234]	287	1	0.22	0.21	0.22	0.22	0.00	0.22			0.22		0.24	0.24		0.24	0.00	0.23		0.27	0.25	0.03
Mal	[1234]	287	2	0.18	0.18	0.18	0.18	0.00	0.19			0.19		0.20	0.20		0.20	0.00	0.19		0.19	0.19	0.00
Mal	[1234]	287	3	0.13	0.13	0.13	0.13	0.00	0.12			0.12		0.12	0.12		0.12	0.00	0.12		0.08	0.10	0.03
Mal	[1234]	287	4	0.06	0.05	0.05	0.05	0.00	0.05			0.05		0.07	0.07		0.07	0.00	0.05		0.05	0.05	0.01
Met	[2345]	218	0	0.42	0.42	0.40	0.41	0.01	0.41	0.42	0.42	0.41	0.01	0.42	0.42	0.44	0.43	0.01	0.45	0.42	0.47	0.45	0.03
Met	[2345]	218	1	0.28	0.29	0.29	0.29	0.01	0.30	0.33	0.30	0.31	0.02	0.32	0.29	0.32	0.31	0.02	0.30	0.32	0.28	0.30	0.02
Met	[2345]	218	2	0.13	0.13	0.14	0.13	0.01	0.14	0.11	0.13	0.13	0.02	0.10	0.11	0.08	0.10	0.02	0.08	0.08	0.08	0.08	0.00
Met	[2345]	218	3	0.14	0.13	0.13	0.13	0.00	0.12	0.10	0.11	0.11	0.01	0.12	0.13	0.10	0.12	0.02	0.13	0.16	0.11	0.13	0.02
Met	[2345]	218	4	0.03	0.03	0.03	0.03	0.00	0.04	0.04	0.04	0.04	0.00	0.04	0.04	0.05	0.04	0.01	0.04	0.02	0.06	0.04	0.02
Met	[2345]	292	0	0.41	0.41	0.40	0.41	0.01	0.41	0.43	0.42	0.42	0.01	0.43	0.41	0.47	0.44	0.03	0.44	0.40	0.46	0.43	0.03
Met	[2345]	292	1	0.29	0.29	0.29	0.29	0.00	0.30	0.29	0.30	0.29	0.01	0.31	0.29	0.28	0.29	0.01	0.29	0.30	0.29	0.29	0.00
Met	[2345]	292	2	0.15	0.14	0.15	0.15	0.00	0.13	0.14	0.13	0.13	0.01	0.11	0.14	0.09	0.11	0.02	0.10	0.13	0.10	0.11	0.02
Met	[2345]	292	3	0.12	0.12	0.14	0.13	0.01	0.12	0.12	0.12	0.12	0.00	0.12	0.12	0.13	0.12	0.00	0.12	0.13	0.12	0.13	0.01
Met	[2345]	292	4	0.03	0.04	0.03	0.03	0.01	0.03	0.03	0.04	0.03	0.00	0.03	0.04	0.03	0.03	0.00	0.04	0.04	0.04	0.04	0.00
Met	[12345]	320	0	0.36	0.35	0.34	0.35	0.01	0.35	0.35	0.35	0.35	0.00	0.35	0.38	0.35	0.36	0.01	0.34	0.40	0.39	0.38	0.03
Met	[12345]	320	1	0.28	0.29	0.29	0.28	0.01	0.30	0.30	0.30	0.30	0.00	0.32	0.29	0.31	0.31	0.02	0.33	0.32	0.20	0.28	0.07
Met	[12345]	320	2	0.12	0.14	0.15	0.14	0.01	0.15	0.14	0.13	0.14	0.01	0.10	0.13	0.14	0.12	0.02	0.15	0.16	0.14	0.15	0.01
Met	[12345]	320	3	0.14	0.13	0.13	0.13	0.00	0.13	0.12	0.13	0.12	0.00	0.14	0.14	0.12	0.13	0.01	0.10	0.03	0.22	0.12	0.10
Met	[12345]	320	4	0.09	0.08	0.07	0.08	0.01	0.07	0.08	0.08	0.08	0.01	0.08	0.06	0.08	0.08	0.01	0.05	0.07	0.06	0.06	0.01
Met	[12345]	320	5	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.01	0.01	0.00	0.01	0.03	0.02	####	0.01	0.02
Phe	[23455667]	234	0	0.23	0.24	0.22	0.23	0.01	0.23	0.23	0.22	0.23	0.00	0.23	0.22	0.23	0.23	0.01	0.22	0.26	0.23	0.24	0.02
Phe	[23455667]	234	1	0.13	0.14	0.13	0.13	0.01	0.13	0.13	0.12	0.13	0.00	0.15	0.12	0.14	0.14	0.01	0.15	0.15	0.13	0.14	0.01

Phe	[23455667]	234	2	0.22	0.21	0.22	0.21	0.01	0.22	0.23	0.21	0.22	0.01	0.21	0.22	0.22	0.22	0.00	0.22	0.20	0.21	0.21	0.01
Phe	[23455667]	234	3	0.17	0.17	0.17	0.17	0.00	0.16	0.16	0.17	0.16	0.01	0.16	0.18	0.17	0.17	0.01	0.17	0.16	0.17	0.17	0.00
Phe	[23455667]	234	4	0.11	0.10	0.12	0.11	0.01	0.11	0.11	0.11	0.11	0.00	0.11	0.12	0.11	0.11	0.01	0.12	0.08	0.12	0.11	0.02
Phe	[23455667]	234	5	0.09	0.08	0.08	0.08	0.01	0.08	0.08	0.09	0.08	0.00	0.08	0.08	0.07	0.08	0.01	0.08	0.09	0.07	0.08	0.01
Phe	[23455667]	234	6	0.04	0.04	0.04	0.04	0.00	0.04	0.06	0.05	0.05	0.01	0.05	0.04	0.04	0.04	0.00	0.04	0.04	0.03	0.04	0.00
Phe	[23455667]	234	7	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Phe	[23455667]	234	8	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.01	0.00
Phe	[12]	302	0	0.66	0.66	0.66	0.66	0.00	0.66	0.66	0.65	0.66	0.00	0.66	0.66	0.67	0.66	0.01	0.65	0.65	0.66	0.65	0.01
Phe	[12]	302	1	0.10	0.10	0.10	0.10	0.00	0.10	0.10	0.11	0.10	0.00	0.11	0.11	0.10	0.11	0.01	0.11	0.13	0.11	0.12	0.01
Phe	[12]	302	2	0.24	0.23	0.24	0.24	0.01	0.24	0.24	0.24	0.24	0.00	0.24	0.24	0.23	0.23	0.00	0.24	0.22	0.23	0.23	0.01
Phe	[123455667]	336	0	0.22	0.22	0.22	0.22	0.00	0.22	0.23	0.23	0.23	0.01		0.21	0.22	0.22	0.01	0.23	0.21	0.19	0.21	0.02
Phe	[123455667]	336	1	0.13	0.14	0.12	0.13	0.01	0.14	0.13	0.14	0.14	0.00		0.14	0.13	0.13	0.01	0.13	0.14	0.14	0.14	0.00
Phe	[123455667]	336	2	0.15	0.15	0.14	0.14	0.00	0.14	0.14	0.12	0.13	0.01		0.13	0.14	0.13	0.01	0.13	0.17	0.17	0.16	0.03
Phe	[123455667]	336	3	0.19	0.21	0.22	0.21	0.01	0.20	0.21	0.18	0.20	0.01		0.18	0.21	0.19	0.01	0.21	0.18	0.21	0.20	0.01
Phe	[123455667]	336	4	0.11	0.11	0.11	0.11	0.00	0.11	0.13	0.12	0.12	0.01		0.13	0.13	0.13	0.00	0.11	0.12	0.12	0.12	0.00
Phe	[123455667]	336	5	0.09	0.09	0.08	0.09	0.00	0.08	0.06	0.09	0.08	0.02		0.10	0.08	0.09	0.01	0.09	0.11	0.08	0.09	0.02
Phe	[123455667]	336	6	0.06	0.05	0.07	0.06	0.01	0.07	0.06	0.07	0.07	0.00		0.06	0.07	0.07	0.00	0.06	0.04	0.06	0.05	0.01
Phe	[123455667]	336	7	0.02	0.03	0.03	0.02	0.00	0.03	0.02	0.03	0.03	0.00		0.02	0.02	0.02	0.00	0.03	0.02	0.03	0.03	0.00
Phe	[123455667]	336	8	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00		0.02	####	0.00	0.01	0.01	0.00	0.00	0.01	0.01
Phe	[123455667]	336	9	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00		0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.01
Ser	[23]	288	0	0.58	0.60	0.60	0.59	0.01	0.58	0.56	0.58	0.57	0.01		0.60	0.61	0.60	0.00	0.59		0.63	0.61	0.02
Ser	[23]	288	1	0.25	0.23	0.26	0.25	0.01	0.24	0.27	0.25	0.25	0.02		0.24	0.23	0.24	0.01	0.24		0.20	0.22	0.03
