Genetic Genealogy Tools:

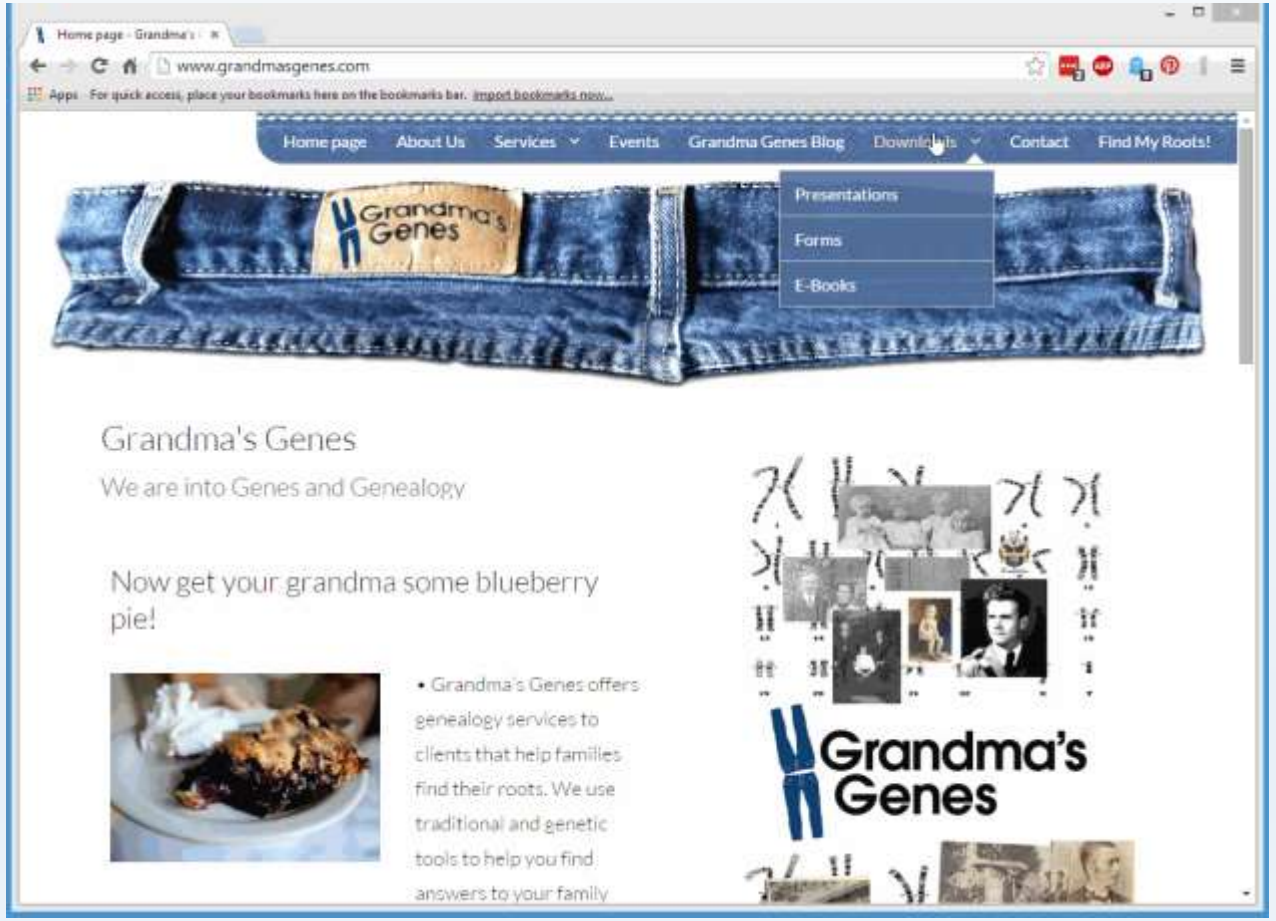
GedMatch & Genome Mate

[GED match]

Genome Mate Pro

Grandma's Genes

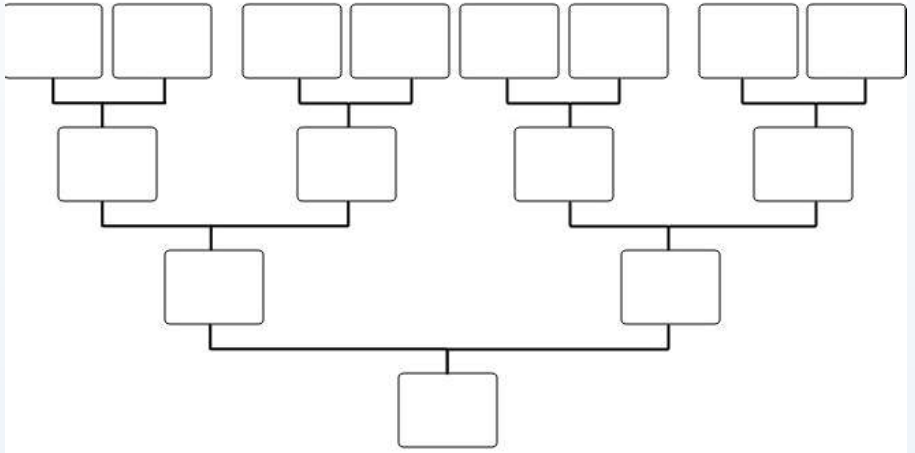
Presentation Download Here at GrandmasGenes.com

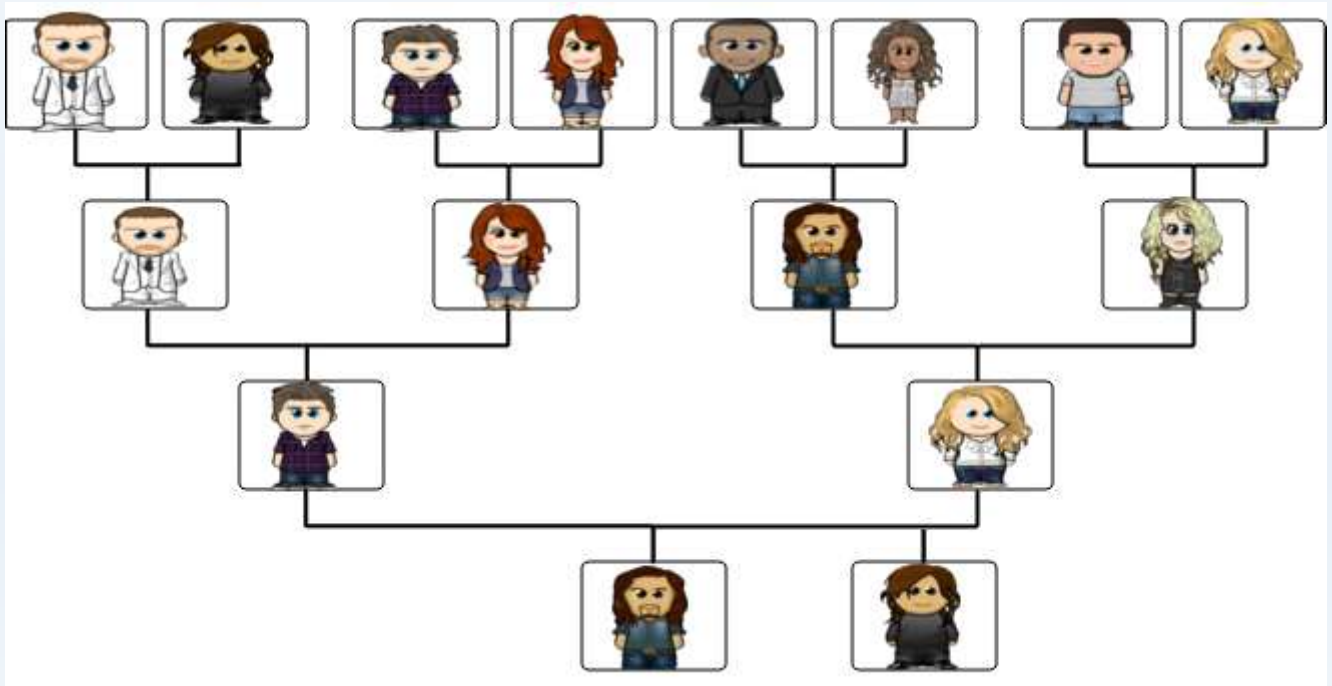


Grandma's Genes

GedMatch

Genome Mate





Grandma's Genes

[GED match] + Genome Mate Pro

GedMatch

- GEDCOM + DNA results from big 3 (FTDNA, 23andMe, AncestryDNA)

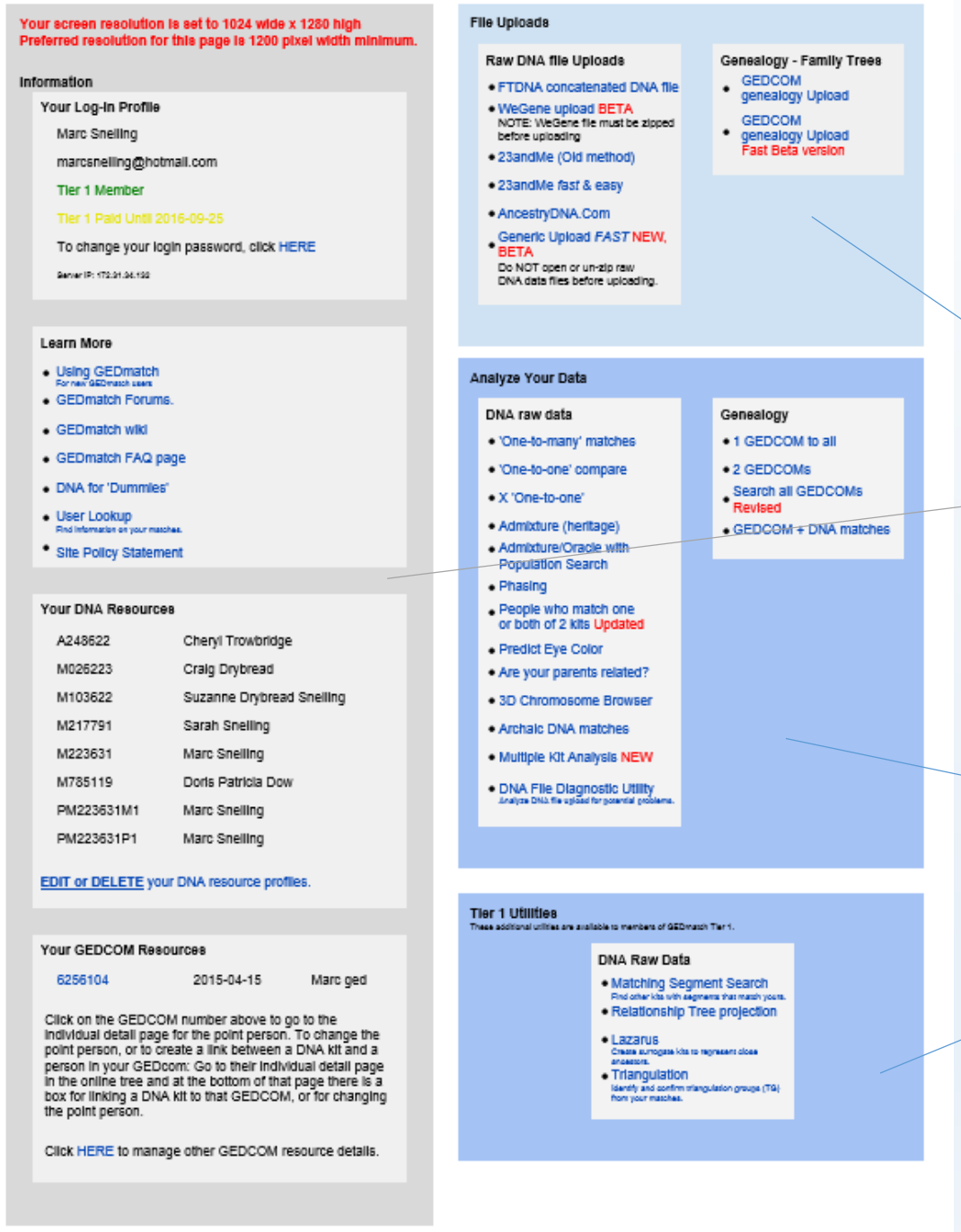
Genome Mate Pro

- Windows/Mac/Linux Computer Program for managing DNA matches

GedMatch + Genome Mate Pro

- Triangulation (Most Recent Common Ancestor) Groups, Segment Maps

Grandma's Genes



GedMatch Main Menu

File Uploads – Big3

Your DNA & GEDCOM Resources

Analysis Tools

Tier-1 Analysis

Grandma's Genes

Getting your DNA results into GedMatch

- Create a GedMatch user and a new email if desired for privacy.
- Download your raw DNA data from FTDNA:
  myFTDNA* > *MyDNA* > *Family Finder* > *Download Raw Data
- Download your raw DNA data from 23andMe:
  23andme.com/you/explorer > Browse Raw Data > Download
- Download your raw DNA data from AncestryDNA:
  AncestryDNA status page > Manage Test Settings > Get Started (under Download your raw DNA data) > Enter password > Receive email > Follow link > Download Raw DNA Data

