DNA and Cold Cases

Using SNP Genotyping to Solve Crimes: The Cold Case of April Tinsley

Steven Armentrout, Ph.D.
Founder and CEO, Parabon

Detective Brian Martin
Fort Wayne (Indiana) Police Department

17 July 2019
Chicago
Warning: This presentation contains graphic sexual content
TIME-LINE for April 1, 1988

11:30 am
April arrives home/lunch

12:30 pm
April arrives Nicole’s house

12:30 – 2:30 pm
April & Nicole playing @ local park

~ 3:05 pm
April leaves Nicole’s for home

~ 3:05 pm
Nicole goes to Denise’s

~ 3:10 pm
April arrives at Denise’s house

~ 3:35 – 3:45 pm
April’s Mom walks to Nicole’s house

3:45 – 7:48 pm
Family/friends search neighborhood

7:48 pm
April’s Mom Calls police

Window of Opportunity

*April’s umbrella was still at Nicole’s
APRIL M TINSLEY BODY DISCOVERED APRIL 4, 1988

- APRIL WAS FOUND 15 FEET OFF ROADWAY IN RURAL AREA.
- SIGNS OF SEXUAL ASSAULT.
- CAUSE OF DEATH SUFFOCATION.
- MISSING ONE SHOE, WHICH WAS LOCATED 200 FEET FROM HER BODY.
WHAT DO WE HAVE TO WORK WITH?

1988
Abduction/Rape/Murder

1990
Taunting Letter
Written on Barn

2004
Four Notes with Pictures and Condoms
EVIDENCE

- THE SUSPECT GAVE US HIS DNA...
- THE SUSPECT GAVE US A SAMPLE OF HIS HANDWRITING...
- THE SUSPECT GAVE US A PARTIAL PICTURE OF HIMSELF...
BARN WRITING

I KILL 8 Yea Nov 16
APRIL movie 75er
I WILL KILL you
NOTE #1, PICTURE, AND CONDOM LEFT ON BIKE

Note found in bicycle basket
Hi Honey I been watching you I am the same person that kidnapped you. Rape and kill in April. Tinsley here is a present for you. You are my next victim. If you don’t report this to police on I don’t see this in the paper. Tomorrow or on the local news.

1. “Hi Honey”
2. Stalking Reference
3. Demand for media attn.
4. Threat to “blow up house”
5. Enclosure

3/25/04
Or I well blow up you

house: killing everyone
but you you will be mine

Written in pencil on yellow lined legal paper from a pad
NOTE #2, CONDOM DISCOVERED
03-27-2004

12634 Witmer Road

Identified March 2009 by the ACSD – A little girl who would have been 7 years of age in 2004 resided at this address.
THE “PRESENT”
Hi Honey, I been wanting you here is some cum for you. I am the same person our Kamped on a rape/murder April 1st buy you our next Ha Ha. An if I don’t see anything about this on the newpapers are on the TV news I will blow up your house killing you/yourly and go’s will be mine forever.

Use of “ha ha”

Note #2
3/27/04
+ Condom
(Gray duct tape?)
NOTE #3, AND CONDOM DISCOVERED 06-12-2004

3rd Note – 12902 Indiana Street, Grabil, Indiana
Found on a 7 yr. old girl’s bike in her side yard
NOTE # 3

Honey I been watching here is some of my cum for you.
I am the same person
On kidnapped Rape am
Kill April tinsley on
You are next if I see you
Out alone, or if I don't
See anything about this
in newspaper or TV news
I will blow up your house
I have planted Bomb some in you house

Note #3
6/12/04
(date notated)
+ Condom
NOTE #4, LETTER AND PICTURE
DISCOVERED ON BIKE 06-25-2004

Bike – 5 yr. old female

4th Note – 9716 Prince Court
Fort Wayne, Indiana
6-25-04

Hi Honey I Beem

Watching you here is some pitch of my dick when it's is hard

Just for you. I can't wait to get me hand on you so I can fuck you pussy, mouth on ass so cum in all three just like you had does.

More sexually graphic/vulgar in tone than the other notes... contains Polaroids, no condom.