Ser	[23]	288	2	0.17	0.17	0.15	0.16	0.01	0.18	0.17	0.17	0.17	0.00		0.15	0.16	0.16	0.01	0.17		0.17	0.17	0.00
Ser	[12]	302	0	0.66	0.65	0.66	0.66	0.01	0.69	0.70	0.65	0.68	0.03		0.65	0.63	0.64	0.01	0.65		0.68	0.67	0.02
Ser	[12]	302	1	0.11	0.11	0.11	0.11	0.00	0.10	0.08	0.11	0.10	0.01		0.14	0.15	0.14	0.01	0.15		0.09	0.12	0.04
Ser	[12]	302	2	0.24	0.25	0.23	0.24	0.01	0.21	0.22	0.24	0.22	0.02		0.22	0.22	0.22	0.00	0.20		0.23	0.21	0.02
Ser	[23]	362	0	0.59	0.60	0.59	0.59	0.01	0.59	0.57	0.59	0.58	0.01		0.59	0.59	0.59	0.00	0.59		0.58	0.58	0.00
Ser	[23]	362	1	0.24	0.23	0.25	0.24	0.01	0.24	0.26	0.25	0.25	0.01		0.25	0.23	0.24	0.01	0.24		0.23	0.24	0.01
Ser	[23]	362	2	0.18	0.17	0.17	0.17	0.00	0.18	0.17	0.16	0.17	0.01		0.16	0.17	0.17	0.01	0.17		0.19	0.18	0.01
Ser	[123]	390	0	0.56	0.56	0.54	0.55	0.01	0.55	0.55	0.56	0.55	0.01		0.53	0.54	0.54	0.01	0.53		0.55	0.54	0.02
Ser	[123]	390	1	0.18	0.17	0.19	0.18	0.01	0.17	0.19	0.18	0.18	0.01		0.21	0.19	0.20	0.01	0.21		0.17	0.19	0.03
Ser	[123]	390	2	0.12	0.13	0.13	0.13	0.00	0.13	0.10	0.14	0.12	0.02		0.11	0.12	0.11	0.01	0.13		0.15	0.14	0.01
Ser	[123]	390	3	0.13	0.15	0.14	0.14	0.01	0.15	0.15	0.13	0.14	0.01		0.15	0.14	0.15	0.01	0.14		0.14	0.14	0.00
Thr	[234]	376	0	0.54	0.55	0.54	0.55	0.00	0.55	0.55	0.55	0.55	0.00	0.59	0.57		0.58	0.01	0.60	0.52		0.56	0.06
Thr	[234]	376	1	0.21	0.22	0.24	0.22	0.02	0.24	0.25	0.23	0.24	0.01	0.24	0.25		0.24	0.00	0.22	0.29		0.26	0.05
Thr	[234]	376	2	0.16	0.16	0.14	0.15	0.01	0.14	0.14	0.15	0.15	0.01	0.10	0.14		0.12	0.03	0.10	0.12		0.11	0.01
Thr	[234]	376	3	0.09	0.07	0.08	0.08	0.01	0.07	0.06	0.07	0.07	0.01	0.07	0.04		0.06	0.02	0.07	0.07		0.07	0.00
Thr	[1234]	404	0	0.48	0.48	0.47	0.48	0.00	0.48	0.47	0.47	0.47	0.00	0.44	0.48		0.46	0.03	0.55	0.57		0.56	0.01
Thr	[1234]	404	1	0.21	0.21	0.21	0.21	0.00	0.22	0.23	0.21	0.22	0.01	0.28	0.25		0.26	0.02	0.17	0.17		0.17	0.00
Thr	[1234]	404	2	0.15	0.15	0.16	0.16	0.01	0.17	0.18	0.18	0.18	0.01	0.17	0.17		0.17	0.00	0.13	0.16		0.14	0.02
Thr	[1234]	404	3	0.11	0.12	0.11	0.11	0.00	0.10	0.08	0.10	0.10	0.01	0.10	0.07		0.08	0.02	0.14	0.10		0.12	0.03
Thr	[1234]	404	4	0.05	0.04	0.04	0.04	0.01	0.03	0.04	0.03	0.03	0.01	0.01	0.03		0.02	0.01	0.02	0.01		0.02	0.00
Tyr	[12]	302	0	0.66	0.66	0.66	0.66	0.00							0.67	0.66	0.66	0.00	0.67	0.69		0.68	0.01
Tyr	[12]	302	1	0.09	0.09	0.10	0.09	0.00							0.10	0.10	0.10	0.00	0.10	0.12		0.11	0.01
Tyr	[12]	302	2	0.25	0.25	0.24	0.25	0.00							0.23	0.23	0.23	0.00	0.23	0.19		0.21	0.03
Tyr	[23455667]	364	0		0.23	0.23	0.23	0.00							0.24	0.23	0.24	0.00	0.24	0.25		0.24	0.01
Tyr	[23455667]	364	1		0.10	0.11	0.11	0.00							0.12	0.12	0.12	0.00	0.11	0.16		0.14	0.03
Tyr	[23455667]	364	2		0.22	0.21	0.21	0.01							0.26	0.26	0.26	0.00	0.05	0.30		0.18	0.18
Tyr	[23455667]	364	3		0.19	0.17	0.18	0.01							0.10	0.10	0.10	0.00	0.34	0.09		0.22	0.18
Tyr	[23455667]	364	4		0.11	0.11	0.11	0.00							0.12	0.13	0.13	0.01	0.08	0.13		0.11	0.04
Tyr	[23455667]	364	5		0.09	0.08	0.09	0.00							0.11	0.10	0.10	0.00	0.12	0.04		0.08	0.06
Tyr	[23455667]	364	6		0.04	0.05	0.04	0.01							0.02	0.02	0.02	0.00	####	0.00		####	0.00
Tyr	[23455667]	364	7		0.01	0.02	0.01	0.00							0.02	0.02	0.02	0.00	0.00	0.04		0.02	0.03
Tyr	[23455667]	364	8		0.01	0.01	0.01	0.00							0.02	0.02	0.02	0.00	0.06	####		0.03	0.05
Tyr	[23455667]	438	0	0.23	0.23	0.24	0.23	0.01							0.23	0.23	0.23	0.00	0.31	0.41		0.36	0.07
Tyr	[23455667]	438	1	0.14	0.12	0.11	0.12	0.01							0.09	0.09	0.09	0.00	####	0.03		####	0.12
Tyr	[23455667]	438	2	0.22	0.21	0.24	0.22	0.01							0.24	0.24	0.24	0.00	0.34	0.19		0.27	0.11
Tyr	[23455667]	438	3	0.16	0.18	0.17	0.17	0.01							0.15	0.15	0.15	0.00	0.20	0.12		0.16	0.06
Tyr	[23455667]	438	4	0.12	0.11	0.11	0.12	0.01							0.13	0.13	0.13	0.00	0.11	0.14		0.13	0.02
Tyr	[23455667]	438	5	0.07	0.08	0.08	0.08	0.01							0.07	0.07	0.07	0.00	0.04	####		0.02	0.04
Tyr	[23455667]	438	6	0.05	0.04	0.05	0.05	0.00							0.06	0.05	0.06	0.00	0.07	0.16		0.11	0.07
Tyr	[23455667]	438	7	0.01	0.01	####	0.00	0.01							0.02	0.01	0.02	0.00	0.01	####		0.00	0.01
Tyr	[23455667]	438	8	0.01	0.01	0.00	0.01	0.00							0.01	0.01	0.01	0.00	0.05	####		0.02	0.05
Tyr	[123455667]	466	0	0.22	0.22	0.22	0.22	0.00							0.23	0.23	0.23	0.00	0.15	0.20		0.18	0.04
Tyr	[123455667]	466	1	0.15	0.12	0.15	0.14	0.02							0.12	0.13	0.12	0.01	0.17	0.17		0.17	0.00
Tyr	[123455667]	466	2	0.13	0.14	0.14	0.13	0.01							0.12	0.12	0.12	0.00	0.12	0.17		0.14	0.03
Tyr	[123455667]	466	3	0.19	0.22	0.20	0.20	0.02							0.20	0.20	0.20	0.01	####	0.14		0.06	0.12
Tyr	[123455667]	466	4	0.12	0.12	0.12	0.12	0.00							0.13	0.13	0.13	0.00	0.45	0.10		0.28	0.25
Tyr	[123455667]	466	5	0.10	0.08	0.08	0.09	0.01							0.10	0.09	0.10	0.00	0.00	0.06		0.03	0.04
Tyr	[123455667]	466	6	0.07	0.06	0.06	0.06	0.01							0.06	0.07	0.06	0.00	0.06	0.08		0.07	0.01

Tyr	[123455667]	466	7	0.02	0.02	0.03	0.02	0.00							0.03	0.03	0.03	0.00	0.04	0.04		0.04	0.01
Tyr	[123455667]	466	8	0.01	0.01	0.01	0.01	0.00							0.00	0.00	0.00	0.00	0.02	####		0.00	0.02
Tyr	[123455667]	466	9	0.00	0.00	0.00	0.00	0.00							0.01	0.01	0.01	0.00	0.02	0.04		0.03	0.02
