



Figure S1. Expression profile of BnaBAM genes under long-term cold conditions. The transcripts of BnaBAM genes are investigated and depicted as a heat map. The color scale represents log₂ (expression values), with red denoting high-level transcription and green denoting low-level transcription.

Table S1. Primers used in this study.

| Primer name | Sequence |
|-----------------|-----------------------------|
| Actin-rtF | TTGGAACGATACAGAGAAGATTAGCA |
| Actin-rtR | TTGGACCATTCTCGATTGTG |
| BnaA08g00480D-F | GGAAAATGGGACATACACAACG |
| BnaA08g00480D-R | AGCCAGTGAACCTCCTGAAACCT |
| BnaC03g78310D-F | TACACCGACCGCAAAGGC |
| BnaC03g78310D-R | TAACAAAGTTCTCCATTGGGTCC |
| BnaC03g78320D-F | GGTATTGAGCAAAGCGTGGAA |
| BnaC03g78320D-R | GGCTTTCCTTCGGGTTAGA |
| BnaA07g05790D-F | ATCTGTCCGTGGCGTGTAAG |
| BnaA07g05790D-R | CACACTATCAAGCGGCATCATC |
| BnaC09g21440D-F | TGAGTCGTCGCTATCGGTTTC |
| BnaC09g21440D-R | CTTTACACGCCACGGACAGAT |
| BnaC08g10900D-F | AGATACCATCATACCCTGAGAGC |
| BnaC08g10900D-R | GAAGTTTGTGTCCGTGTTCCAGT |
| BnaA08g08230D-F | GATTGAGAAAGATGGACCTATGAAGTA |

| | |
|-----------------|------------------------------|
| BnaA08g08230D-R | GGATTCCTTCTCCCAGATTTGTC |
| BnaC04g04570D-F | GAGATGGTTACTGAGATTGCGT |
| BnaC04g04570D-R | CGGCGTATCCGTATCCCAC |
| BnaA02g36650D-F | CTAAGGCGGCACTTGAATGTC |
| BnaA02g36650D-R | TTACGACGCTCTGTGGAATGAA |
| BnaC02g31510D-F | AAACCCCAGCCATACCCAGTC |
| BnaC02g31510D-R | TGTTACATCGCTGTCCGCT |
| BnaA03g11260D-F | CTCGCTTCTGTCTTGTCCCG |
| BnaA03g11260D-R | TGTGTTTCTACCAGTCACTTGTATTGTC |
| BnaC03g14120D-F | GACAGTGAAACGCCTGAGAAGTATC |
| BnaC03g14120D-R | ATCTTTCGCTTGTGTTTCTACCAGT |
| BnaC03g71580D-F | GGGATTGTGGAGCGTTTCTGT |
| BnaC03g71580D-R | AAGACTGACGCCTCCTTTTCC |
| BnaC03g09200D-F | CGCTCCTGCTTACGACCAAC |
| BnaC03g09200D-R | GAGAGGCAACTTCCCCTTACTG |
| BnaC07g34180D-F | GCTCCCCTGAAGGTCTGGTC |
| BnaC07g34180D-R | CTGCTGCCAGTTCTGACCCT |
| BnaA03g42940D-F | AGCCCGAGCACGCAAAC |
| BnaA03g42940D-R | ACCCGTTCCCTGAATCCG |
| BnaA03g37260D-F | CACGGCGAGCGTATCCTTTC |
| BnaA03g37260D-R | GGCGTTGTATCTGGCTAACATTTG |
| BnaC03g43570D-F | GAAGCCAGAGTGGGGCAGTA |
| BnaC03g43570D-R | TCCGCTCGCCGTGATTA |
| BnaA01g17940D-F | ACAACACCAGGTCACACGCC |
| BnaA01g17940D-R | TGTTCCAGCCTGCCTCGTC |
| BnaC01g21190D-F | ACCAGGTCACACGCCGCT |
| BnaC01g21190D-R | TGTTCCAGCCTGCCTCGTC |
| BnaA08g05660D-F | TGTTTGGTGGGGAATCATAGAGTC |
| BnaA08g05660D-R | ACCGCATTGGTGAAACGACA |

