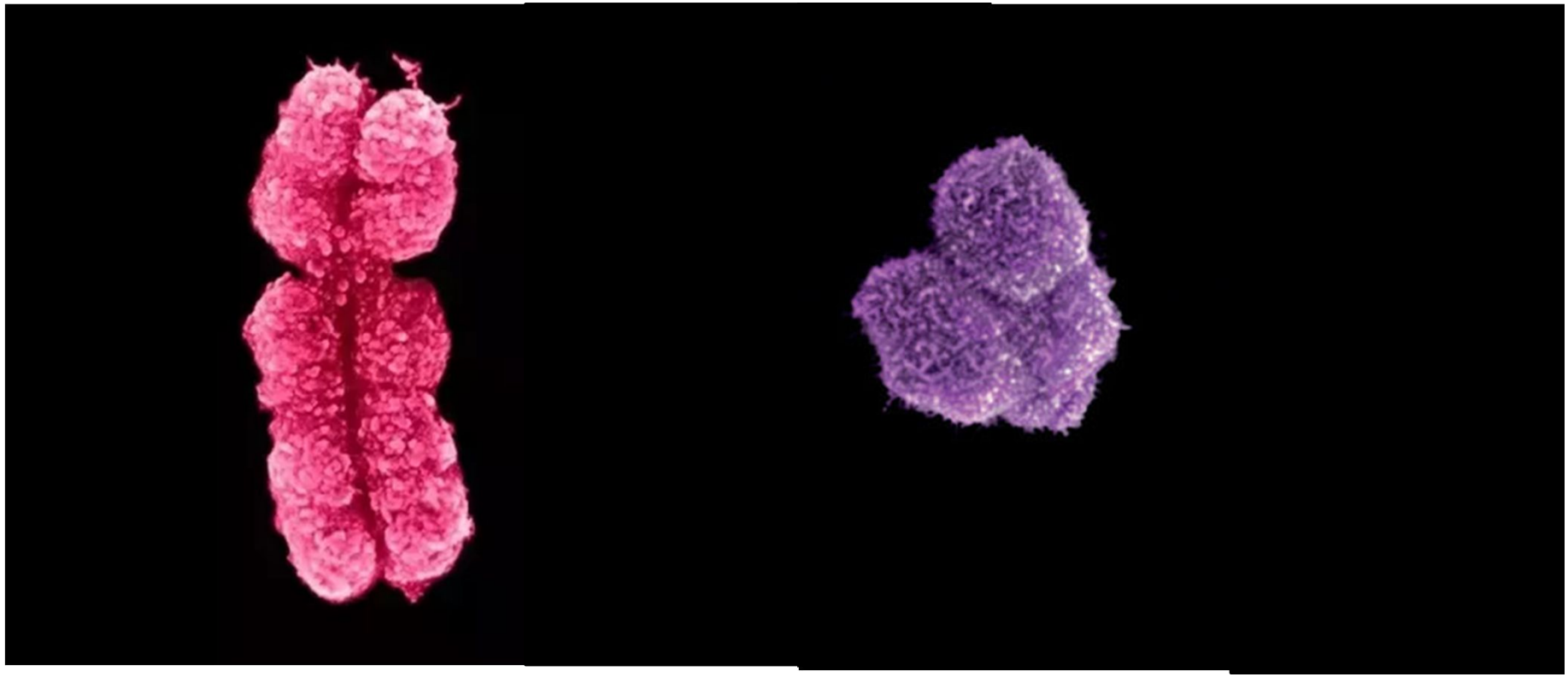
Sex Determination

- Review:
  - Every body cell contains 46 chromosomes (23 pairs)
  - Gametes contain 23 chromosomes
  - When gametes pair up – the sex of the individual is determined
- There are two types of sex chromosomes: X and Y
  - XX = female
  - XY = male
  - All other cells have no control over sex determination