Note #4
6/25/2004 (date notated)
PICTURE WITH LETTER # 4

Film manufacture = Oct 2003
Earliest purchase = Feb 2004
FBI B.A.U. ANALYSIS OF LETTERS

LINGUISTIC ANALYSIS

BARN GRAFFITI in 1990 and FOUR NOTES in 2004 WERE ALL WRITTEN BY THE SAME PERSON.

WRITER IS A WHITE MALE NATIVE BORN TO U.S.

WRITER IS ATTEMPTING TO DISGUISE HIS TRUE INTELLECTUAL/EDUCATIONAL LEVEL.
DNA RESULTS WERE RETURNED IN 2005

- The DNA profile from the semen found in April’s underwear in the 1988 homicide is consistent with the DNA from the semen found in the 3 condoms left in the notes in 2004
- Unidentified latent prints found on the note(s)
- -Negative in AFIS / Negative in CODIS
THE SUSPECT LIST

• THE CASE WAS VERY HIGH PROFILE.
• THE SUSPECT LIST WAS OVER 1,300 AT THE TIME OF THE ARREST.
• WE HAD ELIMINATED OVER 900 SUSPECT FROM THE LIST (DNA, JAIL RECORDS).
• THIS CASE WAS FEATURED ON AMERICA’S MOST WANTED, ON THE CASE WITH PAULA ZAHN, CRIME WATCH DAILY, NATIONAL NEWS, AND LOCAL NEWS.
PARABON-FWPD TIMELINE

- Mar 2009: Parabon began promoting forensic use of SNPs to federal government
- Sep 2009: Received a DHS Phase I SBIR award
- Apr 2011: Received a DTRA SBIR Phase I award
- Mar 2012: Received DTRA SBIR Phase II award
- Oct 2013: Presented Snapshot to NCMEC
- May 2014: NCMEC introduces Parabon to FWPD
- Jul 2014: FWPD ships DNA extract for April Tinsley case to CAFDA for genotyping
- Aug 2014: Parabon delivers Snapshot report to FWPD
PARABON-FWPD TIMELINE

Predicted Phenotypes:
- Eye Color: 0.16 - Green / Blue (79%)
- Skin color: 0.16 - Light Olive / Fair (83%)
- Hair color: 0.47 - Blond (70%)
- Freckles: 0.26 - None / Few (93%)

Sex: Male
Ancestry: European 100%

No exclusions
PARABON-FWPD TIMELINE

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- May 2014: NCMEC introduces Parabon to FWPD
- Jul 2014: FWPD ships DNA extract for April Tinsley case to CAFDA for genotyping
- Aug 2014: Parabon delivers Snapshot report to FWPD 1st casework sample analyzed with Snapshot
Snapshot Prediction Results
Composite Profile

Predicted (□) & Excluded (☒) Phenotypes

- Skin Color: 2.7
  - Very Fair / Fair (98.2% confidence)
    - NOT Light Olive / Dark Olive / Dark (98.2% confidence)

- Eye Color: 45.0
  - Hazel / Green (94.7% confidence)
    - NOT Blue / Brown / Black (94.7% confidence)

- Hair Color: 57.6
  - Brown / Black (96.0% confidence)
    - NOT Red / Blond (96.0% confidence)

- Freckles: 63.5
  - Few / Some (50.0% confidence)
    - NOT None (91.3% confidence)

Sex: Male ♂
Age: Unknown
Ancestry: Central/Eastern European
(Composite shown at age 50)
Snapshot Prediction Results

Composite Profile

Predicted (■) & Excluded (□) Phenotypes

- **Skin Color**: 2.7
  - Very Fair / Fair (98.2% confidence)
  - NOT Lt Olive / Dk Olive / Dark (98.2% confidence)

- **Eye Color**: 45.0
  - Hazel / Green (94.7% confidence)
  - NOT Blue / Brown / Black (94.7% confidence)

- **Hair Color**: 57.6
  - Brown / Black (96.0% confidence)
  - NOT Red / Bond (96.0% confidence)

- **Freckles**: 63.5
  - Few / Some (50.0% confidence)
  - NOT Zero (91.3% confidence)

- **Sex**: Male

- **Age**: Unknown
  (Composite shown at age 50)

- **Body Mass**: Unknown
  (Composite shown at BMI 22, Normal)

- **Ancestry**: Central / Eastern European
• DETECTIVES CONTINUED TO DO INTERVIEWS, COLLECT BUCCAL SWABS, CONDUCT SURVEILLANCE AT THE GRAVE SITE, AND MEMORIAL SITE.

