

For thirty-two genes listed below the genomic structure was predicted based on the University of Maryland UMD3.1 assembly of the bovine genome sequences [1] and the Dana-Farber Cancer Institute bovine gene index release 12.0 [2] by using GENOMETHREADER software tool [3]. The GENOMETHREADER output was viewed and edited using the Apollo sequence annotation editor [4].

1. Zimin AV, Delcher AL, Florea L, Kelley DR, Schatz MC, Puiu D, Hanrahan F, Pertea G, Van Tassell CP, Sonstegard TS, Marçais G, Roberts M, Subramanian P, Yorke JA, Salzberg SL: **A whole-genome assembly of the domestic cow, *Bos taurus***. *Genome Biol* 2009, **10**:R42.
2. Quackenbush J, Cho J, Lee D, Liang F, Holt I, Karamycheva S, Parvizi B, Pertea G, Sultana R, White J: **The TIGR Gene Indices: analysis of gene transcript sequences in highly sampled eukaryotic species**. *Nucl. Acids Res.* 2001, **29**:159–164.
3. Gremme G, Brendel V, Sparks ME, Kurtz S: **Engineering a software tool for gene structure prediction in higher organisms**. *Information and Software Technology* 2005, **47**:965–978.
4. Lewis SE, Searle SMJ, Harris N, Gibson M, Lyer V, Richter J, Wiel C, Bayraktaroglu L, Birney E, Crosby MA, Kaminker JS, Matthews BB, Prochnik SE, Smithy CD, Tupy JL, Rubin GM, Misra S, Mungall CJ, Clamp ME: **Apollo: a sequence annotation editor**. *Genome Biol.* 2002, **3**:RESEARCH0082.

Gene: ACAN

Chr (strand): 21 (+)

txStart: 20800157

txEnd: 20868837

cdsStart: 20829111

cdsEnd: 20868734

exons: 17

exonStarts: 20800157, 20829104, 20831451, 20833151, 20834629, 20835037, 20836594, 20839216, 20840178, 20841381, 20844357, 20847583, 20865291, 20865854, 20867022, 20867969, 20868658

exonEnds: 20800509, 20829180, 20831834, 20833325, 20834756, 20835330, 20836998, 20839390, 20840305, 20841674, 20844572, 20851653, 20865449, 20865936, 20867166, 20868151, 20868837

Gene: APAF1

Chr (strand): 5 (-)

txStart: 63125314

txEnd: 63206764

cdsStart: 63125314

cdsEnd: 63206764

exons: 26

exonStarts: 63125177, 63125482, 63126311, 63137636, 63139812, 63140013, 63144867, 63145509, 63146886, 63149720, 63150274, 63154793, 63156193, 63159487, 63161933, 63170426, 63175619, 63178936, 63181417, 63183565, 63185578, 63192120, 63192542, 63198557, 63200442, 63206764
exonEnds: 63125314, 63125638, 63126508, 63137819, 63139924, 63140144, 63145105, 63145676, 63147017, 63149833, 63150458, 63154919, 63156318, 63159618, 63162058, 63170587, 63175747, 63179061, 63181536, 63183681, 63185703, 63192239, 63192667, 63198682, 63200588, 63207077

Gene: ATP2A1

Chr (strand): 25 (-)

txStart: 26204671

txEnd: 26187372

cdsStart: 26204482

cdsEnd: 26188119

exons: 22

exonStarts: 26204365, 26203498, 26201977, 26200943, 26198520, 26197566, 26197133, 26196535, 26193975, 26193588, 26193224, 26191637, 26191294, 26190149, 26189730, 26189419, 26189160, 26188936, 26188694, 26188436, 26188079, 26187372

exonEnds: 26204671, 26203580, 26202081, 26201081, 26198600, 26197651, 26197430, 26196701, 26194063, 26193690, 26193355, 26191759, 26191512, 26190484, 26189950, 26189621, 26189245, 26189069, 26188811, 26188553, 26188123, 26187685

Gene: B2M

Chr (strand): 10 (-)

txStart: 104139184

txEnd: 104143771

cdsStart: 104139184

cdsEnd: 104143771

exons: 3

exonStarts: 104139093, 104142970, 104143771

exonEnds: 104139184, 104143245, 104145314

Gene: BCKDHA

Chr (strand): 18 (+)

txStart: 50819286

txEnd: 50838369

cdsStart: 50819376

cdsEnd: 50838020

exons: 10

exonStarts: 50819286, 50819371, 50828838, 50829130, 50832646, 50834705, 50836114, 50836418, 50836772, 50837850

exonEnds: 50819308, 50819489, 50829023, 50829216, 50832754, 50834866, 50836320, 50836559, 50836943, 50838369