| | |
|-----------------|----------------------------|
| BnaC04g12480D-F | TGTGGATGGAGAGAAGGGATTG |
| BnaC04g12480D-R | TTGTGAAGTTCGGTTCGCTGA |
| BnaA05g10780D-F | TGTGGATGGAGAGAAGGGATTG |
| BnaA05g10780D-R | GTTGTGAAGTTCGGTTCGCTG |
| BnaA09g51890D-F | ATGCTGCTTGGGATGCGAA |
| BnaA09g51890D-R | TAGGTGGCGACCATCAGGG |
| BnaA05g05170D-F | GATGGGCTTATTGGTTGTCCG |
| BnaA05g05170D-R | CCCCACCAGCAATCCACTTT |
| BnaA02g08900D-F | CCGCACTCAGGGATGGTTATG |
| BnaA02g08900D-R | ATCAAATCTTTCGCTTGTGTTTCTAC |
| BnaC02g12830D-F | CCGCTGTCCAGTGCTACGA |
| BnaC02g12830D-R | TTGCCTTCTTGAGACGCCAC |
| BnaA03g07240D-F | TGGCAGCATCAAAGCATCG |
| BnaA03g07240D-R | GCTCCCATTCTCTGGTAAGTAAACA |
| BnaA10g16290D-F | TTGCTTGTCTTTGCGGTTG |
| BnaA10g16290D-R | CAAACCTAATGTGATTCCCGTGA |
| BnaC09g39140D-F | TTGGGCAACACCATCACGG |
| BnaC09g39140D-R | GGTTTCCTGTGGACTCAGCGTAG |

Table S2. Orthologous gene pairs of BAM-encoding genes between *Arabidopsis* and *B. rapa*, *B. oleracea*, *B. napus*.

| BAM-encoding genes in <i>Arabidopsis</i> | | | BAM-encoding genes in <i>B. rapa</i> | | | | | | BAM-encoding genes in <i>B. oleracea</i> | | | | | | BAM-encoding genes in <i>B. napus</i> | | | | | |
|--|-----------|----------|--------------------------------------|----------|----------------|-----------|----------|----------|--|--------------------|-----------|----------|----------|----------|---------------------------------------|-----------|---------------|----------|----------|--|
| <i>Arabidopsis</i> | Gene-Name | Location | start | end | <i>B. rapa</i> | Gene-Name | Location | start | end | <i>B. oleracea</i> | Gene-Name | Location | start | end | <i>B. napus</i> | Gene-Name | Location | start | end | |
| AT3G23920.1 | AtBAM1 | Chr3 | 8641722 | 8644199 | Bra015025 | BraBAM1.1 | A07 | 4200669 | 4203428 | Bo7g034320.1 | BoBAM1.2 | C7 | 13225248 | 13228060 | BnaA07g05790D | BnaBAM1.4 | chrA07 | 6121654 | 6124373 | |
| AT4G00490.1 | AtBAM2 | Chr4 | 222422 | 224862 | | | | | | | | | | | BnaA09g51890D | BnaBAM2 | chrA09_random | 126993 | 129149 | |
| AT4G17090.1 | AtBAM3 | Chr4 | 9605266 | 9607250 | Bra026230 | BraBAM3.1 | A01 | 10498540 | 10500425 | Bo1g052940.1 | BoBAM3.1 | C1 | 15029435 | 15031326 | BnaC01g21190D | BnaBAM3.1 | chrC01 | 14819094 | 14820988 | |
| | | | | | Bra012676 | BraBAM3.2 | A03 | 22804184 | 22806081 | Bo7g104960.1 | BoBAM3.2 | C7 | 40419711 | 40421605 | BnaA03g42940D | BnaBAM3.2 | chrA03 | 21561950 | 21563838 | |
