

SEQUENCE LISTING

<110> Global Bioenergies

<120> 3-Methylcrotonic acid decarboxylase (MDC) variants

<130> AB1730 PCT S3

<150> EP 18 18 1522.6

<151> 2018-07-03

<160> 9

<170> BiSSAP 1.3.6

<210> 1

<211> 501

<212> PRT

<213> Streptomyces sp. 769

<400> 1

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Ser Asp Leu Arg Glu His Ile Glu Ala Leu Glu Lys Leu Gly Asp Leu
20          25          30
Asp Arg Val His Asp Glu Val Asp Trp Asn Leu Glu Ala Ala Ala Gln
35          40          45
Thr Arg Tyr Ser Thr Glu His His Leu Pro Ala Pro Leu Phe Glu Asn
50          55          60
Val Ala Gly Val Ala Glu Gly Phe Arg Leu Leu Gly Ala Pro Ala Ala
65          70          75          80
Leu Ser Ser Asp Pro Ser Arg Pro Tyr Ala Arg Val Ala Leu Ser Val
85          90          95
Gly Leu Arg Pro Glu Ala Thr Gly Arg Glu Val Val Glu His Leu Val
100         105         110
Ala Ala Arg His Arg Pro Gly Val Pro Pro Val Ala Val Ala Ala Glu
115         120         125
Ala Ala Pro Val Lys Ala Asn Val Leu Leu Gly Asp Glu Ala Asp Leu
130         135         140
Asn Arg Phe Pro Val Pro Phe Val His Glu Gly Asp Gly Asn Arg Tyr
145         150         155         160
Ala Asn Thr Tyr Gly Val Ile Ile Ala Gln Thr Pro Asp Gly Ser Trp
165         170         175
Thr Asn Trp Ser Ile Ala Arg Ile Met Met Ile Asp Gly Lys His Met
180         185         190
Thr Gly Leu Val Met His Pro Gln His Ile Ala Gln Val Trp Gln Gln
195         200         205
Trp Ala Asp Leu Gly Lys Pro Met Pro Tyr Ala Leu Val Gln Gly Gly
210         215         220

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Asp	Pro	Ala	Ile	Pro	Tyr	Val	Gly	Gly	Ile	Pro	Ile	Gly	Asp	Gly	Val
225					230					235					240
Ala	Glu	Ser	Ala	Tyr	Ile	Gly	Ala	Leu	Ile	Gly	Arg	Pro	Leu	Glu	Val
				245						250					255
Val	Lys	Ala	Glu	Leu	Ser	Asp	Leu	Met	Val	Pro	Ala	Gly	Ala	Glu	Ile
			260					265					270		
Val	Ile	Glu	Gly	His	Leu	Ser	Val	Gln	Arg	Asp	Gly	Val	Glu	Gly	Pro
		275					280					285			
Phe	Gly	Glu	Phe	Ala	Gly	Tyr	Ile	Pro	Arg	Glu	Thr	Ser	Leu	Gln	Pro
290						295					300				
Val	Tyr	Thr	Val	Glu	Ala	Ile	Thr	His	Arg	Asp	Ala	Pro	Ile	Trp	Pro
305					310					315					320
Leu	Val	Ala	Glu	Gly	Lys	Pro	Thr	Asp	Asp	Phe	His	Thr	Val	Thr	Gly
				325					330						335
Ile	Gly	Glu	Ala	Ala	Gly	Ala	Leu	Asp	Ala	Ile	Arg	Glu	Ala	Gly	Leu
			340					345					350		
Pro	Ala	Ala	Ser	Ala	Trp	Ala	Pro	Leu	Ser	Ala	Ala	Ser	His	Trp	Leu
		355					360					365			
Val	Val	Thr	Ala	Pro	Gly	Asn	Trp	Arg	Glu	Leu	Leu	Pro	Gly	Val	Ser
		370				375						380			
Glu	Glu	Gln	Tyr	Ala	Arg	Arg	Val	Gly	Glu	Ala	Val	Phe	Gly	Thr	Lys
385					390					395					400
Phe	Gly	Ser	Cys	Leu	Pro	Gln	Val	Phe	Leu	Leu	Asp	Asp	Asp	Phe	Asp
				405					410					415	
Pro	Thr	Asp	Asp	Ala	Asp	Leu	Leu	Trp	Ala	Leu	Ala	Thr	Arg	Val	His
			420					425					430		
Pro	Asp	Gly	Arg	Val	Val	Arg	Phe	Glu	Asp	Gly	Pro	Val	Leu	Pro	Leu
		435					440					445			
Leu	Thr	Cys	Tyr	Thr	Pro	Gln	Glu	Arg	His	Ala	Ala	Arg	Ala	Thr	Lys
	450					455					460				
Val	Val	His	Glu	Ala	Leu	Leu	Ser	Ala	Pro	Gly	Glu	Arg	Glu	Pro	Gln
465					470					475					480
Ser	Thr	Phe	Ala	Asp	Ala	Tyr	Pro	Ala	Glu	Val	Arg	Ala	Lys	Val	Arg
				485					490					495	
Ala	Arg	Tyr	Pro	Asn											
				500											

