So I ran the gel. Now what?

How to interpret DNA fingerprinting results

What can you tell from the gel?

- Fragments of DNA are separated on the basis of their size – smaller pieces move farther.
- If two bands (in different lanes) are at the same distance from their wells, what do you know?

A	B
xxxxx	
	xxxxx
xxxxx	xxxxx

- All you know is that they are the same size – they have the same number of bases
- You don't know if they are the same sequence

The band patterns match – so is it done?

- Just because the bands match in position does not ensure a positive match ---- remember, you only know that they are the same size
- So what happens next?
  - This is why a probe is used
  - The probe sticks to a specific sequence so if the probe is on two bands at the same position you know the bands share some sequence

Applying CODIS

- Matching probe patterns using one probe is great, but there are still many bands that may not match
- Try another probe and restriction enzyme combination to find additional matches
- The more matches the more likely the DNA is from the same source (remember the math we did on this --- product rule)

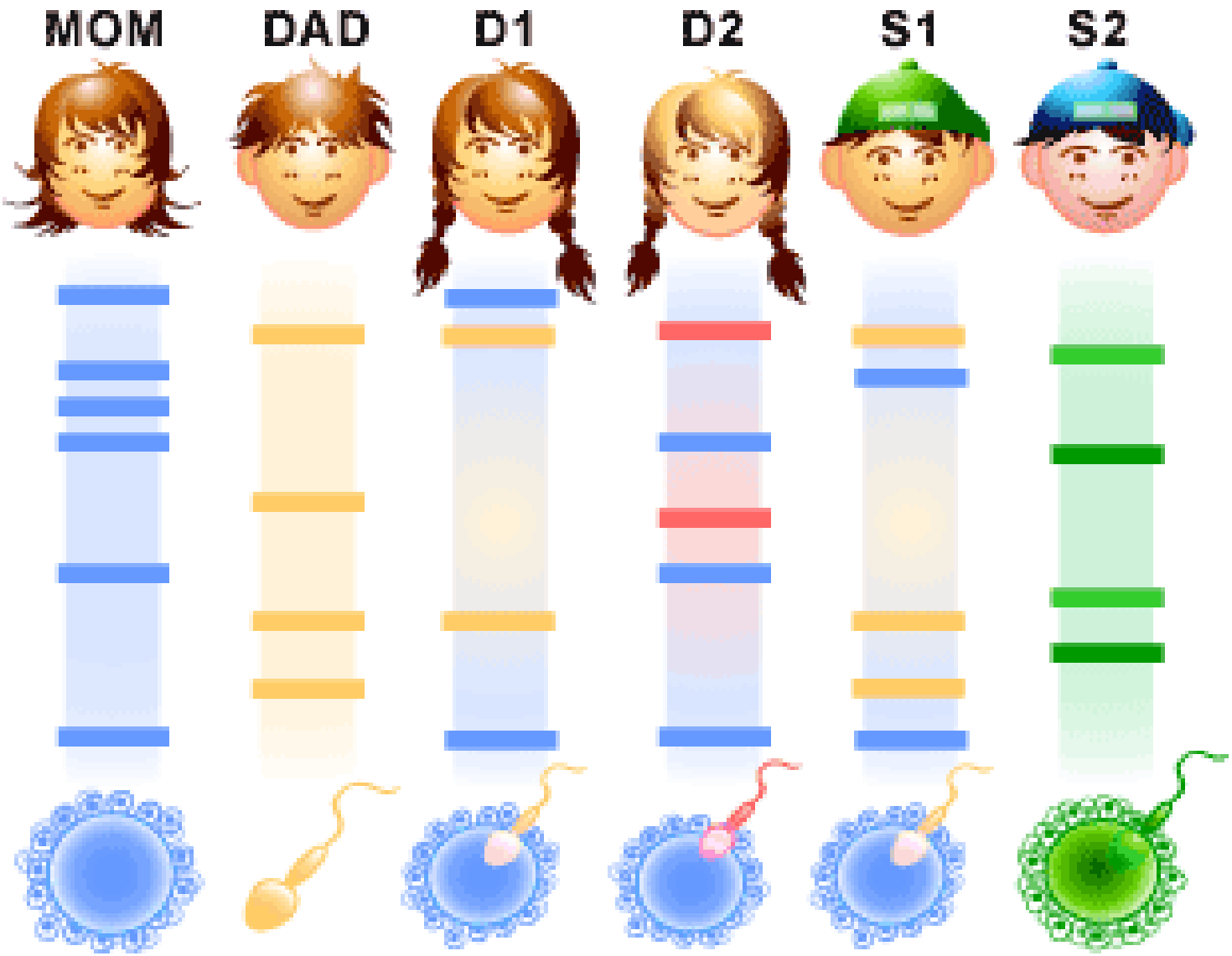
If the test is to determine identity

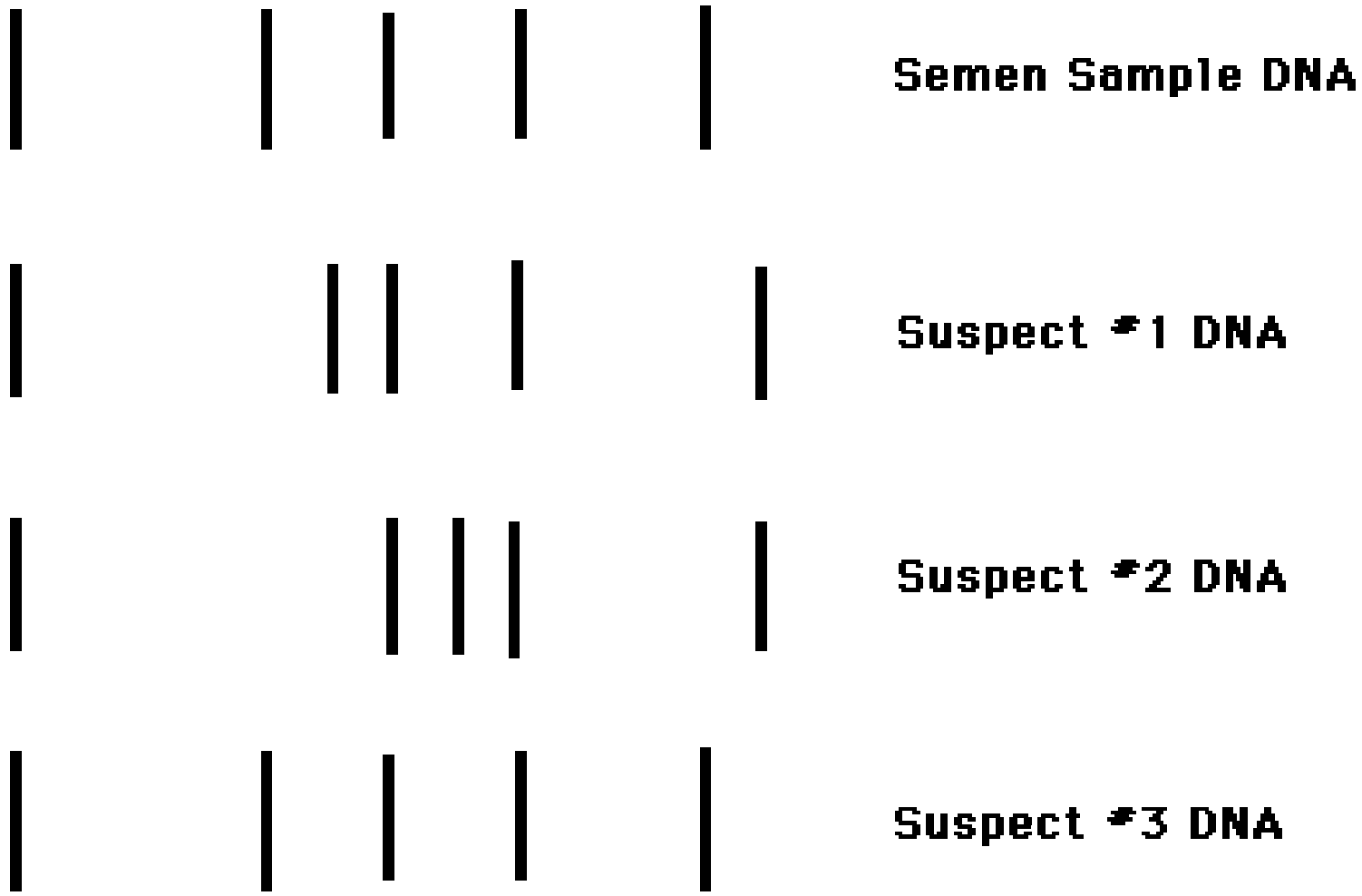
- This test is performed if you want to determine that someone is a match for a sample
- You need an EXACT match – all bands must match and match with more than one probe / STR

