

# How to Test Your DNA and Why

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Middlesex Genealogical Society

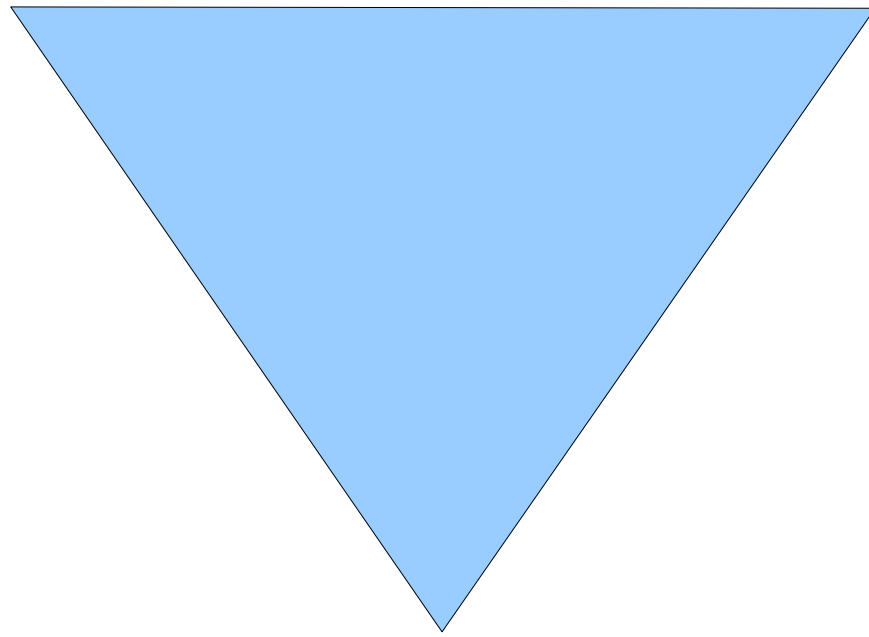
Darien Library  
Darien, Connecticut

October 2, 2010

# DNA Research

History

Genetics



Genealogy

# DNA in Books and on TV

## Books

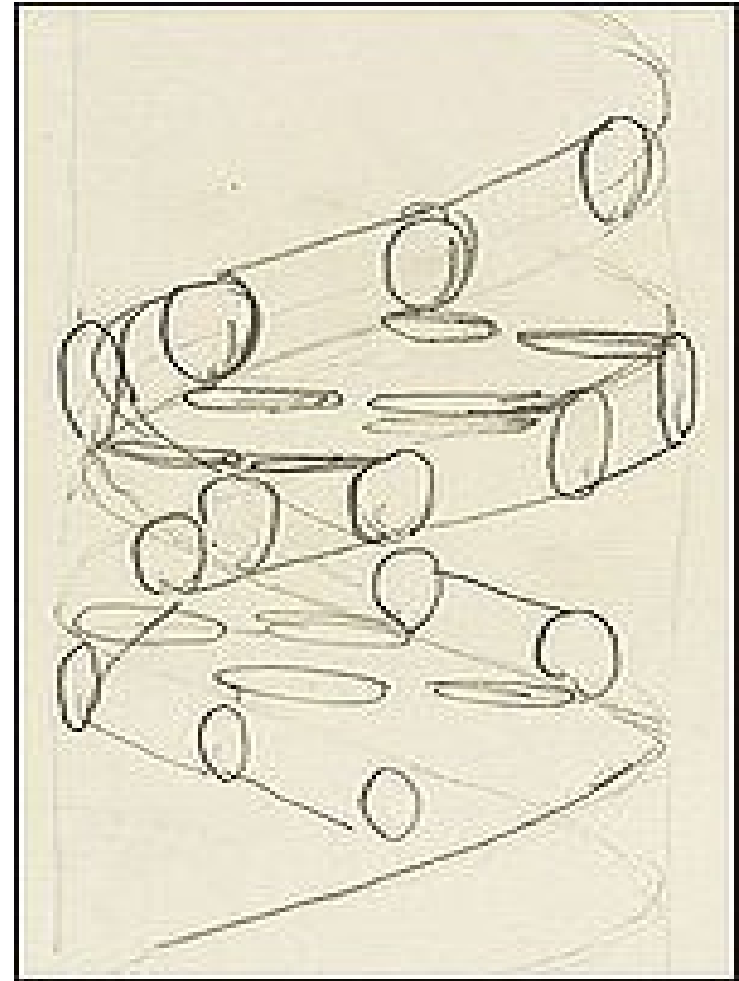
- *Saxons, Vikings and Celts* by Bryan Sykes, 2006
- *The Seven Faces of Eve* by Bryan Sykes, 2001
- *Mapping Human History* by Steve Olson, 2002