Grandma's Genes

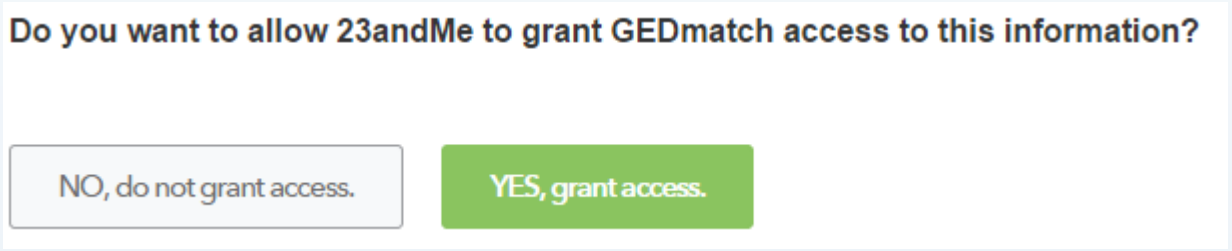
Uploading FTDNA/AncestryDNA to GedMatch

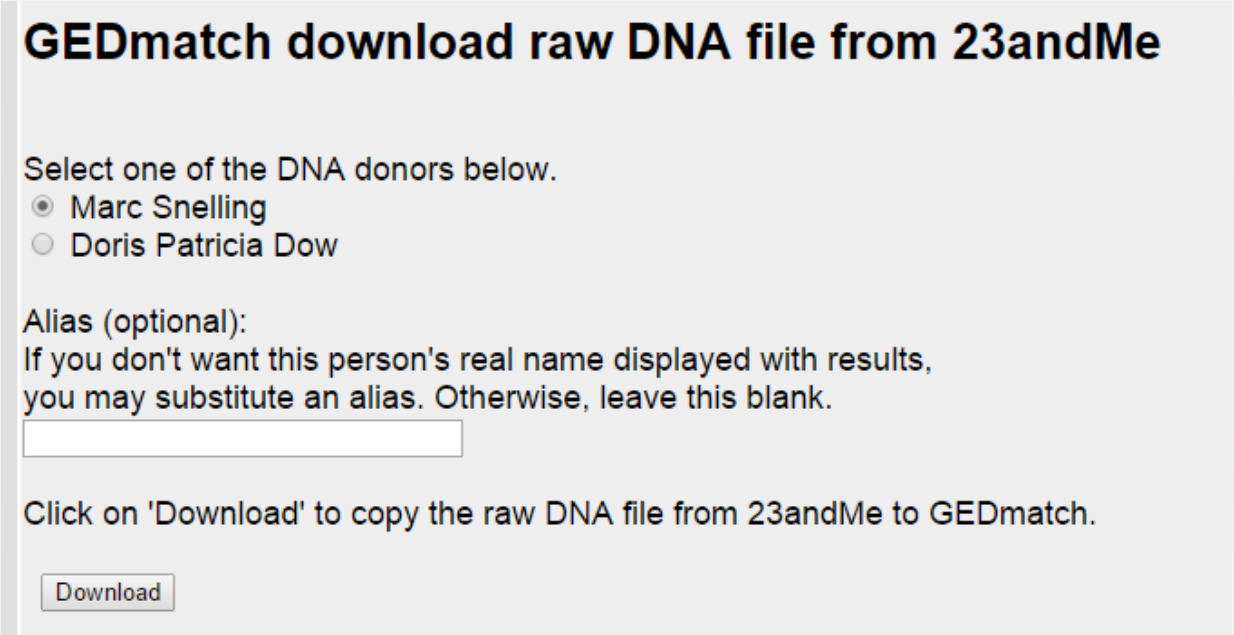
- Enter name of Donor, Alias, Sex, Mitochondrial haplogroup (if known), Y haplogroup (if known), Public (Yes/No) *You will not be able to make comparisons if it is not made public., you will only be able to run admixture results on your kit.
- Click the upload button.
- Be patient!
- FTDNA your kit number will begin with T.
  Ancestry kits begin with A.

Grandma's Genes

Uploading Your 23andMe Raw DNA Data

- Old Method like FTDNA
- New Automatic Method
- Your kit will begin with M





Grandma's Genes

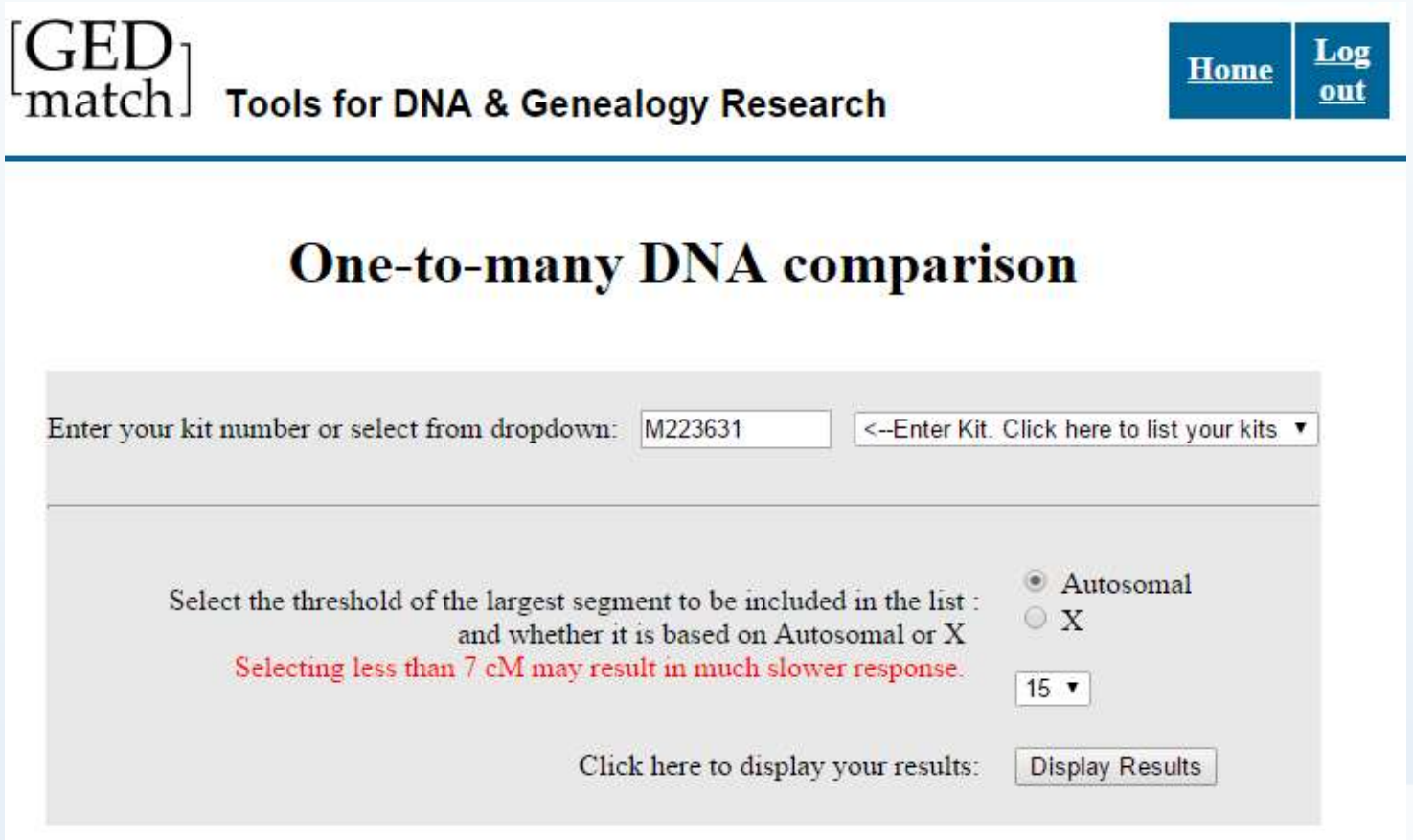
GedMatch Analysis Tools

- One-to-many matches – everyone in the GedMatch database with a segment matching your kit
  **separate tests for autosomal and X matches
- One-to-one compare – compares two kit numbers
- X One-to-one compares two kits X chromosome data
- Multiple Kit Analysis – compares kits in a matrix (works best with 10 or under)
- 3D Chromosome Browser – visualization tools for analyzing multiple kits (part of Multiple Kit Analysis)
- GEDCOM + DNA matches *Most valuable for triangulation

Grandma's Genes

Running a One-to-Many DNA Comparison

- Choose Autosomal or X
- Choose CentiMorgan threshold (3-30cM)
- Click Display Results Button
- Verify these matches with One-to-One compare before contacting.



Grandma's Genes

Reading One-to-Many DNA Comparison Results

Sort by kit number, haplogroup, total cM, largest cM, generations (default), name, or email

NEW (less than a month old)

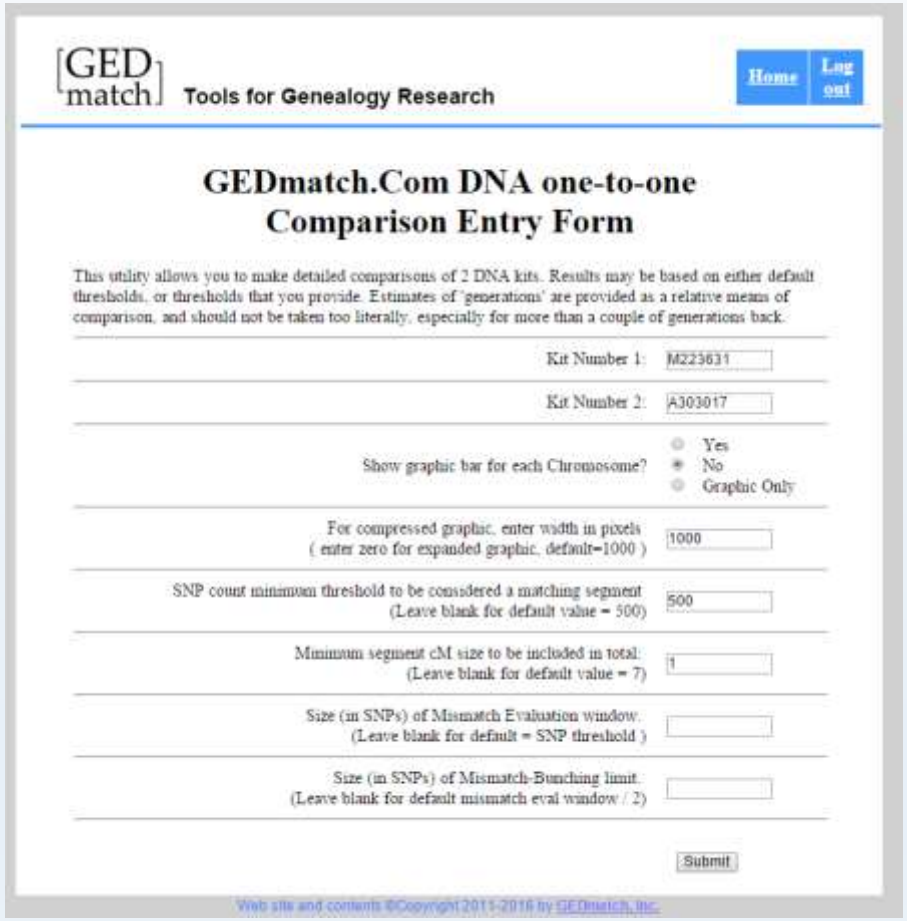
					Haplogroup		Autosomal				X-DNA				
Kit Nbr	Type	List	Select	Sex	Mt	Y	Details	Total cM	largest cM	Gen	Details	Total cM	largest cM	Name	Email
M223631	V4	L		M	H1	I1	A	3552.2	214.5	1.0	X	194.6	119.4	Marc Snelling	marcsnelling
M103622	V4	L		F	H1		A	3550.4	214.5	1.0	X	194.6	119.4	Suzanne Drybread Snelling	marcsnelling
M217791	V4	L		F	h1		A	2768	182.2	1.2	X	74.7	62	Sarah Snelling	marcsnelling
M026223	V4	L		M	h1	i2a2	A	1777.1	133.6	1.5	X	89.5	44.8	Craig Drybread	marcsnelling
[redacted]	F2	L		F			A	108.5	34.2	3.5	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		M			A	39.8	39.8	4.2	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		F			A	38.3	38.3	4.3	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		F			A	35	35.0	4.3	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		F			A	34.6	34.6	4.3	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		F			A	34.6	34.6	4.3	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		F	H		A	32.7	32.7	4.4	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		M		R-M269	A	30.8	30.8	4.4	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		M		R-M269	A	30.5	30.5	4.4	X	0	0	[redacted]	[redacted]
[redacted]	F2	L		M			A	30.5	30.5	4.4	X	0	0	[redacted]	[redacted]

Launch Autosomal One-to-One Compare

Launch X One-to-One Compare

Grandma's Genes

Running a One-to-One DNA Comparison



- Enter Kit numbers.
- Chose graphic display or table display.
- Choose SNP and cM thresholds.
- Consider using 500 SNP and 1cM thresholds to identify small Identical by Descent (IBD) vs Identical by State (IBS) matches.

