

SpaceTx cell type calling

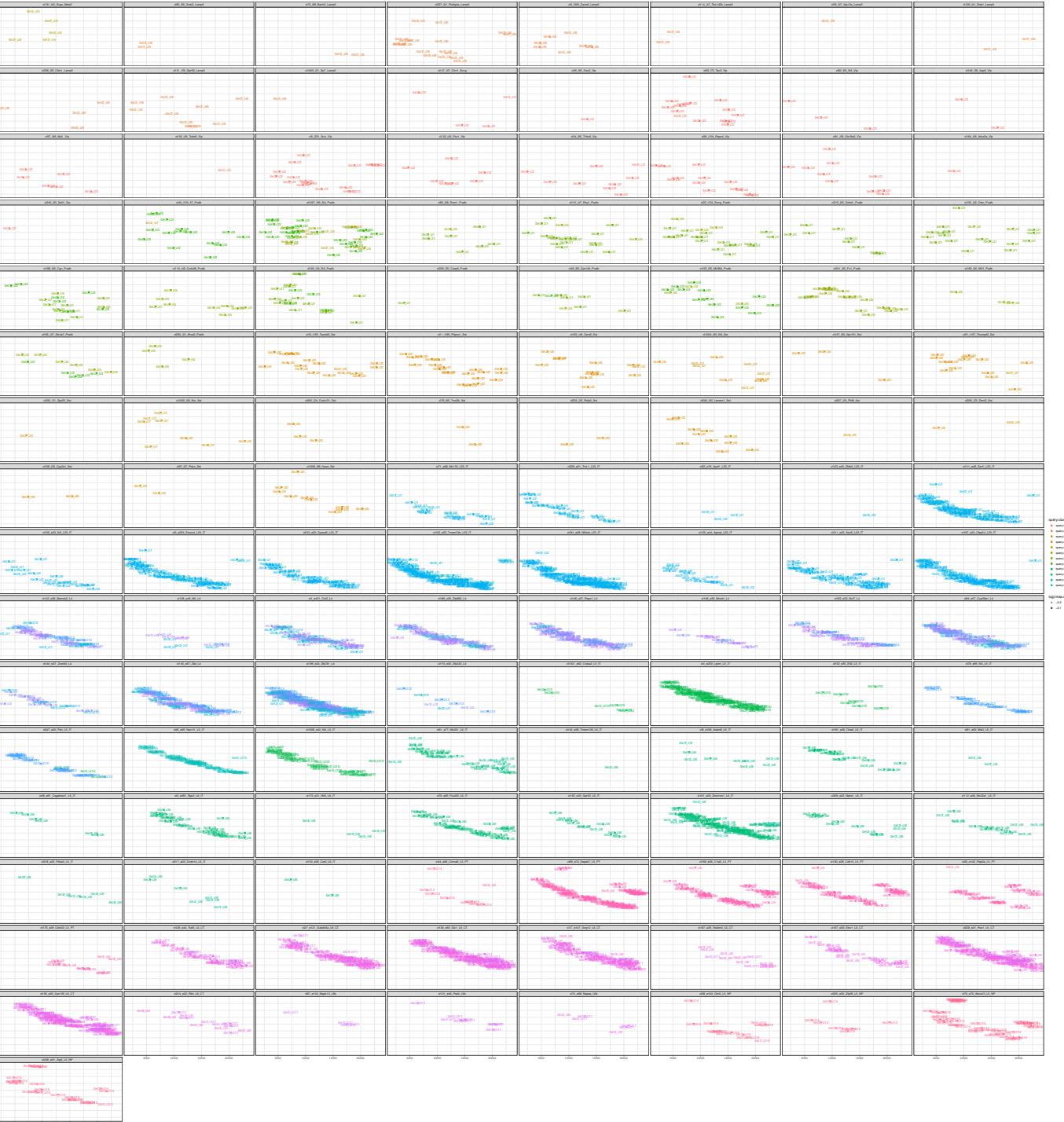
Renee Zhang

01JUL2020

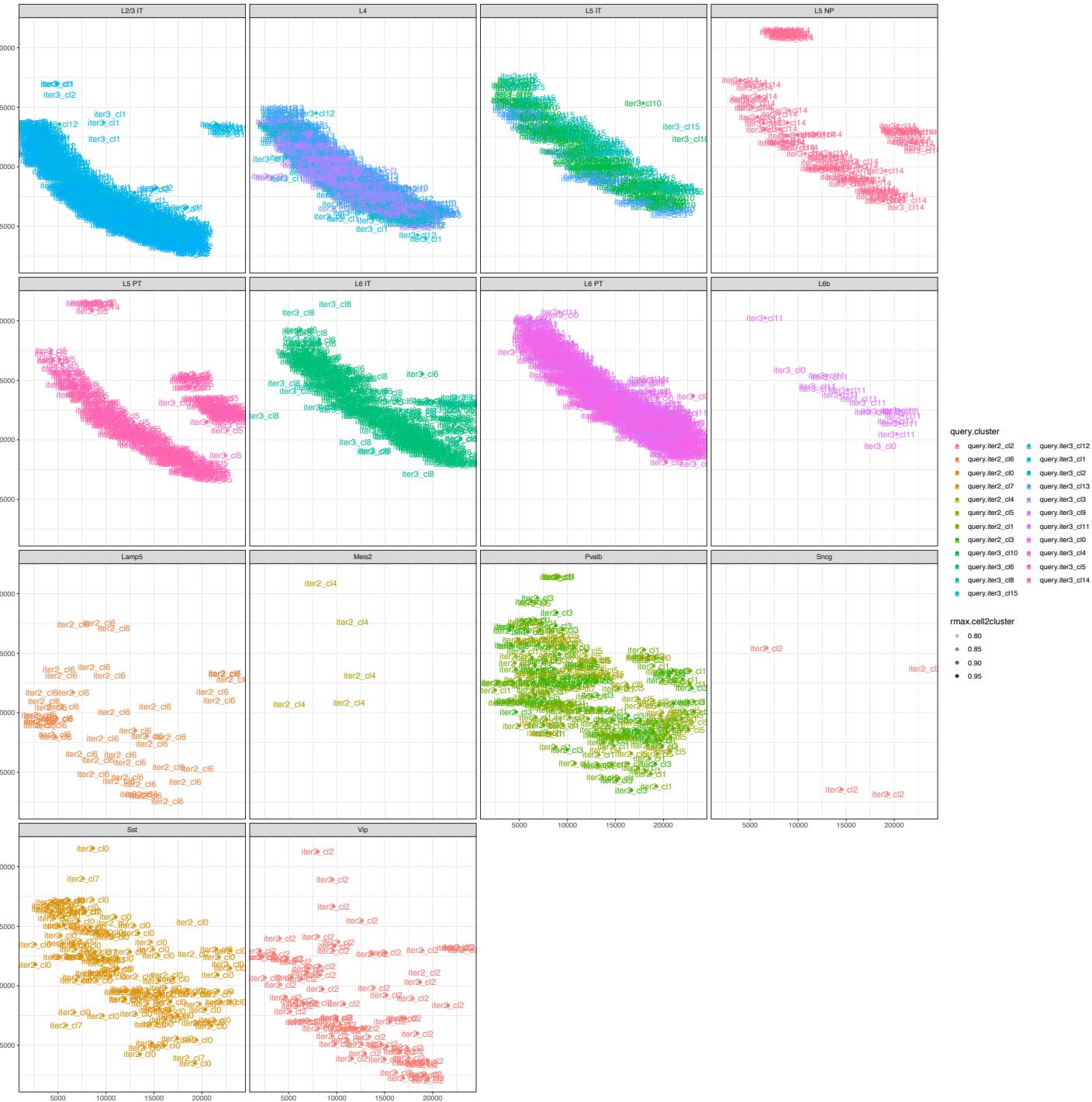
Allen smFISH

- QC on cells (Vicktor's stats)
- QC on genes (data distribution plot, spatial plot) – removed Kcnip4
- Iterative Louvain clustering
 - Initial clustering on all cells with low Louvain resolution and default n_neighbors, to get a coarse splitting into major types: INH, EXC, GLIAL
 - Iteratively re-cluster major types with higher Louvain resolution and smaller n_neighbors, to obtain finer and more local clusters
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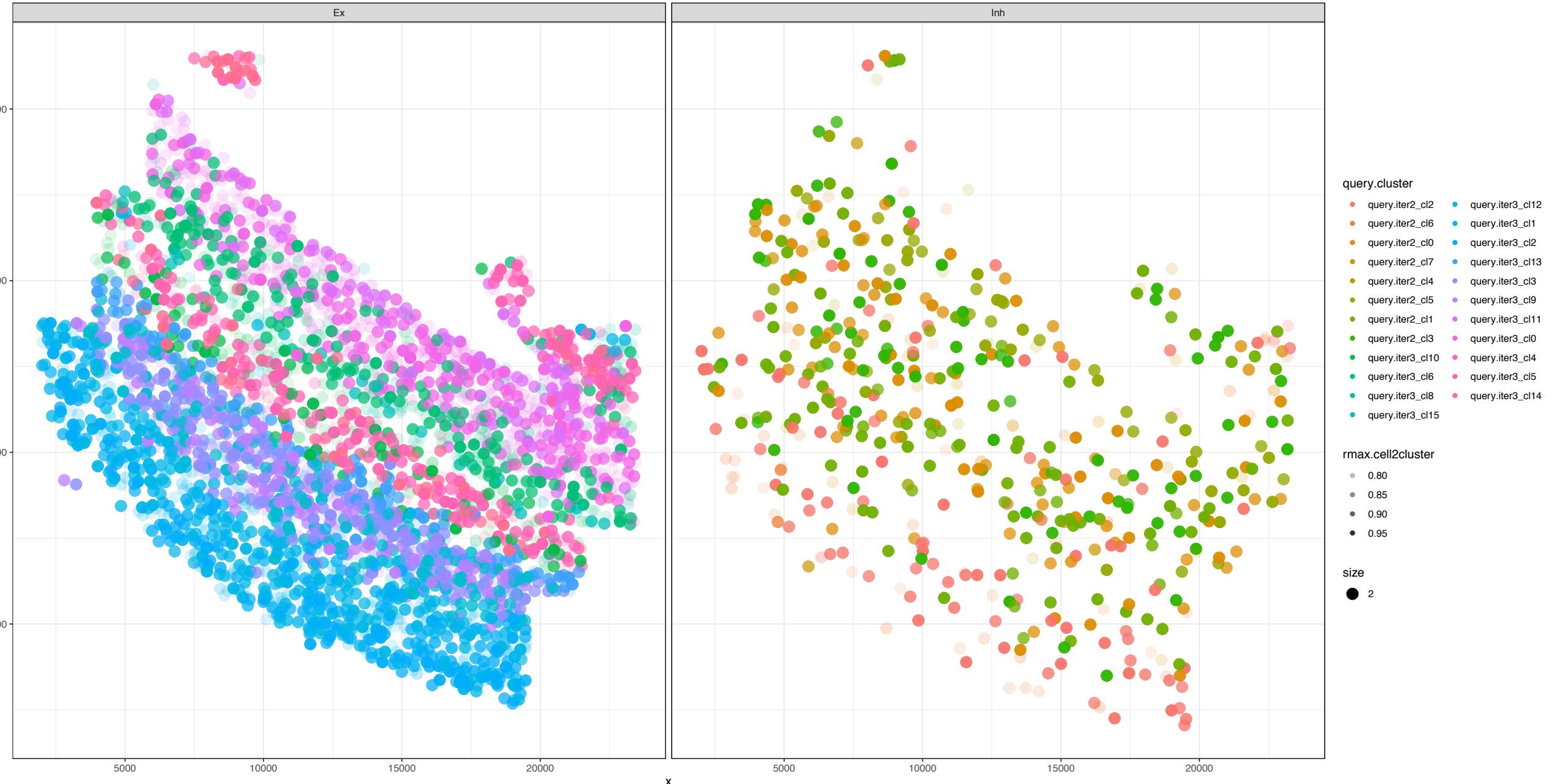
Cell type calling – consensus cluster labels