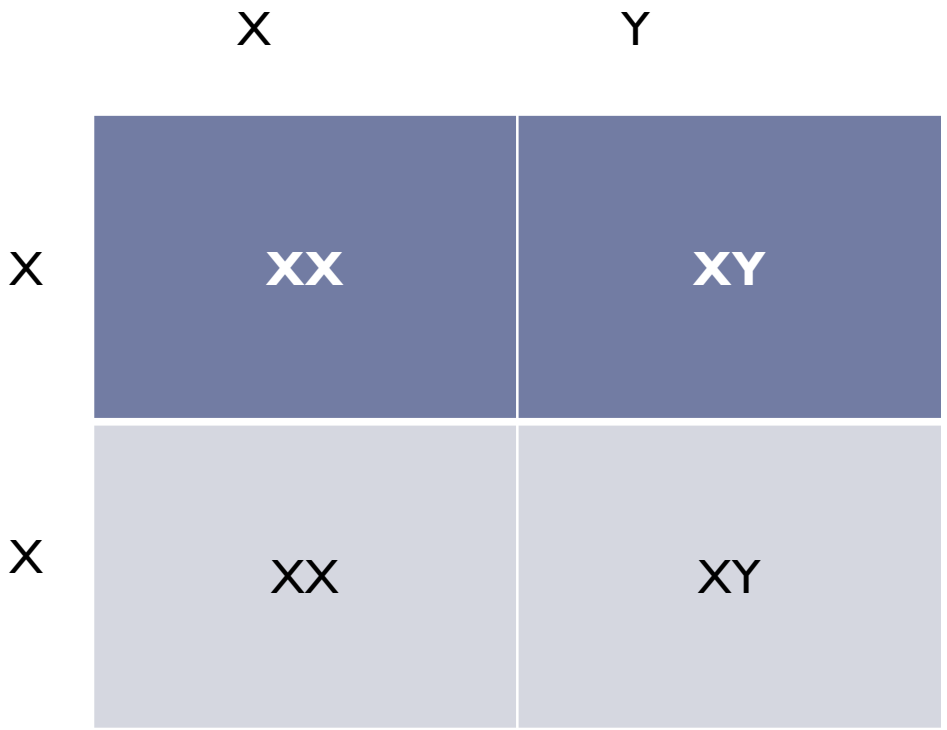
Sex Determination

X chromosome **Y chromosome**



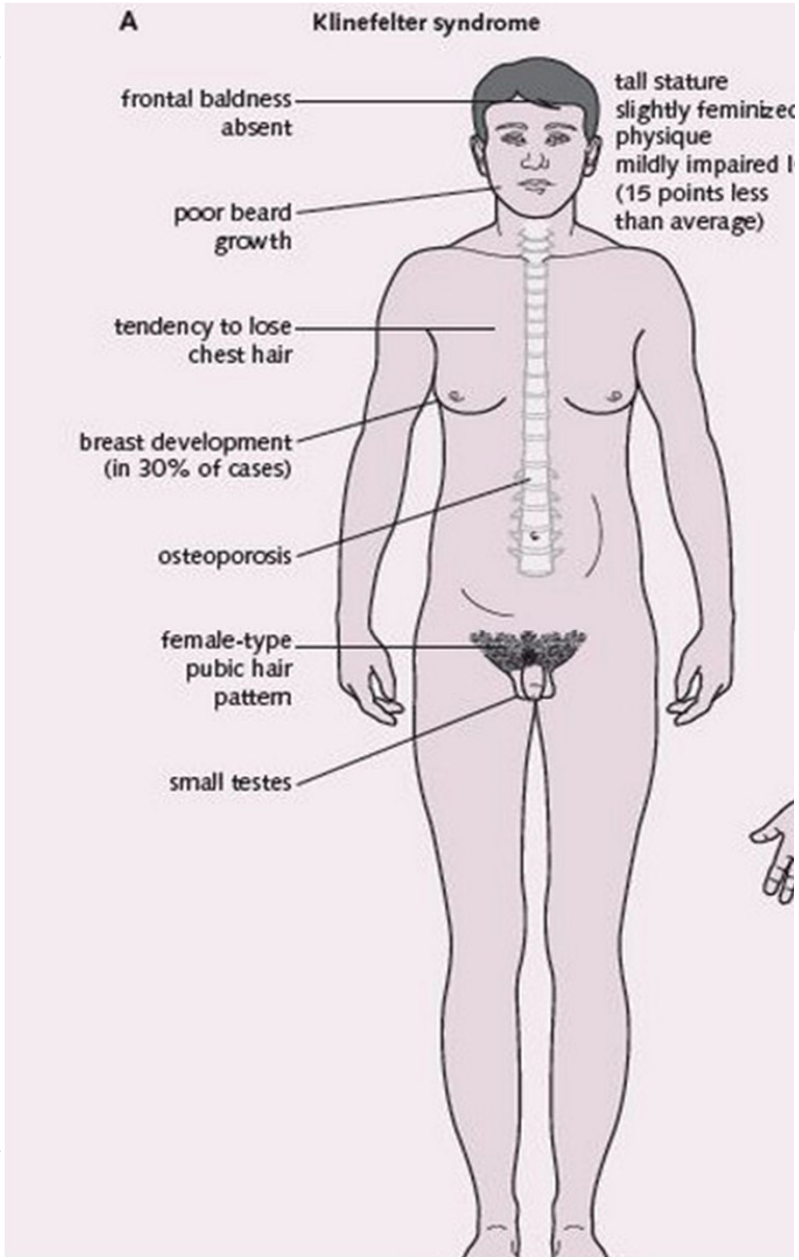
Sex Determination

- You can determine female or male with a Punnett square
- How many children will be female?
- How many children will be male?
- So you ALWAYS have a 50/50 chance right?….
  - What about when it doesn't go "right"?