Grandma's Genes

Reading One-to-One DNA Comparison Results

Table View

Comparing Kit M223631 (Marc Snelling) and A[redacted] (M[redacted]y)

Minimum threshold size to be included in total = 500 SNPs
Mismatch-bunching Limit = 250 SNPs
Minimum segment cM to be included in total = 1.0 cM

Chr	Start Location	End Location	Centimorgans (cM)	SNPs
6	137,104,964	155,598,161	24.8	2,264
8	154,984	18,487,957	34.2	3,779
12	61,880	5,655,745	15.9	1,017
15	87,849,432	94,961,780	21.8	1,247
17	35,294,289	48,375,705	11.7	1,016

Largest segment = 34.2 cM
Total of segments > 1 cM = 108.4 cM
5 matching segments

295961 SNPs used for this comparison.

Comparison took 0.05205 seconds.
Ver: Aug 1 2016 17:12:40

Graphical display – Yellow=half identical match Green=full identical match, Red=No Match, Blue=matches greater than 1cM

Chr	Start Location	End Location	Centimorgans (cM)	SNPs
6	137,104,964	155,598,161	24.8	2,264

Chr 6

Image size reduction: 1/21

Chr 7

Image size reduction: 1/17

Chr	Start Location	End Location	Centimorgans (cM)	SNPs
8	154,984	18,487,957	34.2	3,779

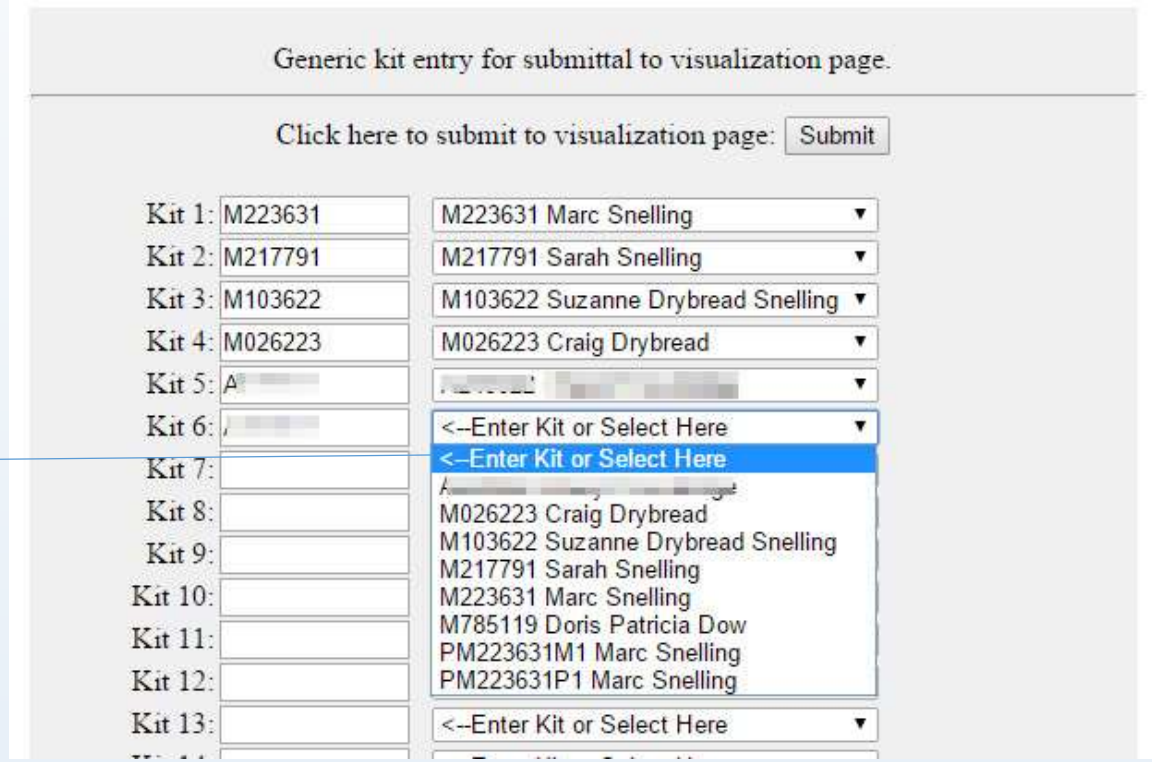
Chr 8

Image size reduction: 1/17

Grandma's Genes

Running a Multiple Kit DNA Analysis

- Use Google Chrome *fields are still populated when you hit the back button.
- Enter kit numbers.
- Your DNA kits can be quickly selected by clicking the triangle and selecting your kit with the drop down tool
- Click the ‘Submit’ button.
- Works best with 10 or fewer kits.

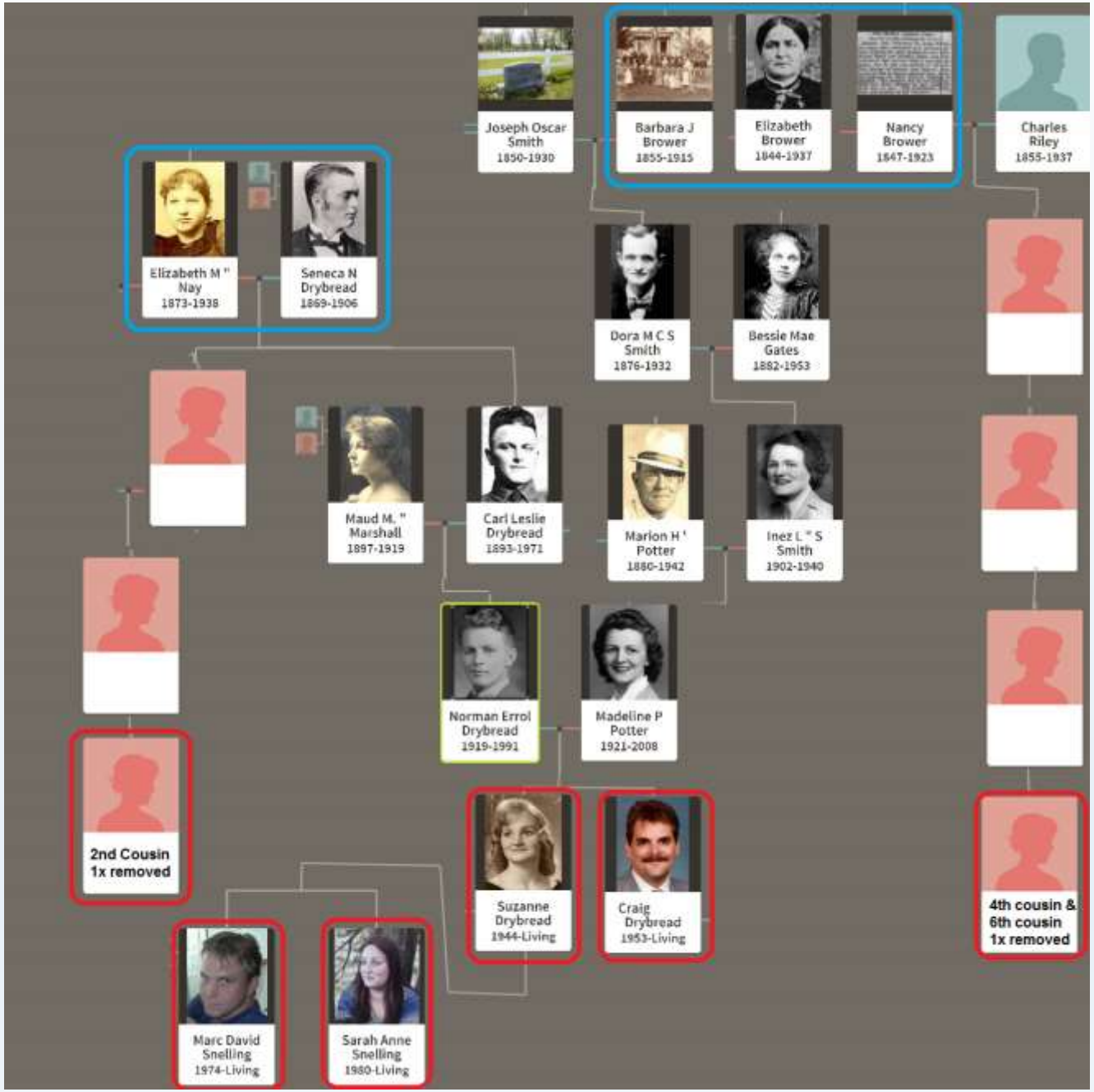


Grandma's Genes

Multiple Kit Analysis Visualization Options

- Matrices – Generations Matrix, Autosomal Matrix, X Matrix, and Segment Matrix
- Traceability – graph and table
- 2D and 3D Chromosome Browser – set your threshold between 3cM and 30cM
- Comma Separated Value (CSV) files – total matches, individual matches
- GEDCOMs – kit numbers with GEDCOM uploaded

Grandma's Genes



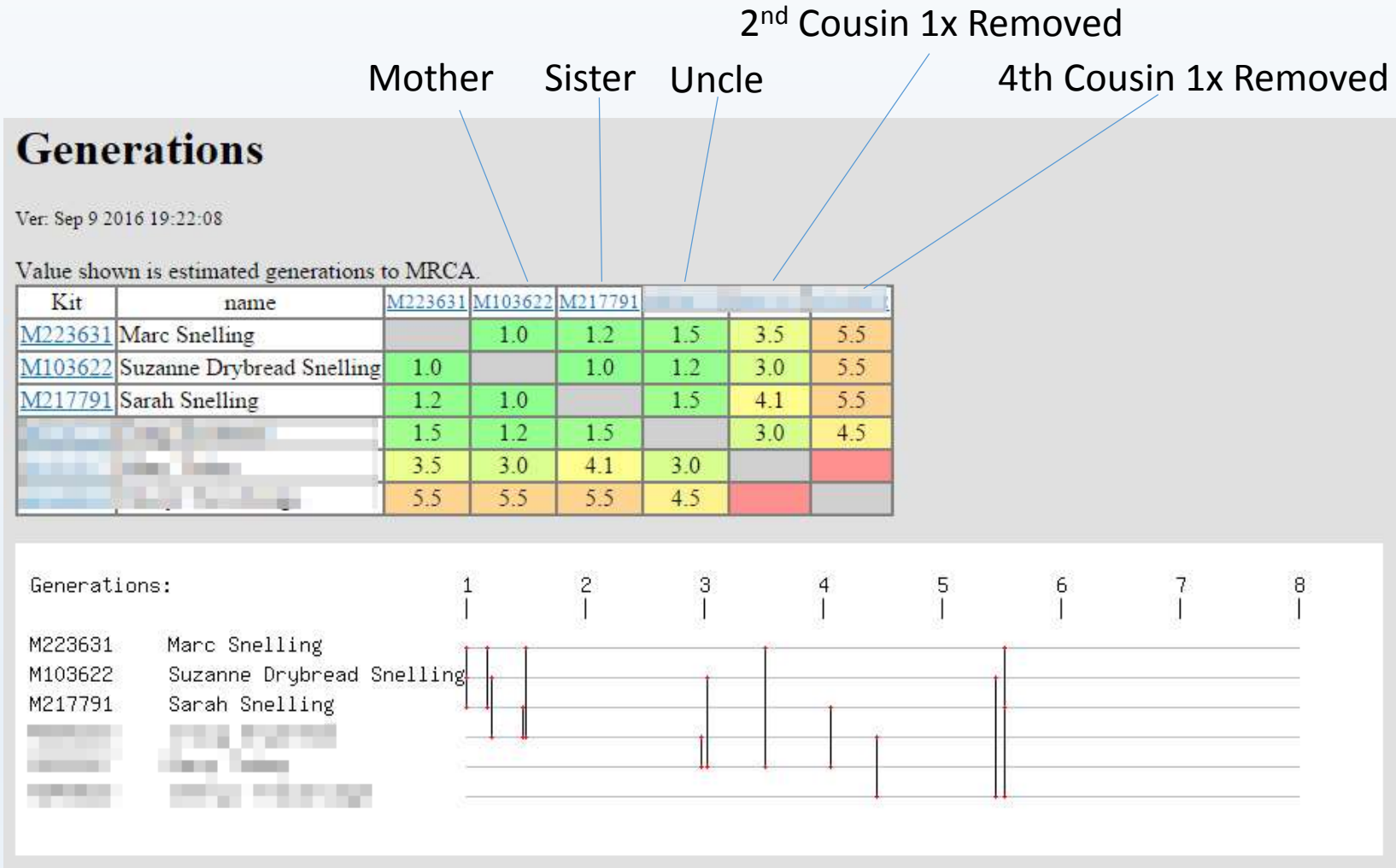
Family Tree of Kits in Examples

- MRCA with 2nd cousin: Seneca Drybread 1869-1906 + Lizzie Nay 1873-1938
- MRCA with 4th cousin: Benjamin Brower 1817–1902 + Elizabeth Bechtel 1816-1912

Grandma's Genes

Multiple Kit Analysis – Generations Matrix

- Generations Matrix - shows estimated number of generations between two kits in table and graphic form, color varies from green - close relation to red - no relation



Multiple Kit Analysis – Other Matrices

Autosomal DNA comparison matrix

Ver: Sep 9 2016 19:22:08

Value shown is cM total of matching segments over minimum threshold.