• DETECTIVES CONTINUED TO USE LOCAL AND NATIONAL MEDIA TO GENERATE TIPS ON THE TINSLEY CASE.

• INFORMATION FROM PARABON WAS USED TO NARROW THE SUSPECT LIST (EYE COLOR, HAIR COLOR, ETC.)
PARABON 2018

• PARABON NANOLABS CONTACTS ME ON MAY 11, 2018. NEW GENETIC GENEALOGY TESTING AVAILABLE.

• PARABON IS CONFIDENT THAT THERE IS AN “ABOVE AVERAGE” CHANCE THAT THEY CAN IDENTIFY A SECOND COUSIN ONCE REMOVED, HALF-SECOND COUSIN, FIRST COUSIN THREE TIMES REMOVED, AND HALF FIRST COUSIN TWICE REMOVED.
“Actually, no, we are saying your case has an above average chance. Sorry if that’s not coming out clearly. Your case’s top cM match is 131.6cM. Please see the screen capture below that I find to be fairly helpful. 90-200cM are the light green group F. They include second cousins once removed, half-second cousins, first cousins thrice remove and half first cousin twice removed. There is at least 1 individual who is ~131cM. Whether or not the majority of the family tree is on the databases, we won’t know until our genealogist starts working it. . . .”

Ball, Catherine A., et al.
Ancestry DNA matching (2016)

Annotated by Leah Larkin, Ph.D.
Total Shared DNA: 0 cM
Total Shared DNA: 292.1 cM
<table>
<thead>
<tr>
<th>cM (centiMorgans)</th>
<th>Percentage (%) of Shared DNA</th>
<th>Group</th>
<th>Relationship</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>Range</td>
<td>Average</td>
<td>Range</td>
<td></td>
</tr>
<tr>
<td>3,600</td>
<td></td>
<td>50%</td>
<td></td>
<td>Parent - Child</td>
</tr>
<tr>
<td>2650</td>
<td></td>
<td>2300 - 3900</td>
<td>37%</td>
<td>32%-54%</td>
</tr>
<tr>
<td>3600</td>
<td></td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td></td>
<td>1300 – 2300</td>
<td>25%</td>
<td>18%-32%</td>
</tr>
<tr>
<td>900</td>
<td></td>
<td>575 - 1330</td>
<td>12.5%</td>
<td>8%-18.5%</td>
</tr>
<tr>
<td>450</td>
<td></td>
<td>215 - 650</td>
<td>6.25%</td>
<td>3%-9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>First Cousin Once Removed (1C1R) Half First Cousin (% 1C) Half Great-Aunt/Uncle/Niece/Nephew</td>
</tr>
<tr>
<td>224</td>
<td></td>
<td>75 - 360</td>
<td>3.125%</td>
<td>1%-5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Second Cousin (2C) First Cousin Twice Removed (1C2R) Half First Cousin Once Removed (%1C1R)</td>
</tr>
<tr>
<td>112</td>
<td></td>
<td>30 - 215</td>
<td>1.56%</td>
<td>0.42% - 3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Second Cousin Once Removed (2C1R) Half Second Cousin (% 2C) First Cousin Three Times Removed (1C3R) Half First Cousin Twice Removed (% 1C2R)</td>
</tr>
<tr>
<td>56</td>
<td></td>
<td>0 - 109*</td>
<td>0.78%</td>
<td>0% - 1.52%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Third Cousin (3C) Second Cousin Twice Removed (2C2R)</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>0 - 75**</td>
<td>0.4%</td>
<td>0%-1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Third Cousin Once Removed (3C1R) Other Distant Cousins</td>
</tr>
</tbody>
</table>

^cM = Ancestry.com & FTDNA
^^^Percentage of DNA = 23AndMe
***3/4 Siblings are a combination of half siblings and 1st cousins, FIRs are included. 
Groups A & B: 99% within the ranges given
Groups C – I: 95% within the ranges given
~10% of 3Cs will not share DNA
~50% of 4Cs will not share DNA

Genetic Genealogy (GG) Analysis
Different levels of sharing can equate to different types of genetic relationships.


