

Supplemental Data
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**Functional Gene-Group Analysis Reveals
a Role of Synaptic Heterotrimeric G Proteins
in Cognitive Ability**

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Table S1. Locus IDs of All Genes Included in the Synaptic Functional Gene Groups and Canonical Pathways

<i>Functional gene groups</i>
<p>EXCITABILITY # genes: 59 LIDs: 773, 774, 775, 776, 777, 778, 781, 782, 784, 785, 3736, 3737, 3739, 3746, 3747, 3749, 3751, 3753, 3760, 3761, 3762, 3763, 3764, 3765, 3766, 3768, 3772, 3778, 3779, 6323, 6324, 6326, 6327, 6328, 6330, 6331, 6334, 6335, 7416, 7419, 7881, 8514, 9254, 9992, 10008, 10242, 10368, 10369, 23630, 23704, 27091, 27092, 27345, 55799, 55800, 57528, 59283, 93589, 115207</p>
<p>LIGAND GATED ION SIGNALING # genes: 36 LIDs: 1137, 1139, 1141, 2550, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2564, 2565, 2566, 2890, 2891, 2892, 2893, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 3359, 8973, 9177, 9568, 11345, 348980</p>
<p>GPCR SIGNALLING # genes: 41 LIDs: 134, 135, 148, 150, 154, 155, 577, 1128, 1129, 1268, 1269, 1394, 1395, 1812, 1813, 2911, 2913, 2914, 2915, 2917, 2918, 3350, 3351, 3352, 3356, 3357, 3363, 4985, 4986, 4988, 5023, 5024, 5027, 5028, 5029, 6000, 9127, 9256, 22859, 25927, 57512</p>
<p>G-PROTEIN RELAY # genes: 27 LIDs: 2767, 2768, 2769, 2770, 2771, 2773, 2774, 2775, 2776, 2778, 2779, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2790, 2791, 9630, 10672, 10681, 54331, 55970, 59345</p>
<p>TYROSINE KINASE SIGNALING # genes: 7 LIDs: 2043, 4915, 5786, 5793, 5799, 5802, 140885</p>
<p>INTRACELLULAR SIGNAL TRANSDUCTION # genes: 150 LIDs: 107, 108, 109, 111, 114, 115, 387, 388, 472, 801, 805, 808, 810, 811, 814, 815, 816, 817, 818, 1152, 1267, 1457, 1460, 1495, 1496, 1499, 1500, 1501, 1612, 1620, 2029, 2885, 2932, 2977, 2982, 2983, 3094, 3208, 3241, 3265, 3631, 3706, 3845, 4082, 4884, 4900, 5037, 5048, 5049, 5121, 5138, 5245, 5331, 5332, 5335, 5337, 5500, 5516, 5518, 5524, 5530, 5532, 5533, 5534, 5566, 5567, 5573, 5575, 5576, 5577, 5578, 5579, 5580, 5581, 5582, 5590, 5594, 5595, 5604, 5780, 5879, 5898, 5908, 5910, 5911, 5912, 6093, 6261, 6262, 6263, 6500, 6620, 7070, 7447, 7529, 7531, 7532, 7533, 7534, 8437, 8536, 8613, 8936, 9201, 9454, 9456, 9475, 9479, 9732, 9922, 10314, 10409, 10458, 10486, 10487, 10857, 10971, 11069, 11113, 11261, 22808, 22933, 23096, 23162, 23236, 23362, 23467, 23542, 50488, 51062, 51440, 51517, 54332, 54769, 55450, 55512, 55915, 57026, 57118, 57172, 57447, 57596, 65108, 80728, 83988, 84446, 84687, 84894, 91860, 196883</p>
<p>STRUCTURAL PLASTICITY # genes: 98 LIDs: 60, 71, 87, 118, 119, 120, 287, 288, 301, 302, 460, 830, 832, 998, 1072, 1428, 1465, 1627, 1780, 1808, 1809, 2036, 2037, 3796, 3800, 3837, 3925, 3927, 3983, 4130, 4131, 4133, 4135, 4137, 4627, 4628, 4637, 4741, 4744, 4747, 4763, 5064, 5216, 5217, 5339, 6624, 6709, 6710, 6711, 6712, 6950, 7114, 7280, 7430,</p>