Kit	name	M223631	M217791	M103622			
M223631	Marc Snelling		2768.0	3550.4	1777.1	9.7	108.5
M217791	Sarah Snelling	2768.0		3552.2	1843.2	9.7	51.3
M103622	Suzanne Drybread Snelling	3550.4	3552.2		2645.6	9.8	213.8
		1777.1	1843.2	2645.6		29.9	228.6
		9.7	9.7	9.8	29.9		
		108.5	51.3	213.8	228.6		

X-DNA comparison matrix

Ver: Sep 9 2016 19:22:08

Value shown is cM total of matching segments over minimum threshold.

Kit	name	M223631	M217791	M103622			
M223631	Marc Snelling		74.7	194.6	89.5		
M217791	Sarah Snelling	74.7		194.6	50.6		
M103622	Suzanne Drybread Snelling	194.6	194.6		107.8		
		89.5	50.6	107.8			

GEDmatch Matching Segment Matrix

Kit	M223631	M217791	M103622			
		Chr1 4M to 22M	Chr1 0M to 69M	Chr1 23M to 69M	Chr20 13M to 19M	Chr6 137M to 156M
		Chr1 38M to 48M	Chr1 69M to 94M	Chr1 69M to 94M		Chr8 0M to 18M
		Chr1 76M to 94M	Chr1 94M to 154M	Chr1 94M to 152M		Chr12 0M to 6M
		Chr1 94M to 154M	Chr1 154M to 196M	Chr1 155M to 178M		Chr15 88M to 95M
		Chr1 154M to 196M	Chr1 196M to 247M	Chr1 203M to 239M		Chr17 35M to 48M
		Chr1 196M to 216M	Chr2 0M to 47M	Chr2 177M to 219M		
		Chr1 234M to 240M	Chr2 48M to 170M	Chr2 220M to 229M		
		Chr2 0M to 7M	Chr2 170M to 219M	Chr3 42M to 56M		
		Chr2 25M to 47M	Chr2 220M to 234M	Chr3 63M to 153M		
		Chr2 48M to 88M	Chr2 234M to 243M	Chr3 187M to 199M		
		Chr2 102M to 170M	Chr3 0M to 12M	Chr4 6M to 24M		
		Chr2 170M to 219M	Chr3 12M to 37M	Chr4 41M to 59M		

Grandma's Genes

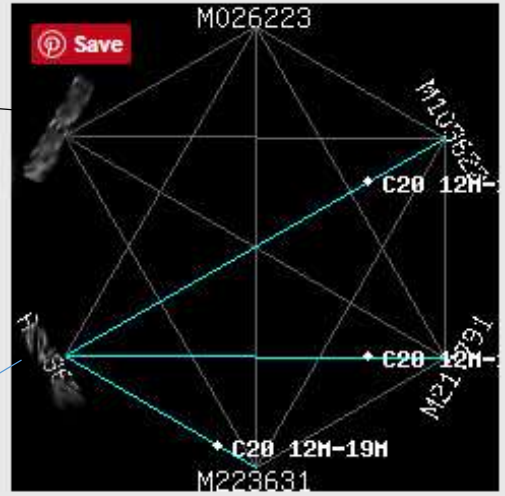
Multiple Kit Analysis –Traceability

Shared segment traceability is a visual representation of shared DNA segments.

- Lines of the same colour indicate a traceable match.
- Dark grey lines indicate multiple matching segments.
- No line indicates no relation.

2nd cousin and 4th cousin not related

All others related on multiple segments



4th cousin related to Suzanne, Marc and Sarah on same segment of chromosome 20

	Kit 1	Kit 2	Chr	From	To	cM
	Dark Gray Lines more than 1 segment					
	M223631		20	12M	19M	9.7cM
	M217791		20	12M	19M	9.7cM
	M103622		20	12M	18M	9.8cM

Finished

Multiple Kit Analysis – 2D Chromosome Browser

- Similar to FTDNA and 23andMe Chromosome Browsers

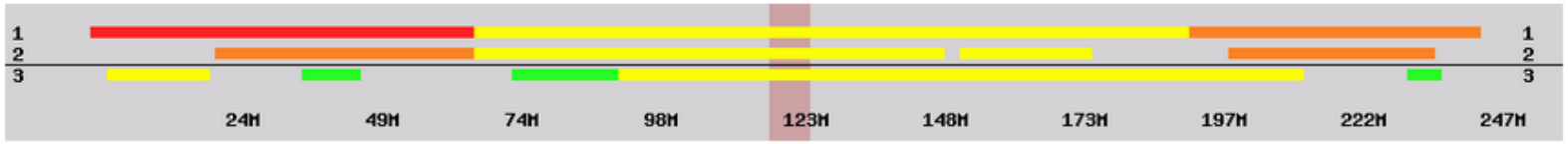
LEGEND

Length Color	> 100 cM	50-100 cM	20-50 cM	10-20 cM	5-10 cM	< 5 cM	Centromere

Chr 1

Match ID	Type	Name	Matching segments on Chromosome 1
1	V4	Suzanne Drybread Snelling (M103622)	742584 - 68676530 (102.159 cM), 68686941 - 94239068 (21.706 cM), 94349650 - 154351362 (33.305 cM), 154375862 - 195564534 (44.569 cM), 195671157 - 247169190 (79.528 cM)
2	V4	Craig Drybread (M026223)	22940797 - 68676530 (53.1063 cM), 68686941 - 94236133 (21.703 cM), 94349650 - 151909533 (31.341 cM), 154805354 - 177997956 (30.431 cM), 202655937 - 238806834 (51.5 cM)
3	V4	Sarah Snelling (M217791)	3502201 - 21546592 (37.5949 cM), 38381912 - 48347805 (10.0094 cM), 75573516 - 94236133 (17.689 cM), 94349650 - 154351362 (33.305 cM), 154375862 - 195564534 (44.569 cM), 195671157 - 215648774 (27.206 cM), 234184974 - 240188419 (16.729 cM)

Chr 1



Granama's Genes

Multiple Kit Analysis – 3D Chromosome Browser

- Two screens – First screen table of matching segment details, Second screen 3D- visualization of shared segments
- Autosomal DNA Comparison Matrix– cM shared
- X DNA Comparison Matrix- cM shared
- Segments in common – the number of shared segments with each other
- Summary by chromosome – number of matches on each chromosome
- Segment Details – specific matches by chromosome and location

Grandma's Genes

3D Chromosome Browser – First Screen Segment Details

Segments in common:

Kit	Name	M223631	M217791	M103622				Tot. Segments	Largest cM
M223631	Marc Snelling	-	74	59	56	1	5	195	214.5
M217791	Sarah Snelling	74	-	60	65	1	3	203	209.3
M103622	Suzanne Drybread Snelling	59	60	-	66	1	10	196	214.5
		56	65	66	-	2	12	201	148.0
		1	1	1	2	-	0	5	20.5
		5	3	10	12	0	-	30	38.6

Segment Details:

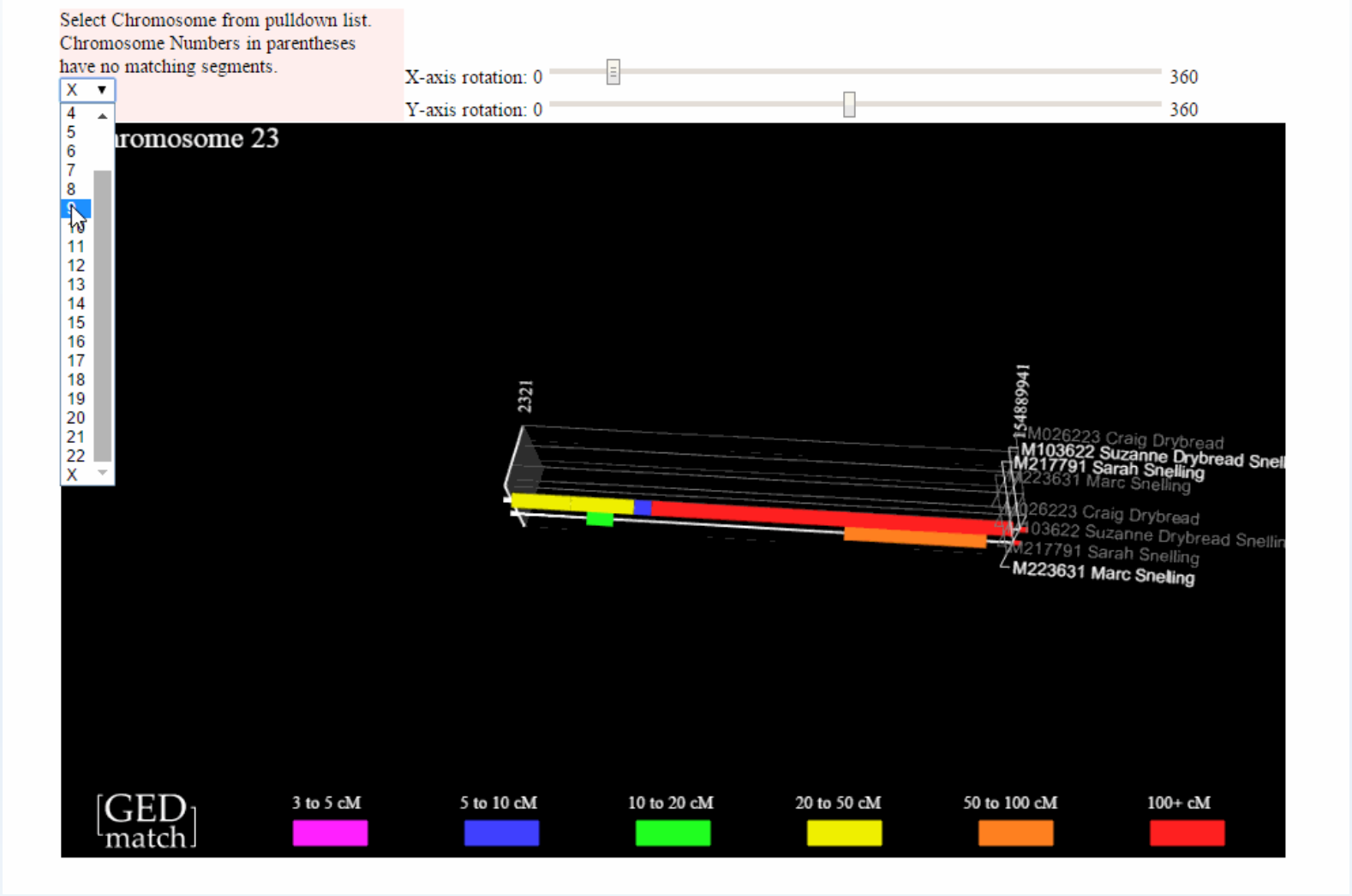
Kit1		Kit2		Chr	Build 36		cM
Kit Nbr.	Name	Kit Nbr.	Name		From	To	
M223631	Marc Snelling	M217791	Sarah Snelling	1	3502201	21546592	37.6
M223631	Marc Snelling	M217791	Sarah Snelling	1	38381912	48347805	10.0
M223631	Marc Snelling	M217791	Sarah Snelling	1	75573516	94236133	17.7
M223631	Marc Snelling	M217791	Sarah Snelling	1	94349650	154351362	33.3
M223631	Marc Snelling	M217791	Sarah Snelling	1	154375862	195564534	44.6
M223631	Marc Snelling	M217791	Sarah Snelling	1	195671157	215648774	27.2
M223631	Marc Snelling	M217791	Sarah Snelling	1	234184974	240188419	16.7
M223631	Marc Snelling	M103622	Suzanne Drybread Snelling	1	742584	68676530	102.2

Summary by Chromosome:

Chr	Tot. Matching Segments for all individuals.	B36 Graphic Posn Range		Largest segment
		From	To	
1	35	72017	247185615	102.2
2	30	8674	242697433	101.2
3	20	36495	199322659	163.1
4	16	49009	191200760	214.5
5	15	78452	180630744	209.3
6	30	100815	170761395	123.3
7	26	139250	158812247	104.7
8	20	154984	146264218	123.4
9	9	36587	140208462	167.2
10	18	84172	135358259	114.0
11	17	188510	134445626	62.9
12	29	61880	132288869	58.1
13	10	17956717	114121631	130.9
14	12	18325726	106358708	62.6
15	18	18294933	100278685	119.6
16	15	28165	88690776	97.5
17	20	8547	78653169	60.9
18	6	3034	76116152	129.5
19	12	211912	63788972	75.8
20	13	9098	62382907	114.8
21	7	9849404	46924583	70.1
22	16	14494244	49558258	35.7
23	21	2321	154889941	119.4

Grandma's Genes

3D Chromosome Browser – Second Screen Visualization



Grandma's Genes

GEDCOM + DNA Matches

- Best triangulation leads
- List will have several duplicate kit numbers

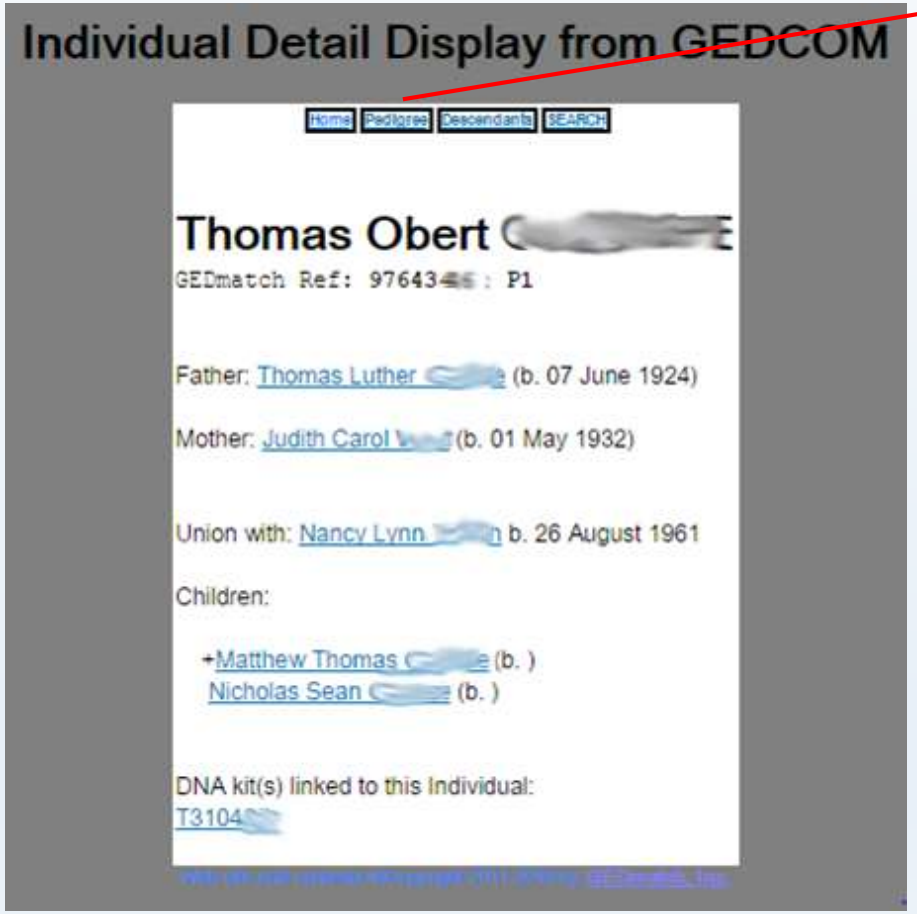
Kit Num	Shared cM	Largest cM	X Shared cM	X Largest cM	GEDCOM ID	DNA Name	GEDCOM Name	
T310407	39.8	39.8	0.0	0.0	9764346 : P1			
T310407	39.8	39.8	0.0	0.0	9230920 : P1			
A540385	38.3	38.3	0.0	0.0	2750714 : P223			
T956496	27.7	13.1	0.0	0.0	4098724 : I500001			
A327139	27.5	27.5	0.0	0.0	7040054 : P1			
T004742	26.8	26.8	0.0	0.0	4618246 : I1269			
A040582	24.0	17.4	0.0	0.0	1426058 : P1			
T463235	24.0	24.0	0.0	0.0	2711002 : P8499			
T957130	23.9	23.9	0.0	0.0	4053070 : I214			
M142923	23.5	23.5	0.0	0.0	3585180 : P1			
A697483	22.6	22.6	0.0	0.0	2935208 : P1			
A852804	22.3	9.5	0.0	0.0	7112828 : P1			
A852804	22.3	9.5	0.0	0.0	7139452 : P3			

Grandma's Genes

GEDCOM + DNA Matches – BEST LEADS

Click Pedigree

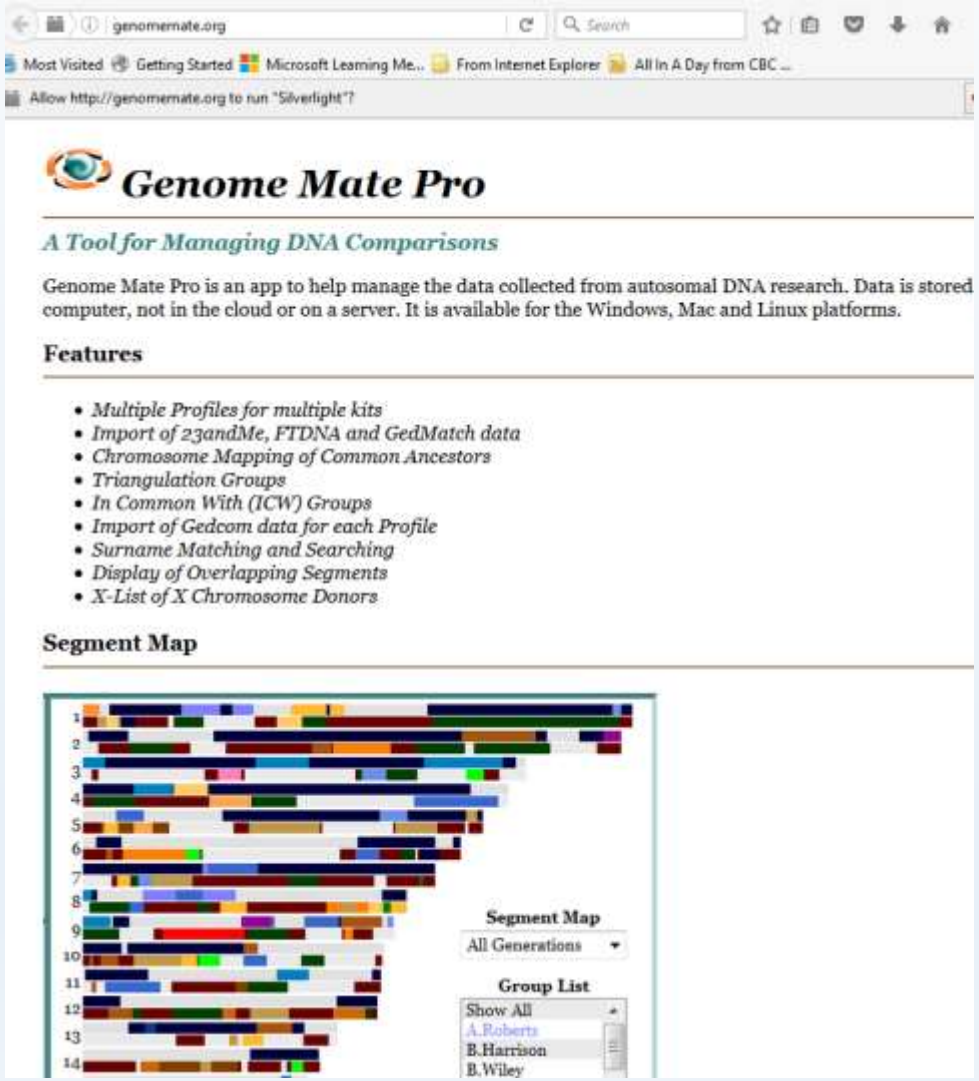
10 generations



Cut and Paste to Word / Writer to search later

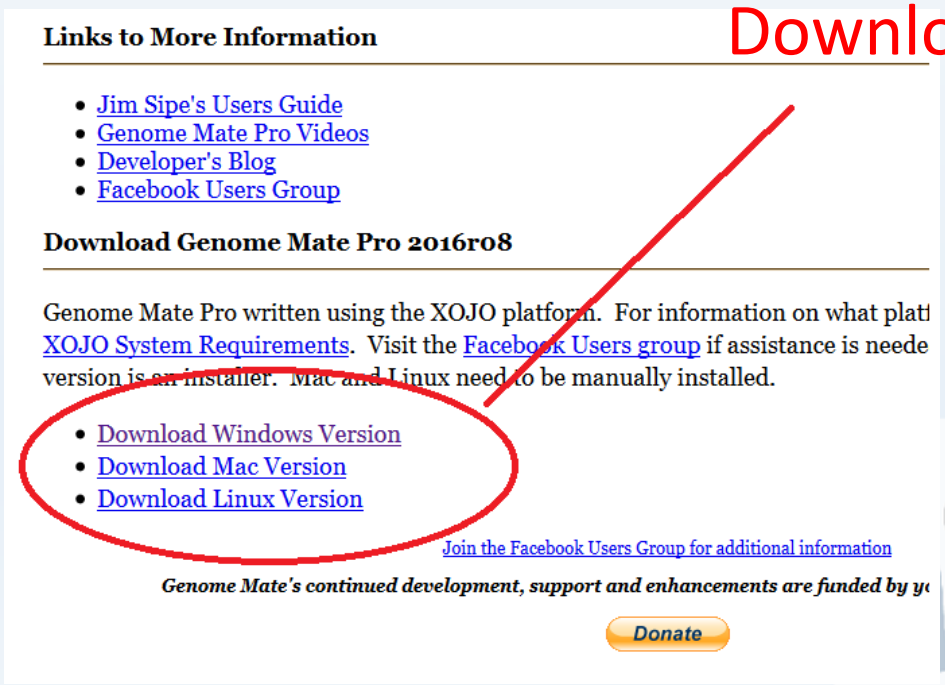
Grandma's Genes

Genome Mate Pro



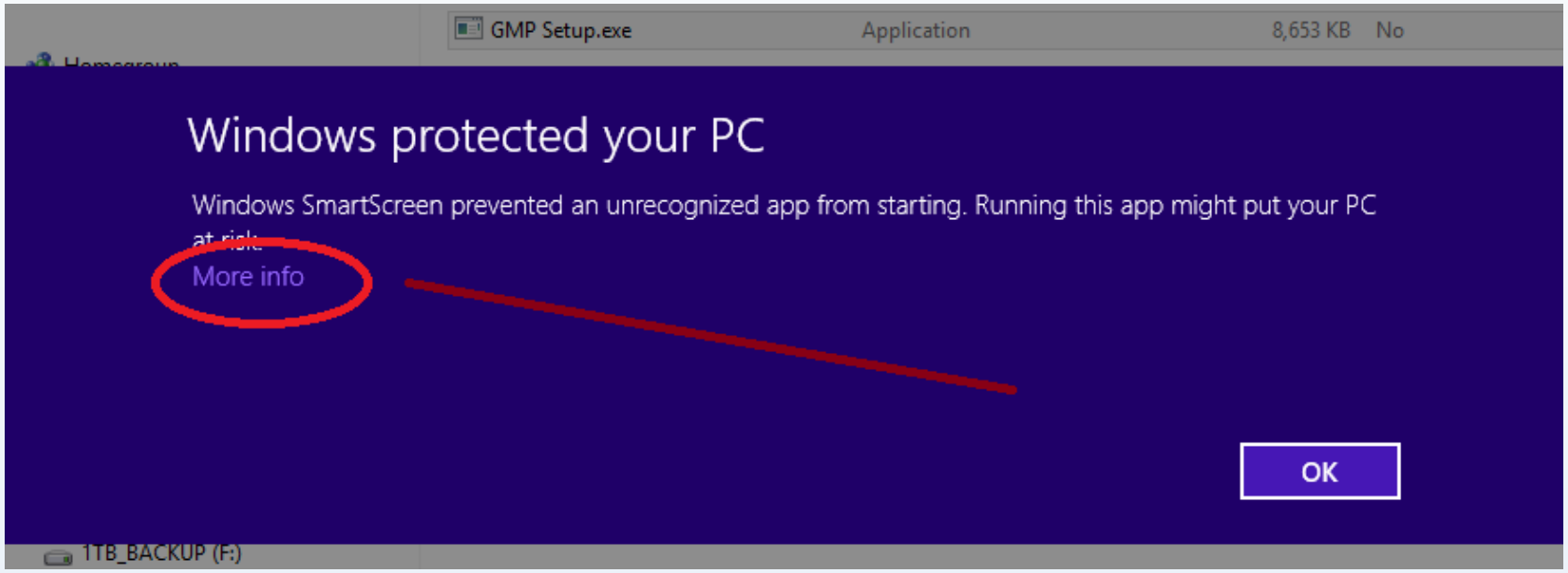
- ✓ GEDCOM Database
- ✓ DNA Match Database
- ✓ Segment Map