## Television

- “Faces of America” with Henry Louis Gates Jr. on PBS
- “Who Do You Think You Are?” on BBC, RTÉ One, NBC

# About This Material

- Y-chromosome DNA
- Where to test
- Planning
- Testing steps
- DNA results
- Research
- More research
- Pluses & minuses



# Types of DNA testing

## **For genealogy and anthropology**

- Y-chromosome DNA: male back to male, to male, etc. -- tracks surname
- Mitochondrial DNA (mtDNA): male or female back to female, to female, etc.

## **For close genealogy**

- Family finder – up to 6 generations back

# Y-Chromosome DNA

- Does not identify diseases or risks
- Only males have a Y-chromosome, passed down from father to son
- Passed down like surnames, so can be traced back
- Only one of a male's lines of ancestors
- To study another line, find a male to test from that line

# Y-DNA

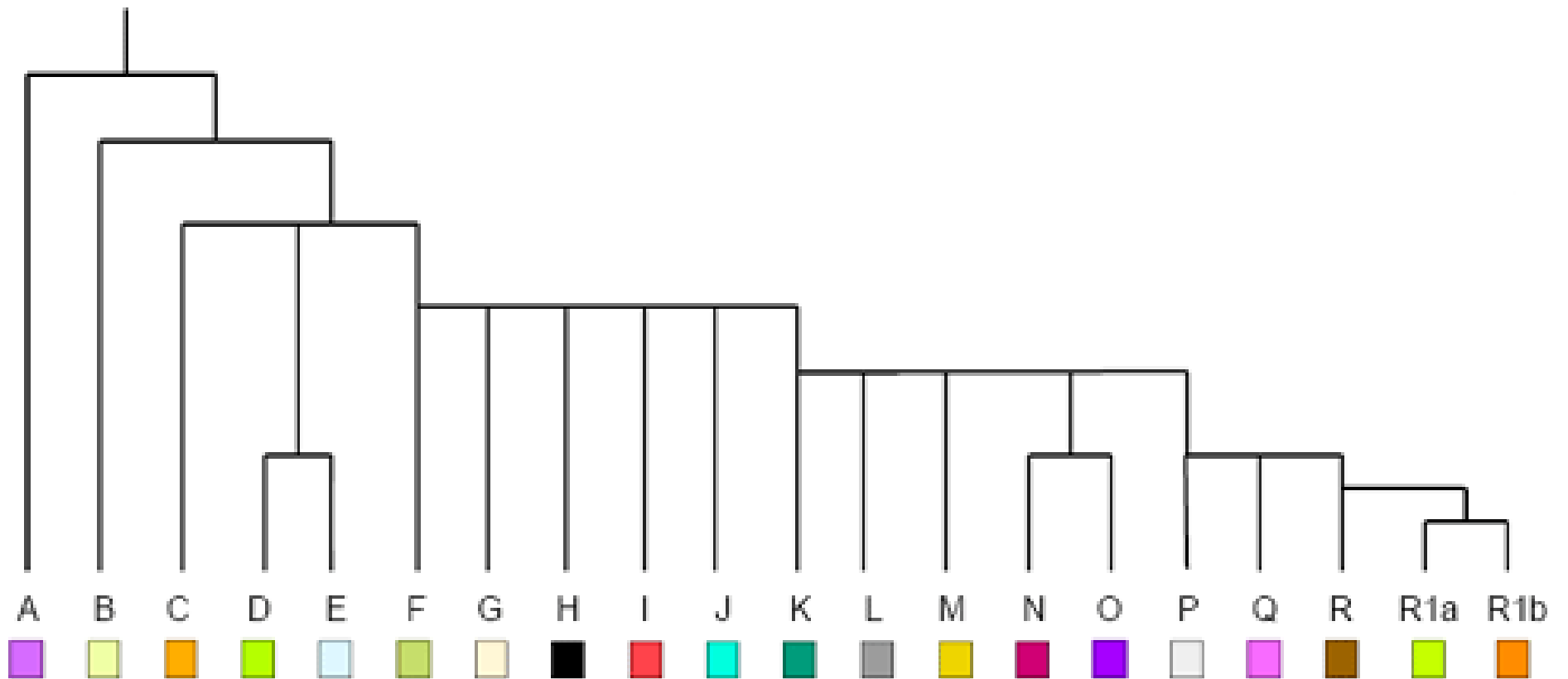
- DNA: deoxyribonucleic acid
- STR: short tandem repeat
- SNP: single nucleotide polymorphism
- DYS: DNA Y-chromosome segment, aka marker
- Allele: the value of a marker
- Haplogroup: set of values with a recurring pattern, designated A to T