Gene: CRIM1

Chr (strand): 11 (+)

txStart: 18834698

txEnd: 19043656

cdsStart: 18835047

cdsEnd: 19041796

exons: 17

exonStarts: 18834698, 18876350, 18928344, 18929665, 18952089, 18961646, 18967407, 18987946, 18996344, 18999210, 18999839, 19003610, 19009194, 19029657, 19037537, 19040118, 19041620

exonEnds: 18835377, 18876523, 18928586, 18929785, 18952210, 18961828, 18967604, 18988074, 18996500, 18999331, 19000048, 19003825, 19009415, 19029851, 19037656, 19040305, 19043656

Gene: CSN2

Chr (strand): 6 (-)

txStart: 87188004

txEnd: 87179499

cdsStart: 87186007

cdsEnd: 87180588

exons: 9

exonStarts: 87187976, 87185957, 87185203, 87185064, 87183147, 87183014, 87181195, 87180552, 87179499

exonEnds: 87188004, 87186019, 87185229, 87185090, 87183170, 87183055, 87181692, 87180593, 87179821

Gene: DCX

Chr (strand): X (-)

txStart: 64861454

txEnd: 64741273

cdsStart: 64860705

cdsEnd: 64742327

exons: 7

exonStarts: 64861065, 64860342, 64850230, 64772852, 64770736, 64755934, 64741273

exonEnds: 64861454, 64860727, 64850570, 64772954, 64770873, 64756028, 64742383

Gene: DGAT1

Chr (strand): 14 (+)

txStart: 1795425

txEnd: 1804838

cdsStart: 1795438

cdsEnd: 1804540

exons: 14

exonStarts: 1795425, 1799245, 1801276, 1801396, 1801574, 1801842, 1802037, 1802251, 1802396, 1802590, 1803951, 1804103, 1804272, 1804407

exonEnds: 1795628, 1799332, 1801316, 1801481, 1801626, 1801947, 1802150, 1802325, 1802499, 1802628, 1804016, 1804190, 1804334, 1804838

Gene: EPS8

Chr (strand): 5 (-)

txStart: 94467480

txEnd: 94447013

cdsStart: 94466303

cdsEnd: 94448652

exons: 12

exonStarts: 94466985, 94466179, 94458419, 94457535, 94455264, 94454563, 94450854, 94448728, 94448651, 94448420, 94448276, 94447013

exonEnds: 94467480, 94466314, 94458500, 94457607, 94455360, 94454700, 94450990, 94448877, 94448656, 94448430, 94448341, 94447573

Gene: EVC2

Chr (strand): 6 (+)

txStart: 105330747

txEnd: 105451901

cdsStart: 105330834

cdsEnd: 105451674

exons: 15

exonStarts: 105330747, 105336587, 105366953, 105373754, 105377769, 105380854, 105389397, 105394391, 105401116, 105420716, 105429588, 105431683, 105437050, 105448810, 105451404

exonEnds: 105330881, 105336726, 105367277, 105373993, 105377944, 105381013, 105389851, 105394595, 105401238, 105420943, 105429802, 105431770, 105437246, 105448911, 105451901

Gene: F11

Chr (strand): 27 (+)

txStart: 15350937

txEnd: 15370082

cdsStart: 15352136

cdsEnd: 15369432

exons: 15

exonStarts: 15350937, 15352135, 15354679, 15356121, 15357119, 15358901, 15359719, 15362156, 15362359, 15362611, 15365705, 15366947, 15367918, 15368566, 15369271

exonEnds: 15351277, 15352190, 15354841, 15356227, 15357278, 15359010, 15359878, 15362265, 15362521, 15362717, 15365873, 15367122, 15368013, 15368705, 15370082