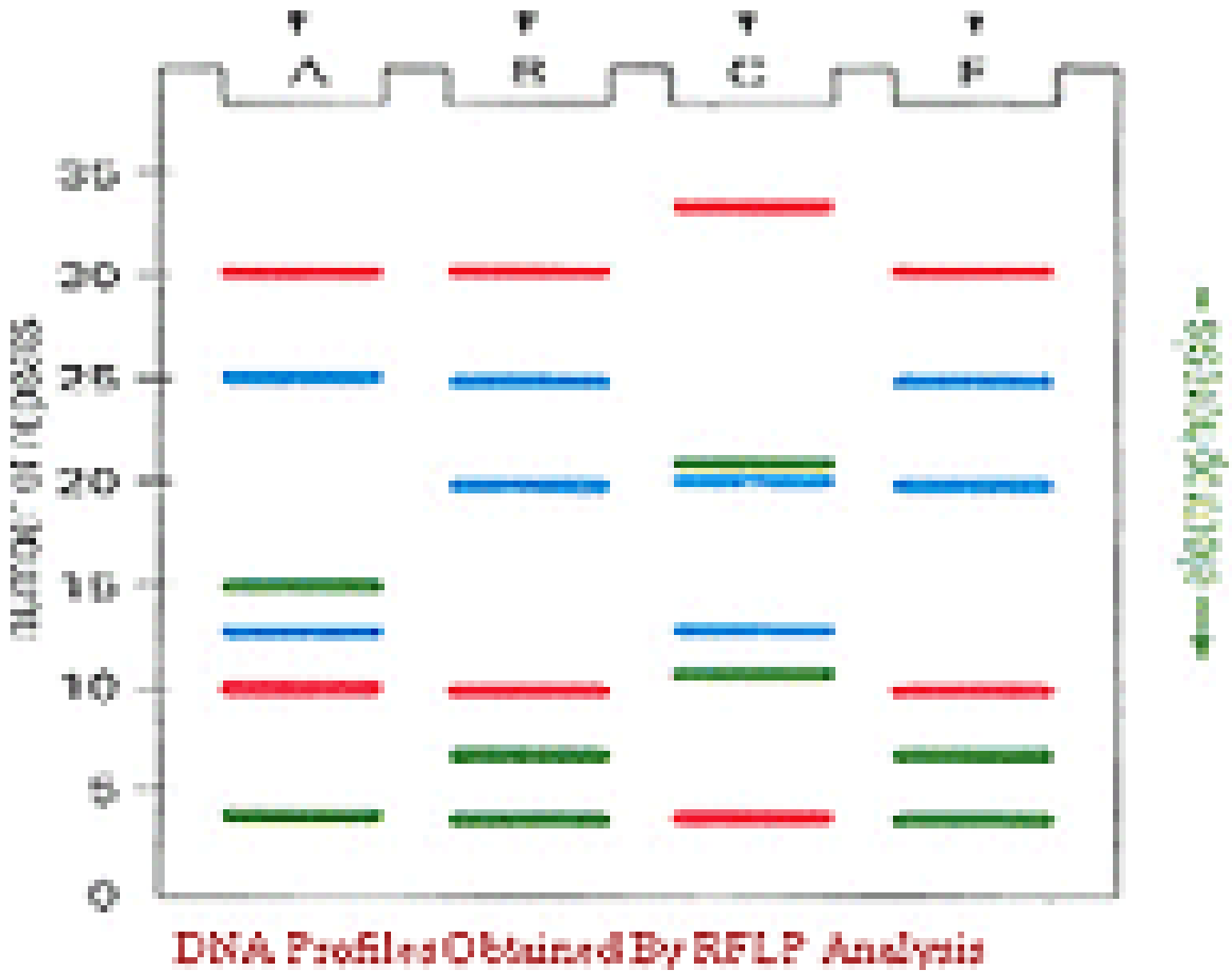
If the test is for paternity

- Remember that you have a pair of each chromosome – one copy came from mom and one came from dad
- This then continues to your DNA fingerprint – some of your bands come from mom and some from dad
  - It won't be exactly half from each parent due to mutation and similar band sizes between parents, but you should have about half from each parent