# Y-DNA Simplified

- 67 markers, e.g., 413b
- Value for each marker, e.g. 24
- Y-DNA: set of values for 67 markers for one person
- Haplogroup: group of matching Y-DNAs, e.g., R1b
- Genetic distance: number of mutations between Y-DNAs

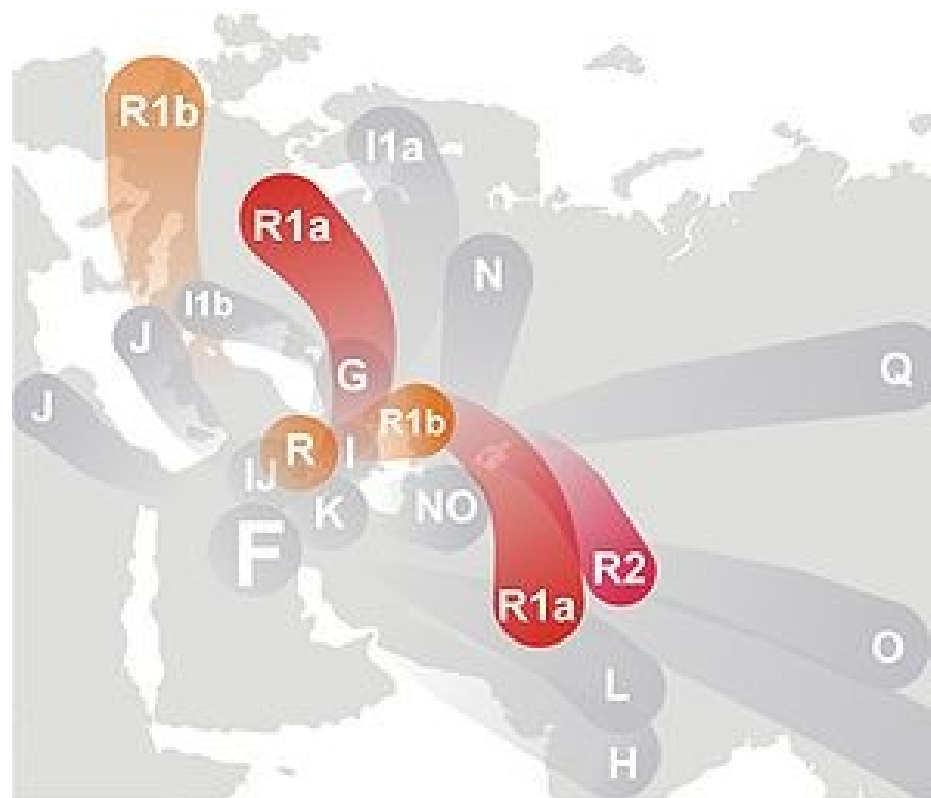


# Haplogroups A to R



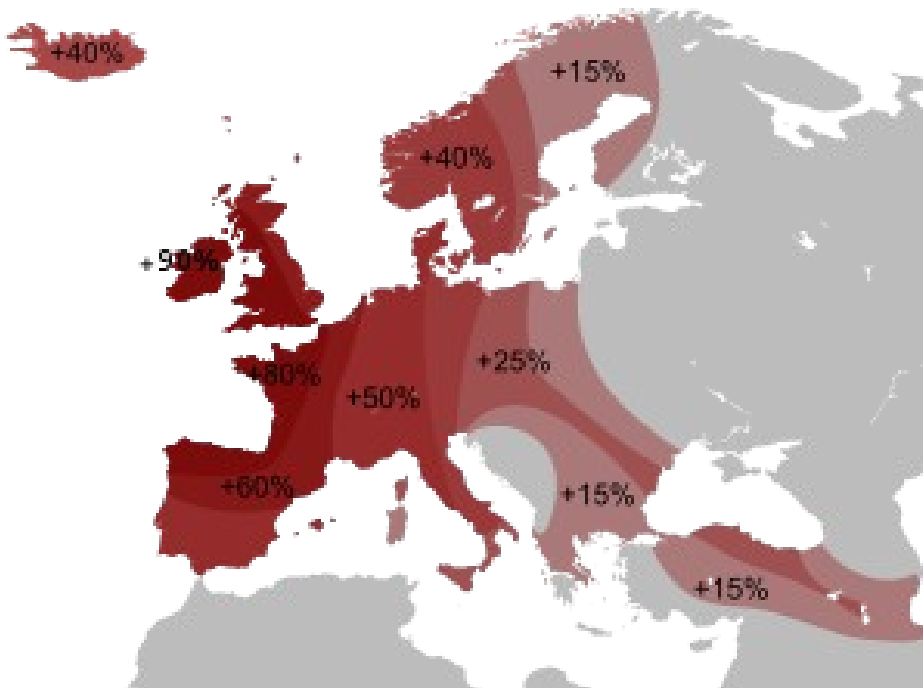
# Haplogroup R

- R1: west Eurasia
- R1a
  - central, south Asia
  - central, northeast Europe
- R1b
  - west Europe
  - west, central Asia
  - north Africa