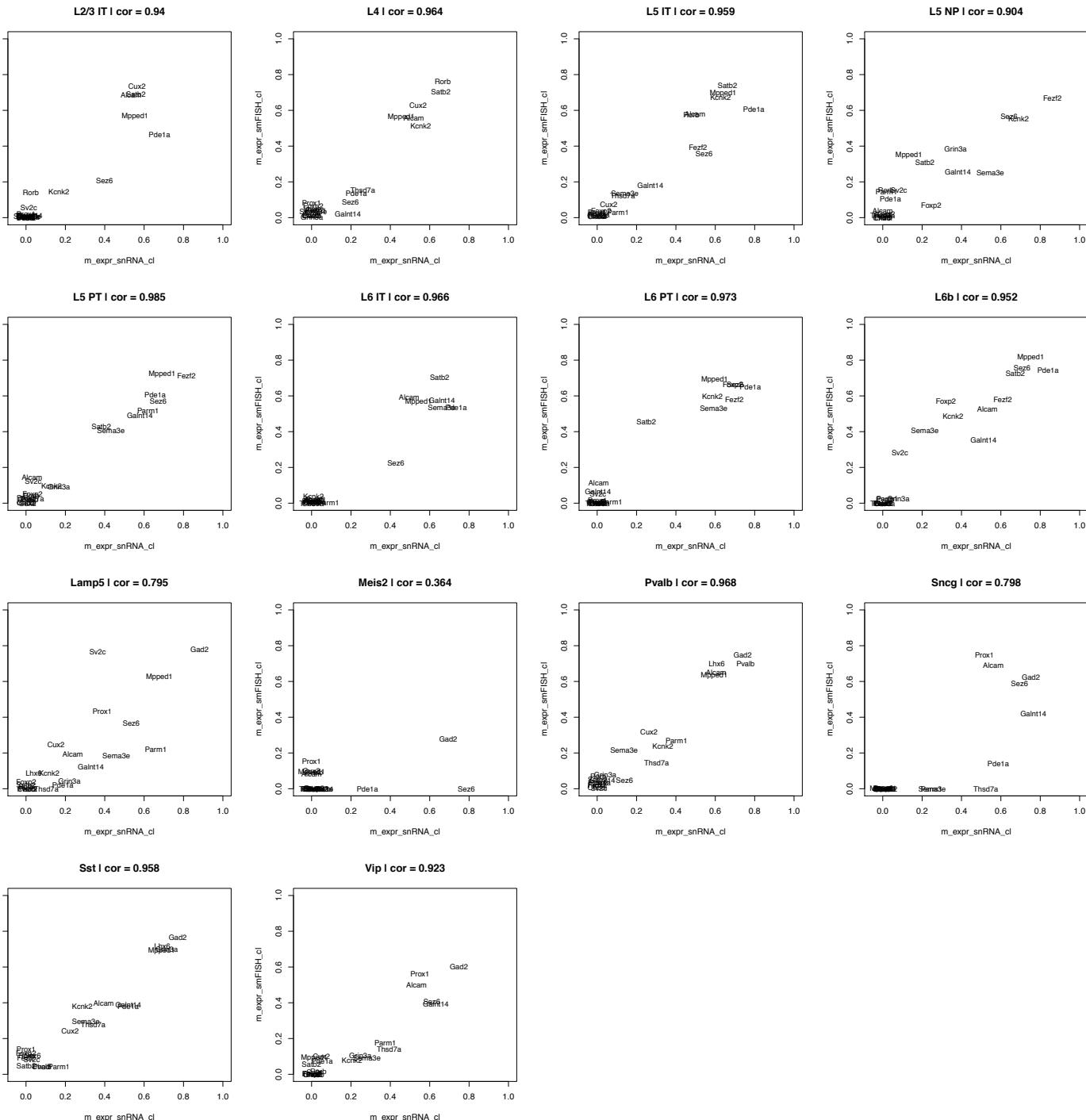
Cell type calling – subclass



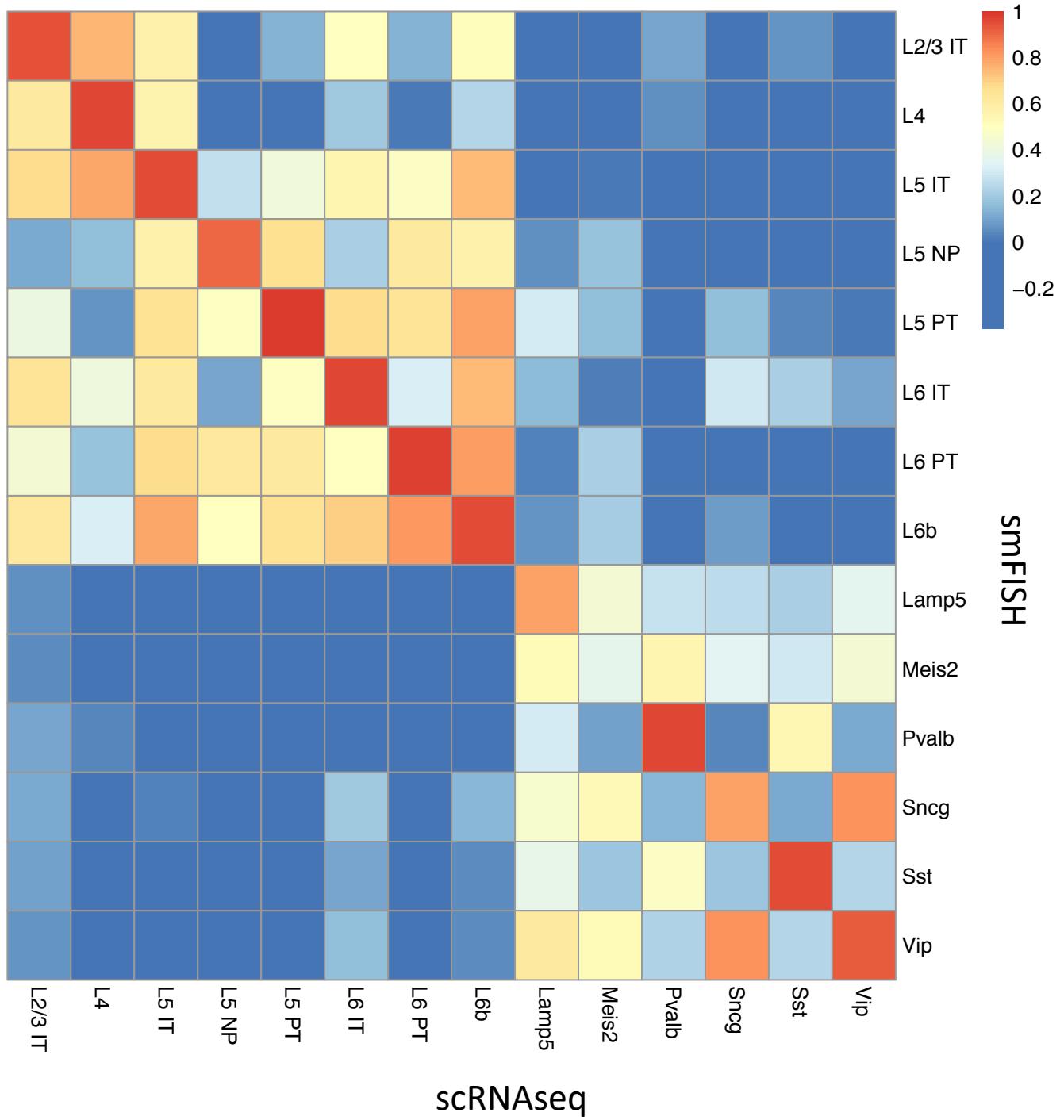
Cell type calling – broad class



Gene expression correlation scatter plot between two data modalities for matched cell type



Gene expression correlation heatmap
between two data modalities



Mapping results cleaned up

smFISH_mapping_results.csv

cell	x	y	query.cluster	match.cell2cluster	rmax.cell2cluster	subclass	broad_class
1	9261.03525	15447.2595	query.iter3_cl0	cl27_e121_Gadd45a_L6_CT	0.926350431	L6 PT	Ex
2	6019.32906	20710.3469	query.iter3_cl8	cl61_e77_Mir221_L6_IT	0.765641709	L6 IT	Ex
4	20329.8807	7044.65788	query.iter3_cl10	cl4_e253_Lgmn_L5_IT	0.957450034	L5 IT	Ex
5	15485.973	8216.10851	query.iter3_cl13	cl144_e37_Zranb3_L4	0.756830429	L4	Ex
6	5229.68687	9931.09638	query.iter3_cl1	cl102_e53_Tmem74b_L23_IT	0.98340547	L2/3 IT	Ex
7	5101.37463	10199.4355	query.iter3_cl1	cl211_e22_AscI5_L23_IT	0.765641709	L2/3 IT	Ex
8	17765.0368	11259.6879	query.iter3_cl0	cl27_e121_Gadd45a_L6_CT	0.752737666	L6 PT	Ex
9	14248.3338	8893.74749	query.iter2_cl1	cl22_i134_Esrrg_Pvalb	0.934933159	Pvalb	Inh
10	19117.3976	5528.2561	query.iter3_cl3	cl146_e37_Rspo1_L4	0.926350431	L4	Ex
11	17269.7331	12526.6729	query.iter3_cl0	cl106_e50_Dlc1_L6_CT	0.761126095	L6 PT	Ex
12	18450.2168	5062.15743	query.iter3_cl1	cl211_e22_AscI5_L23_IT	0.934933159	L2/3 IT	Ex
13	17147.4322	7263.62561	query.iter2_cl2	cl132_i43_Fbn1_Vip	0.985136408	Vip	Inh
14	11253.7036	10028.651	query.iter3_cl13	cl196_e24_Zfp781_L4	0.98340547	L4	Ex
15	4056.33765	13241.6311	query.iter3_cl9	cl186_e26_Zfp882_L4	0.98340547	L4	Ex
16	4863.33247	12692.6414	query.iter3_cl12	cl142_e38_Mam1_Ct17	0.939332375	L4	Ex
17	16708.3048	4848.36962	query.iter3_cl1	cl197_e24_Cfap34_L23_IT	0.770396342	L2/3 IT	Ex
18	14593.8149	10152.2913	query.iter2_cl1	cl188_i27_Csn_Pvalb	0.985136408	Pvalb	Inh
19	13114.1432	8677.83144	query.iter3_cl3	cl196_e26_Zfp882_L4	0.988407198	L4	Ex
24	12682.3844	13871.2567	query.iter3_cl0	cl156_e35_Gpr139_L6_CT	0.939332375	L6 PT	Ex
25	12029.6653	5712.06595	query.iter3_cl2	cl210_e22_Spac6_L23_IT	0.922175654	L2/3 IT	Ex
26	4054.57965	11005.2212	query.iter2_cl1	cl239_i20_Casp9_Pvalb	0.934933159	Pvalb	Inh
27	19010.0205	11896.6237	query.iter3_cl11	cl106_e50_Dlc1_L6_CT	0.798608153	L6 PT	Ex
28	19541.3122	6878.01016	query.iter2_cl0	cl107_i50_Gpr101_Sst	0.926350431	Sst	Inh
29	8230.445	13490.9177	query.iter3_cl5	cl69_e70_Depdc7_L5_PT	0.926350431	L5 PT	Ex
30	7544.69273	16994.5583	query.iter3_cl0	cl27_e121_Gadd45a_L6_CT	0.981620453	L6 PT	Ex
32	14615.7841	12644.4493	query.iter3_cl0	cl187_e26_Teddm2_L6_CT	0.765641709	L6 PT	Ex
33	19460.0166	4830.91787	query.iter3_cl1	cl181_e28_Nfkbid_L23_IT	0.952867847	L2/3 IT	Ex
34	9703.3101	7493.22061	query.iter2_cl0	cl223_i22_Rxfp3_Sst	0.918082162	Sst	Inh
35	13517.6493	9438.34006	query.iter3_cl13	cl247_e20_Pah_L5_IT	0.952867847	L5 IT	Ex
36	5944.14956	15170.1455	query.iter3_cl10	cl1008_e40_NA_L5_IT	0.765641709	L5 IT	Ex
38	16406.625	6521.71288	query.iter3_cl12	cl196_e24_Zfp781_L4	0.934933159	L4	Ex
39	17956.8111	6778.2115	query.iter3_cl3	cl146_e37_Rspo1_L4	0.985136408	L4	Ex

