Supplementary Figure S1. *IQCB1* mRNA sequence and predicted protein in normal and affected dogs. **A**. Normal *IQCB1* mRNA (Accession number KF366421). Boxed are the first Methionin and the stop. **B**. IQCB1 predicted protein in a normal dog, 598 amino acids. **C**. Affected *IQCB1* mRNA. Boxed are the first methionin and the premature stop codon. Underline is the stop codon in a wild-type allele. Bolded and enlarged are the 3 cytosines, which represent the insertional mutation site. **D**. The predicted IQCB1protein in the affected dog. Bold is the sequence that is different from the normal. The predicted protein is 330 amino acids long.

A.

GGAGGCAGTAACGGCAGGCCCAGGAAGACGACTTCCCCAAGCCTCAGGCCCCAGCTCGTG
CTGTGACAACAGGGTGATGTAAGAAATGAAGCCAACAGGTACAGACCCAAGGATCTTAT
CTCTAGCTGCTGAAGTTGCAAAAAGTCCTGAGCAAAATGTCCCTGTTATACTATTGAAGT
TAAAAGAAATAATAAACAACACACCTTTAGGAAGCTCAGAGTTGAAGAAAATCAAACAA
GATATATATTGTTATGACCTCATTCAGTATTGCCTTTTGGTGCTCAGTCAAGATTGTTCT
CGAATCCAGGGAGGTTGGACTACAATATCCCAACTTACACAGATATTAAGCCACTGCTGT
GTGGGCTTGGAGCCAGGAGAAGATGCAGAGGAATTTTACAATGAATTACTCCCATCAGC
TGCAGAAAATTTTCTGGTTTTGGGGAGACGATTGCAAACATGTTTCATCAATTCAGCTA
AGGGTGAAGAAAAAGATGAATTACTACACTCGTTCCAAATTGTGACCGATTCTCTCTTCT
GGCTCTTAGGAGGCCATGTTCAACTCATCCAAAATGTACTACAAAGTGATCATTTCTTGC
ACTTACTGCAAACTGACAATGTTCAAATAGGATCTACAGTCATGACTATGCTACAGAAC
ATACTACAGATCAACAGTGGTGATTTACTCAGAATAGAAGGAAAAATCCTACATTCAAT
TTTAGATGAAGTTGTTTTCAAGCTTTTATCAACTCCTAACCCAGTCATAAGAAGTACTGC
TACAAAGCTCCTACTGCTGATGACTGAATCCCATCAGGAAATTTTGATTTTACTGAGACT
AAGTGCCTGCTACAAAGGACTCAGAAGTCTATTAAACAAACATGAGCCTGGGACAGAGT
TTAGTCAAGAACTTGGACAGCTTATTGCCCTTTTAACCCCTAAGGTCTATCAGGAAGTAG
AAGATCAGAAACTACATCAAGCAGCTTGCTTGATTCAAGCTTATTGGAAGGGTTTCCAA
ACTAGAAAAAGATTAAAGAAGCTTCCATCTGCTGTGATTACTTTGCAGAGGAGTTTCAG
ATCTAAACGAACCAAGATATTACTAAAGCTAAATAAGCAGAAAGAAGAAGAGGACCGCA
GATTACAGTTGCAACTTCAAAGACAGAGAGCCATGAGATTGTCCCGAGAATTACGGCTG
AGTATGCTCGAAATAGTTCATCCAGGTCAGGTGGAAAAATATAATCGGGAAATAGAAGA
GAAATCAGCCTTGATTATCCAGAAACACTGGAGAGGGTACAGGGAAAGGAAAAATTTTC
GCCAACAGAGGCCATCTCTCACGGAATATAAAGCAGCTGTCATACTTCAAAGAGCAACTC
TTAAATTCCTAGCAAAGTGCCGTAAGAAAAAGAAACTATTTGCTCCTTGGCGAGGACTT
CAAGATCTCACCGATGCACGGAGAGTTGAATTAAAGCAACAAGTGGATGACTATCTCAG
AAGACATCCGAGCTCTCAAATGTCAGATATGACTAGCAGAGAGCTCCATTCCCAAGCTCA
AGAACAACTGCAACACTACCTTATGGGCAGGGCCCTAGAAGAGAGAGCCCAGCAGCACAG
GGAGGCTCTGATGGCTCAGATCAGCACCAACATTGAACAGTTAATGAAGGCACCGAGTCT
GAAGGAGGCAGAAGGGAAAGAACCTGAACTCTTCCTAAGTAGATCCAGGCCTGTGGCAG
CTAAGGCCAAGCAGGCCCATCTTACTGCCCTGAAGCATATACAGGCACCTTGGTGGAAGA
AGCTTGGGGAAGAAGCAGGAGATGAGATTGATGTTCCAAAGGATGAGTTTAGTTTAGAA
TTAGGAACTTTATTCATTGGTGGAACCAAACCCCCTTAGGAAGCTATCCAGAGAAATGA
CACAAATCCTTTATTTTAGATTATTTTGGTTCTGCCTCTGGCATGCTAGTAGACTAGAGC
TATCTTTTACTCATGGCTTTCCAGAGATTCCTCTCCAAATAAGATTTTCAGGCAGTAAGC
AAAGA

