

5335455\_1.txt  
SEQUENCE LISTING

<110> MERCK SHARP & DOHME CORP.  
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Cash , Brandon D.  
Chang, Wonsuk  
Cumming, Jared N.  
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Henderson, Timothy J.  
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Larsen, Matthew A.  
Liang, Rui  
Lim, Jongwon  
Lu, Min  
Otte, Ryan D.  
Siu, Tony  
Trotter, Benjamin Wesley  
Tyagarajan, Sriram

<120> BENZO[b]THIOPHENE COMPOUNDS AS STING AGONISTS

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<151> 2016-10-04

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<170> PatentIn version 3.5

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35 40 45

Leu His Leu Ala Ser Leu Gln Leu Gly Leu Leu Leu Asn Gly Val Cys  
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Ser Leu Ala Glu Glu Leu His His Ile His Ser Arg Tyr Arg Gly Ser  
65 70 75 80

Tyr Trp Arg Thr Val Arg Ala Cys Leu Gly Cys Pro Leu Arg Arg Gly  
85 90 95

Ala Leu Leu Leu Leu Ser Ile Tyr Phe Tyr Tyr Ser Leu Pro Asn Ala  
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Val Gly Pro Pro Phe Thr Trp Met Leu Ala Leu Leu Gly Leu Ser Gln  
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 165 170 175  
 Ala Arg Ile Arg Thr Tyr Asn Gln His Tyr Asn Asn Leu Leu Arg Gly  
 180 185 190  
 Ala Val Ser Gln Arg Leu Tyr Ile Leu Leu Pro Leu Asp Cys Gly Val  
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 Pro Asp Asn Leu Ser Met Ala Asp Pro Asn Ile Arg Phe Leu Asp Lys  
 210 215 220  
 Leu Pro Gln Gln Thr Ala Asp Arg Ala Gly Ile Lys Asp Arg Val Tyr  
 225 230 235 240  
 Ser Asn Ser Ile Tyr Glu Leu Leu Glu Asn Gly Gln Arg Ala Gly Thr  
 245 250 255  
 Cys Val Leu Glu Tyr Ala Thr Pro Leu Gln Thr Leu Phe Ala Met Ser  
 260 265 270  
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 275 280 285  
 Lys Leu Phe Cys Gln Thr Leu Glu Asp Ile Leu Ala Asp Ala Pro Glu  
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 Ser Gln Asn Asn Cys Arg Leu Ile Ala Tyr Gln Glu Pro Ala Asp Asp  
 305 310 315 320  
 Ser Ser Phe Ser Leu Ser Gln Glu Val Leu Arg His Leu Arg Gln Glu  
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 Glu Lys Glu Glu Val Thr Val Gly Ser Leu Lys Thr Ser Ala Val Pro  
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| tgtatattct  | cctcccattg  | gactgtgggg  | tgcctgataa  | cctgagtatg | gctgacccca | 1920 |
| acattcgctt  | cctggataaa  | ctgccccagc  | agaccgctga  | ccgtgctggc | atcaaggatc | 1980 |
| gggttttacag | caacagcatc  | tatgagcttc  | tggagaacgg  | gcagcgggcg | ggcacctgtg | 2040 |
| tcctggagta  | cgccaccccc  | ttgcagactt  | tgtttgccat  | gtcacaatac | agtcaagctg | 2100 |
| gcttttagccg | ggaggatagg  | cttgagcagg  | ccaaactctt  | ctgccagaca | cttgaggaca | 2160 |
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| cacgggagaa  | ggtggtggcg  | gcggtgccgc  | cggtataatt  | tgttctggtt | tagtttgttc | 3720 |
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| aatgtaagca  | attgtattgt  | aaagagattg  | tctcaagctc  | ggatcgatcc  | cgcacgccga  | 3960 |
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| ggtttaaacg  | cttcctcgct  | cactgactcg  | ctgcgctcgg  | tcgttcggct  | gcggcgagcg  | 4080 |
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| gggtggtttt  | ttgtttgcaa  | gcagcagatt  | acgcgcagaa  | aaaaaggatc  | tcaagaagat  | 4800 |
| cctttgatct  | tttctacggg  | gtctgacgct  | cagtggaaacg | aaaactcacg  | ttaagggatt  | 4860 |
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| tttaaatcaa  | tctaaagtat  | atatgagtaa  | acttggtctg  | acagttacca  | atgcttaatc  | 4980 |
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| atacgggata  | ataccgcgcc  | acatagcaga  | actttaaaag  | tgctcatcat  | tggaaaacgt  | 5640 |
| tcttcggggc  | gaaaactctc  | aaggatctta  | ccgctgttga  | gatccagttc  | gatgtaaccc  | 5700 |
| actcgtgcac  | ccaactgatc  | ttcagcatct  | tttactttca  | ccagcgtttc  | tgggtgagca  | 5760 |
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Leu His Leu Ala Ser Leu Gln Leu Gly Leu Leu Leu Asn Gly Val Cys  
 50 55 60