Gene: FANCI

Chr (strand): 21 (+)

txStart: 21137918

txEnd: 21198618

cdsStart: 21137918

cdsEnd: 21198015

exons: 37

exonStarts: 21137918, 21143792, 21148879, 21149435, 21149672, 21151169, 21151533, 21152065, 21153680, 21157108, 21157868, 21160931, 21162477, 21168317, 21168907, 21169769, 21171485, 21175328, 21178994, 21180222, 21180469, 21181103, 21181843, 21185396, 21185897, 21186937, 21189160, 21190043, 21190270, 21190524, 21190896, 21192492, 21192626, 21194926, 21196529, 21196916, 21197935

exonEnds: 21138001, 21143864, 21149009, 21149591, 21149729, 21151210, 21151656, 21152150, 21153806, 21157197, 21158004, 21161111, 21162564, 21168447, 21168977, 21169883, 21171607, 21175396, 21179095, 21180392, 21180590, 21181267, 21182022, 21185562, 21185973, 21187053, 21189211, 21190170, 21190338, 21190617, 21191083, 21192545, 21192685, 21194994, 21196624,

21197020, 21198618

Gene: FASN

Chr (strand): 19 (+)

txStart: 51384922

txEnd: 51403614

cdsStart: 51386877

cdsEnd: 51403038

exons: 42

exonStarts: 51384922, 51386866, 51387774, 51389276, 51389689, 51390003, 51390211, 51390417, 51391235, 51391796, 51392081, 51392874, 51393108, 51393348, 51393659, 51394011, 51394264, 51394537, 51394733, 51395082, 51395339, 51396129, 51396738, 51397214, 51397497, 51397696, 51398001, 51398362, 51398598, 51398867, 51399182, 51399430, 51399738, 51400065, 51400327, 51400618, 51400855, 51401430, 51401844, 51402166, 51402466, 51402649

exonEnds: 51385000, 51387003, 51387926, 51389449, 51389889, 51390125, 51390326, 51390551, 51391697, 51391983, 51392270, 51392968, 51393242, 51393551, 51393774, 51394183, 51394455, 51394617, 51394921, 51395261, 51395542, 51396427, 51397130, 51397378, 51397615, 51397850, 51398204, 51398512, 51398776, 51398986, 51399304, 51399653, 51399939, 51400216, 51400418, 51400769, 51401097, 51401618, 51402074, 51402386, 51402564, 51403614

Gene: FUT4

Chr (strand): 15(-)

txStart: 16243413

txEnd: 16241316

cdsStart: 16243368

cdsEnd: 16242172

exons: 1

exonStarts: 16241316

exonEnds: 16243413

Gene: KDSR

Chr (strand): 24 (-)

txStart: 62144321

txEnd: 62118140

cdsStart: 62144294

cdsEnd: 62118580

exons: 6

exonStarts: 62144226, 62138749, 62129306, 62126321, 62122532, 62118140

exonEnds: 62144321, 62138940, 62129389, 62126404, 62122633, 62118699

Gene: KITLG

Chr (strand): 5 (-)

txStart: 18420108

txEnd: 18317428

cdsStart: 18420024

cdsEnd: 18326596

exons: 9

exonStarts: 18420010, 18377331, 18363202, 18342815, 18339747, 18328638, 18327626, 18326559, 18317428

exonEnds: 18420108, 18377444, 18363264, 18342985, 18339906, 18328747, 18327693, 18326635, 18317795

Gene: KRT5

Chr (strand): 5 (+)

txStart: 27541284

txEnd: 27547603

cdsStart: 27541428

cdsEnd: 27547238

exons: 9

exonStarts: 27541284, 27542548, 27543524, 27543695, 27544400, 27544913, 27545268, 27546415, 27546922

exonEnds: 27541985, 27542762, 27543584, 27543790, 27544564, 27545038, 27545488, 27546449, 27547603

Gene: LRP4

Chr (strand): 15 (-)

txStart: 77716107

txEnd: 77663790

cdsStart: 77715842

cdsEnd: 77664021

exons: 38

exonStarts: 77715833, 77701062, 77699548, 77698874, 77698375, 77697909, 77697547, 77696795, 77696071, 77695737, 77695242, 77693965, 77692965, 77691640, 77691303, 77690798, 77688717, 77688461, 77687581, 77686636, 77684984, 77684768, 77683717, 77683286, 77683008, 77681948, 77681629, 77680948, 77679055, 77678776, 77677645, 77675816, 77675429, 77674555, 77669812, 77668895, 77667136, 77663790

exonEnds: 77716107, 77701220, 77699664, 77698987, 77698491, 77698037, 77697666, 77696920, 77696196, 77695871, 77695367, 77694195, 77693121, 77691857, 77691479, 77690920, 77688925, 77688542, 77687686, 77686837, 77685173, 77684899, 77683857, 77683372, 77683179, 77682110, 77681854, 77681251, 77679273, 77678910, 77677753, 77675960, 77675542, 77674690, 77669879, 77668982, 77667277, 77664353