Val	[2345]	186	0	0.44	0.44	0.44	0.44	0.00	0.45	0.44	0.44	0.44	0.00	0.46	0.46	0.42	0.45	0.02	0.45	0.43	0.44	0.44	0.01
Val	[2345]	186	1	0.11	0.11	0.11	0.11	0.00	0.12	0.13	0.13	0.12	0.01	0.12	0.12	0.14	0.13	0.01	0.13	0.15	0.14	0.14	0.01
Val	[2345]	186	2	0.33	0.34	0.33	0.33	0.01	0.33	0.32	0.31	0.32	0.01	0.31	0.31	0.31	0.31	0.00	0.31	0.30	0.31	0.31	0.01
Val	[2345]	186	3	0.05	0.05	0.06	0.05	0.00	0.05	0.05	0.06	0.05	0.00	0.06	0.05	0.06	0.06	0.01	0.06	0.06	0.07	0.06	0.01
Val	[2345]	186	4	0.06	0.06	0.06	0.06	0.00	0.06	0.06	0.06	0.06	0.00	0.05	0.06	0.06	0.06	0.00	0.05	0.06	0.05	0.05	0.01
Val	[2345]	260	0	0.44	0.44	0.44	0.44	0.00	0.44	0.43	0.43	0.44	0.00	0.47	0.47	0.44	0.46	0.02	0.44	0.45	0.47	0.45	0.02
Val	[2345]	260	1	0.12	0.12	0.12	0.12	0.00	0.12	0.13	0.14	0.13	0.01	0.15	0.12	0.14	0.14	0.01	0.13	0.15	0.10	0.13	0.03
Val	[2345]	260	2	0.34	0.34	0.34	0.34	0.00	0.33	0.33	0.32	0.33	0.01	0.29	0.31	0.31	0.30	0.01	0.34	0.29	0.32	0.32	0.03
Val	[2345]	260	3	0.04	0.05	0.05	0.04	0.00	0.05	0.05	0.05	0.05	0.00	0.04	0.05	0.05	0.05	0.01	0.04	0.05	0.05	0.05	0.00
Val	[2345]	260	4	0.06	0.05	0.06	0.06	0.00	0.06	0.06	0.06	0.06	0.00	0.05	0.05	0.05	0.05	0.00	0.05	0.06	0.06	0.06	0.01
Val	[12345]	288	0	0.41	0.43	0.40	0.41	0.01	0.41	0.40	0.40	0.41	0.01	0.39	0.41	0.41	0.40	0.01	0.42	0.44	0.40	0.42	0.02
Val	[12345]	288	1	0.12	0.10	0.12	0.11	0.01	0.13	0.14	0.14	0.14	0.01	0.16	0.14	0.16	0.15	0.01	0.15	0.18	0.13	0.15	0.02
Val	[12345]	288	2	0.20	0.21	0.21	0.21	0.00	0.20	0.20	0.21	0.20	0.00	0.21	0.20	0.20	0.20	0.01	0.21	0.17	0.21	0.19	0.03
Val	[12345]	288	3	0.17	0.18	0.18	0.18	0.00	0.17	0.18	0.16	0.17	0.01	0.17	0.18	0.16	0.17	0.01	0.14	0.19	0.17	0.17	0.02
Val	[12345]	288	4	0.03	0.03	0.03	0.03	0.00	0.03	0.03	0.04	0.03	0.00	0.02	0.03	0.03	0.03	0.00	0.04	0.01	0.03	0.03	0.01
Val	[12345]	288	5	0.05	0.06	0.05	0.06	0.00	0.05	0.05	0.05	0.05	0.00	0.04	0.05	0.04	0.04	0.00	0.04	0.02	0.06	0.04	0.02
Val	[12]	302	0	0.66	0.66	0.64	0.65	0.01	0.65	0.67	0.65	0.66	0.01	0.65	0.67	0.68	0.67	0.01	0.64	0.65	0.67	0.65	0.02
Val	[12]	302	1	0.11	0.12	0.12	0.11	0.01	0.11	0.10	0.12	0.11	0.01	0.14	0.12	0.12	0.13	0.01	0.14	0.12	0.11	0.12	0.01
Val	[12]	302	2	0.24	0.23	0.24	0.23	0.00	0.23	0.23	0.23	0.23	0.00	0.20	0.21	0.20	0.21	0.00	0.22	0.23	0.22	0.22	0.01

Table S10. Isotopomer abundances of soluble amino acids from poplar cell in 98% U-13C ILE

Condition ►				CN					cN					Cn					cn				
				MID					MID					MID					MID				
AA	fragment	m/z	Mass	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD	R1	R2	R3	Mean	SD
Ala	[23]	232	0	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.02		0.01	0.01	0.03	0.02	0.02	0.02	0.00
Ala	[23]	232	1	0.03	0.03	0.03	0.03	0.00	0.06	0.05	0.05	0.05	0.01	0.15	0.13		0.14	0.02	0.14	0.10	0.11	0.11	0.02
Ala	[23]	232	2	0.97	0.97	0.97	0.97	0.00	0.93	0.94	0.94	0.94	0.01	0.85	0.85		0.85	0.00	0.83	0.88	0.87	0.86	0.03
Ala	[123]	260	0	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.02		0.02	0.01	0.02	0.01	0.01	0.01	0.00
Ala	[123]	260	1	0.01	0.00	0.01	0.00	0.00	0.02	0.02	0.02	0.02	0.00	0.08	0.06		0.07	0.02	0.06	0.04	0.04	0.05	0.01
Ala	[123]	260	2	0.04	0.03	0.04	0.04	0.00	0.06	0.06	0.06	0.06	0.00	0.20	0.14		0.17	0.04	0.14	0.11	0.12	0.12	0.02
Ala	[123]	260	3	0.95	0.96	0.95	0.96	0.01	0.91	0.91	0.92	0.91	0.00	0.69	0.79		0.74	0.07	0.78	0.84	0.83	0.82	0.03
Asp	[12]	302	0	0.03	0.00	0.04	0.02	0.02	0.07	0.08	0.08	0.08	0.00	0.03	0.07		0.05	0.02		0.11	0.09	0.10	0.01
Asp	[12]	302	1	0.07	0.07	0.07	0.07	0.00	0.11	0.07	0.11	0.10	0.02	0.09	0.00		0.04	0.06		0.14	0.13	0.14	0.00
Asp	[12]	302	2	0.89	0.93	0.89	0.91	0.02	0.82	0.85	0.82	0.83	0.02	0.88	0.93		0.91	0.04		0.76	0.78	0.77	0.01
Asp	[234]	316	0	0.00	0.01	0.01	0.01	0.00	0.01	0.02	0.02	0.02	0.00							0.04	0.03	0.03	0.01
Asp	[234]	316	1	0.03	0.04	0.04	0.04	0.00	0.07	0.08	0.07	0.07	0.00							0.11	0.10	0.10	0.01
Asp	[234]	316	2	0.11	0.09	0.10	0.10	0.01	0.17	0.17	0.17	0.17	0.00							0.25	0.19	0.22	0.04
Asp	[234]	316	3	0.85	0.86	0.85	0.86	0.01	0.74	0.74	0.74	0.74	0.00							0.60	0.69	0.64	0.06
Asp	[234]	390	0	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.02	0.02	0.00							0.04	0.03	0.04	0.01
Asp	[234]	390	1	0.00	0.03	0.04	0.02	0.02	0.07	0.08	0.07	0.07	0.01							0.10	0.09	0.09	0.00
Asp	[234]	390	2	0.10	0.11	0.09	0.10	0.01	0.16	0.16	0.16	0.16	0.00							0.19	0.19	0.19	0.00
Asp	[234]	390	3	0.90	0.86	0.86	0.87	0.02	0.75	0.74	0.75	0.75	0.01							0.67	0.68	0.68	0.00
Asp	[1234]	418	0	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00							0.01	0.01	0.01	0.00
Asp	[1234]	418	1	0.01	0.01	0.01	0.01	0.00	0.04	0.04	0.03	0.04	0.00							0.05	0.05	0.05	0.00
Asp	[1234]	418	2	0.05	0.06	0.05	0.05	0.00	0.10	0.10	0.10	0.10	0.00							0.11	0.10	0.10	0.00
Asp	[1234]	418	3	0.13	0.12	0.12	0.12	0.01	0.17	0.18	0.18	0.17	0.01							0.18	0.19	0.19	0.00
Asp	[1234]	418	4	0.81	0.82	0.81	0.81	0.01	0.69	0.67	0.68	0.68	0.01							0.64	0.65	0.65	0.00
Glr	[123]	377	0	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00	0.01	0.01		0.01	0.00		0.00	0.01	0.00	0.00
Glr	[123]	377	1	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.00	0.01	0.01		0.01	0.01		0.01	0.01	0.01	0.00