B.

MKPTGTDPRILSLAAEVAKSPEQNVPVILLKLKEIINNTPLGSSELKKIKQDIYC
YDLIQYCLLVLSQDCSRIQGGWTTISQLTQILSHCCVGLEPGEDAEEFYNELLPS
AAENFLVLGRRLQTCFINSAKGEEKDELLHSFQIVTDSLFWLLGGHVQLIQNVLQ
SDHFLHLLQTDNVQIGSTVMTMLQNILQINSGDLLRIEGKILHSILDEVVFKLLS
TPNPVIRSTATKLLLLMTESHQEILILLRLSACYKGLRSLLNKHEPGTEFSQELG
QLIALLTPKVYQEVEDQKLHQAACLIQAYWKGFQTRKRLKKLPSAVITLQRSFRS
KRTKILLKLNKQKEEEDRRLQLQLQRQRAMRLSRELRLSMLEIVHPGQVEKYNRE
IEEKSALIIQKHWRGYRERKNFRQQRPSLTEYKAAVILQRATLKFLAKCRKKKKL
FAPWRGLQDLTDARRVELKQQVDDYLRRHPSSQMSDMTSRELHSQAQEQLQHYLM
GRALEERAQQHREALMAQISTNIEQLMKAPSLKEAEGKEPELFLSRSRPVAAKAK
QAHLTALKHIQAPWWKKLGEEAGDEIDVPKDEFSLELGTLFIGGTKPP

C.