<210> 2

<211> 189

<212> PRT

<213> Escherichia coli K-12

<400> 2

Met	Lys	Arg	Leu	Ile	Val	Gly	Ile	Ser	Gly	Ala	Ser	Gly	Ala	Ile	Tyr
1				5					10					15	
Gly	Val	Arg	Leu	Leu	Gln	Val	Leu	Arg	Asp	Val	Thr	Asp	Ile	Glu	Thr
			20					25					30		
His	Leu	Val	Met	Ser	Gln	Ala	Ala	Arg	Gln	Thr	Leu	Ser	Leu	Glu	Thr
		35					40					45			

Asp	Phe	Ser	Leu	Arg	Glu	Val	Gln	Ala	Leu	Ala	Asp	Val	Thr	His	Asp
50					55					60					
Ala	Arg	Asp	Ile	Ala	Ala	Ser	Ile	Ser	Ser	Gly	Ser	Phe	Gln	Thr	Leu
65				70						75					80
Gly	Met	Val	Ile	Leu	Pro	Cys	Ser	Ile	Lys	Thr	Leu	Ser	Gly	Ile	Val
			85						90					95	
His	Ser	Tyr	Thr	Asp	Gly	Leu	Leu	Thr	Arg	Ala	Ala	Asp	Val	Val	Leu
			100					105					110		
Lys	Glu	Arg	Arg	Pro	Leu	Val	Leu	Cys	Val	Arg	Glu	Thr	Pro	Leu	His
		115					120						125		
Leu	Gly	His	Leu	Arg	Leu	Met	Thr	Gln	Ala	Ala	Glu	Ile	Gly	Ala	Val
		130				135					140				
Ile	Met	Pro	Pro	Val	Pro	Ala	Phe	Tyr	His	Arg	Pro	Gln	Ser	Leu	Asp
145					150					155					160
Asp	Val	Ile	Asn	Gln	Thr	Val	Asn	Arg	Val	Leu	Asp	Gln	Phe	Ala	Ile
			165					170						175	
Thr	Leu	Pro	Glu	Asp	Leu	Phe	Ala	Arg	Trp	Gln	Gly	Ala			
			180					185							

<210> 3

<211> 229

<212> PRT

<213> Candida albicans

<220>

<223> Candida albicans (strain SC5314 / ATCC MYA-2876)

<400> 3

Met	Ile	Ala	Arg	Val	Cys	Leu	Arg	Arg	Ser	Asn	Val	Leu	Pro	Ile	Phe
1				5					10					15	
Gln	Ile	Pro	Ser	Arg	Lys	Tyr	Ser	Ile	Asn	Tyr	Glu	Lys	Val	Asn	Asn
			20					25					30		
Ser	Ile	Tyr	Asn	Asn	Val	Ile	Lys	Pro	Lys	Arg	Ile	Val	Leu	Ala	Ile
		35					40					45			
Thr	Gly	Ala	Thr	Gly	Thr	Gln	Ile	Gly	Val	Arg	Leu	Leu	Glu	Ile	Leu
	50				55					60					
Lys	Glu	Leu	Gly	Val	Glu	Thr	His	Leu	Val	Met	Ser	Lys	Trp	Gly	Ile
65				70					75					80	
Ala	Thr	Leu	Lys	Tyr	Glu	Thr	Asp	Tyr	Gln	Val	Asp	Tyr	Val	Thr	Ser
			85					90					95		
Leu	Ala	Thr	Lys	Thr	Tyr	Ser	Ala	Arg	Asp	Val	Thr	Ala	Pro	Ile	Ser
			100					105					110		
Ser	Gly	Ser	Phe	Val	His	Asp	Gly	Met	Ile	Val	Ala	Pro	Cys	Ser	Met
		115					120					125			
Lys	Ser	Leu	Ser	Ala	Ile	Arg	Thr	Gly	Phe	Thr	Glu	Asp	Leu	Ile	Val
	130					135					140				
Arg	Ala	Ala	Asp	Val	Ser	Leu	Lys	Glu	Arg	Arg	Lys	Leu	Leu	Leu	Val
145					150					155					160
Ala	Arg	Glu	Thr	Pro	Leu	Ser	Asp	Ile	His	Leu	Asp	Asn	Met	Leu	Tyr