Glr	[123]	377	2	0.03	0.04	0.03	0.03	0.00	0.01	0.03	0.02	0.02	0.01	0.01	0.03		0.02	0.01		0.01	0.04	0.02	0.02
Glr	[123]	377	3	0.95	0.95	0.95	0.95	0.00	0.96	0.95	0.95	0.95	0.01	0.98	0.95		0.96	0.02		0.98	0.95	0.96	0.02
Glu	[2345]	330	0	0.01	0.01	0.02	0.02	0.00	0.01	0.00	0.00	0.01	0.01		0.01		0.01		0.01	0.01	0.04	0.02	0.02
Glu	[2345]	330	1	0.01	0.03	0.02	0.02	0.01	0.03	0.05	0.01	0.03	0.02		0.04		0.04		0.06	0.05	0.07	0.06	0.01
Glu	[2345]	330	2	0.08	0.09	0.06	0.08	0.01	0.16	0.12	0.19	0.16	0.03		0.15		0.15		0.15	0.15	0.21	0.17	0.03
Glu	[2345]	330	3	0.11	0.10	0.12	0.11	0.01	0.14	0.18	0.15	0.16	0.02		0.23		0.23		0.20	0.19	0.26	0.22	0.04
Glu	[2345]	330	4	0.78	0.77	0.78	0.78	0.01	0.65	0.64	0.64	0.64	0.01		0.57		0.57		0.58	0.60	0.42	0.53	0.09
Glu	[12345]	432	0	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.01		0.01	0.01	0.00	0.01	0.00	0.00	0.00
Glu	[12345]	432	1	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.03	0.02	0.01	0.02	0.02		0.02	0.00	0.03	0.02	0.05	0.03	0.01
Glu	[12345]	432	2	0.02	0.03	0.03	0.03	0.01	0.06	0.04	0.05	0.05	0.01	0.05	0.03		0.04	0.01	0.06	0.06	0.08	0.07	0.01
Glu	[12345]	432	3	0.20	0.13	0.10	0.15	0.05	0.19	0.20	0.15	0.18	0.02	0.16	0.15		0.16	0.01	0.15	0.17	0.21	0.18	0.03
Glu	[12345]	432	4	0.13	0.12	0.14	0.13	0.01	0.16	0.16	0.17	0.16	0.01	0.24	0.26		0.25	0.01	0.21	0.19	0.19	0.19	0.01
Glu	[12345]	432	5	0.63	0.70	0.70	0.68	0.04	0.56	0.58	0.60	0.58	0.02	0.52	0.52		0.52	0.00	0.55	0.55	0.47	0.52	0.05
Gly	[2]	218	0	0.02	0.03	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.00	0.06	0.03		0.05	0.02	0.01	0.02	0.03	0.02	0.01
Gly	[2]	218	1	0.98	0.97	0.99	0.98	0.01	0.98	0.98	0.98	0.98	0.00	0.94	0.97		0.95	0.02	0.99	0.98	0.97	0.98	0.01
Gly	[12]	246	0	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.02	0.00		0.01	0.02	0.00	0.00	0.01	0.00	0.01
Gly	[12]	246	1	0.02	0.04	0.03	0.03	0.01	0.01	0.02	0.03	0.02	0.01	0.06	0.06		0.06	0.00	0.03	0.06	0.04	0.05	0.01
Gly	[12]	246	2	0.98	0.95	0.96	0.96	0.01	0.99	0.97	0.96	0.97	0.01	0.92	0.94		0.93	0.01	0.97	0.94	0.95	0.95	0.02
His	[2345]	196	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.01	0.00	0.00
His	[2345]	196	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.02	0.01	0.01
His	[2345]	196	2	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00						0.01	0.01	0.03	0.02	0.02
His	[2345]	196	3	0.07	0.06	0.07	0.07	0.00	0.06	0.07	0.07	0.07	0.01						0.08	0.02	0.08	0.06	0.03
His	[2345]	196	4	0.93	0.93	0.92	0.93	0.00	0.93	0.92	0.92	0.93	0.01						0.91	0.96	0.86	0.91	0.05
His	[23456]	338	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.01	0.01	0.00	0.00	0.00
His	[23456]	338	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.00	0.00	0.00
His	[23456]	338	2	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00						0.00	0.00	0.00	0.00	0.00
His	[23456]	338	3	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00						0.00	0.01	0.01	0.01	0.01
His	[23456]	338	4	0.05	0.04	0.06	0.05	0.01	0.05	0.03	0.07	0.05	0.02						0.03	0.07	0.07	0.05	0.02
His	[23456]	338	5	0.94	0.95	0.93	0.94	0.01	0.94	0.95	0.92	0.94	0.02						0.96	0.91	0.92	0.93	0.03
His	[123456]	440	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.01	0.00	0.00	0.00	0.00
His	[123456]	440	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.00	0.00	0.00
His	[123456]	440	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.00	0.00	0.00
His	[123456]	440	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.00	0.00	0.00
His	[123456]	440	4	0.00	0.00	0.01	0.00	0.00	0.02	0.01	0.01	0.01	0.01						0.03	0.01	0.03	0.02	0.01
His	[123456]	440	5	0.02	0.06	0.07	0.05	0.03	0.06	0.07	0.07	0.07	0.01						0.07	0.07	0.07	0.07	0.00
His	[123456]	440	6	0.98	0.94	0.92	0.95	0.03	0.91	0.92	0.92	0.92	0.01						0.90	0.91	0.89	0.90	0.01
Ile	[23456]	200	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01		0.01	0.00	0.00	0.01	0.01	0.01	0.00
Ile	[23456]	200	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00		0.01	0.01	0.01	0.01	0.01	0.01	0.00

Ile	[23456]	200	2	0.02	0.01	0.02	0.02	0.00	0.02	0.02	0.03	0.03	0.00	0.04	0.04	0.04	0.00	0.04	0.05	0.05	0.05	0.00
Ile	[23456]	200	3	0.07	0.05	0.07	0.07	0.01	0.10	0.11	0.10	0.11	0.00	0.16	0.15	0.16	0.00	0.17	0.15	0.15	0.16	0.01
Ile	[23456]	200	4	0.17	0.19	0.16	0.17	0.01	0.22	0.22	0.21	0.21	0.01	0.28	0.27	0.27	0.01	0.25	0.26	0.27	0.26	0.01
Ile	[23456]	200	5	0.74	0.74	0.74	0.74	0.00	0.65	0.65	0.66	0.65	0.01	0.49	0.53	0.51	0.02	0.53	0.53	0.52	0.52	0.00
Ile	[23456]	274	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Ile	[23456]	274	1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01
Ile	[23456]	274	2	0.02	0.02	0.02	0.02	0.00	0.03	0.03	0.02	0.03	0.00	0.04	0.04	0.04	0.00	0.04	0.05	0.04	0.04	0.01
Ile	[23456]	274	3	0.07	0.06	0.07	0.07	0.00	0.10	0.10	0.10	0.10	0.00	0.16	0.15	0.15	0.00	0.10	0.15	0.15	0.13	0.03
Ile	[23456]	274	4	0.15	0.15	0.17	0.16	0.01	0.20	0.20	0.20	0.20	0.00	0.28	0.27	0.27	0.01	0.29	0.26	0.26	0.27	0.01
Ile	[23456]	274	5	0.76	0.77	0.74	0.76	0.01	0.66	0.66	0.67	0.66	0.01	0.51	0.53	0.52	0.01	0.57	0.53	0.53	0.54	0.02