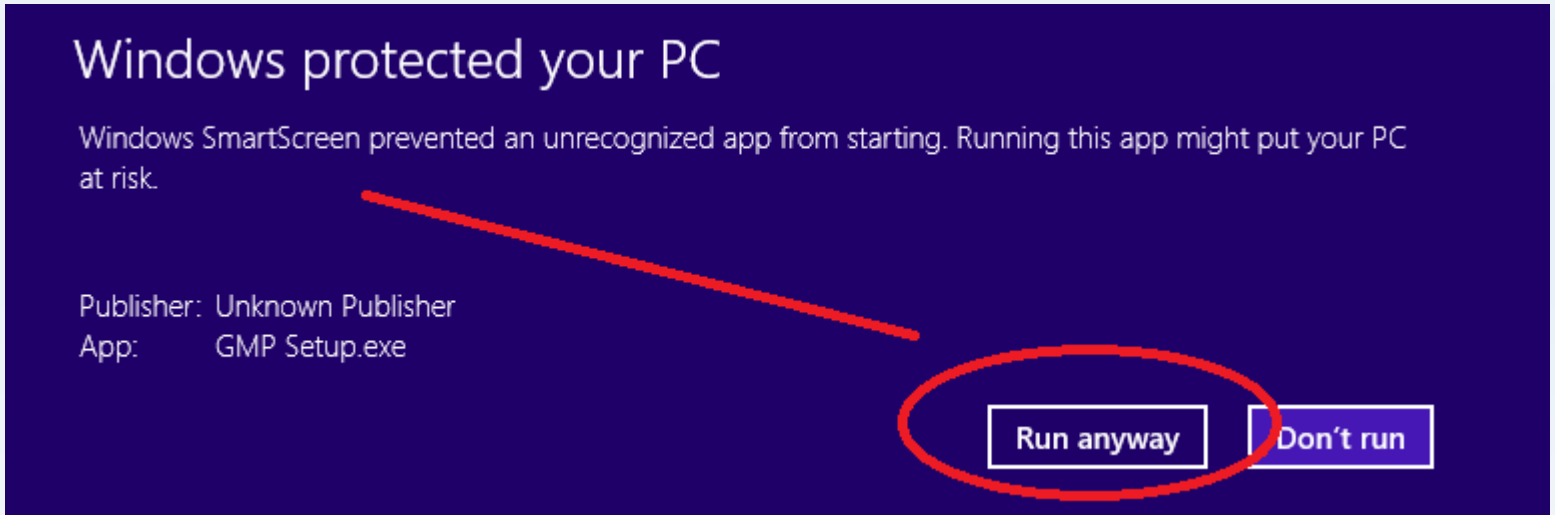
Download



Grandma's Genes

Install Genome Mate Pro - Windows

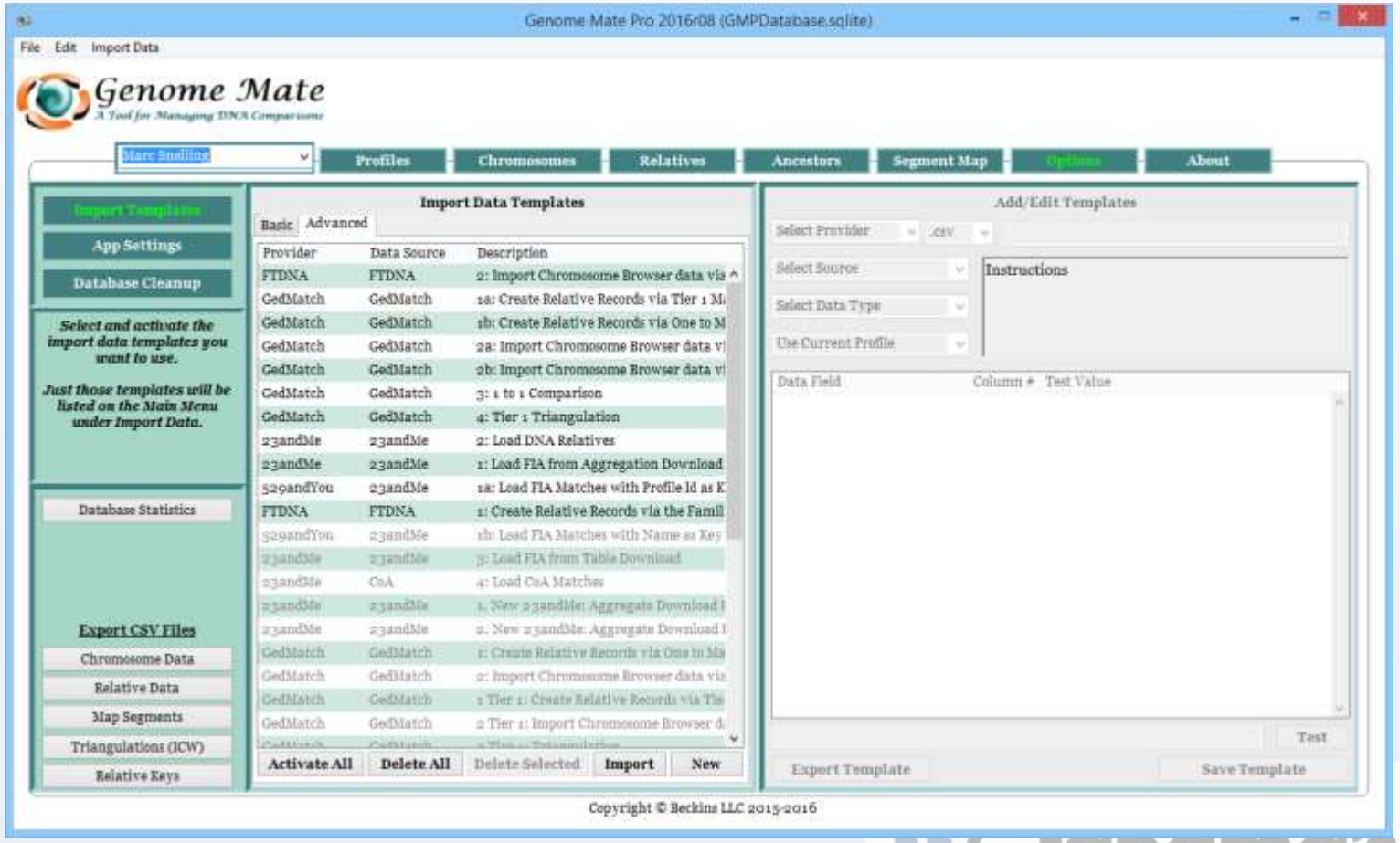




Grandma's Genes

Genome Mate Options Menu

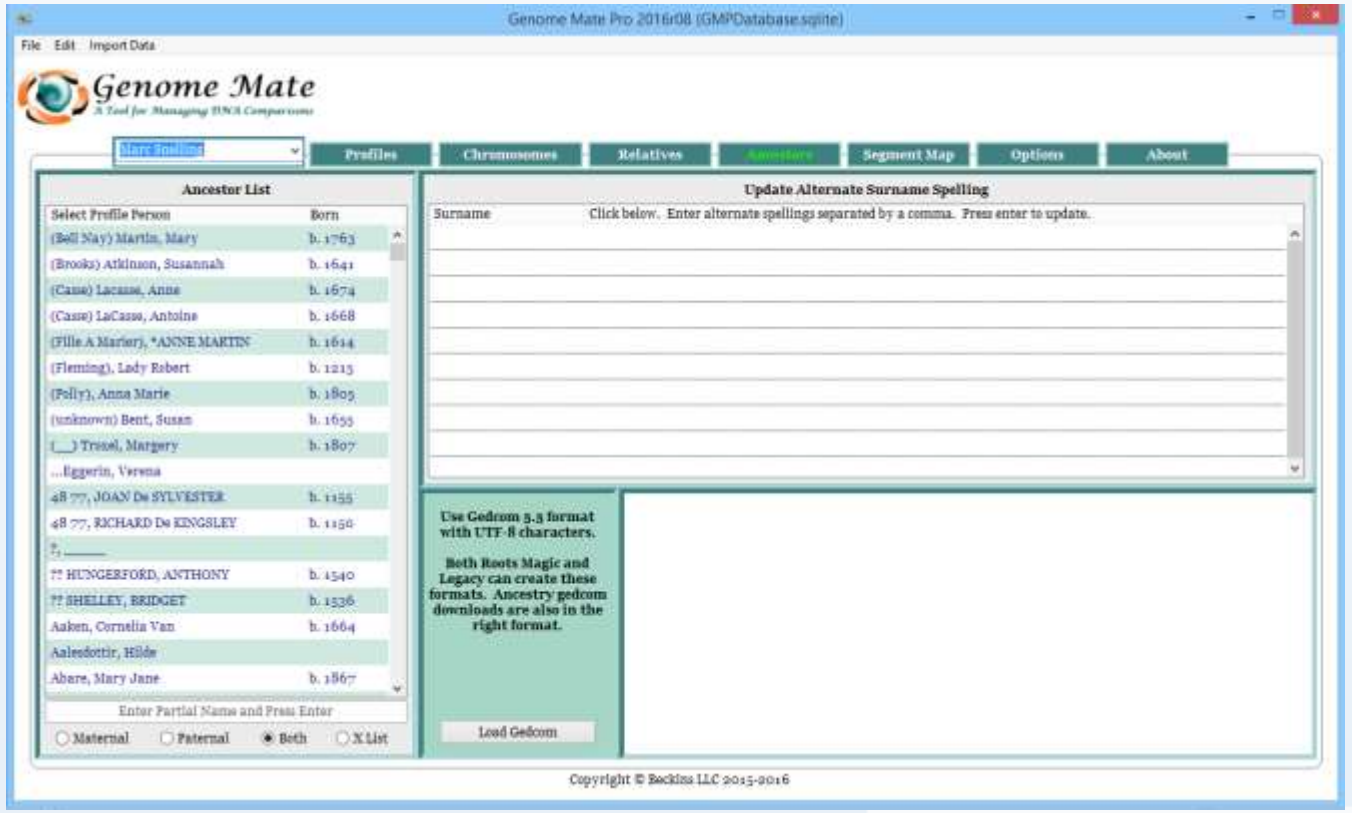
- Enable templates for download
- Export files (can be imported into another Genome Mate DB)
- Set Min / Max segment limits for database
- 529andYou – Chrome Browser Extension



Grandma's Genes

Genome Mate Pro Ancestor Menu

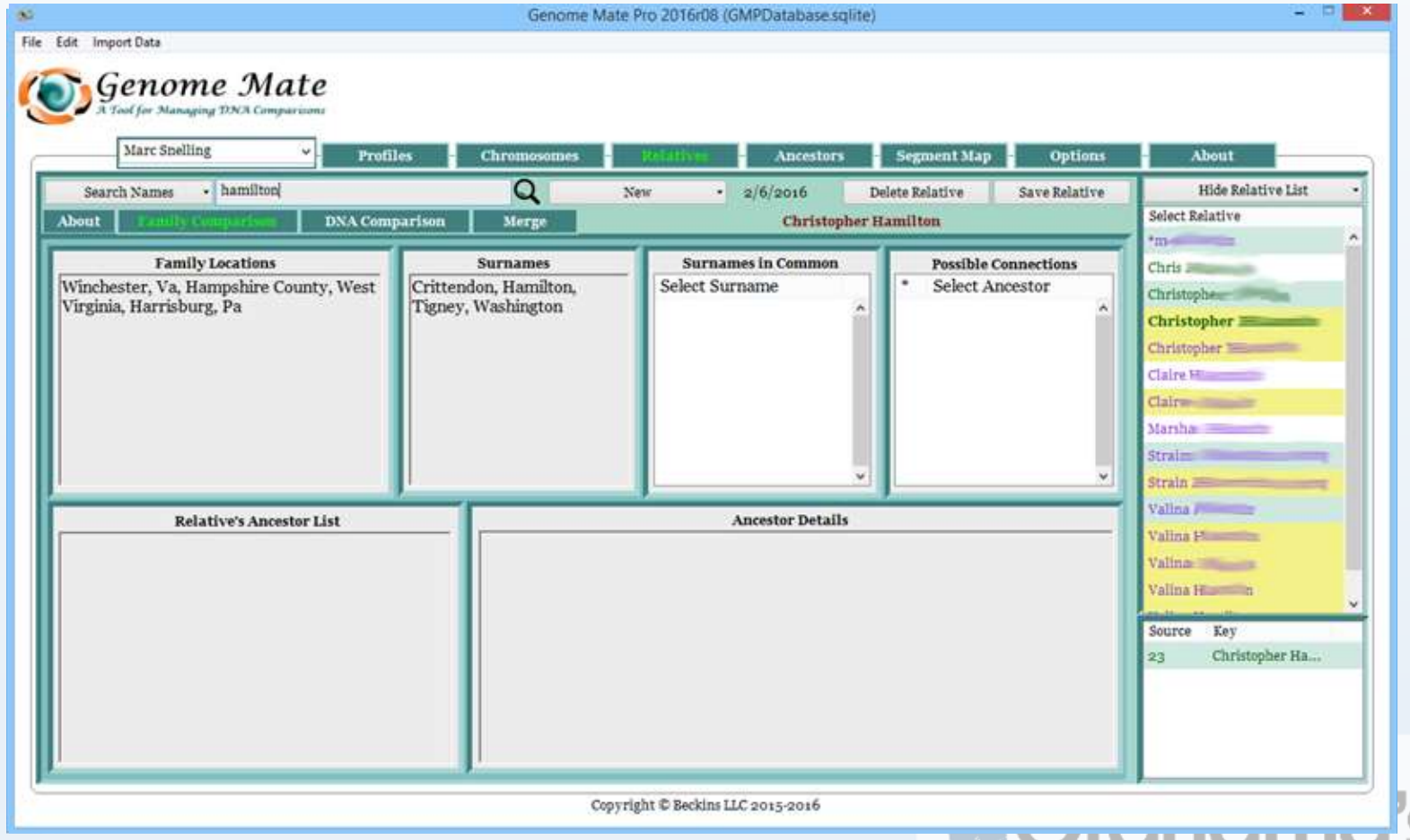
- Load GEDCOM
- List ancestors in GEDCOM