Mapping results all

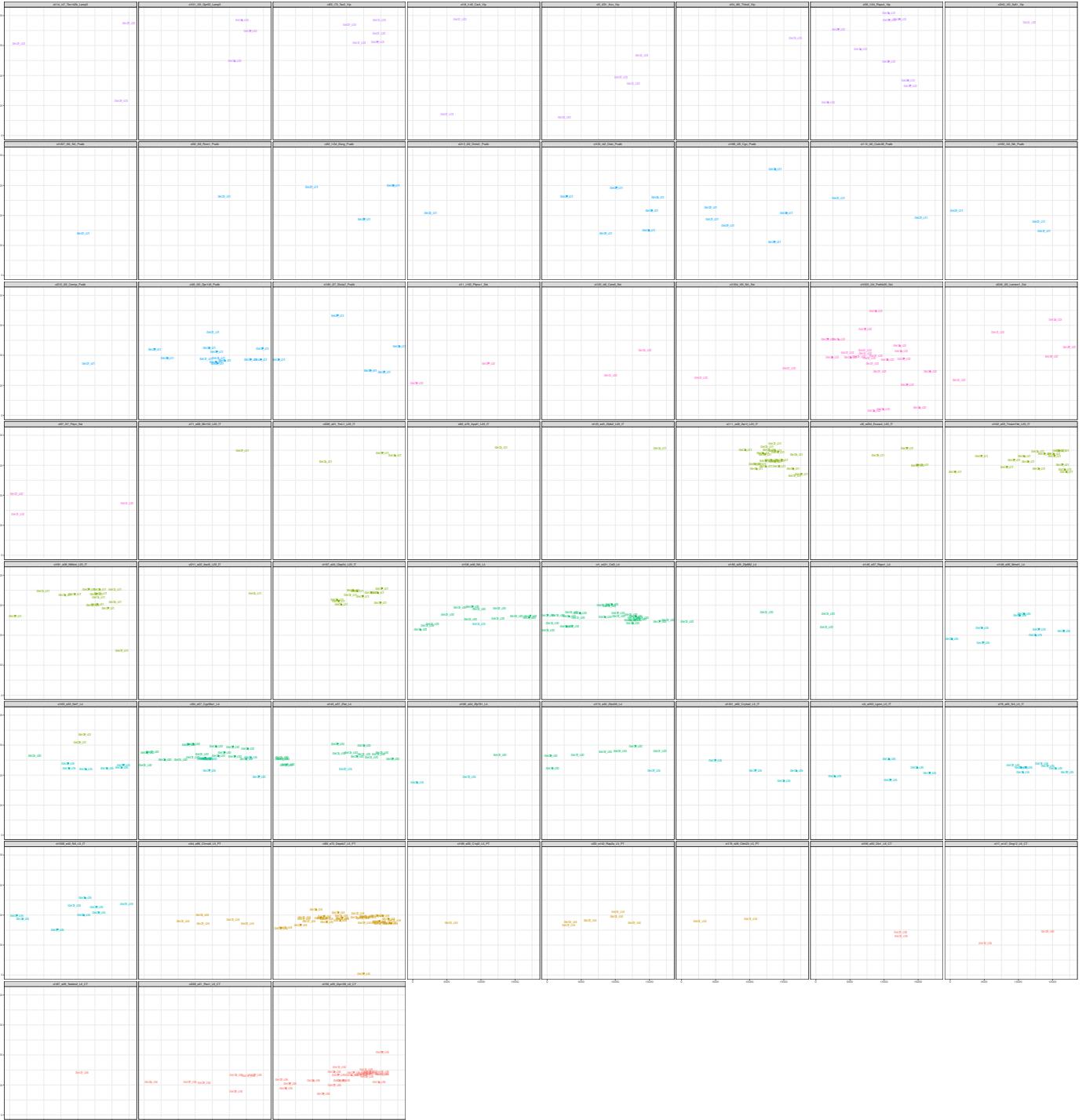
smFISH_mapping_results_all.csv

query.cell	query.cluster	match.cell2c	rmax.cell2cl	ref.cl1_e421	ref.cl10_i163	ref.cl1001_e	ref.cl1002_i2	ref.cl1003_i2	ref.cl1004_i6	ref.cl1005_i2	ref.cl1006_i6	ref.cl1007_i5	ref.cl1008_e	ref.cl1009_e	ref.cl101_e5	ref.cl102_e5
28	query.iter2_ccl107_i50_G	0.92635043	0.01659453	0.78071099	0.01837955	0.5	0.02021199	0.7611261	0.24316957	0.7611261	0.22960366	0.01659453	0.01837955	0.01837955	0.01486359	
34	query.iter2_ccl120_i46_Ce	0.91808216	0.02208567	0.7611261	0.02021199	0.5	0.01659453	0.7611261	0.5	0.78071099	0.24316957	0.02208567	0.01837955	0.00364518	0.01486359	
68	query.iter2_ccl120_i46_Ce	0.92635043	0.01659453	0.77039634	0.01319384	0.5	0.02021199	0.5	0.5	0.76564171	0.24316957	0.02208567	0.01837955	0.02021199		
127	query.iter2_ccl1006_i68_I	0.99732009	0.00364518	0.7611261	0.01837955	0.76564171	0.01659453	0.7754114	0.24316957	0.99732009	0.24316957	0.01319384	0.00364518	0.02021199	0.02021199	
225	query.iter2_ccl10_i163_Ta	0.93493316	0.02021199	0.93493316	0.02208567	0.7754114	0.08191784	0.5	0.5	0.7754114	0.24726233	0.02208567	0.02208567	0.02021199	0.02021199	
251	query.iter2_ccl158_i35_C	0.92635043	0.01837955	0.5	0.00364518	0.75683043	0.02021199	0.5	0.5	0.77039634	0.24726233	0.01837955	0.00364518	0.00314259	0.02021199	
338	query.iter2_ccl248_i20_Ls	0.93933237	0.01837955	0.5	0.00364518	0.7754114	0.01486359	0.5	0.5	0.5	0.5	0.01659453	0.02021199	0.01659453	0.02021199	
359	query.iter2_ccl21_i137_Th	0.91407133	0.02021199	0.7611261	0.00364518	0.76564171	0.01837955	0.79860815	0.24316957	0.76564171	0.5	0.00364518	0.02208567	0.02021199	0.01837955	
363	query.iter2_ccl11_i160_Pi	0.98680616	0.02021199	0.83756395	0.00364518	0.91407133	0.08191784	0.5	0.24316957	0.76564171	0.2388739	0.01486359	0.00364518	0.01659453	0.01837955	
399	query.iter2_ccl11_i160_Pi	0.92635043	0.01837955	0.76564171	0.01486359	0.5	0.01659453	0.5	0.2388739	0.5	0.5	0.01659453	0.01837955	0.02021199	0.00364518	
416	query.iter2_ccl206_i23_Di	0.91407133	0.01659453	0.5	0.01659453	0.76564171	0.01837955	0.7611261	0.24316957	0.7754114	0.24316957	0.01319384	0.00364518	0.01837955	0.01837955	
481	query.iter2_ccl11_i160_Pi	0.98513641	0.02021199	0.75683043	0.01486359	0.78071099	0.02208567	0.5	0.5	0.75683043	0.5	0.01319384	0.00364518	0.01837955	0.01659453	
483	query.iter2_ccl21_i137_Th	0.97978801	0.01837955	0.91407133	0.00364518	0.76564171	0.02021199	0.91208216	0.24316957	0.7611261	0.5	0.01837955	0.00364518	0.01837955	0.02021199	
492	query.iter2_ccl1006_i68_I	0.94379471	0.02021199	0.78071099	0.00364518	0.91407133	0.01837955	0.5	0.24316957	0.94379471	0.5	0.01837955	0.02021199	0.02021199	0.02021199	
504	query.iter2_ccl11_i160_Pi	0.98993162	0.01837955	0.76564171	0.02208567	0.7754114	0.01837955	0.5	0.24316957	0.92635043	0.07782435	0.02021199	0.00364518	0.01837955	0.02021199	
514	query.iter2_ccl1002_i29_I	0.92635043	0.01659453	0.5	0.01837955	0.92635043	0.018364957	0.79860815	0.5	0.78071099	0.24316957	0.01319384	0.02021199	0.01837955	0.01837955	