Edited by Leah Larkin, Ph.D.
DNA Sharing Levels

Graphic depicts the different possible relationships of DNA sharing levels.

Parent – Child & Full Siblings are straightforward with the most DNA sharing levels.

Group B (green) represents less DNA sharing. There are multiple DNA sharing options to research.
As less and less DNA is shared, the more distant and complex the possible relationships become.
DNA Sharing Levels

EXCEPTIONS TO GRAPH:
10% of third cousins share no DNA
50% of fourth cousins share no DNA

4th cousins and beyond are not shown.
GG Tree Building Example 1

Using Phenotypic Ancestry Info
GG Tree Building Example 1
GG Tree Building Example 1

- Father
- Mother
- Match #1
GG Tree Building Example 1
GG Tree Building Example 1
GG Tree Building Example 1
GG Tree Building Example 1
GG Tree Building Example 1

Match #1
GG Tree Building Example 1

Crime Scene DNA Ancestry:
88% Northern European
12% Japanese
Crime Scene DNA Ancestry:
1/8 Japanese
Crime Scene DNA Ancestry:
One Japanese Great-Grandparent
GG Tree Building Example 1

Crime Scene DNA Ancestry:
One Japanese Great-Grandparent
Crime Scene DNA Ancestry:
One Japanese Great-Grandparent
Deciphering between TWO Promising Matches
GG Tree Building Example 2

Match #1
GG Tree Building Example 2
GG Tree Building Example 2
GG Tree Building Example 2
GG Tree Building Example 2

Match #1
GG Tree Building Example 2

Match #1
GG Tree Building Example 2
GG Tree Building Example 2
GG Tree Building Example 2
GG Tree Building Example 2
GG Tree Building Example 2
GG Tree Building Example 2
PARABON ON THE CASE

CeCe Moore
Chief Genetic Genealogist, Parabon

- One of the original pioneers of genetic genealogy
- Began leading high-profile identification investigations in 2010
- Founded DNA Detectives in 2013
- Performs research for Finding Your Roots on PBS
- Has led Parabon’s genetic genealogy team to 61 “solves” since May 2018 (> 1 per week)
- Began working the April Tinsley case late June 2018
Building Genetic Networks

Grouping Matches

Tinsley Case = Four Separate Genetic Networks
Genetic Network #1 = Ancestor
  John C. Green, b.c. 1836
  Matches #1, #3, #8 and #12
  Descend from John C. Green and Match #9 descends from his parents.
Building Genetic Networks

Tinsley Case = Four Separate Genetic Networks
Genetic Network #2 = Ancestral Couple James Miller and Nancy Barnett
Matches #2, #4, #13 and #14 Descend from James and Nancy Barnett
Building Genetic Networks

Henry McIntosh
b. 1820

Rachel Mays
b. 1824

Peter McIntosh
b. 1856

Abraham McIntosh
b. 1843

Dulcena Banks
b. 1910

Nancy McIntosh
b. 1862

Christine Clemons
b. 1929

Henley McIntosh
b. 1886

LouEllen McIntosh
b. 1914

Match #5
96.8 cM

Match #11
55.2 cM

Grouping Matches

Tinsley Case = Four Separate Genetic Networks
Genetic Network #3 = Ancestral Couple Henry McIntosh and Rachel Mays
Matches #5 and #11 Descend from Henry and Rachel McIntosh
Building Genetic Networks

**Grouping Matches**

Tinsley Case = Four Separate Genetic Networks

Genetic Network #4 = Ancestral Couple Wright Dillion and Avery Cantley
Matches #6 and #7
Descend from Wright Dillion and Avery Cantley

- Wright Dillion b. 1863
- Avery Cantley b. 1869
- Otey Dillon b. 1898
- Doyle Dillon b. 1925
- Jerry Dillon b. 1954
- Okey Dillon b. 1889
- Martha Dillon b. 1914
- Match #7 81.7 cM
- Match #6 91 cM
Triangulation