Grandma's Genes

Genome Mate Relatives Menu

- Search your cousin matches
- Identify DNA segments shared with cousins and where they tested
- Search for common surnames and locations, add contact info and research notes

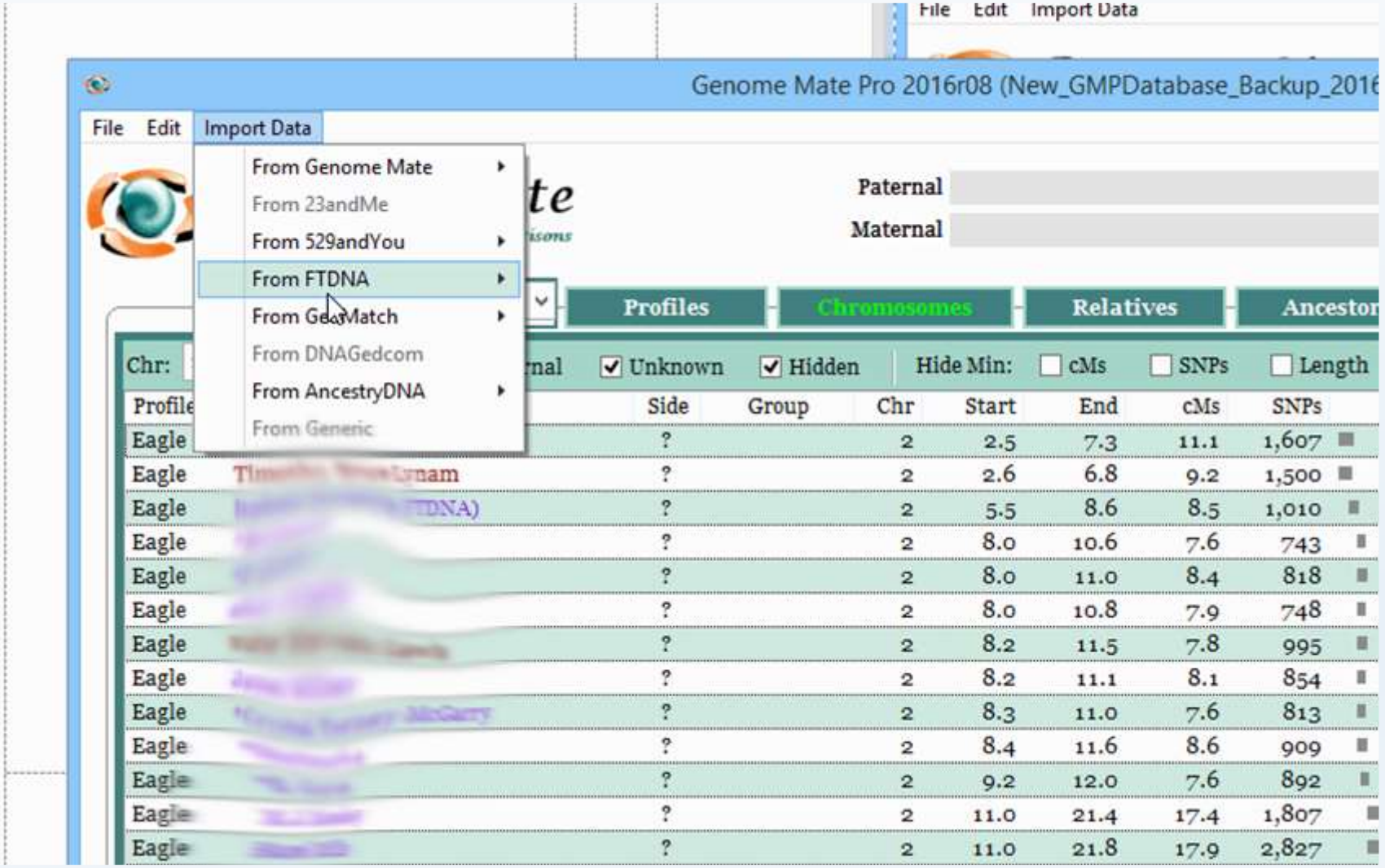


Genome Mate Database Creation

- **Be Very Patient** Imports can take hours
- Create a practice database first
- Backup often and before big imports
- AncestryDNA import data DOES NOT give matching segment results

Grandma's Genes

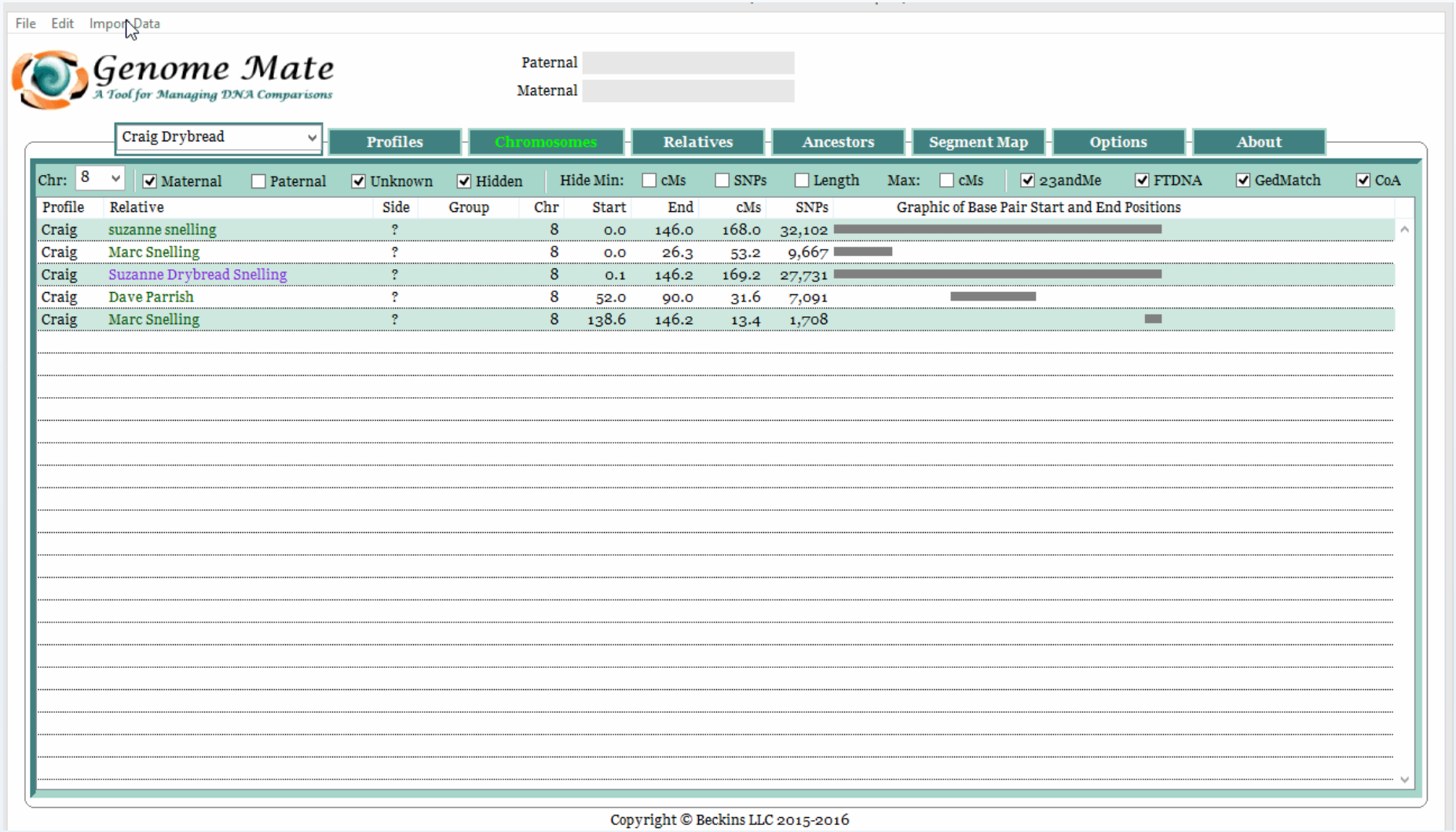
Import data into Genome Mate - BE PATIENT!



- Genome Mate
- 23andMe
- 529andYou
- FTDNA
- GedMatch
- DNAGedcom
- AncestryDNA
  *Relatives only no chromosome data