708	query.iter2_ccl1004_i65_I	0.92635043	0.02208567	0.5	0.02021199	0.7611261	0.08191784	0.92635043	0.24316957	0.78071099	0.5	0.02021199	0.01837955	0.02021199	0.02021199	
893	query.iter2_ccl11_i160_Pi	0.98993162	0.02021199	0.76564171	0.01006838	0.7254114	0.02021199	0.5	0.24316957	0.5	0.5	0.00364518	0.01486359	0.02021199	0.00364518	
912	query.iter2_ccl11_i160_Pi	0.98680616	0.01837955	0.75683043	0.00364518	0.77039634	0.02021199	0.93060413	0.5	0.91808216	0.5	0.00364518	0.00364518	0.00364518	0.02021199	
1021	query.iter2_ccl79_i65_Tnr	0.93060413	0.01486359	0.76564171	0.02021199	0.91407133	0.01837955	0.79860815	0.5	0.5	0.5	0.00314259	0.02021199	0.02021199	0.01319384	
1031	query.iter2_ccl21_i137_Th	0.98162045	0.01837955	0.76564171	0.02208567	0.7611261	0.02021199	0.79860815	0.2388739	0.91407133	0.5	0.01837955	0.01837955	0.02021199	0.02021199	
1036	query.iter2_ccl1004_i65_I	0.92635043	0.02021199	0.76564171	0.01486359	0.5	0.02021199	0.92635043	0.5	0.76564171	0.08592867	0.00364518	0.00364518	0.01659453	0.01659453	
1078	query.iter2_ccl120_i46_Ce	0.93060413	0.02021199	0.92635043	0.01006838	0.78071099	0.01837955	0.92217565	0.24316957	0.7611261	0.2388739	0.02021199	0.02021199	0.00364518	0.01486359	
1137	query.iter2_ccl10_i163_Ta	0.98340547	0.01837955	0.98340547	0.00364518	0.92635043	0.01837955	0.5	0.92217565	0.08191784	0.01837955	0.01837955	0.01837955	0.01486359		
1201	query.iter2_ccl10_i163_Ta	0.98340547	0.01837955	0.98340547	0.01659453	0.78071099	0.02021199	0.92217565	0.78071099	0.7754114	0.24316957	0.01837955	0.01837955	0.01319384	0.01837955	
1370	query.iter2_ccl11_i160_Pi	0.98513641	0.01486359	0.91808216	0.01837955	0.7754114	0.08191784	0.92635043	0.5	0.7754114	0.5	0.02208567	0.01837955	0.02021199	0.02021199	
1403	query.iter2_ccl21_i137_Th	0.93493316	0.01837955	0.76564171	0.01837955	0.5	0.01837955	0.75683043	0.5	0.7754114	0.24316957	0.02021199	0.02021199	0.02021199	0.02021199	
1453	query.iter2_ccl248_i20_Ls	0.93933237	0.02021199	0.77039634	0.02208567	0.78071099	0.01837955	0.79860815	0.23435829	0.5	0.5	0.02021199	0.01837955	0.01659453	0.01319384	
1462	query.iter2_ccl10_i163_Ta	0.93060413	0.01837955	0.93060413	0.00314259	0.78071099	0.01837955	0.91808216	0.78071099	0.91808216	0.24316957	0.02021199	0.02021199	0.02021199	0.01837955	
1475	query.iter2_ccl120_i46_Ce	0.93060413	0.01837955	0.78071099	0.01319384	0.5	0.07364957	0.5	0.5	0.77039634	0.23435829	0.02021199	0.00364518	0.01659453	0.01837955	
1599	query.iter2_ccl1006_i68_I	0.92217565	0.02021199	0.78071099	0.00364518	0.76564171	0.01837955	0.5	0.23435829	0.92217565	0.24316957	0.00364518	0.02021199	0.01659453	0.02021199	
1608	query.iter2_ccl11_i160_Pi	0.80535786	0.02021199	0.5	0.00364518	0.7611261	0.01837955	0.5	0.5	0.5	0.22960366	0.00364518	0.00364518	0.02021199	0.01659453	
1624	query.iter2_ccl248_i20_Ls	0.9884072	0.01837955	0.77039634	0.02021199	0.5	0.01837955	0.7611261	0.2388739	0.5	0.08191784	0.01837955	0.00364518	0.02021199	0.01837955	
1704	query.iter2_ccl11_i160_Pi	0.98993162	0.02021199	0.83756395	0.01837955	0.5	0.02021199	0.7754114	0.24316957	0.7754114	0.07782435	0.02021199	0.00364518	0.01837955	0.01486359	