Leu	[23456]	200	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Leu	[23456]	200	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Leu	[23456]	200	2	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.02	0.02	0.00	0.01	0.02	0.01	0.01	0.00
Leu	[23456]	200	3	0.03	0.03	0.03	0.03	0.00	0.04	0.05	0.04	0.04	0.00	0.08	0.08	0.08	0.00	0.08	0.07	0.07	0.07	0.00
Leu	[23456]	200	4	0.23	0.24	0.23	0.23	0.01	0.30	0.29	0.30	0.30	0.00	0.48	0.46	0.47	0.02	0.41	0.44	0.43	0.43	0.01
Leu	[23456]	200	5	0.74	0.72	0.73	0.73	0.01	0.64	0.65	0.65	0.65	0.00	0.42	0.44	0.43	0.01	0.49	0.47	0.47	0.48	0.01
Leu	[23456]	274	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Leu	[23456]	274	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Leu	[23456]	274	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.02	0.00	0.01	0.02	0.01	0.01	0.00
Leu	[23456]	274	3	0.03	0.01	0.03	0.02	0.01	0.04	0.04	0.04	0.04	0.00	0.08	0.08	0.08	0.00	0.03	0.07	0.07	0.06	0.02
Leu	[23456]	274	4	0.22	0.25	0.23	0.23	0.02	0.30	0.31	0.30	0.30	0.00	0.49	0.46	0.47	0.02	0.45	0.44	0.45	0.45	0.01
Leu	[23456]	274	5	0.74	0.73	0.74	0.74	0.01	0.66	0.65	0.65	0.65	0.00	0.41	0.44	0.42	0.02	0.50	0.47	0.46	0.48	0.02
Lys	[23456]	329	0	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.01	0.02	0.01	0.00	0.01	0.01
Lys	[23456]	329	1	0.00	0.06	0.01	0.02	0.03	0.00	0.01	0.01	0.01	0.00	0.02	0.02	0.02	0.00	0.02	0.01	0.02	0.02	0.01
Lys	[23456]	329	2	0.03	0.04	0.03	0.03	0.01	0.04	0.03	0.01	0.03	0.01	0.02	0.02	0.02	0.00	0.04	0.05	0.07	0.06	0.01
Lys	[23456]	329	3	0.07	0.00	0.07	0.05	0.04	0.11	0.08	0.09	0.10	0.01	0.08	0.16	0.12	0.06	0.18	0.13	0.13	0.15	0.03
Lys	[23456]	329	4	0.18	0.17	0.17	0.17	0.01	0.22	0.20	0.23	0.22	0.01	0.33	0.27	0.30	0.04	0.26	0.26	0.28	0.26	0.01
Lys	[23456]	329	5	0.72	0.73	0.71	0.72	0.01	0.62	0.67	0.65	0.65	0.02	0.53	0.51	0.52	0.01	0.49	0.54	0.49	0.50	0.03
Lys	[123456]	431	0						0.01	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.00	0.02	0.01	0.01
Lys	[123456]	431	1						0.01	0.01	0.00	0.01	0.00	0.03	0.00	0.02	0.02	0.01	0.01	0.00	0.01	0.00
Lys	[123456]	431	2						0.01	0.00	0.01	0.01	0.00	0.03	0.00	0.01	0.02	0.02	0.00	0.00	0.01	0.01
Lys	[123456]	431	3						0.04	0.04	0.03	0.04	0.01	0.03	0.06	0.05	0.02	0.07	0.01	0.09	0.06	0.04
Lys	[123456]	431	4						0.14	0.12	0.12	0.13	0.01	0.18	0.11	0.14	0.05	0.04	0.06	0.18	0.09	0.07
Lys	[123456]	431	5						0.19	0.23	0.22	0.22	0.02	0.25	0.30	0.27	0.03	0.27	0.26	0.19	0.24	0.04
Lys	[123456]	431	6						0.59	0.60	0.62	0.60	0.01	0.48	0.51	0.49	0.02	0.59	0.67	0.52	0.59	0.07
Lys	[123456]	488	0						0.00	0.00	0.00	0.00	0.00					0.01	0.01	0.00	0.00	0.00
Lys	[123456]	488	1						0.00	0.01	0.00	0.00	0.00					0.00	0.00	0.01	0.00	0.00
Lys	[123456]	488	2						0.00	0.00	0.00	0.00	0.00					0.02	0.02	0.02	0.02	0.00
Lys	[123456]	488	3						0.01	0.04	0.03	0.03	0.01					0.05	0.06	0.08	0.07	0.01
Lys	[123456]	488	4						0.10	0.09	0.11	0.10	0.01					0.12	0.17	0.20	0.17	0.04
Lys	[123456]	488	5						0.19	0.13	0.20	0.17	0.04					0.28	0.22	0.29	0.27	0.04
Lys	[123456]	488	6						0.69	0.73	0.65	0.69	0.04					0.52	0.51	0.40	0.48	0.06
Mal	[1234]	419	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Mal	[1234]	419	1	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Mal	[1234]	419	2	0.01	0.02	0.02	0.02	0.00	0.04	0.04	0.04	0.04	0.00	0.11	0.07	0.09	0.03	0.03	0.03	0.05	0.03	0.01
Mal	[1234]	419	3	0.09	0.08	0.09	0.09	0.00	0.12	0.12	0.13	0.12	0.00	0.19	0.18	0.19	0.01	0.16	0.11	0.15	0.14	0.03
Mal	[1234]	419	4	0.89	0.90	0.89	0.89	0.01	0.82	0.83	0.82	0.82	0.00	0.70	0.72	0.71	0.02	0.80	0.84	0.78	0.80	0.03
Mal	[1234]	287	0	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.00					
Mal	[1234]	287	1	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.02	0.02	0.02	0.00					
Mal	[1234]	287	2	0.01	0.02	0.01	0.02	0.00	0.04	0.04	0.04	0.04	0.00	0.14	0.07	0.11	0.05					
Mal	[1234]	287	3	0.09	0.10	0.09	0.09	0.01	0.12	0.13	0.13	0.12	0.00	0.17	0.18	0.17	0.01					
Mal	[1234]	287	4	0.89	0.87	0.90	0.89	0.01	0.83	0.82	0.82	0.82	0.00	0.63	0.70	0.67	0.05					
Met	[2345]	218	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00
Met	[2345]	218	1	0.01	0.01	0.02	0.01	0.00	0.02	0.03	0.02	0.02	0.01	0.03	0.03	0.03	0.00	0.03	0.01	0.01	0.02	0.01
Met	[2345]	218	2	0.04	0.03	0.04	0.04	0.01	0.07	0.07	0.07	0.07	0.00	0.07	0.09	0.08	0.01	0.05	0.05	0.07	0.06	0.01
Met	[2345]	218	3	0.13	0.14	0.13	0.13	0.00	0.16	0.15	0.18	0.17	0.01	0.17	0.17	0.17	0.00	0.15	0.14	0.15	0.15	0.01
Met	[2345]	218	4	0.81	0.82	0.81	0.81	0.00	0.74	0.75	0.72	0.74	0.01	0.72	0.70	0.71	0.01	0.77	0.79	0.76	0.77	0.02
Met	[2345]	292	0	0.01		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Met	[2345]	292	1	0.00		0.01	0.01	0.00	0.02	0.00	0.01	0.01	0.01	0.03	0.02	0.02	0.01	0.00	0.02	0.02	0.01	0.01
Met	[2345]	292	2	0.04		0.04	0.04	0.00	0.07	0.01	0.08	0.05	0.04	0.07	0.08	0.07	0.00	0.05	0.05	0.04	0.05	0.01
Met	[2345]	292	3	0.13		0.11	0.12	0.01	0.17	0.17	0.16	0.17	0.01	0.18	0.17	0.17	0.01	0.11	0.15	0.12	0.12	0.02
Met	[2345]	292	4	0.82		0.84	0.83	0.01	0.75	0.82	0.75	0.77	0.04	0.71	0.73	0.72	0.01	0.83	0.78	0.82	0.81	0.03
Met	[12345]	320	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01
Met	[12345]	320	1	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01