				165				170				175			
Leu	Ser	Arg	Met	Gly	Val	Thr	Ile	Phe	Pro	Pro	Val	Pro	Ala	Phe	Tyr
			180					185					190		
Thr	Lys	Pro	Lys	Thr	Ile	Asp	Asp	Ile	Val	Glu	Gln	Thr	Cys	Gly	Arg
		195				200						205			
Ile	Leu	Asp	Asn	Phe	Gly	Ile	Asn	Ile	Asp	Thr	Phe	Glu	Arg	Trp	Asp
	210					215					220				
Gly	Ile	Asn	His	Arg											
225															

<210> 4

<211> 227

<212> PRT

<213> Aspergillus niger

<400> 4

Met	Phe	Asn	Ser	Leu	Leu	Ser	Gly	Thr	Thr	Thr	Pro	Asn	Ser	Gly	Arg
1				5				10						15	
Ala	Ser	Pro	Pro	Ala	Ser	Glu	Met	Pro	Ile	Asp	Asn	Asp	His	Val	Ala
			20					25					30		
Val	Ala	Arg	Pro	Ala	Pro	Arg	Arg	Arg	Ile	Val	Val	Ala	Met	Thr	
		35				40					45				
Gly	Ala	Thr	Gly	Ala	Met	Leu	Gly	Ile	Lys	Val	Leu	Ile	Ala	Leu	Arg
	50					55					60				
Arg	Leu	Asn	Val	Glu	Thr	His	Leu	Val	Met	Ser	Lys	Trp	Ala	Glu	Ala
65					70					75				80	
Thr	Ile	Lys	Tyr	Glu	Thr	Asp	Tyr	His	Pro	Ser	Asn	Val	Arg	Ala	Leu
				85					90					95	
Ala	Asp	Tyr	Val	His	Asn	Ile	Asn	Asp	Met	Ala	Ala	Pro	Val	Ser	Ser
			100					105					110		
Gly	Ser	Phe	Arg	Ala	Asp	Gly	Met	Ile	Val	Val	Pro	Cys	Ser	Met	Lys
		115				120						125			
Thr	Leu	Ala	Ala	Ile	His	Ser	Gly	Phe	Cys	Asp	Asp	Leu	Ile	Ser	Arg
	130					135					140				
Thr	Ala	Asp	Val	Met	Leu	Lys	Glu	Arg	Arg	Arg	Leu	Val	Leu	Val	Ala
145					150					155					160
Arg	Glu	Thr	Pro	Leu	Ser	Glu	Ile	His	Leu	Arg	Asn	Met	Leu	Glu	Val
				165					170					175	
Thr	Arg	Ala	Gly	Ala	Val	Ile	Phe	Pro	Pro	Val	Pro	Ala	Phe	Tyr	Ile
			180					185					190		
Lys	Ala	Gly	Ser	Ile	Glu	Asp	Leu	Ile	Asp	Gln	Ser	Val	Gly	Arg	Met
		195				200						205			
Leu	Asp	Leu	Phe	Asp	Leu	Asp	Thr	Gly	Asp	Phe	Glu	Arg	Trp	Asn	Gly
	210					215					220				
Trp	Glu	Lys													
225															