Gene: LTF

Chr (strand): 22 (+)

txStart: 53522006

txEnd: 53557385

cdsStart: 53522045

cdsEnd: 53555898

exons: 18

exonStarts: 53522006, 53526609, 53529749, 53530153, 53530952, 53532043, 53537446, 53538052, 53538752, 53540863, 53543180, 53543850, 53545916, 53550815, 53552803, 53554118, 53555864, 53557284

exonEnds: 53522087, 53526772, 53529857, 53530335, 53531099, 53532098, 53537624, 53538226, 53538906, 53540953, 53543227, 53544005, 53546057, 53550882, 53552987, 53554307, 53556096,

53557385

Gene: LYST

Chr (strand): 28 (-)

txStart: 8567662

txEnd: 8422583

cdsStart: 8567655

cdsEnd: 8424445

exons: 51

exonStarts: 8567464, 8552189, 8548496, 8546042, 8544347, 8542409, 8539938, 8539101, 8533708, 8531555, 8530274, 8528700, 8523686, 8522656, 8520288, 8515323, 8514262, 8510218, 8508557, 8502596, 8499833, 8498960, 8497088, 8495498, 8493164, 8492348, 8488477, 8486629, 8484258, 8479843, 8479194, 8478860, 8476679, 8476496, 8475671, 8473786, 8471590, 8465053, 8458780, 8457280, 8454046, 8450731, 8444293, 8442601, 8439014, 8436531, 8430885, 8430510, 8426664, 8425508, 8422583

exonEnds: 8567662, 8552279, 8550575, 8547065, 8544508, 8542565, 8540164, 8539167, 8533817, 8531972, 8530418, 8528873, 8523846, 8522846, 8520533, 8515496, 8514411, 8510355, 8508755, 8502727, 8500460, 8499137, 8497257, 8495728, 8493330, 8492500, 8488668, 8486807, 8484464, 8480019, 8479270, 8479048, 8476824, 8476592, 8475732, 8473841, 8471742, 8465297, 8458846, 8457436, 8454186, 8450948, 8444523, 8442790, 8439150, 8436629, 8431024, 8430607, 8426820, 8425579, 8424583

Gene: MGST1

Chr (strand): 5 (-)

txStart: 93946277

txEnd: 93926635

cdsStart: 93942180

cdsEnd: 93927151

exons: 4

exonStarts: 93946180, 93942055, 93939150, 93926635

exonEnds: 93946277, 93942195, 93939244, 93927397

Gene: MITF

Chr (strand): 22 (-)

txStart: 31839314

txEnd: 31735782

cdsStart: 31839314

cdsEnd: 31736217

exons: 10

exonStarts: 31839259, 31826415, 31768019, 31766884, 31764658, 31754241, 31752215, 31746439, 31742357, 31735782

exonEnds: 31839314, 31826664, 31768246, 31766967, 31764753, 31754358, 31752289, 31746514, 31742504, 31736618

Gene: MOCS1

Chr (strand): 23 (-)

txStart: 13866995

txEnd: 13832469
cdsStart: 13866914
cdsEnd: 13833191
exons: 11
exonStarts: 13866801, 13858301, 13856667, 13843066, 13840653, 13840252, 13839729, 13839139, 13836649, 13836096, 13832469
exonEnds: 13866995, 13858427, 13856834, 13843230, 13840714, 13840363, 13839841, 13839249, 13836769, 13836143, 13833951

Gene: PITPNM3
Chr (strand): 19 (+)
txStart: 25933697
txEnd: 26018336
cdsStart: 25933697
cdsEnd: 26017902
exons: 20
exonStarts: 25933697, 25940042, 25942789, 25977407, 25994161, 25994791, 25998211, 25998802, 25999550, 26003160, 26004574, 26006535, 26007265, 26009297, 26012295, 26012708, 26013139, 26015180, 26015776, 26017600
exonEnds: 25933795, 25940084, 25942884, 25977454, 25994237, 25995026, 25998400, 25998924, 25999734, 26003332, 26004744, 26006726, 26007413, 26009413, 26012411, 26012856, 26013288, 26015363, 26015904, 26018336