Met	[12345]	320	2	0.01	0.03	0.02	0.02	0.01	0.02	0.04	0.04	0.03	0.01	0.04	0.03	0.04	0.01	0.03	0.04	0.02	0.03	0.01
Met	[12345]	320	3	0.06	0.03	0.05	0.05	0.02	0.08	0.09	0.09	0.08	0.00	0.09	0.10	0.09	0.00	0.08	0.07	0.04	0.06	0.02
Met	[12345]	320	4	0.13	0.14	0.13	0.13	0.00	0.17	0.18	0.18	0.18	0.00	0.17	0.16	0.17	0.01	0.14	0.13	0.16	0.14	0.01
Met	[12345]	320	5	0.80	0.80	0.78	0.80	0.01	0.71	0.69	0.69	0.70	0.01	0.68	0.69	0.69	0.01	0.73	0.76	0.77	0.75	0.02
Phe	[23455667]	234	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Phe	[23455667]	234	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phe	[23455667]	234	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[23455667]	234	6	0.00	0.01	0.01	0.01	0.00	0.01	0.02	0.01	0.01	0.01	0.03	0.03		0.03	0.00	0.00	0.01	0.01	0.01	0.00
Phe	[23455667]	234	7	0.08	0.07	0.06	0.07	0.01	0.07	0.07	0.07	0.07	0.00	0.08	0.08		0.08	0.00	0.08	0.08	0.08	0.08	0.00
Phe	[23455667]	234	8	0.91	0.91	0.92	0.92	0.01	0.92	0.90	0.92	0.91	0.01	0.87	0.88		0.88	0.01	0.90	0.91	0.91	0.90	0.01
Phe	[12]	302	0	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.01	0.01	0.00	0.01	0.00	0.00	0.00
Phe	[12]	302	1	0.03	0.01	0.03	0.02	0.01	0.02	0.01	0.04	0.02	0.02	0.02	0.03		0.03	0.01	0.03	0.03	0.02	0.03	0.01
Phe	[12]	302	2	0.97	0.99	0.97	0.98	0.01	0.98	0.99	0.96	0.97	0.02	0.97	0.97		0.97	0.00	0.96	0.96	0.98	0.97	0.01
Phe	[123455667]	336	0	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01
Phe	[123455667]	336	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.00
Phe	[123455667]	336	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phe	[123455667]	336	7	0.01	0.01	0.03	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01		0.01	0.00	0.01	0.01	0.01	0.01	0.00
Phe	[123455667]	336	8	0.08	0.10	0.07	0.08	0.01	0.09	0.06	0.08	0.08	0.02	0.08	0.10		0.09	0.01	0.08	0.09	0.10	0.09	0.01
Phe	[123455667]	336	9	0.90	0.89	0.90	0.90	0.01	0.90	0.91	0.90	0.90	0.01	0.88	0.88		0.88	0.00	0.88	0.89	0.89	0.88	0.01
Ser	[23]	288	0	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.04	0.00		0.02	0.03	0.01	0.01	0.01	0.01	0.00
Ser	[23]	288	1	0.02	0.03	0.03	0.03	0.00	0.03	0.03	0.03	0.03	0.00	0.02	0.04		0.03	0.02	0.07	0.03	0.04	0.05	0.02
Ser	[23]	288	2	0.97	0.97	0.97	0.97	0.00	0.96	0.97	0.96	0.96	0.00	0.94	0.96		0.95	0.02	0.92	0.96	0.95	0.94	0.02
Ser	[12]	302	0	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00							0.02	0.01	0.01	0.00
Ser	[12]	302	1	0.05	0.01	0.05	0.04	0.02	0.06	0.05	0.06	0.05	0.00							0.05	0.01	0.03	0.03
Ser	[12]	302	2	0.95	0.99	0.95	0.96	0.03	0.93	0.94	0.94	0.94	0.00							0.93	0.98	0.96	0.03
Ser	[23]	362	0	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.05	0.00		0.02	0.03	0.01	0.01	0.00	0.01	0.00
Ser	[23]	362	1	0.00	0.03	0.00	0.01	0.01	0.03	0.03	0.00	0.02	0.02	0.02	0.02		0.02	0.00	0.04	0.03	0.03	0.03	0.01
Ser	[23]	362	2	1.00	0.97	0.99	0.99	0.01	0.96	0.97	0.99	0.97	0.02	0.94	0.98		0.96	0.03	0.96	0.96	0.97	0.96	0.01
Ser	[123]	390	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00		0.02	0.02	0.01	0.01	0.00	0.00	0.00
Ser	[123]	390	1	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.02		0.02	0.01	0.04	0.01	0.01	0.02	0.02
Ser	[123]	390	2	0.04	0.04	0.04	0.04	0.00	0.04	0.02	0.05	0.03	0.02	0.00	0.06		0.03	0.04	0.07	0.06	0.06	0.06	0.00
Ser	[123]	390	3	0.95	0.95	0.95	0.95	0.00	0.95	0.98	0.95	0.96	0.02	0.95	0.91		0.93	0.02	0.89	0.93	0.93	0.92	0.03
Thr	[234]	376	0	0.01	0.03	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.04	0.03		0.04	0.00	0.03	0.03	0.03	0.03	0.00
Thr	[234]	376	1	0.05	0.01	0.06	0.04	0.03	0.08	0.08	0.10	0.09	0.01	0.14	0.13		0.14	0.01	0.14	0.12	0.14	0.13	0.01
Thr	[234]	376	2	0.13	0.09	0.14	0.12	0.03	0.19	0.17	0.19	0.18	0.01	0.21	0.23		0.22	0.01	0.23	0.23	0.24	0.23	0.01
Thr	[234]	376	3	0.81	0.88	0.79	0.83	0.04	0.71	0.72	0.70	0.71	0.01	0.61	0.61		0.61	0.00	0.60	0.63	0.59	0.61	0.02
Thr	[1234]	404	0	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.02		0.02	0.00	0.02	0.01	0.02	0.02	0.00
Thr	[1234]	404	1	0.00	0.04	0.02	0.02	0.02	0.04	0.03	0.04	0.04	0.01	0.06	0.07		0.07	0.01	0.06	0.05	0.05	0.05	0.01
Thr	[1234]	404	2	0.07	0.07	0.07	0.07	0.00	0.11	0.11	0.11	0.11	0.00	0.19	0.17		0.18	0.01	0.17	0.16	0.18	0.17	0.01
Thr	[1234]	404	3	0.12	0.19	0.15	0.15	0.03	0.19	0.18	0.18	0.18	0.00	0.24	0.23		0.23	0.01	0.23	0.22	0.22	0.22	0.00
Thr	[1234]	404	4	0.80	0.70	0.76	0.75	0.05	0.66	0.67	0.66	0.66	0.00	0.50	0.51		0.50	0.01	0.53	0.56	0.52	0.54	0.02
Tyr	[12]	302	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00						0.02	0.02	0.02	0.02	0.00
Tyr	[12]	302	1	0.02	0.02	0.01	0.02	0.01	0.02	0.02		0.02	0.00						0.02	0.02	0.02	0.02	0.00
Tyr	[12]	302	2	0.97	0.98	0.99	0.98	0.01	0.98	0.98		0.98	0.00						0.96	0.96	0.96	0.96	0.00
Tyr	[23455667]	364	0	0.00		0.00	0.00	0.00											0.02	0.00	0.00	0.01	0.01
Tyr	[23455667]	364	1	0.00		0.00	0.00	0.00											0.00	0.00	0.00	0.00	0.00
Tyr	[23455667]	364	2	0.00		0.00	0.00	0.00											0.00	0.00	0.00	0.00	0.00
Tyr	[23455667]	364	3	0.00		0.00	0.00	0.00											0.02	0.00	0.00	0.01	0.01
Tyr	[23455667]	364	4	0.00		0.00	0.00	0.00											0.01	0.00	0.00	0.01	0.01