Ser Leu Ala Glu Glu Leu Arg His Ile His Ser Arg Tyr Arg Gly Ser  
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Tyr Trp Arg Thr Val Arg Ala Cys Leu Gly Cys Pro Leu Arg Arg Gly  
 85 90 95

Ala Leu Leu Leu Leu Ser Ile Tyr Phe Tyr Tyr Ser Leu Pro Asn Ala  
 100 105 110

Val Gly Pro Pro Phe Thr Trp Met Leu Ala Leu Leu Gly Leu Ser Gln  
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Ala Leu Asn Ile Leu Leu Gly Leu Lys Gly Leu Ala Pro Ala Glu Ile  
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Trp Ser Tyr Tyr Ile Gly Tyr Leu Arg Leu Ile Leu Pro Glu Leu Gln  
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Ala Val Ser Gln Arg Leu Tyr Ile Leu Leu Pro Leu Asp Cys Gly Val  
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Pro Asp Asn Leu Ser Met Ala Asp Pro Asn Ile Arg Phe Leu Asp Lys  
210 215 220

Leu Pro Gln Gln Thr Gly Asp Arg Ala Gly Ile Lys Asp Arg Val Tyr  
225 230 235 240

Ser Asn Ser Ile Tyr Glu Leu Leu Glu Asn Gly Gln Arg Ala Gly Thr  
245 250 255

Cys Val Leu Glu Tyr Ala Thr Pro Leu Gln Thr Leu Phe Ala Met Ser  
260 265 270

Gln Tyr Ser Gln Ala Gly Phe Ser Arg Glu Asp Arg Leu Glu Gln Ala  
275 280 285

Lys Leu Phe Cys Arg Thr Leu Glu Asp Ile Leu Ala Asp Ala Pro Glu  
290 295 300

Ser Gln Asn Asn Cys Arg Leu Ile Ala Tyr Gln Glu Pro Ala Asp Asp  
305 310 315 320

Ser Ser Phe Ser Leu Ser Gln Glu Val Leu Arg His Leu Arg Gln Glu  
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Glu Lys Glu Glu Val Thr Val Gly Ser Leu Lys Thr Ser Ala Val Pro  
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Ser Thr Ser Thr Met Ser Gln Glu Pro Glu Leu Leu Ile Ser Gly Met  
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Glu Lys Pro Leu Pro Leu Arg Thr Asp Phe Ser Gly Gly Gly Leu Asn  
370 375 380

Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His Glu Gly Ser Leu Glu  
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| acattcgctt  | cctggataaa  | ctgccccagc  | agaccgggtga | ccgtgctggc | atcaaggatc  | 1980 |
| gggttttacag | caacagcatc  | tatgagcttc  | tggagaacgg  | gcagcgggcg | ggcacctgtg  | 2040 |
| tcctggagta  | cgccaccccc  | ttgcagactt  | tgtttgccat  | gtcacaatac | agtcaagctg  | 2100 |
| gcttttagccg | ggaggatagg  | cttgagcagg  | ccaaactctt  | ctgccggaca | cttgaggaca  | 2160 |
| tcctggcaga  | tgcccctgag  | tctcagaaca  | actgccgcct  | cattgcctac | caggaaacctg | 2220 |
| cagatgacag  | cagcttctcg  | ctgtcccagg  | aggttctccg  | gcacctgcgg | caggaggaaa  | 2280 |
| aggaagaggt  | tactgtgggc  | agcttgaaga  | cctcagcgg   | gccagtagc  | tccacgatgt  | 2340 |
| cccaagagcc  | tgagctcctc  | atcagtggaa  | tggaaaagcc  | cctccctctc | cgcacggatt  | 2400 |
| tctctggcgg  | tggcctgaac  | gacatcttcg  | aagcccagaa  | aatcgaatgg | catgaaggca  | 2460 |
| gcctggaagt  | gctgttccag  | ggcccacacc  | accatcatca  | ccatcaccat | taatgagcgg  | 2520 |
| ccgcactcga  | gcaccaccac  | caccaccact  | aacctaggta  | gctgagcgca | tgcaagctga  | 2580 |
| tccgggttat  | tagtacattt  | attaagcgct  | agattctgtg  | cgttgttgat | ttacagacaa  | 2640 |
| ttgttgtagc  | tattttaata  | attcattaaa  | tttataatct  | ttaggggtgg | atgttagagc  | 2700 |
| gaaaatcaaa  | tgattttcag  | cgtctttata  | tctgaattta  | aatattaaat | cctcaataga  | 2760 |
| tttgtaaaat  | aggtttcgat  | tagtttcaaa  | caaggggtgt  | ttttccgaac | cgatggctgg  | 2820 |
| actatcta    | ggattttcgc  | tcaacgccac  | aaaacttgcc  | aaatcttgta | gcagcaatct  | 2880 |
| agctttgtcg  | atattcgttt  | gtgttttggt  | ttgtaataaa  | ggttcgacgt | cgttcaaaat  | 2940 |
| attatgcgct  | tttgatattt  | tttcatcact  | gtcgtagtg   | tacaattgac | tcgacgtaaa  | 3000 |
| cacgttaaat  | agagcttgg   | catatttaac  | atcgggcgtg  | ttagctttat | taggccgatt  | 3060 |
| atcgtcgtcg  | tcccaaccct  | cgtcgtaga   | agttgcttcc  | gaagacgatt | ttgccatagc  | 3120 |
| cacacgacgc  | ctattaattg  | tgtcggctaa  | cacgtccgcg  | atcaaatttg | tagttgagct  | 3180 |
| ttttggaatt  | atttctgatt  | gcgggcgttt  | ttgggcgggt  | ttcaatctaa | ctgtgcccga  | 3240 |
| ttttaattca  | gacaacacgt  | tagaaagcga  | tgggtgcaggc | ggtggtaaca | tttcagacgg  | 3300 |
| caaatctact  | aatggcggcg  | gtgggtggagc | tgatgataaa  | tctaccatcg | gtggaggcgc  | 3360 |
| aggcggggct  | ggcggcggag  | gcggaggcgg  | aggtggtggc  | ggtgatgcag | acggcggttt  | 3420 |
| aggctcaaat  | gtctcttttag | gcaacacagt  | cggcacctca  | actattgtac | tggtttcggg  | 3480 |
| cgccgttttt  | ggtttgaccg  | gtctgagacg  | agtgcgattt  | ttttcgtttc | taatagcttc  | 3540 |
| caacaattgt  | tgtctgtcgt  | ctaaagggtgc | agcgggttga  | ggttccgtcg | gcattgggtg  | 3600 |
| agcgggcggc  | aattcagaca  | tcgatgggtg  | tgggtgggtg  | ggaggcgcgt | gaatgttagg  | 3660 |
| cacgggagaa  | ggtgggtggc  | gcgggtgccgc | cgggtataatt | tgttctgggt | tagtttgttc  | 3720 |
| gcgcacgatt  | gtgggcaccg  | gcgcaggcgc  | cgctggctgc  | acaacggaag | gtcgtctgct  | 3780 |
| tcgaggcagc  | gcttggggtg  | gtggcaattc  | aatattataa  | ttggaataca | aatcgtaaaa  | 3840 |
| atctgctata  | agcattgtaa  | tttcgctatc  | gtttaccgtg  | ccgatattta | acaaccgctc  | 3900 |