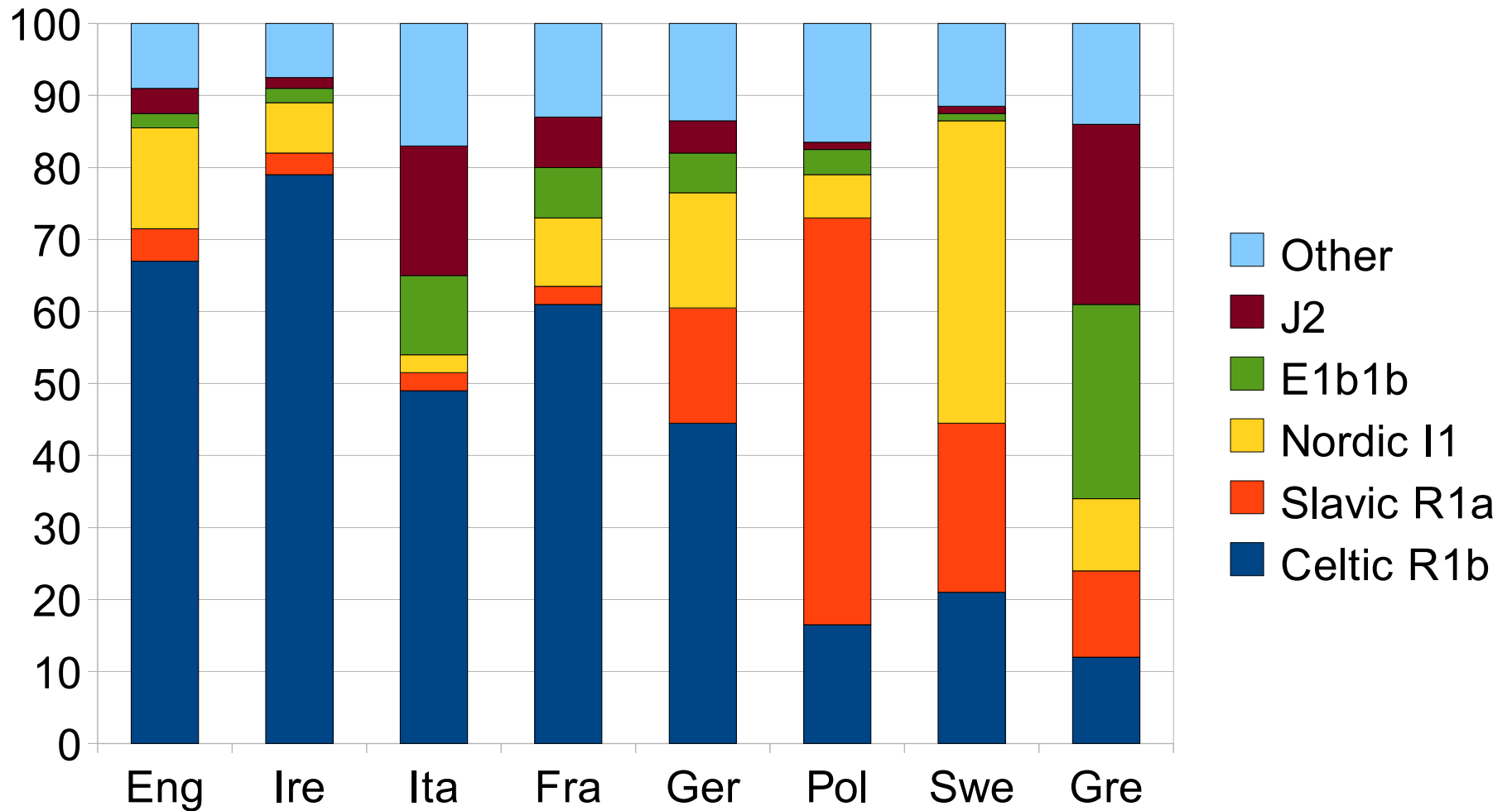


# R1b Haplogroup

- Percent of people in European areas that are R1b
- 90% in Ireland
- 80% in west England, west France, north Spain



# % Distribution of Ethnicities



# Testing Organizations

- Family Tree DNA (FTDNA)
- DNA Heritage
- Oxford Ancestors
- EthnoAncestry
- 23andMe
- Ancestry.com

# Family Tree DNA (FTDNA)

- Best known
- Started in April 2000
- Largest database
  - 188,000 Y-DNA records