AGACGACTTCCCCAAGCCTCAGGCCCCAGCTCGTGCTGTGACAACAGGGTGATGTAAGAA
ATGAAGCCAACAGGTACAGACCCAAGGATCTTATCTCTAGCTGCTGAAGTTGCAAAAAG
TCCTGAGCAAAATGTCCCTGTTATACTATTGAAGTTAAAAGAAATAATAAACAACACAC
CTTTAGGAAGCTCAGAGTTGAAGAAAATCAAACAAGATATATATTGTTATGACCTCATT
CAGTATTGCCTTTTGGTGCTCAGTCAAGATTGTTCTCGAATCCAGGGAGGTTGGACTACA
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GCAGAGGAATTTTACAATGAATTACTCCCATCAGCTGCAGAAAATTTTCTGGTTTTGGG
GAGACGATTGCAAACATGTTTCATCAATTCAGCTAAGGGTGAAGAAAAAGATGAATTAC
TACACTCGTTCCAAATTGTGACCGATTCTCTCTTCTGGCTCTTAGGAGGCCATGTTCAAC
TCATCCAAAATGTACTACAAAGTGATCATTTCTTGCACTTACTGCAAACTGACAATGTTC
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TTACTCAGAATAGAAGGAAAAATCCTACATTCAATTTTAGATGAAGTTGTTTTCAAGCT
TTTATCAACTCCTAACCCAGTCATAAGAAGTACTGCTACAAAGCTCCTACTGCTGATGAC
TGAATCCCATCAGGAAATTTTGATTTTACTGAGACTAAGTGCCTGCTACAAAGGACTCAG
AAGTCTATTAAACAAACATGAGCCTGGGACAGAGTTTAGTCAAGAACTTGGACAGCTTA
TTGCCCTTTTAACCCCTAAGGTCTATCAGGAAGTAGAAGATCAGAAACTACATCAAGCAG
CTTGCTTGATTCAAGCTTATTGGAAGGGTTTCCAAACTAGAAAAAGATTAAAGAAGCTT
CCCATCTGCTGTGATTACTTTGCAGAGGAGTTTCAGATCTAAACGAACCAAGATATTAC
TAAAGCTAAATAAGCAGAAAGAAGAAGAGGACCGCAGATTACAGTTGCAACTTCAAAGA
CAGAGAGCCATGAGATTGTCCCGAGAATTACGGCTGAGTATGCTCGAAATAGTTCATCCA
GGTCAGGTGGAAAAATATAATCGGGAAATAGAAGAGAAATCAGCCTTGATTATCCAGAA
ACACTGGAGAGGGTACAGGGAAAGGAAAAATTTTCGCCAACAGAGGCCATCTCTCACGG
AATATAAAGCAGCTGTCATACTTCAAAGAGCAACTCTTAAATTCCTAGCAAAGTGCCGT
AAGAAAAAGAAACTATTTGCTCCTTGGCGAGGACTTCAAGATCTCACCGATGCACGGAG
AGTTGAATTAAAGCAACAAGTGGATGACTATCTCAGAAGACATCCGAGCTCTCAAATGT
CAGATATGACTAGCAGAGAGCTCCATTCCCAAGCTCAAGAACAACTGCAACACTACCTTA
TGGGCAGGGCCCTAGAAGAGAGAGCCCAGCAGCACAGGGAGGCTCTGATGGCTCAGATCA
GCACCAACATTGAACAGTTAATGAAGGCACCGAGTCTGAAGGAGGCAGAAGGGAAAGAA
CCTGAACTCTTCCTAAGTAGATCCAGGCCTGTGGCAGCTAAGGCCAAGCAGGCCCATCTT
ACTGCCCTGAAGCATATACAGGCACCTTGGTGGAAGAAGCTTGGGGAAGAAGCAGGAGA

TGAGATTGATGTTCCAAAGGATGAGTTTAGTTTAGAATTAGGAACTTTATTCATTGGTG
GAACCAAACCCCCTTAGGAAGCTATCCAGAGAAATGACACAAATCCTTTATTTTAGATTA
TTTTGGTTCTGCCTCTGGCATGCTAGTAGACTAGAGCTATCTTTTACTCATGGCTTTCCA
GAGATTCCTCTCCAAATAAGATTTTCAGGCAGTAAGCAAAGAGTTGTCTTCCCACTTTTT
GCAGTTC

D.

MKPTGTDPRILSLAAEVAKSPEQNVPVILLKLKEIINNTPLGSSELKKIKQDIYC
YDLIQYCLLVLSQDCSRIQGGWTTISQLTQILSHCCVGLEPGEDAEEFYNELLPS
AAENFLVLGRRLQTCFINSAKGEEKDELLHSFQIVTDSLFWLLGGHVQLIQNVLQ
SDHFLHLLQTDNVQIGSTVMTMLQNILQINSGDLLRIEGKILHSILDEVVFKLLS
TPNPVIRSTATKLLLLMTESHQEILILLRLSACYKGLRSLLNKHEPGTEFSQELG
QLIALLTPKVYQEVEDQKLHQAACLIQAYWKGFQTRKRLKKLP**ICCDYFAEEFQI**