| | | | | | | | | | | Bo8g046130.1 | BoBAM9.4 | C8 | 15583635 | 15585005 | BnaC07g34180D | BnaBAM3.3 | chrC07 | 37099448 | 37101348 | |
| | | | | | | | | | | | | | | | BnaA01g17940D | BnaBAM3.4 | chrA01 | 9483862 | 9485751 | |
| | | | | | | | | | | | | | | | BnaC08g10900D | BnaBAM3.6 | chrC08 | 16342627 | 16343635 | |
| AT5G55700.1 | AtBAM4 | Chr5 | 22551873 | 22554702 | Bra035586 | BraBAM4 | A02 | 7408259 | 7410757 | Bo3g021390.1 | BoBAM4.1 | C3 | 7167639 | 7170389 | BnaC03g14120D | BnaBAM4.1 | chrC03 | 6768572 | 6771333 | |
| | | | | | | | | | | Bo2g037740.1 | BoBAM4.2 | C2 | 10399330 | 10402605 | BnaA03g11260D | BnaBAM4.3 | chrA03 | 5050886 | 5053547 | |
| | | | | | | | | | | | | | | | BnaA02g08900D | BnaBAM4.4 | chrA02 | 4429617 | 4432105 | |
| | | | | | | | | | | | | | | | BnaC02g12830D | BnaBAM4.5 | chrC02 | 8167152 | 8169713 | |
| AT4G15210.1 | AtBAM5 | Chr4 | 8666734 | 8669357 | Bra038088 | BraBAM5 | A08 | 6619783 | 6622218 | Bo8g040610.1 | BoBAM5.1 | C8 | 13860892 | 13862943 | BnaA08g05660D | BnaBAM5.1 | chrA08 | 5553480 | 5555924 | |
| AT2G32290.1 | AtBAM6 | Chr2 | 13714643 | 13716906 | Bra005581 | BraBAM6 | A05 | 6338859 | 6341224 | Bo4g045870.1 | BoBAM6 | C4 | 10696860 | 10699390 | BnaC04g12480D | BnaBAM6.1 | chrC04 | 9717378 | 9719767 | |
| | | | | | | | | | | | | | | | BnaA05g10780D | BnaBAM6.2 | chrA05 | 5901832 | 5904179 | |
| AT2G45880.1 | AtBAM7 | Chr2 | 18878674 | 18881824 | Bra004944 | BraBAM7 | A05 | 2587413 | 2590431 | Bo4g025050.1 | BoBAM7 | C4 | 4131171 | 4134476 | BnaA05g05170D | BnaBAM7.1 | chrA05 | 2697113 | 2700136 | |
| | | | | | | | | | | | | | | | BnaC04g04570D | BnaBAM7.2 | chrC04 | 3393159 | 3396247 | |
| AT5G45300.1 | AtBAM8 | Chr5 | 18353636 | 18356696 | Bra021962 | BraBAM8 | A02 | 17928394 | 17931297 | Bo2g127050.1 | BoBAM8 | C2 | 39136275 | 39139346 | BnaC02g31510D | BnaBAM8.2 | chrC02 | 33718069 | 33721130 | |
| AT5G18670.1 | AtBAM9 | Chr5 | 6226138 | 6227999 | Bra002178 | BraBAM9.1 | A10 | 11069000 | 11070867 | Bo3g013270.1 | BoBAM9.1 | C3 | 4592661 | 4594899 | BnaA10g16290D | BnaBAM9.1 | chrA10 | 12426993 | 12428859 | |
| | | | | | | | | | | Bo9g154650.1 | BoBAM9.2 | C9 | 46305431 | 46307444 | BnaA03g07240D | BnaBAM9.2 | chrA03 | 3214063 | 3216446 | |
| | | | | | | | | | | | | | | | BnaC03g09200D | BnaBAM9.3 | chrC03 | 4394436 | 4396680 | |
| | | | | | | | | | | | | | | | BnaC09g39140D | BnaBAM9.4 | chrC09 | 41822923 | 41824840 | |