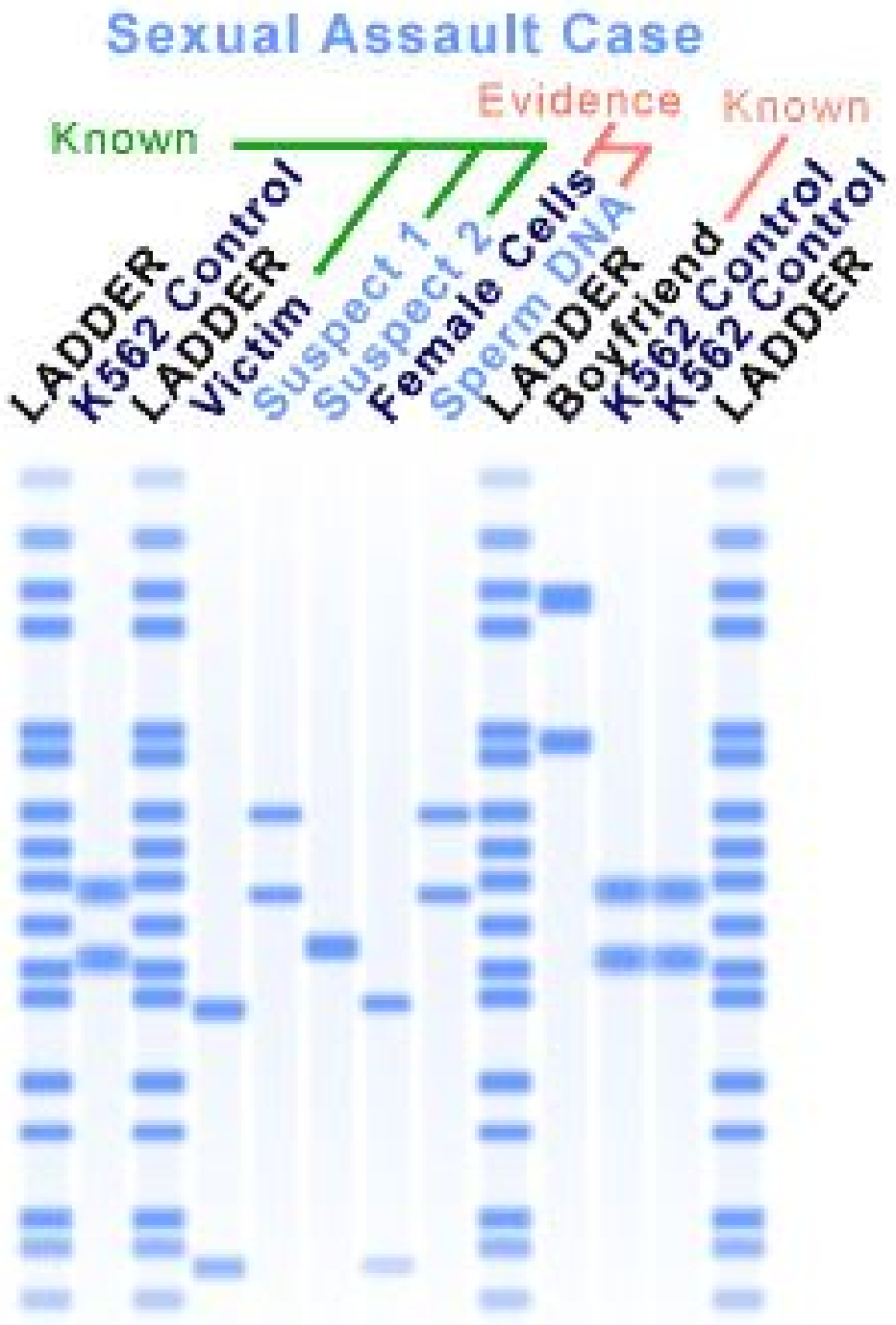
standard	mother	husband	suspect	child
29		29		29
26			26	
23	23			
20			20	
	19			19
17		17		
		16		
14	14		14	14
11				
	10			
8	8 x2	8 x2	8 x2	8 x2
	7 x2	7 x2	7 x3	7 x2
	5 x2	5 x3	5 x2	5 x3