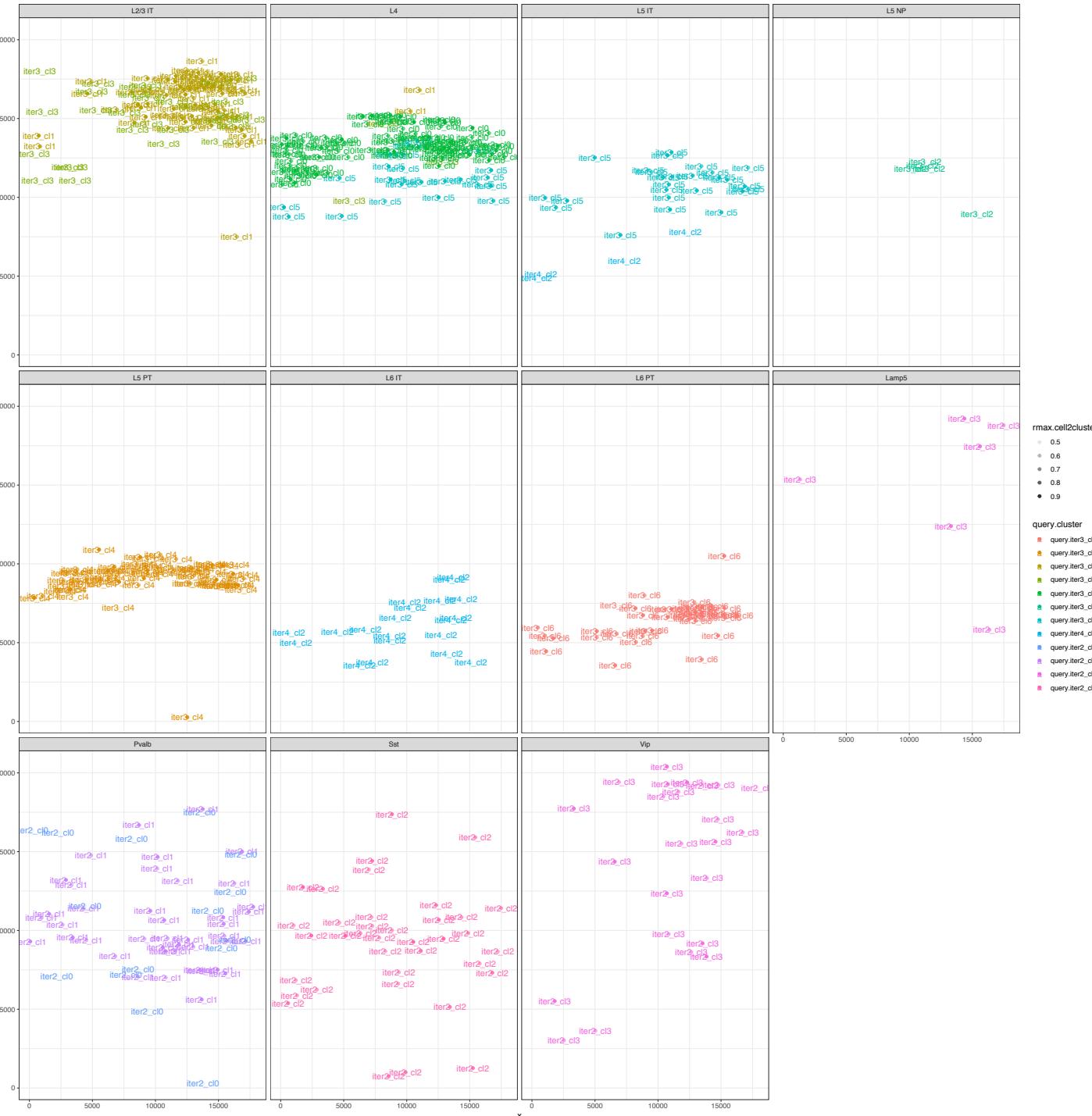
exSeq

- QC on cells (Vicktor's stats)
- QC on genes (data distribution plot, spatial plot)
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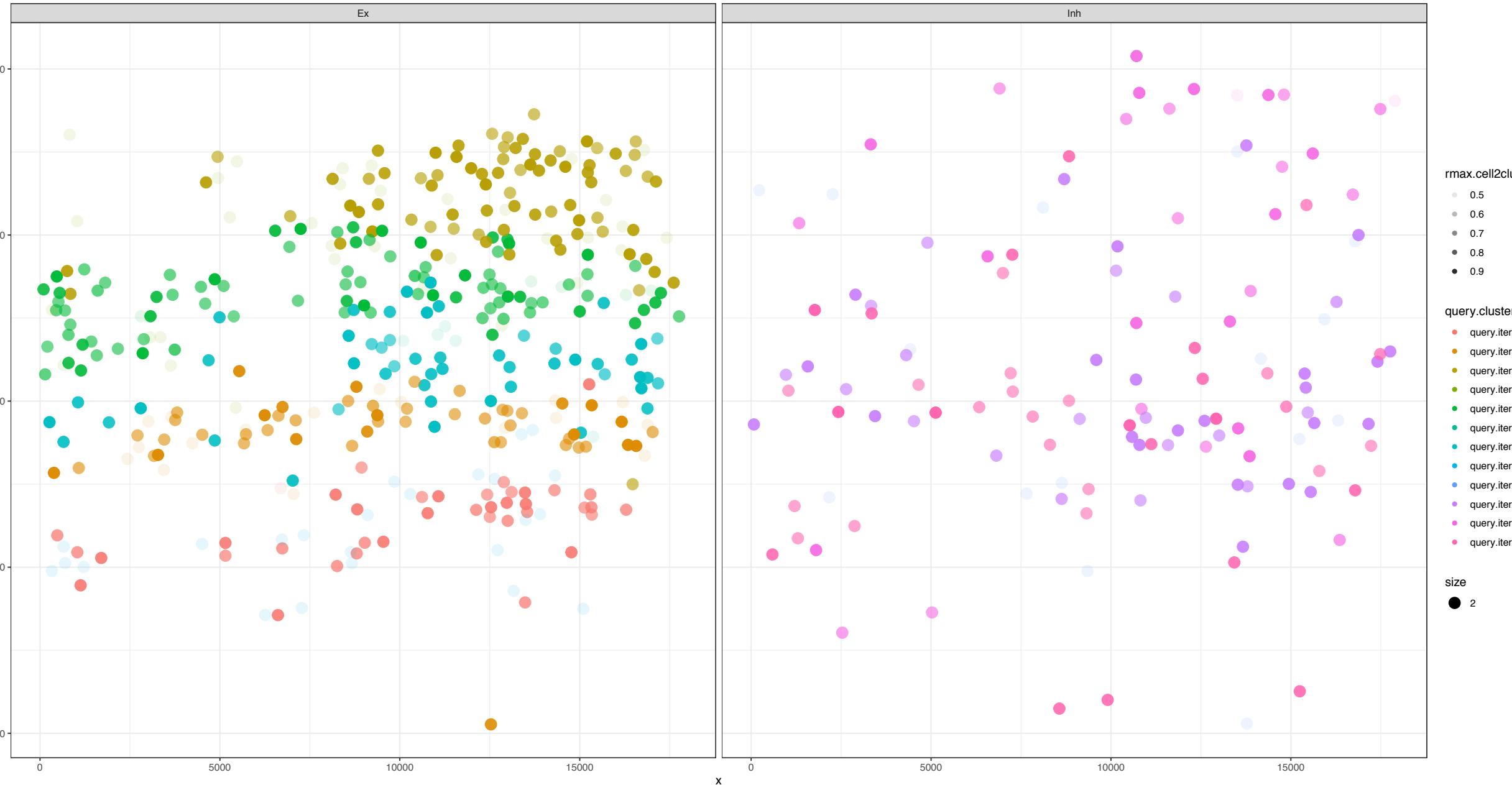