<210> 5

<211> 242

<212> PRT

<213> *Saccharomyces cerevisiae* S288c

<400> 5

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Gly Ile Phe Ala Asn Phe Pro Leu Leu Gly Arg Thr Ile Thr Thr Ser
          20          25          30
Pro Ser Phe Leu Thr His Lys Leu Ser Lys Glu Val Thr Arg Ala Ser
          35          40          45
Thr Ser Pro Pro Arg Pro Lys Arg Ile Val Val Ala Ile Thr Gly Ala
          50          55          60
Thr Gly Val Ala Leu Gly Ile Arg Leu Leu Gln Val Leu Lys Glu Leu
65          70          75          80
Ser Val Glu Thr His Leu Val Ile Ser Lys Trp Gly Ala Ala Thr Met
          85          90          95
Lys Tyr Glu Thr Asp Trp Glu Pro His Asp Val Ala Ala Leu Ala Thr
          100          105          110
Lys Thr Tyr Ser Val Arg Asp Val Ser Ala Cys Ile Ser Ser Gly Ser
          115          120          125
Phe Gln His Asp Gly Met Ile Val Val Pro Cys Ser Met Lys Ser Leu
          130          135          140
Ala Ala Ile Arg Ile Gly Phe Thr Glu Asp Leu Ile Thr Arg Ala Ala
145          150          155          160
Asp Val Ser Ile Lys Glu Asn Arg Lys Leu Leu Leu Val Thr Arg Glu
          165          170          175
Thr Pro Leu Ser Ser Ile His Leu Glu Asn Met Leu Ser Leu Cys Arg
          180          185          190
Ala Gly Val Ile Ile Phe Pro Pro Val Pro Ala Phe Tyr Thr Arg Pro
          195          200          205
Lys Ser Leu His Asp Leu Leu Glu Gln Ser Val Gly Arg Ile Leu Asp
          210          215          220
Cys Phe Gly Ile His Ala Asp Thr Phe Pro Arg Trp Glu Gly Ile Lys
225          230          235          240
Ser Lys
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<210> 6

<211> 180

<212> PRT

<213> *Cryptococcus gattii* WM276

<220>

<223> serotype B

<400> 6

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Met Arg Arg Lys Arg Tyr Val Val Ala Val Thr Gly Ala Thr Gly Ala
1          5          10          15
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Thr	Leu	Ala	Ile	Arg	Leu	Leu	Gln	Ala	Leu	Arg	Ala	Leu	Asp	Ile	Glu
			20					25					30		
Thr	His	Leu	Ile	Ile	Ser	Lys	Trp	Ala	Val	Lys	Thr	Leu	Lys	Tyr	Glu
		35					40					45			
Thr	Asp	Met	Ile	Glu	Arg	Glu	Leu	Lys	Asp	Leu	Ala	Asp	Tyr	Ser	Tyr
		50				55					60				
Ser	Asn	Ser	Asp	Leu	Ala	Ala	Pro	Pro	Ser	Ser	Gly	Ser	Phe	Ile	His
65					70					75				80	
Asp	Gly	Met	Phe	Ile	Ile	Pro	Cys	Ser	Met	Lys	Thr	Leu	Ala	Ala	Val
			85					90						95	
Arg	Ile	Gly	Leu	Gly	Asp	Glu	Leu	Ile	Ser	Arg	Ser	Ala	Asp	Val	Cys
		100						105					110		
Leu	Lys	Glu	Gly	Arg	Lys	Leu	Met	Leu	Val	Val	Arg	Glu	Thr	Pro	Leu
		115					120					125			
Asn	Asp	Ile	His	Leu	Glu	Asn	Met	Leu	Phe	Leu	Arg	Arg	Ala	Gly	Ala
		130				135					140				
Ile	Ile	Phe	Pro	Pro	Val	Pro	Ala	Tyr	Tyr	Ile	Arg	Pro	Gln	Thr	Ile
145					150					155					160
Asp	Asp	Leu	Thr	Asn	Gln	Thr	Val	Gly	Arg	Ile	Leu	Asp	Ser	Ser	Lys
				165					170					175	
Cys	Ser	Gln	Lys												
			180												

