

1

SEQUENCE LISTING

<110> CHIANG MAI UNIVERSITY
NATIONAL SCIENCE AND TECHNOLOGY DEVELOPMENT AGENCY

<120> MATURE VIRUS-LIKE PARTICLES OF FLAVIVIRUSES

<130> CMU-P001WO

<160> 8

<170> PatentIn version 3.5

<210> 1

<211> 570

<212> PRT

<213> Dengue virus

<400> 1

Ser Val Ala Leu Ala Pro Ala Val Gly Leu Gly Leu Glu Thr Arg Thr
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Glu Thr Trp Met Ser Ser Glu Gly Ala Trp Lys Gln Ile Gln Arg Val
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Glu Thr Trp Ala Leu Arg His Pro Gly Phe Thr Val Ile Ala Leu Phe
35 40 45

Leu Ala His Ala Ile Gly Thr Ser Ile Thr Gln Lys Gly Ile Ile Phe
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Ile Leu Leu Met Leu Val Thr Pro Ser Met Ala Met Arg Cys Val Gly
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Ile Gly Ser Arg Asp Phe Val Glu Gly Leu Ser Gly Ala Thr Trp Val
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Asp Val Val Leu Glu Asn Gly Ser Cys Val Thr Thr Met Ala Lys Asp
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Lys Pro Thr Leu Asp Ile Glu Leu Leu Lys Thr Glu Val Thr Asn Pro
115 120 125

2

Ala Val Leu Arg Lys Leu Cys Ile Glu Ala Lys Ile Ser Asn Thr Thr
130 135 140

Thr Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala Thr Leu Val Glu Glu
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Gln Asp Ala Asn Phe Val Cys Arg Arg Thr Phe Val Asp Arg Gly Trp
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Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser Leu Leu Thr Cys Ala
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Lys Phe Lys Cys Val Thr Lys Leu Glu Gly Lys Ile Val Gln Tyr Glu
195 200 205

Asn Leu Lys Tyr Ser Val Ile Val Thr Val His Thr Gly Asp Gln Asn
210 215 220

Gln Val Gly Asn Glu Ser Thr Glu His Gly Thr Thr Ala Thr Ile Thr
225 230 235 240

Pro Gln Ala Pro Thr Thr Glu Ile Gln Leu Thr Asp Tyr Gly Ala Leu
245 250 255

Thr Leu Asp Cys Phe Pro Leu Thr Gly Leu Asp Phe Asn Glu Met Val
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Leu Leu Thr Met Lys Glu Lys Ser Trp Leu Val Asn Lys Gln Trp Phe
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Leu Asp Leu Pro Leu Pro Trp Thr Ser Gly Ala Ser Thr Ser Gln Glu
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Thr Trp Asn Arg Gln Asp Leu Leu Val Thr Phe Lys Thr Ala His Ala
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Lys Lys Gln Glu Val Val Val Leu Gly Ser Gln Glu Gly Ala Met Ala
325 330 335

Thr Ala Leu Thr Gly Ala Thr Glu Ile Gln Thr Ser Gly Thr Thr Thr
340 345 350

Ile Phe Ala Gly Ala Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Thr
 355 360 365

Leu Lys Gly Met Ser Tyr Val Met Cys Thr Gly Ser Phe Lys Leu Glu
 370 375 380

Lys Glu Val Ala Glu Thr Gln Ala Gly Thr Val Leu Val Gln Ile Lys
 385 390 395 400

Tyr Glu Gly Thr Asp Ala Pro Cys Lys Ile Pro Phe Ser Thr Gln Asp
 405 410 415

Glu Lys Gly Val Thr Gln Asn Gly Arg Leu Ile Thr Ala Asn Pro Ile
 420 425 430

Val Thr Asp Lys Glu Lys Pro Val Asn Ile Glu Ala Glu Pro Pro Phe
 435 440 445

Gly Glu Ser Tyr Ile Val Ile Gly Ala Gly Glu Lys Ala Leu Lys Leu
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Ser Trp Phe Lys Lys Gly Ser Thr Leu Gly Lys Ala Phe Ser Thr Thr
 465 470 475 480

Leu Lys Gly Ala Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp
 485 490 495

Phe Gly Ser Ile Gly Gly Val Phe Asn Ser Ile Gly Lys Ala Val His
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Gln Val Phe Gly Gly Ala Phe Arg Thr Leu Phe Gly Gly Met Ser Trp
 515 520 525

Ile Thr Gln Gly Leu Met Gly Ala Leu Leu Leu Trp Met Gly Val Asn
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Leu Val Phe Leu Ala Thr Asn Val His Ala
565 570