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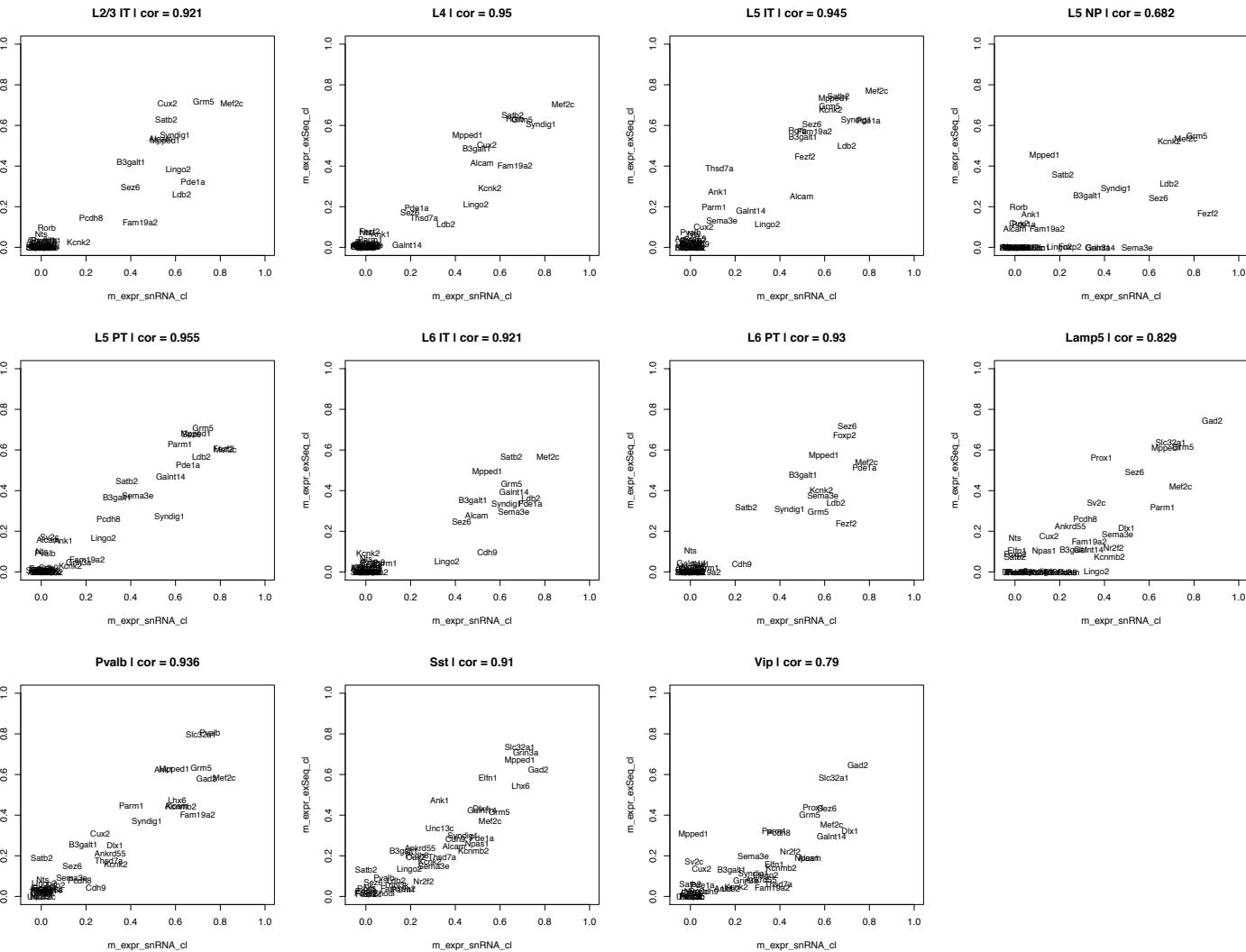
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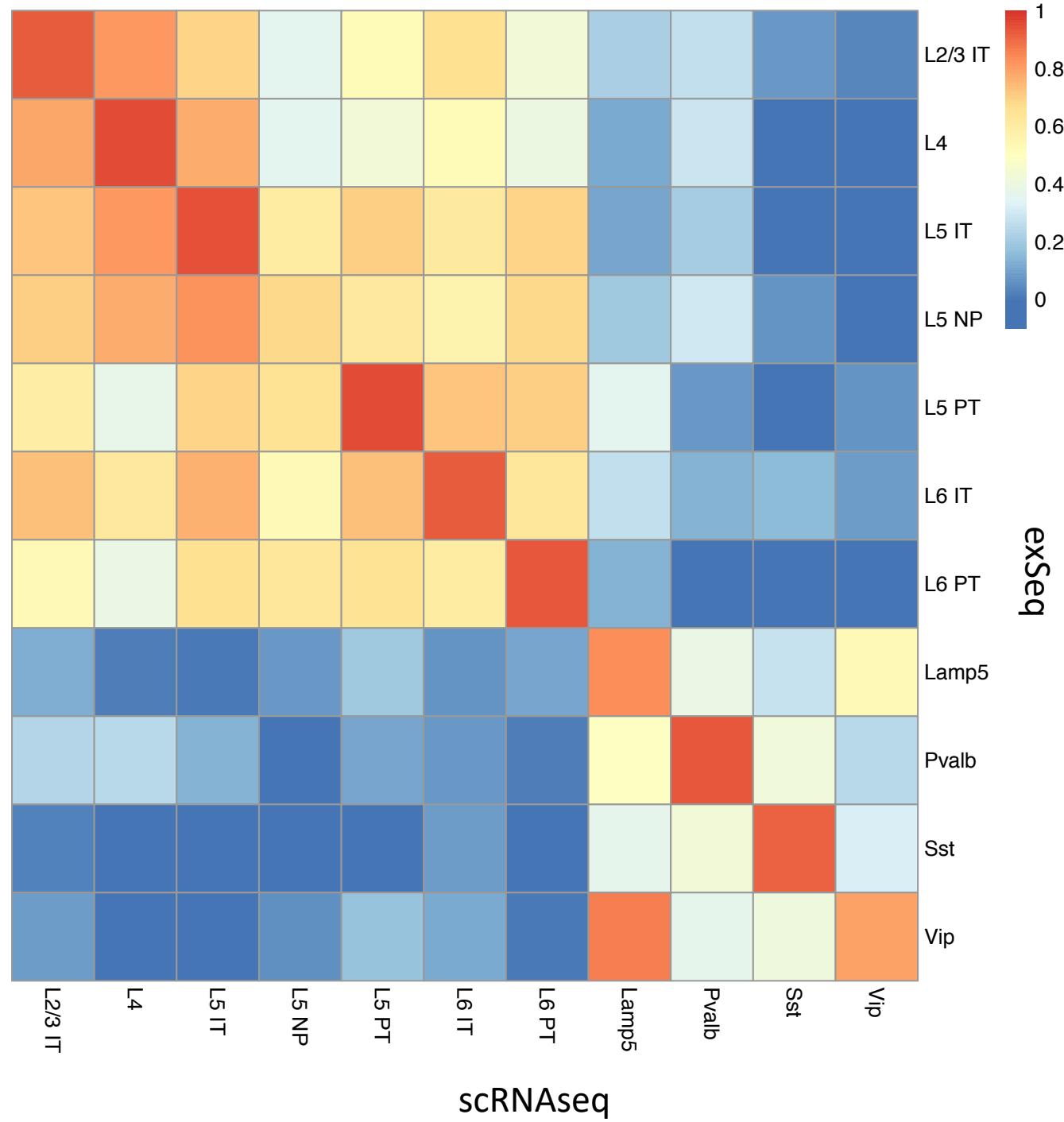
Cell type calling – broad class