Convergence of Genetic Networks

Two Genetic Networks Converge:
Genetic Networks #1 and #4
Convergence of Genetic Networks

Two Genetic Networks Converge:
Genetic Networks #2 and #3
Convergence

Convergence of Genetic Networks Leads to Suspect

All four Genetic Networks converge through the marriage of Patricia Green and Robert Miller. They had three sons, including John D. Miller, b. 1959.
Convergence

Convergence of Genetic Networks Leads to Suspect

Miller Family Tree with Genetic Networks Noted
WHAT THE HELL!

• CALL FROM PARABON, WE NEED TO HAVE A CONFERENCE CALL. (07-02-2018)
• I GATHER THE TEAM.
• WE WERE HOPING FOR A GRANDPARENT. WE DIDN’T GET IT! YOUR SUSPECT IS ONE OF TWO BROTHERS!
• WE JUST LOOKED AT EACH OTHER. I SAID HOLY S*** HE IS STILL ALIVE AND WE GOT THIS @#$!&%.
A FACE TO THE NAMES

- Genetic genealogy identifies John D Miller or his brother Joseph Miller as a strong suspect.
- Neither suspect has ever been on the suspect list.
- We instantly run both men in the local police database and criminal history checks.
- We set up surveillance on John Miller within two hours of the Parabon conference call.
Snapshot Prediction Results
Composite Profile

Predicted (■) & Excluded (■) Phenotypes

**Skin Color:**
- 2.7
- Very Fair / Fair (98.2% confidence)
- NOT Lt Olive / Dk Olive / Dark (98.2% confidence)

**Eye Color:**
- 45.0
- Hazel / Green (94.7% confidence)
- NOT Blue / Brown / Black (94.7% confidence)

**Hair Color:**
- 57.6
- Brown / Black (96.0% confidence)
- NOT Red / Blond (96.0% confidence)

**Freckles:**
- 63.5
- Few / Some (50.0% confidence)
- NOT Zero (91.3% confidence)

**Sex:**
- Male 🧒

**Age:**
- Unknown
  (Age progressed to ~50 years)

**Body Mass:**
- Unknown
  (Composite shown at BMI 23)

**Ancestry:**
- Central/Eastern European

Photo
JOHN D MILLER

- LIVES IN GRABILL, IN WHICH IS JUST OUTSIDE FT. WAYNE, IN.
- HIS HOME IS WITHIN CLOSE PROXIMITY OF THE 2004 LETTER, PICTURE, AND CONDOMS.
- NO ADULT ARREST. ONE JUVENILE ARREST.
- IDENTIFIED AS A SUSPICIOUS PERSON IN 2002, AND 2003 MAKING SEXUAL COMMENTS TO WOMEN AND CHILDREN IN SHOPPING CENTER PARKING LOTS.
SURVEILLANCE

• DET. CLINT HETRICK (ISP) AND I START SURVEILLANCE ON 07-02-2018.

• WE DISCOVER JOHN MILLER LIVES ALONE.

• JOHN MILLER WORKS 3RD SHIFT AT WALMART, IN KENDALLVILLE, IN.

• DETECTIVES OBSERVE THAT JOHN MILLER MEETS WITH HIS BROTHER, JOSEPH MILLER IN AUBURN, IN.

• HIS TRAILER IS 200 FEET FROM A CITY PARK AND SOFTBALL FIELD.
SUSPECT’S VIEW
PARK AND BASEBALL FIELDS
DETECTIVES MEET AND CONDUCT A COVERT TRASH PULL 07-06-2018.

WE DISCOVER 3 USED CONDOMS.

T.V. DINNERS/ WALMART COLA.

DETECTIVES PACKAGE AND TRANSPORT THE EVIDENCE TO ISP LAB FOR TESTING.