7846, 8522, 8976, 9118, 9211, 9253, 9362, 9890, 9948, 10006, 10092, 10093, 10094, 10096, 10097, 10152, 10381, 10382, 10383, 10391, 10398, 10529, 10552, 10570, 11034, 11151, 22924, 23122, 23136, 23406, 23499, 28988, 29114, 29767, 51286, 56896, 80086, 83660, 114299, 114787, 131034, 166336, 203068, 347733
NEUROTRANSMITTER METABOLISM # genes: 29 LIDs: 1103, 1621, 2744, 4128, 4129, 6505, 6506, 6507, 6509, 6511, 6512, 6529, 6530, 6531, 6532, 6536, 6570, 6571, 6572, 7166, 9152, 23576, 26002, 57030, 57084, 121278, 140679, 246213, 388662
EXOCYTOSIS # genes: 87 LIDs: 273, 378, 396, 2054, 4905, 5874, 6616, 6804, 6809, 6810, 6812, 6813, 6814, 6843, 6844, 6853, 6854, 6855, 6856, 6857, 6861, 8224, 8447, 8448, 8618, 8674, 8773, 8774, 8775, 9066, 9143, 9144, 9145, 9341, 9342, 9515, 9522, 9545, 9699, 9783, 9805, 9899, 9900, 10066, 10067, 10497, 10640, 10814, 10815, 11336, 22895, 22987, 22999, 23025, 23265, 23557, 25924, 29091, 54536, 54843, 55530, 55738, 55763, 55770, 55968, 60412, 63908, 80331, 80725, 84258, 84958, 91683, 94120, 94121, 94122, 112755, 116841, 127833, 132204, 134957, 143425, 148281, 149371, 192683, 201294, 252983, 440279
ENDOCYTOSIS # genes: 26 LIDs: 160, 161, 162, 163, 1173, 1175, 1213, 1759, 1785, 6456, 8301, 8867, 8871, 8907, 8943, 9892, 10053, 10059, 10239, 10947, 22848, 25977, 26052, 28964, 51100, 56904
PEPTIDE/NEUROTROPHIN SIGNALING 28 LIDs: 551, 627, 885, 1113, 1392, 1393, 2246, 3084, 4282, 4852, 4922, 5020, 5122, 5126, 5173, 5179, 5663, 5664, 6447, 6750, 7857, 9542, 10718, 23385, 51107, 55851, 83464, 145957
INTRACELLULAR TRAFFICKING # genes: 79 LIDs: 392, 547, 1639, 1778, 2664, 2665, 3799, 3831, 3895, 4218, 4644, 5861, 5862, 5864, 5865, 5867, 5868, 5869, 5870, 5877, 5878, 6811, 6845, 6993, 7879, 8417, 8655, 8675, 9117, 9135, 9218, 9230, 9363, 9482, 10228, 10540, 10567, 10890, 11021, 11031, 11311, 22930, 22931, 23011, 23095, 23258, 23647, 23673, 24137, 25837, 26276, 27131, 27314, 27342, 30845, 51209, 51552, 51560, 51762, 53916, 53917, 55207, 55638, 57111, 57498, 64145, 64837, 65082, 79659, 79874, 81876, 84643, 89953, 115827, 116986, 140735, 143187, 201475, 376267
PROTEIN CLUSTERING # genes: 47 LIDs: 989, 1487, 1488, 1739, 1740, 1741, 1742, 4355, 4356, 4735, 5413, 8495, 8496, 8497, 8499, 8500, 8541, 8573, 8825, 8927, 9228, 9229, 9463, 10580, 10801, 22839, 22866, 22884, 22941, 23085, 23157, 23176, 23349, 26059, 27445, 29993, 51678, 55752, 55964, 57513, 57524, 57554, 58512, 58538, 64130, 64398, 85358
CELL ADHESION AND TRANSSYNAPTIC SIGNALING # genes: 81 LIDs: 214, 682, 708, 961, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1012, 1013, 1014, 1016, 1272, 1400, 1404, 1463, 2017, 2064, 2817, 2823, 2824, 3897, 4045, 4062, 4155, 4340, 4345, 4684, 4685, 4756, 4974, 4978, 5067, 5097, 5354, 5818, 6091, 6092, 6900, 7087, 7143, 8502, 8506, 8642, 9369, 9378, 9379, 10675, 22871, 23114, 23705, 26047, 27020, 27255, 28316,

28513, 50863, 53942, 54413, 54798, 55914, 57502, 57555, 60437, 63827, 64072, 64405, 93185, 152330, 199731, 253559, 375790, 404037

ION BALANCE/TRANSPORT

genes: 43

LIDs: 361, 476, 477, 478, 481, 482, 488, 490, 491, 492, 493, 523, 525, 526, 527, 528, 529, 534, 535, 537, 2697, 6521, 6543, 6546, 6547, 7779, 7781, 7782, 8671, 9114, 9296, 9368, 10396, 10463, 51382, 51606, 55676, 57282, 57348, 57468, 64924, 80727, 148867

RNA AND PROTEIN SYNTHESIS, FOLDING AND BREAKDOWN

genes: 71

LIDs: 726, 821, 908, 1471, 1804, 1915, 1917, 1938, 1975, 2280, 2923, 3301, 3308, 3309, 3312, 3320, 4259, 4738, 5034, 5478, 5479, 5813, 5860, 6124, 6128, 6134, 6137, 6159, 6189, 6203, 6217, 6222, 6233, 6238, 7184, 7203, 7295, 7317, 7334, 7336, 7345, 7415, 8078, 8745, 9520, 9829, 10130, 10134, 10574, 10575, 10576, 10598, 10694, 10808, 10963, 22824, 23052, 23191, 23193, 25813, 26278, 51559, 53616, 55611, 55690, 55735, 55832, 85365, 150726, 259217, 360200