  - 6,000 surname projects
- Good at sharing information
- Expensive, but competitive
- Did National Geographic project

# More About FTDNA

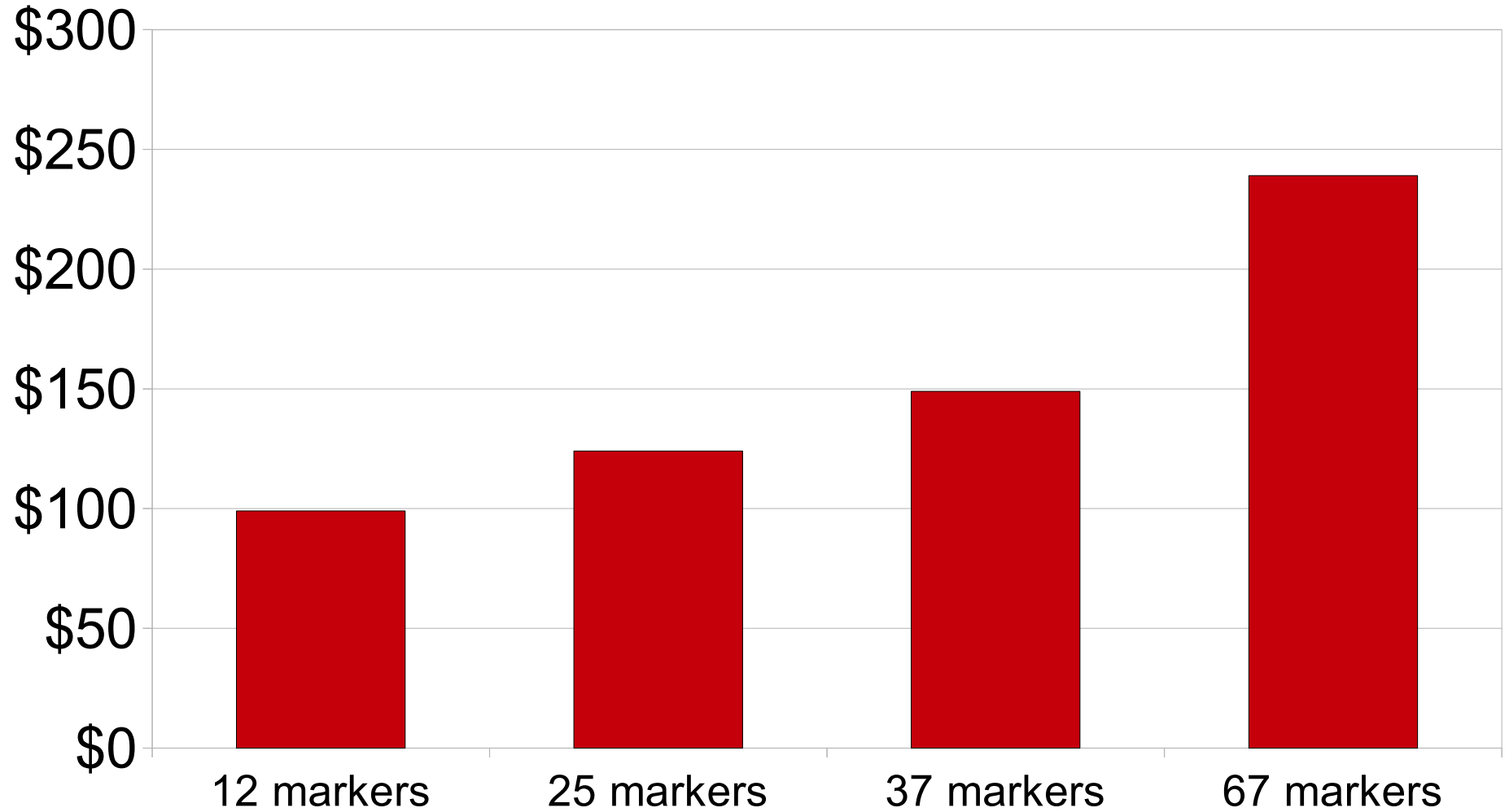
- President: Bennett Greenspan, founded FTDNA in 1999; founded GoCollege.com in 1997
- Chief Scientist: Michael Hammer, PhD; Biotechnology Research Scientist, University of Arizona
- Laboratory Manager: Connie Bormans, PhD
- Headquarters in Houston, TX