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<210> 2
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<212> PRT
<213> Dengue virus
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<400> 2

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Glu Thr Trp Ile Leu Arg His Pro Gly Phe Thr Ile Met Ala Ala Ile
35 40 45

Leu Ala Tyr Thr Ile Gly Thr Thr His Phe Gln Arg Val Leu Ile Phe
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Ile Leu Leu Thr Ala Val Ala Pro Ser Met Thr Met Arg Cys Ile Gly
65 70 75 80

Ile Ser Asn Arg Asp Phe Val Glu Gly Val Ser Gly Gly Ser Trp Val
85 90 95

Asp Ile Val Leu Glu Asn Gly Ser Cys Val Thr Thr Met Ala Lys Asn
100 105 110

Lys Pro Thr Leu Asp Phe Glu Leu Ile Lys Thr Glu Ala Lys Gln Pro
115 120 125

Ala Thr Leu Arg Lys Tyr Cys Ile Glu Ala Lys Leu Thr Asn Thr Thr
130 135 140

Thr Glu Ser Arg Cys Pro Thr Gln Gly Glu Pro Ser Leu Lys Glu Glu
145 150 155 160

Gln Asp Lys Arg Phe Val Cys Lys His Ser Met Val Asp Arg Gly Trp
165 170 175

5

Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Gly Ile Val Thr Cys Ala
 180 185 190

Met Phe Thr Cys Lys Lys Asn Met Glu Gly Lys Ile Val Gln Pro Glu
 195 200 205

Asn Leu Glu Tyr Thr Ile Val Val Thr Pro His Ser Gly Glu Glu Asn
 210 215 220

Ala Val Gly Asn Asp Thr Gly Lys His Gly Lys Glu Ile Lys Val Thr
 225 230 235 240

Pro Gln Ser Ser Ile Thr Glu Ala Glu Leu Thr Gly Tyr Gly Thr Val
 245 250 255

Thr Met Glu Cys Phe Pro Leu Thr Gly Leu Asp Phe Asn Glu Met Val
 260 265 270

Leu Leu Gln Met Glu Asn Lys Ala Trp Leu Val Asn Arg Gln Trp Phe
 275 280 285

Leu Asp Leu Pro Leu Pro Trp Leu Pro Gly Ala Asp Lys Gln Glu Ser
 290 295 300

Asn Trp Ile Gln Lys Glu Thr Leu Val Thr Phe Lys Ser Pro His Ala
 305 310 315 320

Lys Lys Gln Asp Val Val Val Leu Gly Ser Gln Glu Gly Ala Met Ala
 325 330 335

Thr Ala Leu Thr Gly Ala Thr Glu Ile Gln Met Ser Ser Gly Asn Leu
 340 345 350

Leu Phe Thr Gly Ala Leu Lys Cys Arg Leu Arg Met Asp Lys Leu Gln
 355 360 365

Leu Lys Gly Met Ser Tyr Ser Met Cys Thr Gly Lys Phe Lys Val Val
 370 375 380

Lys Glu Ile Ala Glu Thr Gln Ala Gly Thr Ile Val Ile Gln Val Gln

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Val	Thr	Glu 435	Lys	Asp	Ser	Pro	Val 440	Asn	Ile	Glu	Ala	Glu 445	Pro	Pro	Phe
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<210> 3
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<212> PRT
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<400> 3

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

Ala Val Gly Asn Asp Thr Ser Asn His Gly Val Thr Ala Met Ile Thr
 225 230 235 240

Pro Arg Ser Pro Ser Val Glu Val Lys Leu Pro Asp Tyr Gly Glu Leu
 245 250 255

Thr Leu Asp Cys Phe Pro Leu Ser Gly Ile Asp Phe Asn Glu Met Ile
 260 265 270

Leu Met Lys Met Lys Lys Lys Thr Trp Leu Val Asn Lys Gln Trp Phe
 275 280 285

Leu Asp Leu Pro Leu Pro Trp Thr Ala Gly Ala Asp Thr Ser Glu Val
 290 295 300

His Trp Asn Tyr Lys Glu Arg Met Val Thr Phe Lys Ser Pro His Ala
 305 310 315 320

Lys Arg Gln Asp Val Thr Val Leu Gly Ser Gln Glu Gly Ala Met Ala
 325 330 335

Ser Ala Leu Ala Gly Ala Thr Glu Val Asp Ser Gly Asp Gly Asn His
 340 345 350

Met Phe Ala Gly Ala Leu Lys Cys Lys Val Arg Met Glu Lys Leu Arg
 355 360 365

Ile Lys Gly Met Ser Tyr Thr Met Cys Ser Gly Lys Phe Ser Ile Asp
 370 375 380

Lys Glu Met Ala Glu Thr Gln Ala Gly Thr Thr Val Val Gln Val Lys
 385 390 395 400

Tyr Glu Gly Ala Gly Ala Pro Cys Lys Val Pro Ile Glu Ile Arg Asp
 405 410 415

Val Asn Lys Glu Lys Val Val Gly Arg Ile Ile Ser Ser Thr Pro Leu
 420 425 430

9

Ala Glu Asn Thr Asn Ser Val Thr Asn Ile Glu Leu Glu Pro Pro Phe
435 440 445

Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asn Ser Ala Leu Thr Leu
450 455 460