Tyr	[23455667]	364	5	0.01		0.00	0.00	0.00											0.02	0.00	0.00	0.01	0.01
Tyr	[23455667]	364	6	0.01		0.03	0.02	0.01											0.03	0.03	0.03	0.03	0.00
Tyr	[23455667]	364	7	0.01		0.07	0.04	0.04											0.02	0.11	0.11	0.08	0.05
Tyr	[23455667]	364	8	0.97		0.90	0.93	0.05											0.87	0.85	0.85	0.86	0.02
Tyr	[23455667]	438	0	0.00	0.00	0.00	0.00	0.00	0.00	0.01		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[23455667]	438	1	0.00	0.01	0.00	0.00	0.01	0.00	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[23455667]	438	2	0.00	0.00	0.00	0.00	0.00	0.01	0.01		0.01	0.00							0.00	0.00	0.00	0.00
Tyr	[23455667]	438	3	0.00	0.00	0.00	0.00	0.00	0.02	0.01		0.01	0.01							0.00	0.00	0.00	0.00
Tyr	[23455667]	438	4	0.00	0.00	0.00	0.00	0.00	0.00	0.01		0.00	0.01							0.01	0.01	0.01	0.00
Tyr	[23455667]	438	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.02	0.02	0.02	0.00
Tyr	[23455667]	438	6	0.01	0.01	0.00	0.01	0.00	0.01	0.01		0.01	0.00							0.10	0.11	0.11	0.00
Tyr	[23455667]	438	7	0.08	0.06	0.08	0.07	0.01	0.08	0.08		0.08	0.00							0.86	0.86	0.86	0.00
Tyr	[23455667]	438	8	0.91	0.92	0.91	0.91	0.01	0.88	0.87		0.88	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	4	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.00	0.00	0.00	0.00
Tyr	[123455667]	466	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00							0.01	0.01	0.01	0.00

Tyr	[123455667]	466	7	0.01	0.00	0.01	0.01	0.00	0.03	0.03		0.03	0.00						0.02	0.02	0.02	0.00
Tyr	[123455667]	466	8	0.08	0.08	0.10	0.09	0.01	0.08	0.07		0.08	0.01						0.13	0.12	0.12	0.00
Tyr	[123455667]	466	9	0.90	0.90	0.88	0.90	0.01	0.87	0.89		0.88	0.01						0.83	0.83	0.83	0.01
Val	[2345]	186	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Val	[2345]	186	1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00
Val	[2345]	186	2	0.01	0.02	0.01	0.01	0.00	0.02	0.02	0.02	0.02	0.00	0.03	0.03	0.03	0.00	0.02	0.03	0.03	0.03	0.01
Val	[2345]	186	3	0.09	0.09	0.09	0.09	0.00	0.10	0.10	0.11	0.10	0.00	0.15	0.14	0.14	0.00	0.11	0.13	0.12	0.12	0.01
Val	[2345]	186	4	0.90	0.89	0.90	0.90	0.00	0.88	0.88	0.87	0.88	0.00	0.81	0.82	0.82	0.00	0.85	0.83	0.83	0.84	0.01
Val	[2345]	260	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00
Val	[2345]	260	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Val	[2345]	260	2	0.01	0.01	0.01	0.01	0.00	0.02	0.03	0.02	0.02	0.01	0.03	0.02	0.03	0.01	0.02	0.02	0.03	0.02	0.01
Val	[2345]	260	3	0.07	0.07	0.07	0.07	0.00	0.09	0.08	0.09	0.09	0.01	0.14	0.13	0.13	0.01	0.11	0.11	0.09	0.11	0.01
Val	[2345]	260	4	0.92	0.92	0.92	0.92	0.00	0.89	0.89	0.89	0.89	0.00	0.81	0.84	0.82	0.02	0.85	0.85	0.87	0.86	0.01
Val	[12345]	288	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Val	[12345]	288	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Val	[12345]	288	2	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Val	[12345]	288	3	0.01	0.00	0.01	0.01	0.01	0.03	0.03	0.03	0.03	0.00	0.04	0.04	0.04	0.00	0.03	0.04	0.04	0.04	0.00
Val	[12345]	288	4	0.07	0.06	0.07	0.07	0.00	0.10	0.10	0.10	0.10	0.00	0.12	0.13	0.13	0.01	0.10	0.10	0.12	0.11	0.01
Val	[12345]	288	5	0.91	0.93	0.91	0.91	0.01	0.86	0.86	0.86	0.86	0.00	0.82	0.81	0.81	0.00	0.85	0.84	0.83	0.84	0.01
Val	[12]	302	0	0.01	0.02	0.01	0.01	0.00	0.02	0.00	0.02	0.01	0.01	0.04	0.04	0.04	0.00	0.02	0.03	0.03	0.03	0.00
Val	[12]	302	1	0.04	0.04	0.03	0.04	0.00	0.02	0.04	0.03	0.03	0.01	0.04	0.03	0.04	0.01	0.05	0.03	0.04	0.04	0.01
Val	[12]	302	2	0.95	0.95	0.96	0.95	0.00	0.96	0.96	0.96	0.96	0.00	0.91	0.92	0.92	0.01	0.93	0.95	0.93	0.93	0.01

Table S11. Metabolic network model established in this study

	Reaction	R = reversible
glci	→ Glc	
CO2in	→ CO_2	
ACAin	→ ACA_m	
CO2out	CO_2 →	
CO2exf	CO_2 → CO_{2b}	R
pgif	G6P (123456) → F6P (123456)	R
g6pdh	G6P (123456) → P5P (23456) + CO_2 (1)	
tktAf	P5P (12345) + P5P (67890) → S7P (1267890) + T3P (345)	R
talf	S7P (1234567) + T3P (890) → F6P (123890) + E4P (4567)	R
tktBf	P5P (12345) + E4P (6789) → F6P (126789) + T3P (345)	R
pfk	F6P (123456) → T3P (321) + T3P (456)	R
pepf	T3P (123) → PEP (123)	R
pyrf	PEP (123) → Pyr (123)	R
g6pt	G6P (123456) → $G6P_p$ (123456)	R
pgifp	$G6P_p$ (123456) → $F6P_p$ (123456)	R
g6pdhp	$G6P_p$ (123456) → $P5P_p$ (23456) + CO_2 (1)	
tktAfp	$P5P_p$ (12345) + $P5P_p$ (67890) → $S7P_p$ (1267890) + $T3P_p$ (34	R
talfp	$S7P_p$ (1234567) + $T3P_p$ (890) → $F6P_p$ (123890) + $E4P_p$ (456	R
tktBfp	$P5P_p$ (12345) + $E4P_p$ (6789) → $F6P_p$ (126789) + $T3P_p$ (345)	R
pfkp	$F6P_p$ (123456) → $T3P_p$ (321) + $T3P_p$ (456)	R
pepfp	$T3P_p$ (123) → Pyr_p (123)	R
pdhp	Pyr_p (123) → ACA_p (23)	
t3pt	$T3P_p$ (123) → T3P (123)	R
P5Ptf	P5P (12345) → $P5P_p$ (12345)	R
pyrtpf	Pyr (123) → Pyr_p (123)	R
pdh	Pyr (123) → ACA_m (23)	
citdh	ACA_m (12) + OAA_m (3456) → AKG_m (65421) + CO_2 (3)	
akgdh	AKG_m (12345) → Suc_m (2345) + CO_2 (1)	
sdhf	Suc_m (1234) → Mal_m (1234)	R
sdhs	Suc_m (1234) → Mal_m (4321)	
mdhf	Mal_m (1234) → OAA_m (1234)	R
mef	Mal_m (1234) → Pyr (123) + CO_{2b} (4)	R
pyrc	Pyr (123) + CO_{2b} (4) → OAA_m (1234)	
pepck	OAA_m (1234) → T3P (123) + CO_{2b} (4)	R
Serf	$T3P_p$ (123) → Ser (123)	R