# Test Planning

- Choose a testing organization
  - FTDNA recommended
- Decide who is to be tested
- Select 12, 25, 37, or 67 markers
  - More markers are more accurate but cost more



# Cost of Testing at FTDNA



# Testing Steps

1. Select a surname project at FTDNA
2. Enroll and pay online
3. Get kit in mail, test, return
4. Get results online
5. Do some research
6. Do some more research

# 1. Select a Surname Project

- Research your surname for variants
- Go to FTDNA at: [familytreedna.com](http://familytreedna.com)
- Search for a project at FTDNA
- If no project,
  - Start a new project
  - Join a geographic project
- After you get results, other projects can be joined at no extra cost

## 2. Enroll and Pay Online

- Go to: [www.familyreedna.com](http://www.familyreedna.com)
- Search for surname
- Order selected test
  - Contact information
  - Shipping address
  - Phone and email
- Provide payment information or request an invoice

# 3. Get Kit in Mail, Test, Return



- Swab kit
  - 3 scrapers with cotton “toothed” tips
  - 3 tubes for 3 tips
  - Return envelope
- Swab inside of cheek
  - 3 times
  - 60 seconds each
  - 4 hours apart

## 4. Get Results Online

- Use your kit number and password to get to My FTDNA Home
- Get results in about 6 weeks
  - Your haplotree: history of your Y-chromosome
  - Recent ancestral origins by country
  - Your marker values
  - Matches with other people

# Peter Biggins: Y-DNA Kit 127469

393	390	19	391	385a	385b	426	388	439	389-1	392	389-2	
<b>13</b>	<b>24</b>	<b>15</b>	<b>11</b>	<b>11</b>	<b>15</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>13</b>	<b>13</b>	<b>29</b>	
458	459a	459b	455	454	447	437	448	449	464a	464b	464c	464d
<b>17</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>25</b>	<b>15</b>	<b>19</b>	<b>28</b>	<b>15</b>	<b>15</b>	<b>17</b>	<b>17</b>
460	GATA H4	YCA II a	YCA II b	456	607	576	570	CDY a	CDY b	442	438	
<b>11</b>	<b>11</b>	<b>19</b>	<b>23</b>	<b>15</b>	<b>15</b>	<b>17</b>	<b>19</b>	<b>36</b>	<b>38</b>	<b>12</b>	<b>12</b>	
531	578	395S1a	395S1b	590	537	641	472	406S1	511			
<b>11</b>	<b>9</b>	<b>15</b>	<b>16</b>	<b>8</b>	<b>10</b>	<b>10</b>	<b>8</b>	<b>10</b>	<b>9</b>			
425	413a	413b	557	594	436	490	534	450	444			
<b>null</b>	<b>22</b>	<b>24</b>	<b>16</b>	<b>10</b>	<b>12</b>	<b>12</b>	<b>16</b>	<b>8</b>	<b>12</b>			
481	520	446	617	568	487	572	640	492	565			
<b>22</b>	<b>20</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>13</b>	<b>11</b>	<b>11</b>	<b>12</b>	<b>12</b>			

Haplotype: R1b1b2a1b5

Tests: P312+ M269+ L21+ U106- P66- M37- M222- M126- L4- L20- L2- L1-

# 5. Add Genealogical Data

- Family tree
- Most distant known ancestor



# 6. Do Some Research

- Email people you match up with
  - Share your ancestry
  - Learn about theirs
- Compare with others in your surname project
- Join additional surname projects
  - Name variants
  - Geographic projects
  - Haplogroup projects
- Do deep clade testing