Gene expression correlation scatter plot between two data modalities for matched cell type



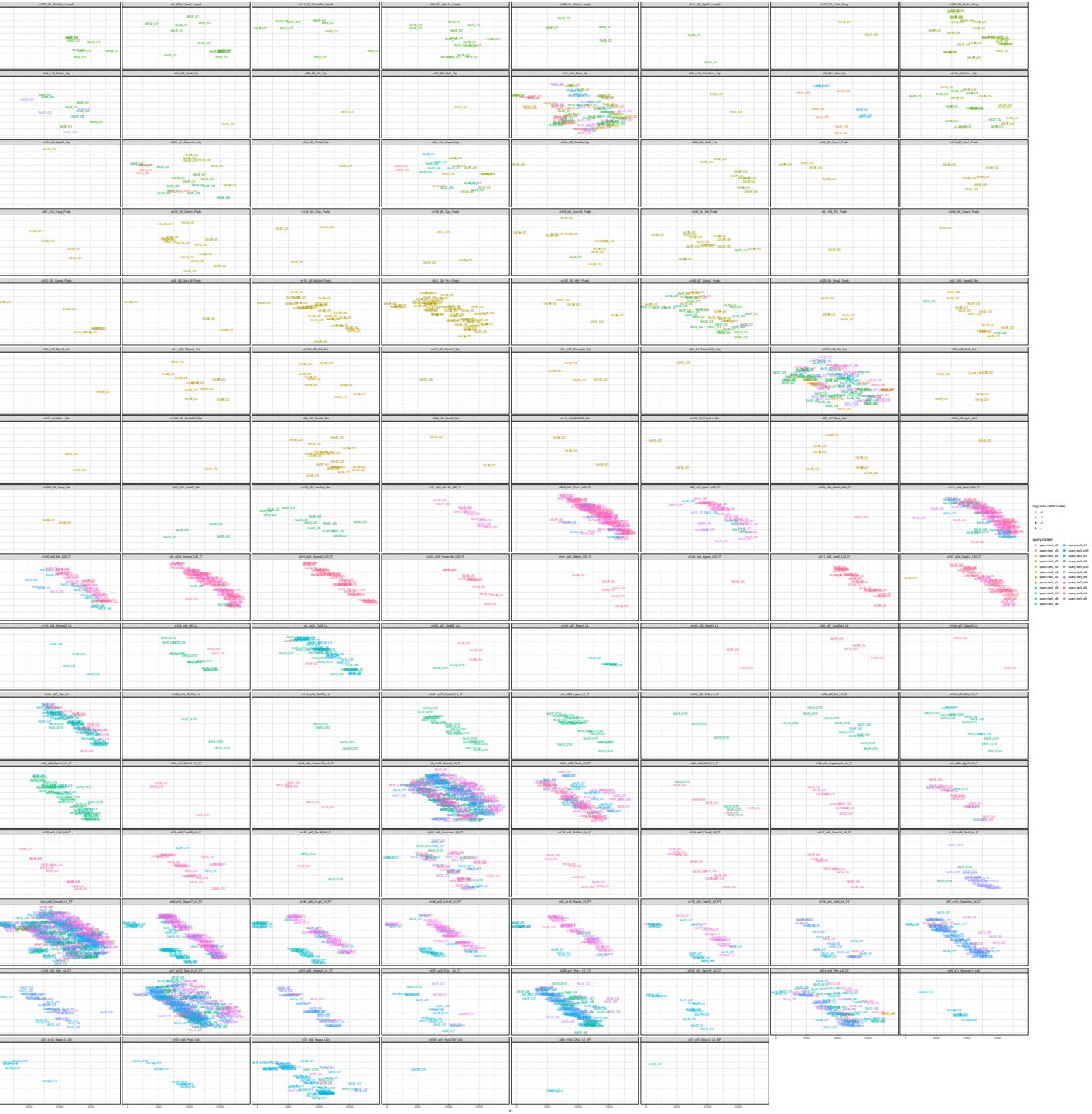
Gene expression correlation heatmap between two data modalities



