



		4-Hydroxy Benzoic Acid	D-Alanine	Inosine	L-Alanine	L-Leucine	L-Ornithine	Malonic Acid	Adenosine	D-Malic Acid	D-Ribose	D-Serine	D,L- α -Glycerol Phosphate	Glycine	L-Phenylalanine	L-Serine	L-Threonine	2-Aminoethanol	Acetic Acid	alpha-D-Glucose	alpha-Keto-Glutaric Acid	Citric Acid	D-Fructose	D-Gluconic Acid	D-Mannitol	Fumaric Acid	gamma-Amino Butyric Acid	Glycerol	Itaconic Acid	L-Arginine	L-Asparagine	L-Aspartic Acid	L-Glutamic Acid	L-Glutamine	L-Histidine	L-Isoleucine	L-Lactic Acid	L-Malic Acid	L-Proline	Putrescine	Pyruvic Acid	Succinic Acid	
	Ancestor																																										
	PIP																																										
PA14_39190	<i>bacA</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PA14_38530	<i>fahA</i>														X																												
PA14_36570	<i>glgA</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PA14_38480	<i>gnyA</i>				X																																X						
PA14_38460	<i>gnyB</i>				X																																						
PA14_38440	<i>gnyD</i>				X																																						
PA14_38470	<i>gnyH</i>				X																																						
PA14_38490	<i>gnyL</i>				X																																						
PA14_38510	<i>hmgA</i>														X																												
PA14_39330	<i>rbsA</i>									X																																	
PA14_39350	<i>rbsB</i>									X																																	
PA14_39320	<i>rbsC</i>									X																																	
PA14_39280	<i>rbsK</i>									X																																	
PA14_38660	<i>scoA</i>	X																																									
PA14_38640	<i>scoB</i>	X																																									
PA14_38130	<i>ycjJ</i>										X					X																											
PA14_38110	<i>ygjU</i>										X					X																											

in vitro

 No Growth
 Growth

in silico

 Essential
 Not Essential