CELL METABOLISM

genes: 57

LIDs: 291, 292, 348, 760, 1622, 2023, 2026, 2180, 2181, 2194, 2597, 2710, 2739, 2805, 2819, 2947, 2949, 2950, 3098, 3295, 3417, 3939, 4035, 4190, 4830, 4831, 5052, 5211, 5213, 5214, 5223, 5230, 5297, 5306, 5447, 5834, 6513, 6515, 6520, 6533, 6534, 6535, 7001, 7086, 8140, 8396, 9615, 10991, 11343, 23396, 26227, 51097, 55276, 55750, 55754, 79837, 340146

UNKNOWN

genes: 58

LIDs: 308, 309, 310, 311, 320, 321, 351, 1855, 2319, 2596, 2631, 3916, 3920, 5621, 6252, 6305, 6622, 7466, 8508, 8537, 9501, 9546, 9758, 9764, 9796, 10211, 10313, 10439, 10513, 10550, 10787, 10972, 23154, 23312, 23335, 23504, 26090, 26960, 27095, 57142, 57552, 58485, 65125, 78997, 80863, 84152, 84293, 85300, 114569, 126003, 157378, 285368, 286205, 343990, 347730, 387104, 388336, 389813

Pathways

METABOTROPIC GLUTAMATE RECEPTOR

genes: 65

LIDs: 774, 777, 781, 782, 784, 785, 2596, 2767, 2776, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2790, 2791, 2911, 3845, 4082, 4905, 5331, 5332, 5578, 5579, 5580, 5581, 5582, 5594, 5595, 5604, 5605, 5894, 6505, 6509, 6511, 6512, 6616, 6714, 6812, 6813, 6814, 6853, 6857, 9254, 9630, 10368, 10369, 10497, 10681, 23025, 23236, 27091, 27092, 54331, 55799, 55970, 57030, 57084, 59345, 93589, 148281, 246213, 440279

CANABINOID

genes: 86

LIDs: 107, 108, 109, 111, 114, 673, 773, 774, 777, 781, 782, 784, 785, 1268, 1269, 2596, 2770, 2771, 2773, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2790, 2791, 3760, 3762, 3763, 3765, 3845, 4082, 4905, 5331, 5332, 5573, 5575, 5576, 5577, 5578, 5579, 5580, 5581, 5582, 5594, 5595, 5604, 5605, 5609, 5894, 5909, 6616, 6812, 6813, 6814, 6853, 6854, 6857, 8224, 8775, 9254, 9751, 10368, 10369, 10411, 10497, 10681, 11069, 11343, 22895, 22999, 23025, 23236, 23557, 27091, 27092, 54331, 55799, 55970, 59345, 93589, 148281, 196883, 440279

DOPAMINE

genes: 73

LIDs: 107, 108, 109, 111, 114, 673, 773, 774, 777, 781, 782, 784, 785, 1312, 1644, 1812, 1816, 2596, 2778, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2790, 2791, 3845, 4082, 4128, 4129, 4905, 5573, 5575, 5576, 5577, 5595, 5604, 5605, 5609, 5894, 6531, 6616, 6812, 6813, 6814, 6853, 6854, 6857, 7054, 8224, 8775, 9254, 9751, 10368, 10369, 10411, 10681, 11069, 22820, 22895, 22999, 23557, 27091, 27092, 54331, 55799, 55970, 59345, 93589, 148281, 196883

SEROTONIN

genes: 111

LIDs: 107, 108, 109, 111, 114, 673, 773, 774, 775, 776, 777, 778, 781, 782, 784, 785, 801, 805, 808, 810, 814, 815, 816, 817, 818, 1644, 2596, 2770, 2771, 2773, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2790, 2791, 3350, 3351, 3352, 3760, 3762, 3763, 3765, 3845, 4082, 4128, 4129, 4905, 5331, 5332, 5573, 5575, 5576, 5577, 5578, 5579, 5580, 5581, 5582, 5594, 5595, 5604, 5605, 5609, 5894, 5909, 6532, 6616, 6812, 6813, 6814, 6843, 6853, 6854, 6855, 6857, 7166, 8224, 8536, 8775, 9254, 9751, 10368, 10369, 10411, 10497, 10681, 11069, 22895, 22999, 23025, 23236, 23557, 27091, 27092, 54331, 55450, 55799, 55970, 57118, 57172, 59345, 91860, 93589, 121278, 148281, 196883, 440279

Table S2. Main References Used to Identify Functional Synaptic Groups and Canonical Pathways

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