Glyf	Ser (123) → Gly (12) + CHO (3)	R
pepo	PEP →	
T3Po	T3P →	
Sero	Ser →	
Glyo	Gly →	
E4Ppo	$E4P_p$ →	

Table S11. Metabolic network model established in this study

	Reaction	R = reversible
Pyro	$Pyr \rightarrow$	
pyrpo	$Pyr_p \rightarrow$	
ACApo	$ACA_p \rightarrow$	
OAAmo	$OAA_m \rightarrow$	
Gluco	$AKG_m \rightarrow$	
G6Ppout	$G6P_p \rightarrow$	
P5Ppout	$P5P_p \rightarrow$	
F6Po	$F6P \rightarrow$	
CHOout	$CHO \rightarrow$	

Table S12. Calculated fluxes throught metabolic flux analysis

Condition ►			CN		cN		Cn		cn	
▼ Reaction // Evaluated flux ►			Avg	SD	Avg	SD	Avg	SD	Avg	SD
glci	glci	→ Glc	2.60	0.02	2.04	0.07	1.53	0.01	1.26	0.02
CO2in	CO2in	→ CO_2	0.19	0.12	0.12	0.08	0.03	0.03	0.03	0.05
acain	acain	→ ACA_m	0.14	0.03	0.27	0.04	0.35	0.04	0.21	0.04
CO2out	CO2out	CO_2 →	10.74	0.19	9.58	0.48	7.17	0.13	5.28	0.14
CO2exf	CO2exf	CO_2 → CO_{2b}	0.04	0.12	0.01	0.08	0.08	0.03	0.07	0.05
CO2exr			0.71	0.30	0.45	0.36	0.35	0.38	0.53	0.35
pgif	pgif	G6P→ F6P	1.96	0.33	1.62	0.20	1.25	0.17	1.15	0.18
pgib			0.14	0.19	0.12	0.15	0.06	0.13	0.07	0.14
g6pdh	g6pdh	G6P → P5P + CO_2	0.23	0.15	0.18	0.12	0.20	0.10	0.06	0.06
tktAf	tktAf	P5P + P5P → S7P + T3P	-0.44	0.16	-0.31	0.12	-0.16	0.09	-0.25	0.10
tktAb			0.14	0.20	0.11	0.17	0.04	0.12	0.23	0.17
talf	talf	S7P + T3P → F6P + E4P	-0.44	0.16	-0.31	0.12	-0.16	0.09	-0.25	0.10
talb			0.81	0.22	0.79	0.25	0.91	0.16	0.93	0.12
tktBf	tktBf	P5P + E4P → F6P + T3P	-0.47	0.16	-0.32	0.12	-0.18	0.09	-0.27	0.10
tktBb			0.66	0.14	0.74	0.12	0.81	0.12	0.76	0.13
pfk	pfk	F6P → T3P + T3P	0.97	0.26	0.95	0.21	0.86	0.16	0.59	0.14
f16bp			0.59	0.23	0.54	0.21	0.39	0.23	0.48	0.20
pepf	pepf	T3P → PEP	2.39	0.27	2.15	0.32	1.83	0.21	1.09	0.20
pepfr			0.52	0.31	0.71	0.29	0.88	0.21	0.94	0.14
pyrf	pyrf	PEP → Pyr	2.38	0.45	1.26	0.37	1.16	0.33	0.48	0.17
pyrfr			0.22	0.18	0.16	0.13	0.15	0.12	0.17	0.15
g6pt	g6pt	G6P → $G6P_p$	0.41	0.36	0.24	0.22	0.07	0.18	0.04	0.17
g6ptb			0.28	0.29	0.28	0.30	0.54	0.35	0.56	0.32
pgifp	pgifp	$G6P_p$ → $F6P_p$	-6.04	0.96	-3.59	0.98	-1.85	0.63	-2.55	0.65
pgibp			0.91	0.11	0.88	0.16	0.90	0.14	0.97	0.09
g6pdhp	g6pdhp	$G6P_p$ → $P5P_p$ + CO_2	6.37	0.89	3.79	1.00	1.88	0.65	2.54	0.62
tktAfp	tktAfp	$P5P_p$ + $P5P_p$ → $S7P_p$ + T3P	2.64	0.37	1.64	0.40	0.86	0.27	1.12	0.27
tktAbp			0.99	0.04	0.99	0.06	0.99	0.08	0.99	0.08
talfp	talfp	$S7P_p$ + $T3P_p$ → $F6P_p$ + $E4P_p$	2.64	0.37	1.64	0.40	0.86	0.27	1.12	0.27
talbp			0.99	0.04	0.99	0.06	0.99	0.08	0.99	0.08
tktBfp	tktBfp	$P5P_p$ + $E4P_p$ → $F6P_p$ + $T3P_p$	2.64	0.37	1.64	0.40	0.86	0.27	1.12	0.27
tktBbp			0.80	0.24	0.83	0.23	0.89	0.18	0.94	0.13
pfkp	pfkp	$F6P_p$ → $T3P_p$ + $T3P_p$	-0.75	0.35	-0.32	0.25	-0.14	0.16	-0.31	0.16
f16bpp			0.10	0.09	0.11	0.13	0.30	0.19	0.15	0.14
pepfp	pepfp	$T3P_p$ → Pyr_p	0.19	0.10	0.37	0.16	0.26	0.12	0.28	0.10
pdhp	pdhp	Pyr_p → ACA_p	0.91	0.01	0.73	0.02	0.53	0.00	0.53	0.00
t3pt	t3pt	$T3P_p$ → T3P	0.91	0.60	0.58	0.42	0.30	0.28	0.20	0.25
t3pb			0.14	0.19	0.13	0.18	0.05	0.12	0.14	0.19
P5Ptf	P5Ptf	P5P → $P5P_p$	1.57	0.48	1.12	0.33	0.71	0.23	0.83	0.29
P5Ptr			0.03	0.08	0.02	0.04	0.00	0.02	0.01	0.03
pyrtpf	pyrtpf	Pyr → Pyr_p	1.00	0.10	0.49	0.17	0.33	0.12	0.31	0.10
pyrtpr			0.24	0.27	0.42	0.29	0.51	0.30	0.31	0.31
pdh	pdh	Pyr → ACA_m	1.05	0.25	1.48	0.31	1.34	0.19	0.62	0.18
citdh	citdh	ACA_m + OAA_m → AKG_m + C	1.19	0.26	1.75	0.35	1.69	0.23	0.83	0.21
akgdh	akgdh	AKG_m → Suc_m + CO_2	1.03	0.26	1.65	0.34	1.63	0.23	0.78	0.21
sdhf	sdhf	Suc_m → Mal_m	1.03	0.26	1.65	0.34	1.63	0.23	0.78	0.21
sdhr			0.98	0.05	0.97	0.06	0.98	0.08	0.99	0.08
sdhs	sdhs	Suc_m → Mal_m	0.67	0.32	0.56	0.33	0.42	0.35	0.62	0.32
mdhf	mdhf	Mal_m → OAA_m	1.08	0.49	0.79	0.40	0.94	0.35	0.24	0.18
mdhr			0.88	0.22	0.98	0.09	0.99	0.08	0.99	0.08
mef	mef	Mal_m → Pyr + CO_{2b}	-0.05	0.10	0.87	0.11	0.69	0.12	0.53	0.07
mer			0.59	0.21	0.26	0.26	0.36	0.26	0.24	0.24
pyrc	pyrc	Pyr + CO_{2b} → OAA_m	0.22	0.08	0.13	0.08	0.17	0.06	0.07	0.01
pepck	pepck	OAA_m → T3P + CO_{2b}	0.04	0.08	-0.87	0.12	-0.63	0.11	-0.57	0.07
pepc			0.33	0.24	0.22	0.19	0.21	0.11	0.17	0.09
Serf	Serf	$T3P_p$ → Ser	0.05	0.00	0.04	0.00	0.03	0.00	0.03	0.00

Serb			0.33	0.21	0.27	0.21	0.18	0.20	0.20	0.20
Glyf	Glyf	Ser → Gly + CHO	0.03	0.00	0.02	0.00	0.02	0.00	0.02	0.00
Glyr			0.72	0.07	0.73	0.07	0.69	0.08	0.69	0.08
pepo	pepo	PEP →	0.01	0.00	0.02	0.00	0.04	0.00	0.04	0.00
T3Po	T3Po	T3P →	0.05	0.00	0.01	0.00	0.01	0.00	0.01	0.00
Sero	Sero	Ser →	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.00
Glyo	Glyo	Gly →	0.03	0.00	0.02	0.00	0.02	0.00	0.02	0.00
E4Po	E4Ppo	$E4P_p$ →	0.03	0.00	0.01	0.00	0.02	0.00	0.02	0.00
Pyro	Pyro	Pyr →	0.05	0.00	0.03	0.00	0.02	0.00	0.01	0.00
pyrpo	pyrpo	Pyr_p →	0.28	0.01	0.12	0.00	0.07	0.00	0.06	0.00
ACApo	ACApo	ACA_p →	0.91	0.01	0.73	0.02	0.53	0.00	0.53	0.00
OAAmo	OAAmo	OAA_m →	0.08	0.01	0.04	0.00	0.06	0.00	0.05	0.00
Gluco	Gluco	AKG_m →	0.16	0.01	0.10	0.00	0.05	0.00	0.05	0.00
G6Ppout	G6Ppout	$G6P_p$ →	0.09	0.01	0.04	0.00	0.05	0.01	0.05	0.00
P5Ppout	P5Ppout	$P5P_p$ →	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F6Po	F6Po	F6P →	0.08	0.00	0.04	0.00	0.05	0.00	0.05	0.00
CHOout	CHOout	CHO →	0.03	0.00	0.02	0.00	0.02	0.00	0.02	0.00