Gene: PLAG1
Chr (strand): 14 (-)
txStart: 25052394
txEnd: 25007082
cdsStart: 25008544
cdsEnd: 25007291
exons: 3
exonStarts: 25052215, 25012350, 25007082
exonEnds: 25052394, 25012448, 25008548

Gene: PLCB3
Chr (strand): 29 (+)
txStart: 43170291
txEnd: 43188249
cdsStart: 43170432
cdsEnd: 43187727
exons: 31
exonStarts: 43170291, 43173826, 43174172, 43174329, 43174691, 43174875, 43175021, 43175199, 43175830, 43176071, 43177123, 43177564, 43177724, 43178637, 43179658, 43180668, 43181035, 43181502, 43181737, 43182569, 43182755, 43183730, 43185088, 43185343, 43185490, 43186237, 43186493, 43186808, 43187013, 43187357, 43187524
exonEnds: 43170530, 43173903, 43174240, 43174469, 43174770, 43174928, 43175096, 43175299, 43175996, 43176217, 43177363, 43177648, 43177910, 43178842, 43179754, 43180752, 43181159, 43181656, 43181898, 43182668, 43182859, 43183821, 43185253, 43185378, 43185682, 43186393,

43186569, 43186921, 43187070, 43187443, 43188249

Gene: PLD4

Chr (strand): 21 (+)

txStart: 70995733

txEnd: 71004743

cdsStart: 70997394

cdsEnd: 71004475

exons: 11

exonStarts: 70995733, 70997228, 70999611, 71000430, 71000797, 71001120, 71002072, 71002912, 71003759, 71003864, 71004273

exonEnds: 70995782, 70997420, 70999810, 71000613, 71000917, 71001247, 71002272, 71003051, 71003789, 71003960, 71004743

Gene: PRKG2

Chr (strand): 6 (-)

txStart: 97735624

txEnd: 97651497

cdsStart: 97735536

cdsEnd: 97652569

exons: 17

exonStarts: 97735458, 97729722, 97728193, 97724550, 97716146, 97713677, 97710654, 97706403, 97704768, 97702742, 97699715, 97697077, 97672666, 97667320, 97665516, 97654843, 97651497

exonEnds: 97735624, 97729835, 97728298, 97724613, 97716223, 97713771, 97710722, 97706501, 97704921, 97702878, 97699804, 97697218, 97672829, 97667442, 97665578, 97654909, 97652664

Gene: SPEM1

Chr (strand): 19 (+)

txStart: 27733908

txEnd: 27735192

cdsStart: 27733917

cdsEnd: 27735158

exons: 3

exonStarts: 27733908, 27734160, 27734419

exonEnds: 27734060, 27734217, 27735192

Gene: TG

Chr (strand): 14 (-)

txStart: 9508938

txEnd: 9262209

cdsStart: 9508896

cdsEnd: 9262209

exons: 47

exonStarts: 9508830, 9507787, 9507259, 9505688, 9504888, 9495978, 9495377, 9495008, 9487632, 9486462, 9485978, 9483686, 9483000, 9482340, 9480029, 9478786, 9474909, 9473480, 9472031, 9469709, 9461819, 9459539, 9456049, 9455409, 9453584, 9448252, 9443775, 9434313, 9432971, 9432149, 9430852, 9428788, 9427410, 9426338, 9418155, 9396262, 9393926, 9388175, 9386505,

9384346, 9376981, 9314427, 9312812, 9298761, 9296197, 9263796, 9262209
exonEnds: 9508938, 9507895, 9507356, 9505891, 9505047, 9496084, 9495520, 9495193, 9488732,
9487049, 9486217, 9483823, 9483077, 9482452, 9480131, 9478986, 9475121, 9473634, 9472187,
9469933, 9461968, 9459709, 9456165, 9455524, 9453692, 9448443, 9443939, 9434378, 9433051,
9432286, 9431028, 9428899, 9427489, 9426481, 9418217, 9396396, 9394090, 9388394, 9386598,
9384505, 9377183, 9314591, 9312979, 9298942, 9296304, 9263930, 9262440

Gene: TMEM95

Chr (strand): 19 (+)

txStart: 27688383

txEnd: 27689818

cdsStart: 27688399

cdsEnd: 27689818

exons: 7

exonStarts: 27688383, 27688794, 27689045, 27689227, 27689380, 27689576, 27689791

exonEnds: 27688567, 27688850, 27689125, 27689247, 27689460, 27689663, 27689818