SURVEILLANCE CONTINUES.
TRASH/EVIDENCE
SURVEILLANCE
SURVEILLANCE
ISP CONFIRMATION

- On 07-09-2016, ISP lab calls and confirms that the DNA from the condoms from John D Miller’s trash on 07-06-2018 matches the suspect of the April Tinsley abduction, rape, and murder.
- The DNA also matches the condoms left with the taunting letters and pictures.
- John Miller’s DNA matches previously unknown profile on April’s jacket.
CONTACT WITH SUSPECT

- ON 07-15-2018 DET. CLINT HETRICK AND I APPROACH JOHN D MILLER.
- JOHN D MILLER HAD JUST GOT OFF WORK AT WALMART AND ARRIVED AT HIS TRAILER.
- JOHN MILLER ASK, “IS EVERYTHING O.K.?”
- JOHN MILLER AGREES TO ACCOMPANY DETECTIVES TO THE POLICE DEPT. TO TALK.
TRANSPORT

- Detectives have small talk with John D Miller on the way to the station.
- John Miller tells us that he likes “Cop” shows, and crossword puzzles.
- John Miller has lived in this same trailer since the mid ’80s.
- John Miller has an incredible memory for dates.
DETECTIVES ADVISE JOHN D MILLER OF HIS RIGHTS.

JOHN MILLER AGREES TO AN INTERVIEW.

WE ASK JOHN MILLER WHY HE THINKS WE MIGHT WANT TO TALK TO HIM? JOHN REPLIES, “APRIL TINSLEY.”

JOHN MILLER STARTS TO TALK, THEN SAYS, “I CAN’T.”
• DETECTIVES ARE ABLE TO KEEP JOHN MILLER TALKING.

• JOHN MILLER CONFESSES TO ABDUCTION, RAPE, AND MURDER OF APRIL MARIE TINSLEY.

• JOHN GIVES VERY SPECIFIC DETAILS AND TIMES OF THE ABDUCTION, RAPE, AND MURDER.

• JOHN MILLER APPEARS TO BE RELIVING THE CRIME AS HE IS CONFESSING.
WHAT WE LEARNED

• JOHN MILLER HAS HISTORY OF SEXUAL ASSAULT AS A MINOR.

• JOHN MILLER SPENT TIME IN BOYS SCHOOL AND JUVENILE DETENTION FACILITY.

• JOHN MILLER TRIED AN ABDUCTION WHEN HE WAS 17 YEARS OLD, BUT VICTIM FOUGHT BACK SO HE RAN OFF.

• JOHN MILLER HAS BEEN OUT LOOKING FOR NEW VICTIM BUT COULD NOT FIND AN OPPORTUNITY.
CONTINUED

• JOHN MILLER ADVISED HE HAD A HOMOSEXUAL RELATIONSHIP TO FULLFILL HIS SEXUAL DESIRES, THAT PARTNER WENT IN A NURSING HOME SO THAT ENDED RELATIONSHIP.

• JOHN MILLER ADVISED HE SITS IN HIS TRAILER AND MASTURBATES IN CONDOMS WHILE WATCHING HOMOSEXUAL PORN.

• JOHN MILLER USES THE CONDOMS TO MASTURBATE. (HE SAYS HE DOESN’T WANT TO GET MESSY.)
NEW FACTS FROM INTERVIEW

- JOHN MILLER TELLS US THAT IT TOOK 2 DAYS FOR US TO FIND APRIL’S BODY IN THE DITCH, AND HE HAD ACTUALLY DROVE BY THE DUMP SITE THE NEXT DAY.

- JOHN MILLER TELLS US THAT IT TOOK 2 MONTHS FOR ANYONE TO NOTICE THE WRITING ON THE BARN.

- JOHN NEVER HAD A BLUE TRUCK. HE WAS DRIVING A BLUE MERCURY LYNX.
CONFESSION LETTER

I saw April Littlesley walking down the side walk. I was standing by my car. I grabbed her and told her not to scream. I put her in my car. I drove out my driveway and went back inside. I carry her back bedroom and had sex with her. Later I killed her, then early next day I took to Country Road 68 and dumped her body in the pitch.

Arne L Miller 7/15/18
GENETIC GENEALOGY SUCCESS

- As of June 12 2019, Parabon has provided police with leads resulting in > 60 positive identifications.
- This number does not include other identifications made by FBI, state and local law enforcement organizations or other labs performing genetic genealogy.