Table S3. Orthologous gene pairs of BAM-encoding genes between *B. napus* and *B. rapa*, *B. oleracea*.

| <i>B. napus</i> | BAM-encoding genes in <i>B. napus</i> | | | | BAM-encoding genes in <i>B. rapa</i> | | | | BAM-encoding genes in <i>B. oleracea</i> | | | | | |
|-----------------|---------------------------------------|---------------|----------|----------|--------------------------------------|-----------|----------|----------|--|--------------------|-----------|----------|----------|----------|
| | Gene-Name | Location | start | end | <i>B. rapa</i> | Gene-Name | Location | start | end | <i>B. oleracea</i> | Gene-Name | Location | start | end |
| BnaA03g37260D | BnaBAM1.1 | chrA03 | 18437399 | 18439520 | Bra015025 | BraBAM1.1 | A07 | 4200669 | 4203428 | Bo3g082110.1 | BoBAM1.1 | C3 | 30584504 | 30586921 |
| | | | | | Bra001937 | BraBAM1.2 | A03 | 19461784 | 19463944 | Bo7g034320.1 | BoBAM1.2 | C7 | 13225248 | 13228060 |
| BnaC03g43570D | BnaBAM1.2 | chrC03 | 28618604 | 28621024 | Bra015025 | BraBAM1.1 | A07 | 4200669 | 4203428 | Bo3g082110.1 | BoBAM1.1 | C3 | 30584504 | 30586921 |
| | | | | | Bra001937 | BraBAM1.2 | A03 | 19461784 | 19463944 | Bo7g034320.1 | BoBAM1.2 | C7 | 13225248 | 13228060 |
| BnaA07g05790D | BnaBAM1.4 | chrA07 | 6121654 | 6124373 | Bra015025 | BraBAM1.1 | A07 | 4200669 | 4203428 | Bo3g082110.1 | BoBAM1.1 | C3 | 30584504 | 30586921 |
| | | | | | Bra001937 | BraBAM1.2 | A03 | 19461784 | 19463944 | Bo7g034320.1 | BoBAM1.2 | C7 | 13225248 | 13228060 |
| BnaA09g51890D | BnaBAM2 | chrA09_random | 126993 | 129149 | | | | | | Bo9g002380.1 | BoBAM2 | C9 | 245084 | 247243 |
| BnaC01g21190D | BnaBAM3.1 | chrC01 | 14819094 | 14820988 | Bra026230 | BraBAM3.1 | A01 | 10498540 | 10500425 | Bo1g052940.1 | BoBAM3.1 | C1 | 15029435 | 15031326 |
| | | | | | Bra012676 | BraBAM3.2 | A03 | 22804184 | 22806081 | Bo7g104960.1 | BoBAM3.2 | C7 | 40419711 | 40421605 |
| BnaA03g42940D | BnaBAM3.2 | chrA03 | 21561950 | 21563838 | Bra026230 | BraBAM3.1 | A01 | 10498540 | 10500425 | Bo1g052940.1 | BoBAM3.1 | C1 | 15029435 | 15031326 |
| | | | | | Bra012676 | BraBAM3.2 | A03 | 22804184 | 22806081 | Bo7g104960.1 | BoBAM3.2 | C7 | 40419711 | 40421605 |
| | | | | | | | | | | Bo8g046130.1 | BoBAM9.4 | C8 | 15583635 | 15585005 |
| BnaC07g34180D | BnaBAM3.3 | chrC07 | 37099448 | 37101348 | Bra026230 | BraBAM3.1 | A01 | 10498540 | 10500425 | Bo1g052940.1 | BoBAM3.1 | C1 | 15029435 | 15031326 |
| | | | | | Bra012676 | BraBAM3.2 | A03 | 22804184 | 22806081 | Bo7g104960.1 | BoBAM3.2 | C7 | 40419711 | 40421605 |
| | | | | | | | | | | Bo8g046130.1 | BoBAM9.4 | C8 | 15583635 | 15585005 |
| BnaA01g17940D | BnaBAM3.4 | chrA01 | 9483862 | 9485751 | Bra026230 | BraBAM3.1 | A01 | 10498540 | 10500425 | Bo1g052940.1 | BoBAM3.1 | C1 | 15029435 | 15031326 |
| | | | | | Bra012676 | BraBAM3.2 | A03 | 22804184 | 22806081 | Bo7g104960.1 | BoBAM3.2 | C7 | 40419711 | 40421605 |
| | | | | | | | | | | Bo8g046130.1 | BoBAM9.4 | C8 | 15583635 | 15585005 |
| BnaA08g08230D | BnaBAM3.5 | chrA08 | 8068950 | 8076869 | Bra026230 | BraBAM3.1 | A01 | 10498540 | 10500425 | Bo1g052940.1 | BoBAM3.1 | C1 | 15029435 | 15031326 |
| | | | | | Bra012676 | BraBAM3.2 | A03 | 22804184 | 22806081 | Bo7g104960.1 | BoBAM3.2 | C7 | 40419711 | 40421605 |
| | | | | | | | | | | Bo8g046130.1 | BoBAM9.4 | C8 | 15583635 | 15585005 |
| BnaC08g10900D | BnaBAM3.6 | chrC08 | 16342627 | 16343635 | | | | | | Bo8g046130.1 | BoBAM9.4 | C8 | 15583635 | 15585005 |