# 6. Do Some More Research

- Upload your results to Ysearch
  - Search for more matches with people
  - Search for matches with haplotype modals
- Study the origin of your ancestors
- Study clan history
- Visit the area they came from
- Recruit new project members
- Incorporate the results in your genealogy

# My DNA Matches – 67 markers

GD	Name	GD	Name
3	Keith J. Bigham	7	Craig Steven Beeman
5	Harry Napoleon Carroll	7	Lee Donald Calkins
6	John Ramsay Dundas	7	John F. Calkins
6	Michael Beaghen	7	Kenneth W. Calkins
6	Sean Biggins	7	Charles Calkins
6	Bartholomew O'Toole	7	Donald Duffy
6	John Patrick Little	7	Lynn Bailey Calkins
6	Geoffrey Walker	7	James Edward McDaniel
		7	William James Carroll
		7	Clifford Eugene Carroll
		7	Robert David Calkins

# *Irish Names and Surnames,* Patrick Woulfe, 1923

Ó bígín—*I*—*O* *Beggín*, Biggin, Biggins; 'des. of bígín'  
(dim. of beag, small); a var. of Ó beagáin and  
Ó Beigín, q.v.

# Biggins Genetic Distance

67

Markers

Biggins, P.  
Biggins, S.  
Bigham  
Little  
Beaghen

Biggins, P.

Biggins, S.

Bigham

Little

Beaghen

	6	3	6	6
6		5	6	4
3	5		7	5
6	6	7		6
6	4	5	6	

# My DNA Matches – 67 markers

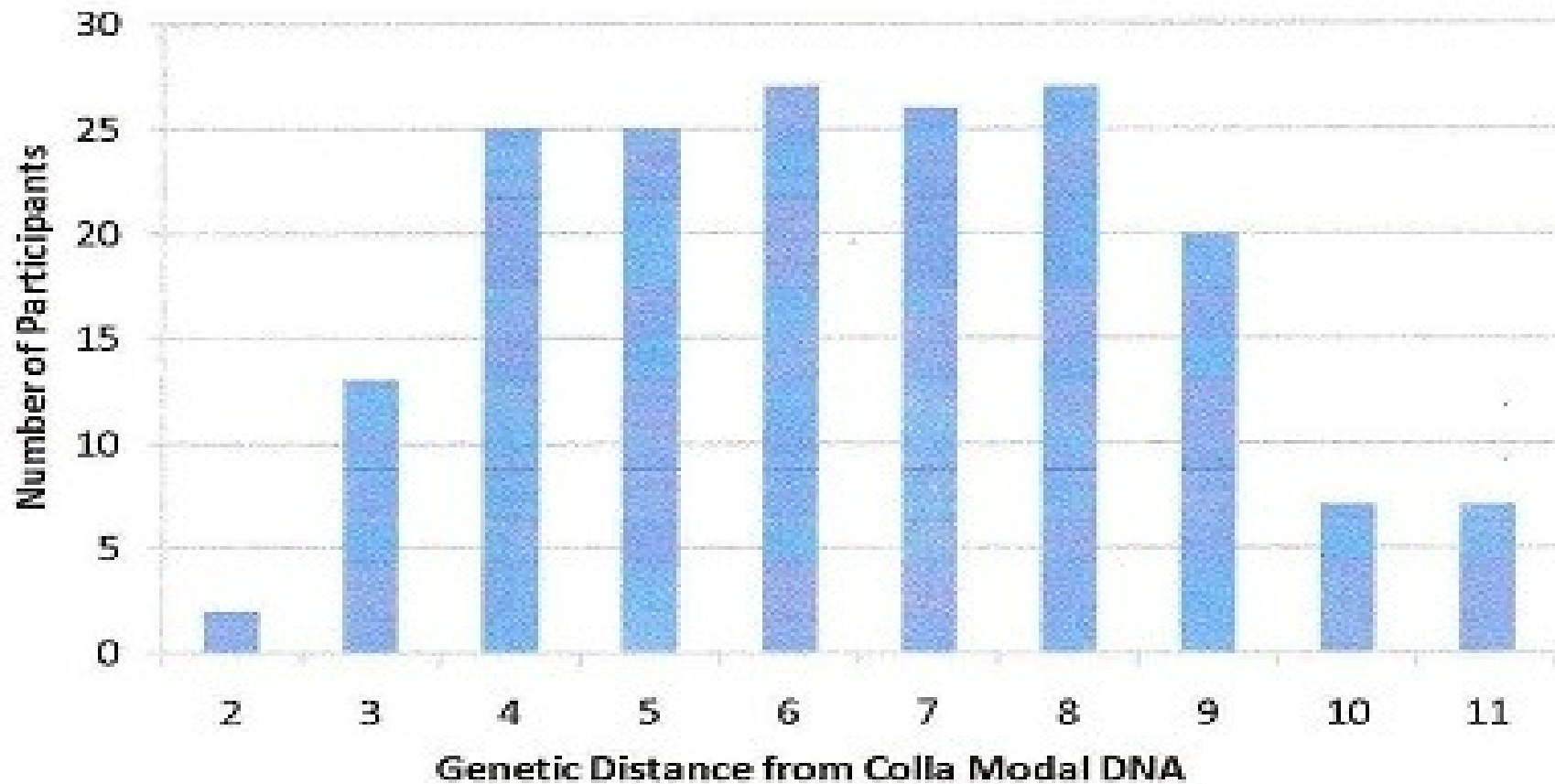
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6	Geoffrey Walker	7	James Edward McDaniel
		7	William James Carroll
		7	Clifford Eugene Carroll
		7	Robert David Calkins