<210> 7

<211> 192

<212> PRT

<213> Bacillus subtilis

<400> 7

Met	Lys	Leu	Val	Ile	Gly	Met	Thr	Gly	Ala	Thr	Gly	Ala	Ile	Phe	Gly
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Ile	Arg	Leu	Leu	Glu	Tyr	Leu	Lys	Ala	Ala	Glu	Ile	Glu	Thr	His	Leu
			20					25					30		
Val	Val	Ser	Pro	Trp	Ala	Asn	Val	Thr	Ile	Thr	His	Glu	Thr	Asp	Tyr
		35					40					45			
Thr	Leu	Lys	Asp	Val	Glu	Lys	Leu	Ala	Ser	Tyr	Thr	Tyr	Ser	His	Lys
		50				55					60				
Asp	Gln	Ala	Ala	Ala	Ile	Ser	Ser	Gly	Ser	Phe	Glu	Thr	Asp	Gly	Met
65					70					75				80	
Ile	Ile	Ala	Pro	Cys	Ser	Met	Lys	Ser	Leu	Ala	Ser	Ile	Arg	Thr	Gly
			85					90					95		
Met	Ala	Asp	Asn	Leu	Leu	Thr	Arg	Ala	Ala	Asp	Val	Ile	Leu	Lys	Glu
			100					105					110		
Arg	Lys	Lys	Leu	Val	Leu	Leu	Thr	Arg	Glu	Thr	Pro	Leu	Ser	Gln	Ile
		115					120					125			
His	Leu	Glu	Asn	Met	Leu	Ala	Leu	Thr	Lys	Met	Gly	Ser	Val	Ile	Leu
		130				135					140				
Pro	Pro	Met	Pro	Ala	Phe	Tyr	Asn	Lys	Pro	Ala	Asp	Met	Asp	Glu	Leu
145					150					155					160

Ile	Asp	His	Ile	Val	Phe	Arg	Thr	Leu	Asp	Gln	Phe	Gly	Ile	Arg	Leu
				165					170					175	
Pro	Glu	Ala	Lys	Arg	Trp	Tyr	Gly	Ile	Glu	Lys	Gln	Lys	Gly	Gly	Ile
			180					185					190		

<210> 8
 <211> 209
 <212> PRT
 <213> *Pseudomonas aeruginosa*

<400> 8

Met	Ser	Gly	Pro	Glu	Arg	Ile	Thr	Leu	Ala	Met	Thr	Gly	Ala	Ser	Gly
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Ala	Gln	Tyr	Gly	Leu	Arg	Leu	Leu	Asp	Cys	Leu	Val	Gln	Glu	Glu	Arg
			20					25					30		
Glu	Val	His	Phe	Leu	Ile	Ser	Lys	Ala	Ala	Gln	Leu	Val	Met	Ala	Thr
		35					40					45			
Glu	Thr	Asp	Val	Ala	Leu	Pro	Ala	Lys	Pro	Gln	Ala	Met	Gln	Ala	Phe
	50					55					60				
Leu	Thr	Glu	Tyr	Cys	Gly	Ala	Ala	Ala	Gly	Gln	Ile	Arg	Val	Phe	Gly
65					70					75					80
Gln	Asn	Asp	Trp	Met	Ala	Pro	Pro	Ala	Ser	Gly	Ser	Ser	Ala	Pro	Asn
				85					90					95	
Ala	Met	Val	Ile	Cys	Pro	Cys	Ser	Thr	Gly	Thr	Leu	Ser	Ala	Val	Ala
			100						105					110	
Thr	Gly	Ala	Cys	Asn	Asn	Leu	Ile	Glu	Arg	Ala	Ala	Asp	Val	Ala	Leu
	115						120					125			
Lys	Glu	Arg	Arg	Pro	Leu	Val	Leu	Val	Pro	Arg	Glu	Ala	Pro	Phe	Ser
	130					135					140				
Ser	Ile	His	Leu	Glu	Asn	Met	Leu	Lys	Leu	Ser	Asn	Leu	Gly	Ala	Val
145					150					155					160
Ile	Leu	Pro	Ala	Ala	Pro	Gly	Phe	Tyr	His	Gln	Pro	Gln	Ser	Val	Glu
			165						170					175	
Asp	Leu	Val	Asp	Phe	Val	Val	Ala	Arg	Ile	Leu	Asn	Thr	Leu	Gly	Ile
			180					185					190		
Pro	Gln	Asp	Met	Leu	Pro	Arg	Trp	Gly	Glu	Gln	His	Leu	Val	Ser	Asp
		195					200						205		

Glu

<210> 9
 <211> 219
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 <213> *Enterobacter* sp.

<220>