His Trp Phe Arg Lys Gly Ser Thr Leu Gly Lys Ala Phe Ser Thr Thr
465 470 475 480

Leu Lys Gly Ala Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp
485 490 495

Phe Gly Ser Ile Gly Gly Val Phe Asn Ser Ile Gly Lys Ala Val His
500 505 510

Gln Val Phe Gly Gly Ala Phe Arg Thr Leu Phe Gly Gly Met Ser Trp
515 520 525

Ile Thr Gln Gly Leu Met Gly Ala Leu Leu Leu Trp Met Gly Val Asn
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Ala Arg Asp Arg Ser Ile Ala Leu Ala Phe Leu Ala Thr Gly Gly Val
545 550 555 560

Leu Val Phe Leu Ala Thr Asn Val His Ala
565 570

<210> 4
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<212> PRT
<213> Dengue virus

<400> 4

Ser Val Ala Leu Ala Pro Ala Val Gly Met Gly Leu Asp Thr Arg Thr
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Gln Thr Trp Met Ser Ala Glu Gly Ala Trp Arg Gln Val Glu Lys Val
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Glu Thr Trp Ala Leu Arg His Pro Gly Phe Thr Ile Leu Ala Leu Phe
35 40 45

10

Leu Ala His Tyr Ile Gly Thr Ser Leu Thr Gln Lys Val Val Ile Phe
50 55 60

Ile Leu Leu Met Leu Val Thr Pro Ser Met Thr Met Arg Cys Val Gly
65 70 75 80

Val Gly Asn Arg Asp Phe Val Glu Gly Leu Ser Gly Ala Thr Trp Val
85 90 95

Asp Val Val Leu Glu Asn Gly Gly Cys Val Thr Thr Met Ala Lys Asn
100 105 110

Lys Pro Thr Leu Asp Ile Glu Leu Gln Lys Thr Glu Ala Thr Gln Leu
115 120 125

Ala Thr Leu Arg Lys Leu Cys Ile Glu Gly Lys Ile Thr Asn Ile Thr
130 135 140

Thr Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala Ala Leu Pro Glu Glu
145 150 155 160

Gln Asp Gln Asn Tyr Val Cys Lys His Thr Tyr Val Asp Arg Gly Trp
165 170 175

Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser Leu Val Thr Cys Ala
180 185 190

Lys Phe Gln Cys Leu Glu Pro Ile Glu Gly Lys Val Val Gln Tyr Glu
195 200 205

Asn Leu Lys Tyr Thr Val Ile Ile Thr Val His Thr Gly Asp Gln Asn
210 215 220

Gln Val Gly Asn Glu Thr Gln Gly Val Thr Val Glu Ile Thr Pro Gln
225 230 235 240

Ala Ser Thr Thr Glu Ala Ile Leu Pro Glu Tyr Gly Thr Leu Gly Leu
245 250 255

Glu Cys Phe Pro Leu Thr Gly Leu Asp Phe Asn Glu Met Ile Leu Leu

12

Gly Ala Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly
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Ser Ile Gly Gly Val Phe Asn Ser Ile Gly Lys Ala Val His Gln Val
 500 505 510

Phe Gly Gly Ala Phe Arg Thr Leu Phe Gly Gly Met Ser Trp Ile Thr
 515 520 525

Gln Gly Leu Met Gly Ala Leu Leu Leu Trp Met Gly Val Asn Ala Arg
 530 535 540

Asp Arg Ser Ile Ala Leu Ala Phe Leu Ala Thr Gly Gly Val Leu Val
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Phe Leu Ala Thr Asn Val His Ala
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<210> 5
 <211> 1710
 <212> DNA
 <213> Dengue virus

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14

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<211> 1710

<212> DNA

<213> Dengue virus

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<210> 8

<211> 1707

<212> DNA

<213> Dengue virus

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caggaccaga actacgtgtg caagcacacc tacgtggacc gcggttgggg taacggttgc 540

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17

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