# Clan Colla Study

- Three Colla brothers lived in 4<sup>th</sup> century Ireland
- Surnames adopted in 11<sup>th</sup> century: Carroll, McGuire, McMahan, McDonald, etc.
- People with these names saw that they were matching each other
- Found 145 people with surname and DNA
- Computed the Colla modal value for 67 markers
- Found another 34 without surname

# Colla Group – 67 Markers

## Colla Group (179 Participants)





# Biggins Genetic Distance

67  
Markers

Clan Colla  
Biggins, P.  
Biggins, S.  
Bigham  
Little  
Beaghen

Clan Colla		6	4	5	6	4
Biggins, P.	6		6	3	6	6
Biggins, S.	4	6		5	6	4
Bigham	5	3	5		7	5
Little	6	6	6	7		6
Beaghen	4	6	4	5	6	

# Pluses/Minuses of Y-DNA Testing

## Pluses

- Surname matches
- Mismatches
- Variant surnames
- Geographical origin
- Clan origin
- Ethnoancestry
- Feeling connected

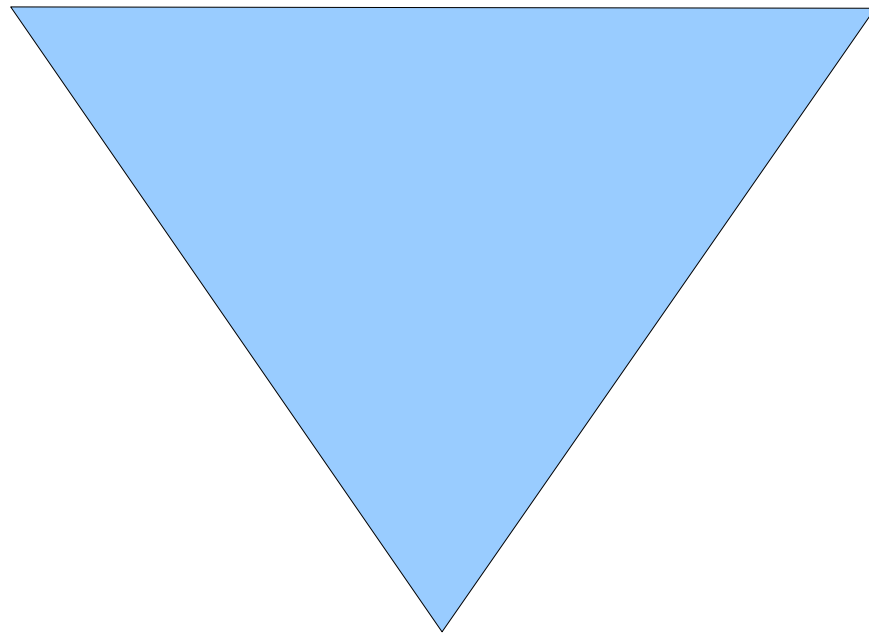
## Minuses

- Cost
- Complexity
- Computer skills
- Patronymic only
- Time consuming
- No or few matches
- Disappointment

# DNA Research

History

Genetics



Genealogy