| | | | | | | | | | | | | | | |
|---------------|-----------|--------|----------|----------|-----------|-----------|-----|----------|----------|--------------|----------|----|----------|----------|
| BnaC03g14120D | BnaBAM4.1 | chrC03 | 6768572 | 6771333 | Bra035586 | BraBAM4 | A02 | 7408259 | 7410757 | Bo3g021390.1 | BoBAM4.1 | C3 | 7167639 | 7170389 |
| | | | | | | | | | | Bo2g037740.1 | BoBAM4.2 | C2 | 10399330 | 10402605 |
| BnaA03g11260D | BnaBAM4.3 | chrA03 | 5050886 | 5053547 | Bra035586 | BraBAM4 | A02 | 7408259 | 7410757 | Bo3g021390.1 | BoBAM4.1 | C3 | 7167639 | 7170389 |
| | | | | | | | | | | Bo2g037740.1 | BoBAM4.2 | C2 | 10399330 | 10402605 |
| BnaA02g08900D | BnaBAM4.4 | chrA02 | 4429617 | 4432105 | Bra035586 | BraBAM4 | A02 | 7408259 | 7410757 | Bo3g021390.1 | BoBAM4.1 | C3 | 7167639 | 7170389 |
| | | | | | | | | | | Bo2g037740.1 | BoBAM4.2 | C2 | 10399330 | 10402605 |
| BnaC02g12830D | BnaBAM4.5 | chrC02 | 8167152 | 8169713 | Bra035586 | BraBAM4 | A02 | 7408259 | 7410757 | Bo3g021390.1 | BoBAM4.1 | C3 | 7167639 | 7170389 |
| | | | | | | | | | | Bo2g037740.1 | BoBAM4.2 | C2 | 10399330 | 10402605 |
| BnaA08g05660D | BnaBAM5.1 | chrA08 | 5553480 | 5555924 | Bra038088 | BraBAM5 | A08 | 6619783 | 6622218 | Bo8g040610.1 | BoBAM5.1 | C8 | 13860892 | 13862943 |
| BnaA08g00480D | BnaBAM5.2 | chrA08 | 296747 | 299203 | | | | | | Bo3g185170.1 | BoBAM5.4 | C3 | 64572299 | 64575054 |
| BnaC04g12480D | BnaBAM6.1 | chrC04 | 9717378 | 9719767 | Bra005581 | BraBAM6 | A05 | 6338859 | 6341224 | Bo4g045870.1 | BoBAM6 | C4 | 10696860 | 10699390 |
| BnaA05g10780D | BnaBAM6.2 | chrA05 | 5901832 | 5904179 | Bra005581 | BraBAM6 | A05 | 6338859 | 6341224 | Bo4g045870.1 | BoBAM6 | C4 | 10696860 | 10699390 |
| BnaA05g05170D | BnaBAM7.1 | chrA05 | 2697113 | 2700136 | Bra004944 | BraBAM7 | A05 | 2587413 | 2590431 | Bo4g025050.1 | BoBAM7 | C4 | 4131171 | 4134476 |
| BnaC04g04570D | BnaBAM7.2 | chrC04 | 3393159 | 3396247 | Bra004944 | BraBAM7 | A05 | 2587413 | 2590431 | Bo4g025050.1 | BoBAM7 | C4 | 4131171 | 4134476 |
| BnaC02g31510D | BnaBAM8.2 | chrC02 | 33718069 | 33721130 | Bra021962 | BraBAM8 | A02 | 17928394 | 17931297 | Bo2g127050.1 | BoBAM8 | C2 | 39136275 | 39139346 |
| BnaA10g16290D | BnaBAM9.1 | chrA10 | 12426993 | 12428859 | Bra002178 | BraBAM9.1 | A10 | 11069000 | 11070867 | Bo3g013270.1 | BoBAM9.1 | C3 | 4592661 | 4594899 |
| | | | | | | | | | | Bo9g154650.1 | BoBAM9.2 | C9 | 46305431 | 46307444 |
| BnaA03g07240D | BnaBAM9.2 | chrA03 | 3214063 | 3216446 | Bra002178 | BraBAM9.1 | A10 | 11069000 | 11070867 | Bo3g013270.1 | BoBAM9.1 | C3 | 4592661 | 4594899 |
| | | | | | | | | | | Bo9g154650.1 | BoBAM9.2 | C9 | 46305431 | 46307444 |
| BnaC03g09200D | BnaBAM9.3 | chrC03 | 4394436 | 4396680 | Bra002178 | BraBAM9.1 | A10 | 11069000 | 11070867 | Bo3g013270.1 | BoBAM9.1 | C3 | 4592661 | 4594899 |
| | | | | | | | | | | Bo9g154650.1 | BoBAM9.2 | C9 | 46305431 | 46307444 |
| BnaC09g39140D | BnaBAM9.4 | chrC09 | 41822923 | 41824840 | Bra002178 | BraBAM9.1 | A10 | 11069000 | 11070867 | Bo3g013270.1 | BoBAM9.1 | C3 | 4592661 | 4594899 |
| | | | | | | | | | | Bo9g154650.1 | BoBAM9.2 | C9 | 46305431 | 46307444 |