## 5335455\_1.txt

|             |             |             |             |            |             |      |
|-------------|-------------|-------------|-------------|------------|-------------|------|
| aatgtaagca  | attgtattgt  | aaagagattg  | tctcaagctc  | ggatcgatcc | cgcacgccga  | 3960 |
| taacaagcct  | tttcattttt  | actacagcat  | tgtagtggcg  | agacacttcg | ctgtcgtcga  | 4020 |
| ggtttaaacg  | cttcctcgct  | cactgactcg  | ctgcgctcgg  | tcgttcggct | gcggcgagcg  | 4080 |
| gtatcagctc  | actcaaaggc  | ggtaatacgg  | ttatccacag  | aatcagggga | taacgcagga  | 4140 |
| aagaacatgt  | gagcaaaaag  | ccagcaaaaag | gccaggaacc  | gtaaaaaggc | cgcgttgctg  | 4200 |
| gcgtttttcc  | ataggctccg  | ccccctgac   | gagcatcaca  | aaaatcgacg | ctcaagtcag  | 4260 |
| aggtggcgaa  | acccgacagg  | actataaaga  | taccaggcgt  | ttccccctgg | aagctccctc  | 4320 |
| gtgcgctctc  | ctgttccgac  | cctgccgctt  | accggatacc  | tgtccgcctt | tctcccttcg  | 4380 |
| ggaagcgtgg  | cgcttttctca | tagctcacgc  | tgtaggatc   | tcagttcggt | gtaggtcgtt  | 4440 |
| cgctccaagc  | tgggctgtgt  | gcacgaaccc  | cccgttcagc  | ccgaccgctg | cgcttatcc   | 4500 |
| ggtaactatc  | gtcttgagtc  | caacccggta  | agacacgact  | tatcgccact | ggcagcagcc  | 4560 |
| actggtaaca  | ggattagcag  | agcgaggat   | gtaggcggtg  | ctacagagtt | cttgaagtgg  | 4620 |
| tggcctaact  | acggctacac  | tagaaggaca  | gtatttggtg  | tctgcgctct | gctgaagcca  | 4680 |
| gttaccttcg  | gaaaaagagt  | tggtagctct  | tgatccggca  | aacaaaccac | cgctggtagc  | 4740 |
| gggtggttttt | ttgtttgcaa  | gcagcagatt  | acgcgcagaa  | aaaaaggatc | tcaagaagat  | 4800 |
| cctttgatct  | tttctacggg  | gtctgacgct  | cagtggaaacg | aaaactcacg | ttaagggatt  | 4860 |
| ttggtcatga  | gattatcaaa  | aaggatcttc  | acctagatcc  | ttttaaatga | aaaatgaagt  | 4920 |
| tttaaatcaa  | tctaaagtat  | atatgagtaa  | acttgggtctg | acagttacca | atgcttaatc  | 4980 |
| agtgaggcac  | ctatctcagc  | gatctgtcta  | tttcgttcac  | ccatagttgc | ctgactcccc  | 5040 |
| gtcgtgtaga  | taactacgat  | acgggagggc  | ttaccatctg  | gccccagtgc | tgcaatgata  | 5100 |
| ccgcgagacc  | cacgctcacc  | ggctccagat  | ttatcagcaa  | taaaccagcc | agccggaagg  | 5160 |
| gccgagcgca  | gaagtgggtcc | tgcaacttta  | tccgcctcca  | tccagtctat | taattgttgc  | 5220 |
| cgggaagcta  | gagtaagtag  | ttcgccagtt  | aatagtttgc  | gcaacgttgt | tgccattgct  | 5280 |
| acaggcatcg  | tgggtgtcacg | ctcgtcgttt  | ggatatggctt | cattcagctc | cggttcccaa  | 5340 |
| cgatcaaggc  | gagttacatg  | atcccccatg  | ttgtgcaaaa  | aagcggttag | ctccttcggt  | 5400 |
| cctccgatcg  | ttgtcagaag  | taagttggcc  | gcagtgttat  | cactcatggt | tatggcagca  | 5460 |
| ctgcataatt  | ctcttactgt  | catgccatcc  | gtaagatgct  | tttctgtgac | tgggtgagtac | 5520 |
| tcaaccaagt  | cattctgaga  | atagtgtatg  | cggcgaccga  | gttgctcttg | cccggcgta   | 5580 |
| atacgggata  | ataccgcgcc  | acatagcaga  | actttaaaag  | tgctcatcat | tggaaaacgt  | 5640 |
| tcttcggggc  | gaaaactctc  | aaggatctta  | ccgctgttga  | gatccagttc | gatgtaaccc  | 5700 |
| actcgtgcac  | ccaactgac   | ttcagcatct  | tttactttca  | ccagcgtttc | tgggtgagca  | 5760 |
| aaaacaggaa  | ggcaaaatgc  | cgcaaaaaag  | ggaataaggg  | cgacacggaa | atgttgata   | 5820 |
| ctcatactct  | tcctttttca  | atattattga  | agcatttatc  | agggttattg | tctcatgagc  | 5880 |
| ggatacatat  | ttgaatgtat  | ttagaaaaat  | aaacaaatag  | gggttccgcg | cacatttccc  | 5940 |

5335455\_1.txt

|                                                                     |      |
|---------------------------------------------------------------------|------|
| cgaaaagtgc cacctgacgc gccctgtagc ggcgcattaa gcgcggcggg tgtggtggtt   | 6000 |
| acgcgcagcg tgaccgctac acttgccagc gccctagcgc ccgctccttt cgctttcttc   | 6060 |
| ccttcctttc tcgccacggt cgccggcttt ccccgtaag ctctaaatcg ggggctccct    | 6120 |
| ttagggttcc gatttagtgc tttagcggcac ctcgacccca aaaaacttga ttagggatgat | 6180 |
| ggttcacgta gtgggccatc gccctgatag acgggttttc gccctttgac gttggagtcc   | 6240 |
| acgttcttta atagtggact cttgttccaa actggaacaa cactcaacc tatctcggtc    | 6300 |
| tattcttttg atttataagg gattttgccg atttcggcct attgggttaa aaatgagctg   | 6360 |
| atttaacaaa aatttaacgc gaattttaac aaaatattaa cgtttacaat ttcccattcg   | 6420 |
| ccattcaggc tgcgcaactg ttgggaaggc cgatcgggtgc gggcctcttc gctattacgc  | 6480 |
| ca                                                                  | 6482 |