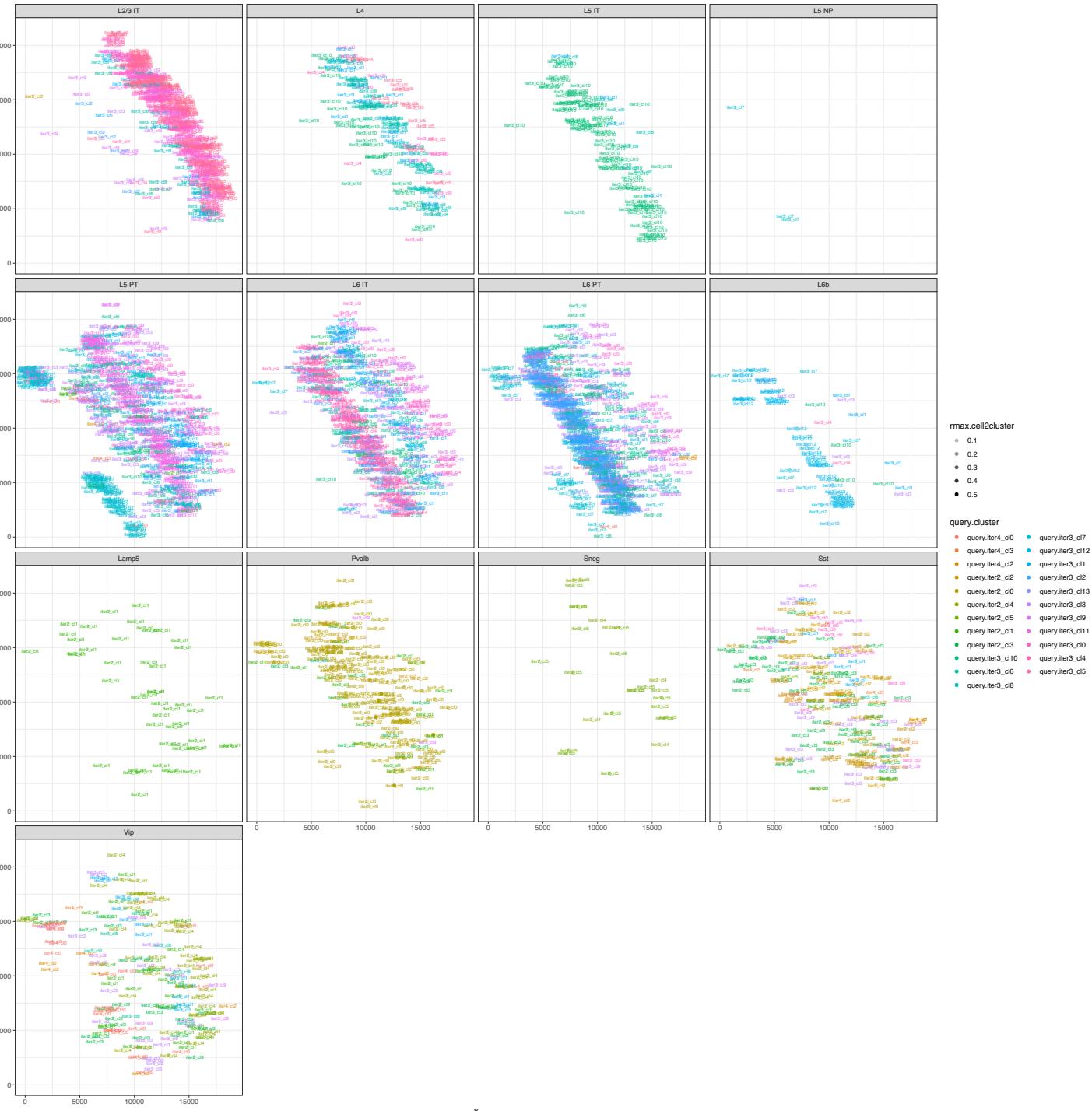
Allen MERFISH

- QC on cells (Vicktor's stats)
- QC on genes (data distribution plot, spatial plot) – removed Cd52, Mup5, Rprml, Rab3b, Tac2
- Iterative Louvain clustering
 - Initial clustering on all cells with low Louvain resolution and default n_neighbors, to get a coarse splitting into major types: INH, EXC, GLIAL
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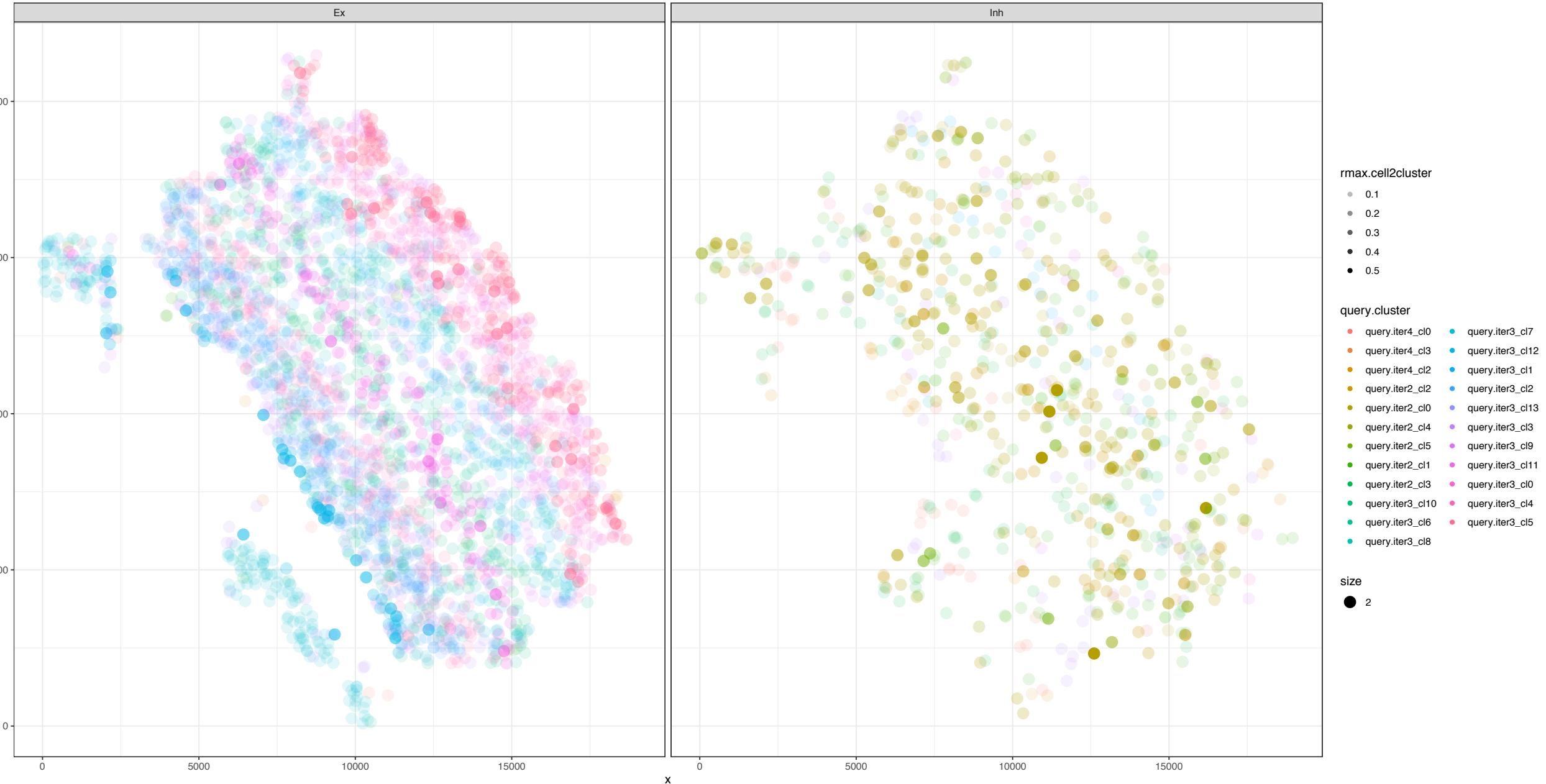
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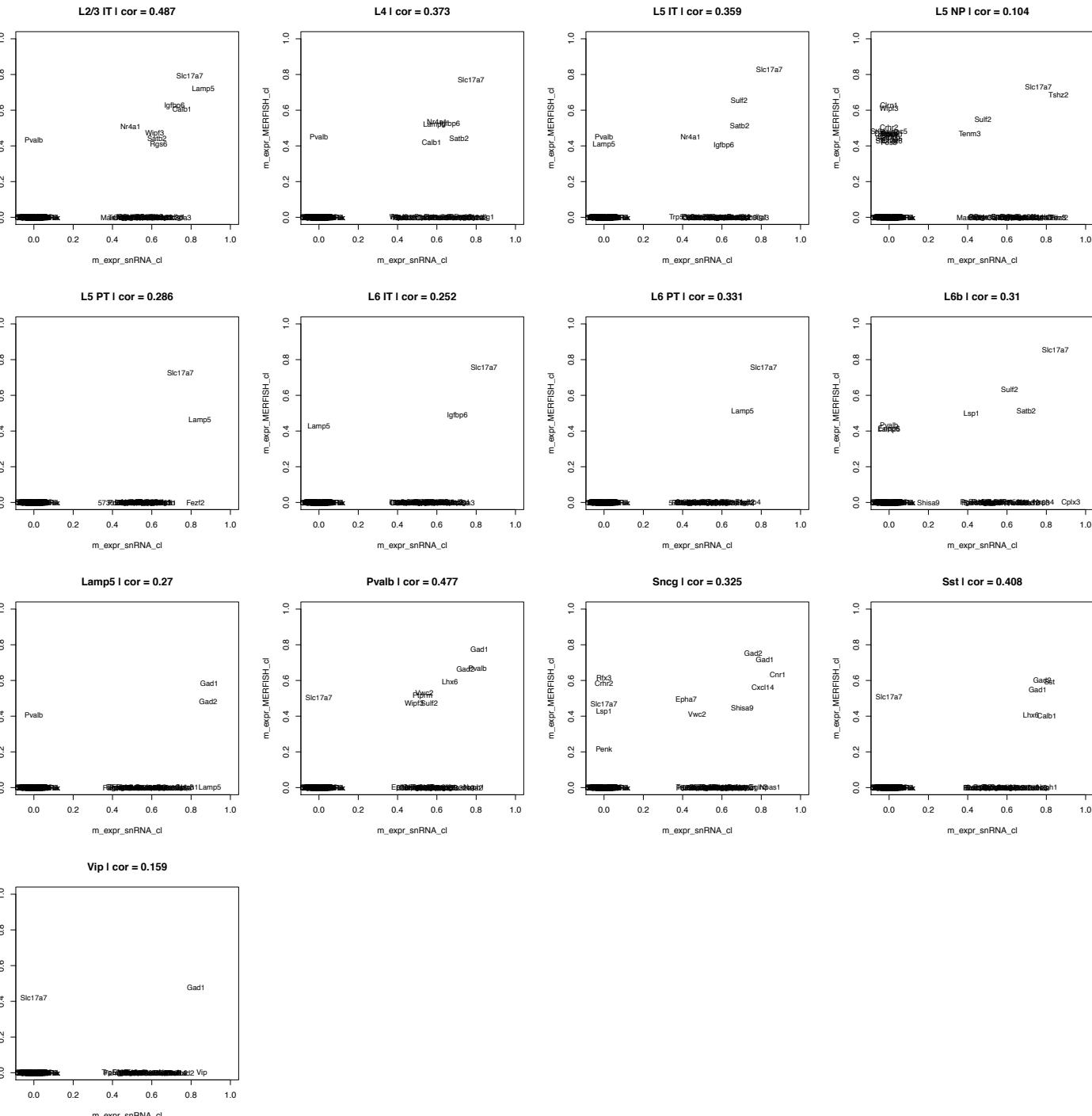
Cell type calling – subclass



Cell type calling – broad class



Gene expression correlation scatter plot between two data modalities for matched cell type



Gene expression correlation heatmap between two data modalities