Grandma's Genes

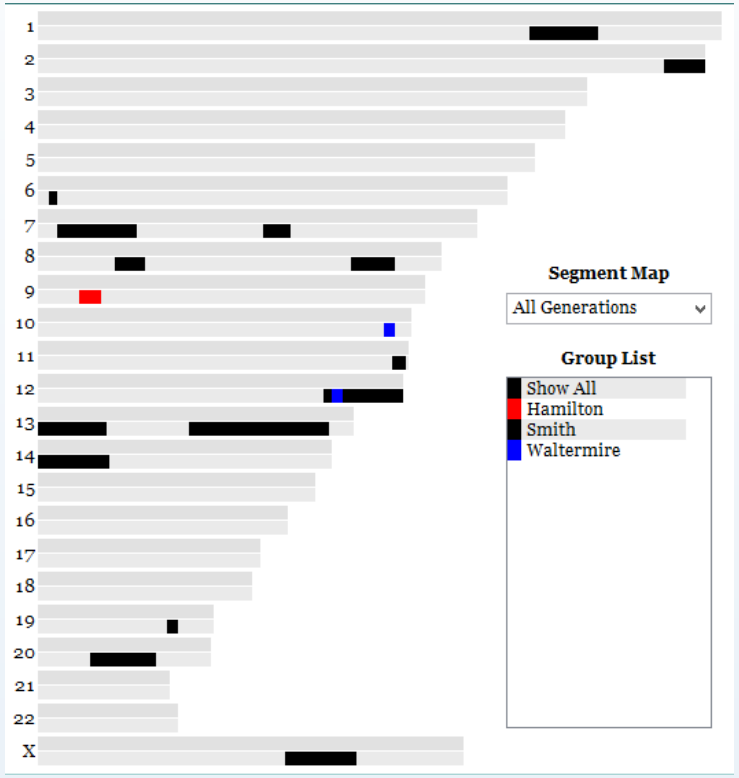
Genome Mate Import of GedMatch 1-1 Data



Grandma's Genes

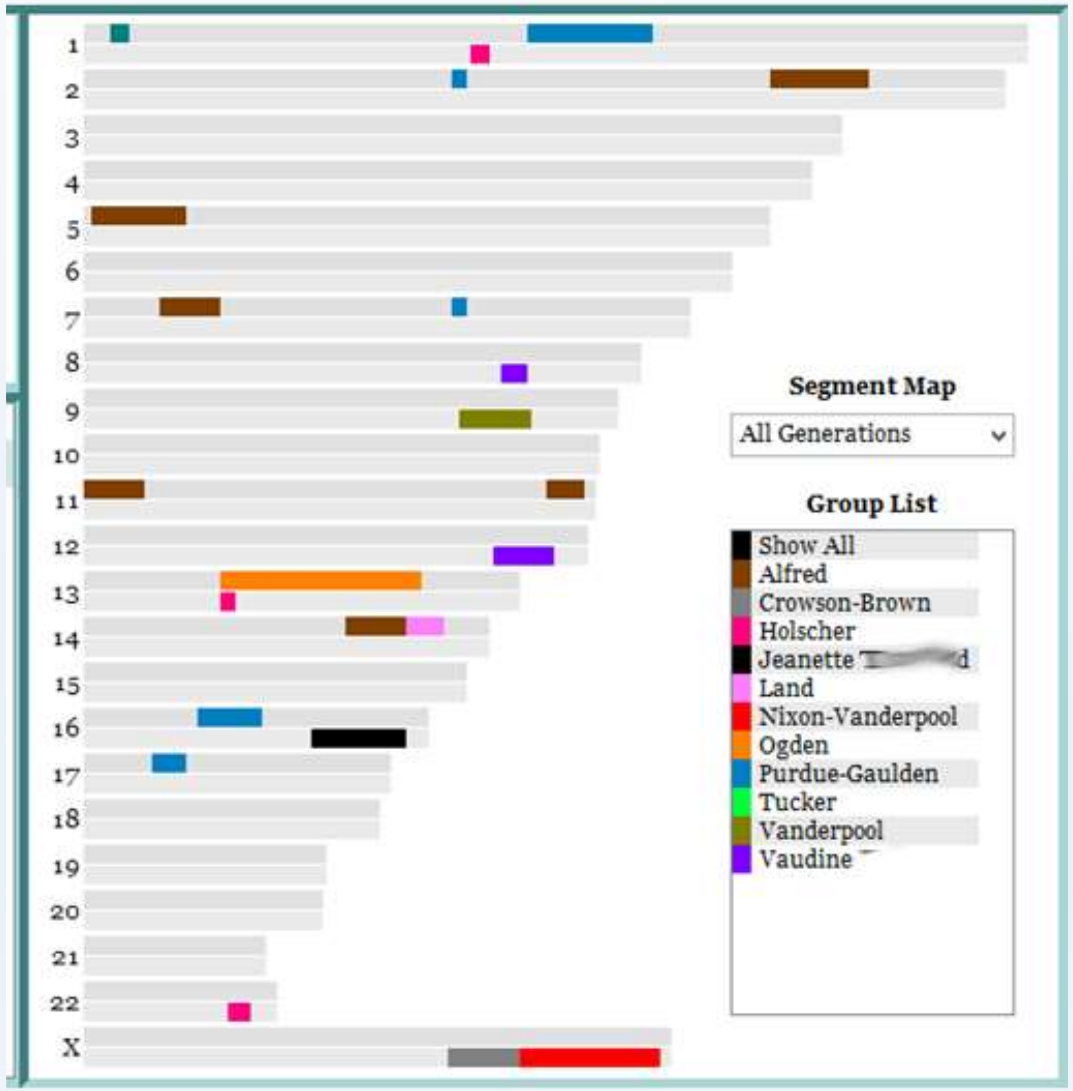
Genome Mate Segment Map

- Mapping Most Recent Common Ancestor (MRCA) triangulation groups to chromosomes.
- Known Triangulation Groups – i.e. mother, 2nd cousin, me are connected through MRCAs Seneca Drybread and Elizabeth Nay.
- Discovered Triangulation Groups – someone else's known group identified through DNA comparison.
- Adoptees – all triangulation groups for adoptees all discovered.

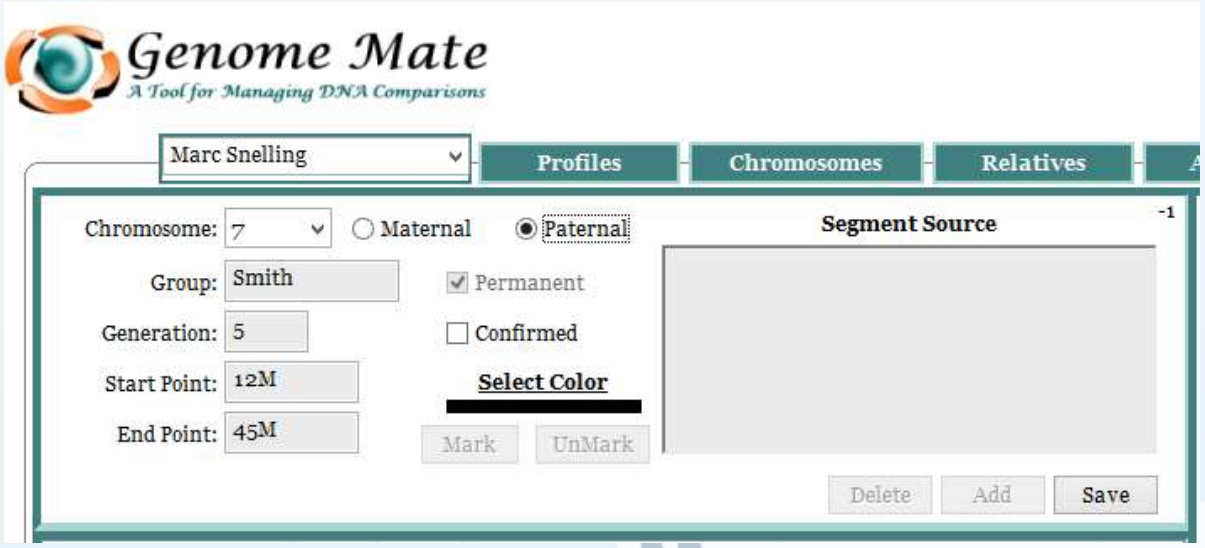


Grandma's Genes

Genome Mate Segment Map

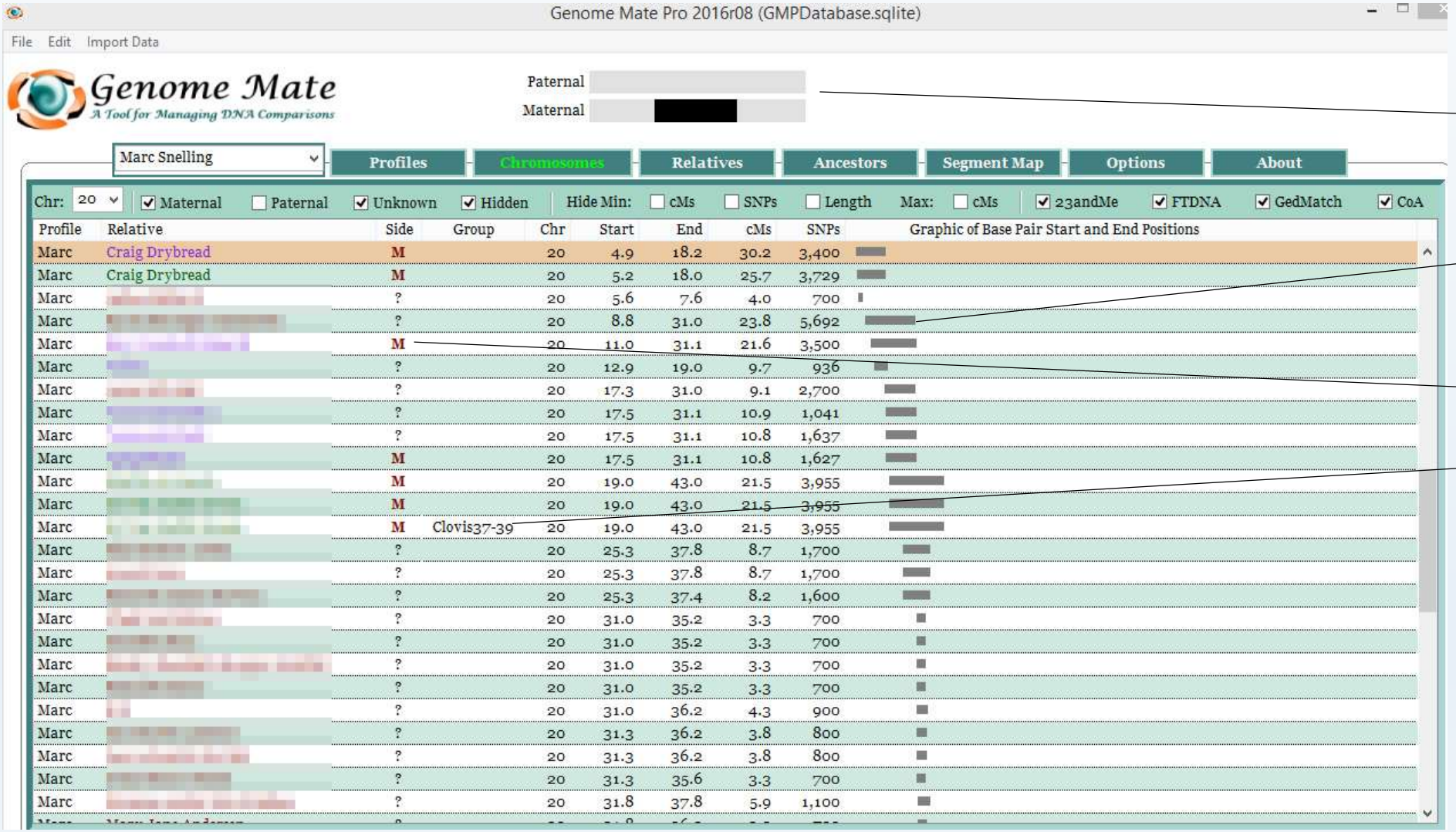


- Maternal and Paternal sides
- Number of Generations
- Confirmed Checkbox



Grandma's Genes

Genome Mate Chromosome Browser

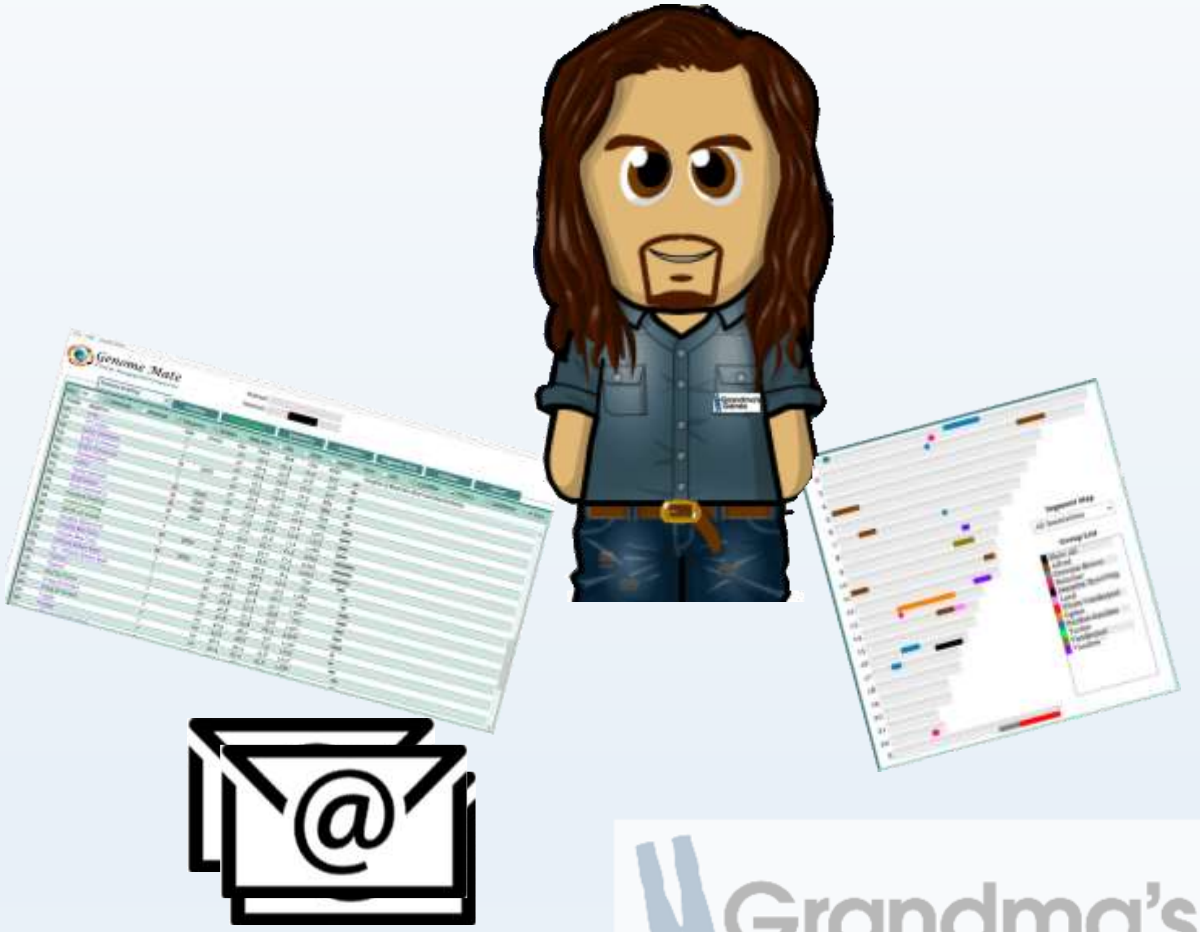


- Segment Map for chromosome
- Chromosome Browser
- Identify side
- Identify by Group

Grandma's Genes

Genome Mate with GedMatch data

- Gives reference for all future match enquiries
- Enables you to instantly see triangulation groups
- Archive match data and research notes



Grandma's Genes