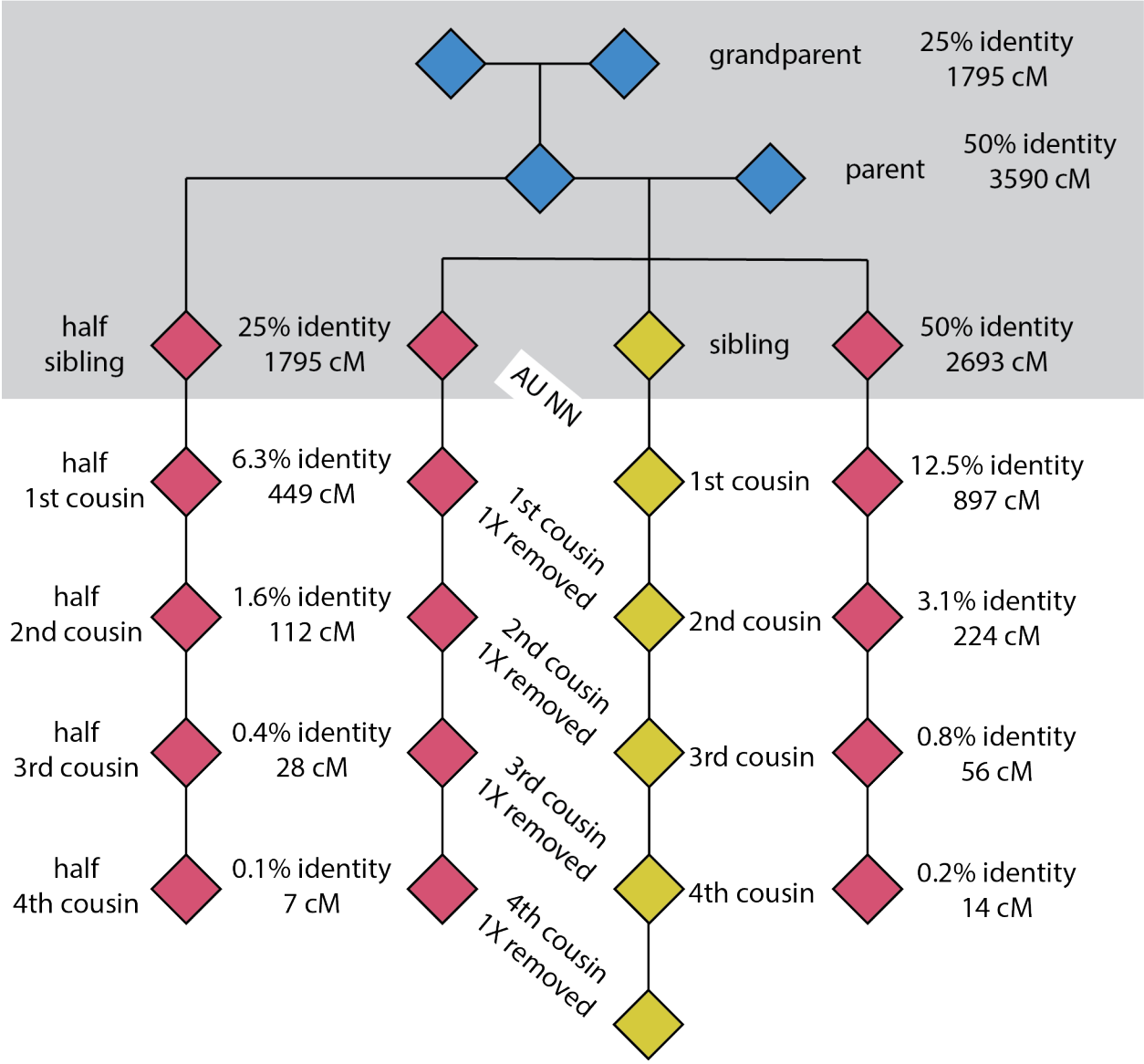
Predicted Identity by Descent Between Relatives



Two measures of genome identity: the percent (%) identity between DNA of the relatives, and the total length (cM) of identical segments along the autosomal genetic map. Parents and grandparents are relative to the set of siblings identified in the pedigree. The child of a full cousin (yellow lineage) is equivalent to a comparison with a half cousin. For example, a 1st cousin 1X removed and half 1st cousin are expected to both have 6.3% DNA identity or 449 cM shared. Moreover, a full 3rd cousin 2X removed is expected to exhibit the same measures as a full 4th cousin. Values are given for a 3590 cM autosomal map, and except for the absolute value for parent-child relationships, variability is expected in the realized values of all other relationships.

The Shared cM Project is a citizen science effort led by Blaine Bettinger, The Genetic Genealogist (www.thegeneticgenealogist.com). A survey was used to collect self-reported measures of shared cM between relatives with known common ancestry. Measures of shared cM were obtained from matches using 23andMe, AncestryDNA, Family Finder (FTDNA), and/or GEDmatch reports. The table below provides summaries organized by clusters representing different levels of relationship. These clusters correspond to the different expectations illustrated on the opposite page.

The Shared cM Project – Version 3.0
August 2017

Blaine T. Bettinger
www.TheGeneticGenealogist.com

For MUCH more information (including histograms and company breakdowns) see: goo.gl/Z1EcJQ

Cluster	Relationships	Total #	Average	Range (95th Percentile)	Range (99th Percentile)	Expected
Cluster #1	Siblings	1345	2629	2342 - 2917	2209 – 3384	2550
Cluster #2	Half Sibling, Aunt/Uncle/Niece/Nephew, and Grandparent/Grandchild	2473	1760	1435 – 2083	1294 – 2230	1700
Cluster #3	1C, Half Aunt/Uncle/Niece/Nephew, Great-Grandparent/Great-Grandchild, and Great-Aunt/Uncle/Niece/Nephew	2261	884	619 – 1159	486 – 1761	850
Cluster #4	1C1R, Half 1C, Half Great-Aunt/Uncle/Niece/Nephew, and Great-Great Aunt/Uncle/Niece/Nephew	1842	440	235 – 665	131 – 851	425
Cluster #5	1C2R, Half 1C1R, 2C, and Half Great-Great-Aunt/Uncle/Niece/Nephew	2224	232	99 – 397	47 – 517	213
Cluster #6	1C3R, Half 1C2R, Half 2C, and 2C1R	2284	123	0 – 236	0 – 317	106
Cluster #7	Half 1C3R, Half 2C1R, 2C2R, and 3C	2492	75	0 – 158	0 – 229	53
Cluster #8	Half 2C2R, 2C3R, Half 3C, and 3C1R	1864	49	0 – 114	0 – 175	27
Cluster #9	Half 3C1R, 3C2R, and 4C	1528	36	0 – 84	0 – 122	13
Cluster #10	Half 3C2R, 3C3R, Half 4C, and 4C1R	1040	29	0 – 67	0 – 118	7

Additional Resources

Ancestry DNA Matching White Paper
https://www.ancestry.com/dna/resource/whitePaper/AncestryDNA-Matching-White-Paper.pdf

23andMe, DNA Relatives: Detecting Relatives and Predicting Relationships
https://customercare.23andme.com/hc/en-us/articles/212170958-DNA-Relatives-Detecting-Relatives-and-Predicting-Relationships

Shared Centimorgan Project – Blaine T. Bettinger
https://thegeneticgenealogist.com/2015/05/29/the-shared-cm-project/

International Society of Genetic Genealogy
https://isogg.org/wiki/Autosomal_DNA_statistics