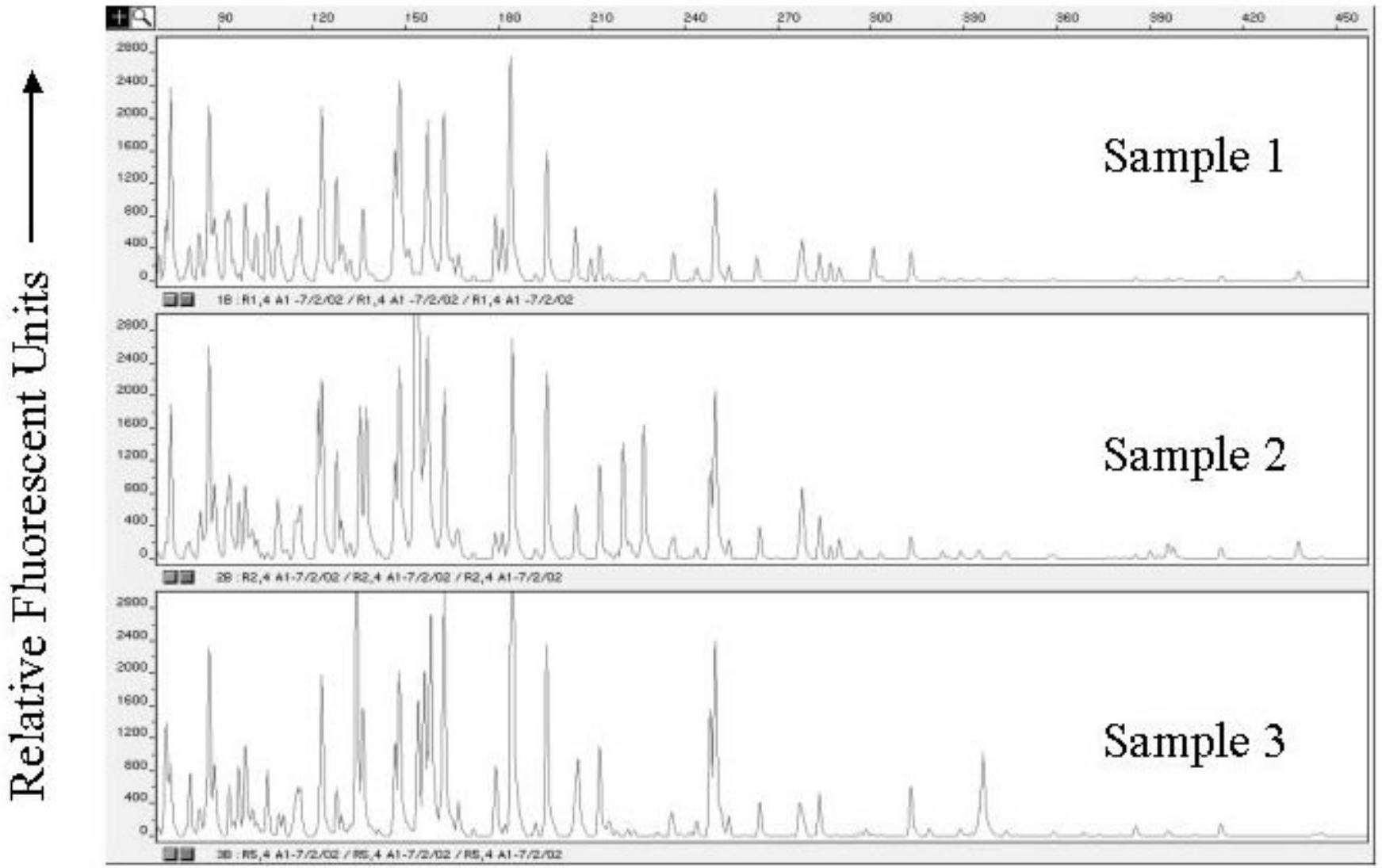

MOM
DAD
D1
D2
S1
S2


Semen Sample DNA
Suspect #1 DNA
Suspect #2 DNA
Suspect #3 DNA



DNA Profiles Obtained By RFLP Analysis


Sexual Assault Case
Known
Evidence
Known
LADDER
K562 Control
LADDER
Victim
Suspect 1
Suspect 2
Female Cells
Sperm DNA
LADDER
Boyfriend
K562 Control
K562 Control
LADDER


Size (Bases)
Relative Fluorescent Units
Sample 1
Sample 2
Sample 3