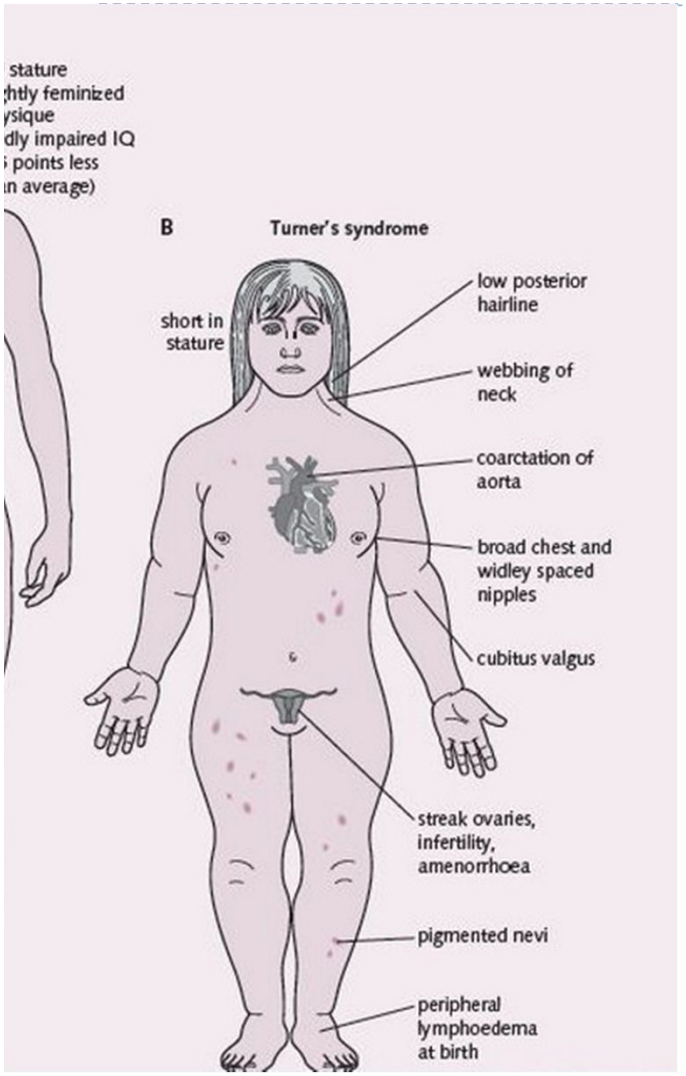


Sex Determination

- Sometimes the X and Y don't group together like expected:
  - XXY – Klinefelter syndrome
    - Display as male
    - Infertile
    - Weak muscles, very tall, poor coordination, breast growth
    - Usually only realized once they hit puberty
    - No effect on intelligence
    - No telling when it might happen
    - Can live a normal lifespan
    - Thought to be what Abraham Lincoln had!



Sex Determination

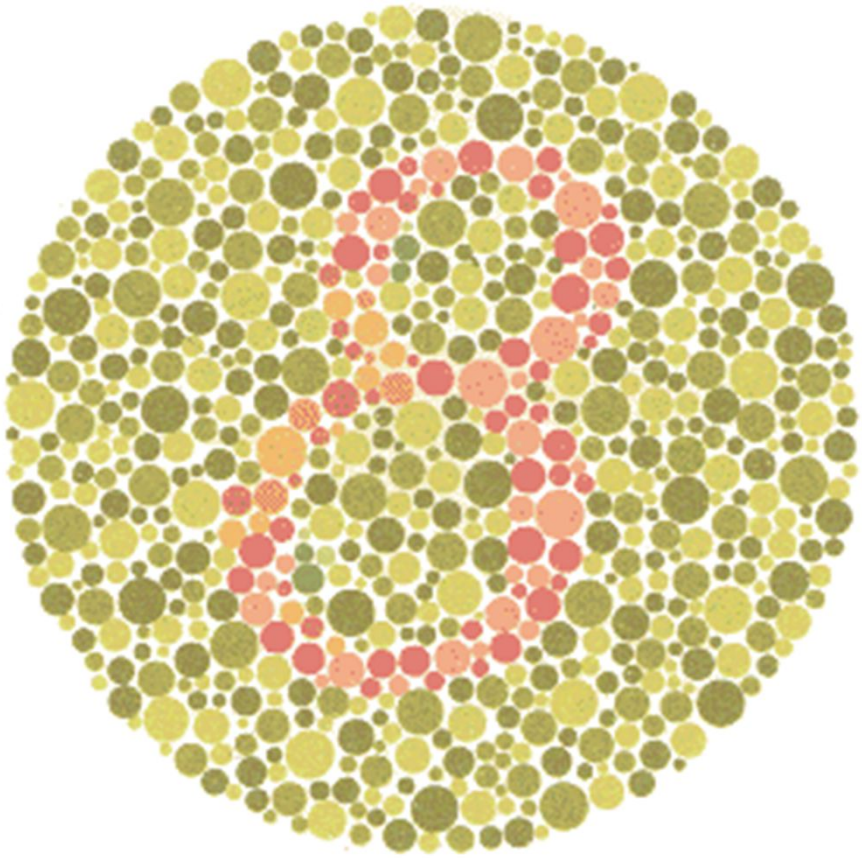


- X – Turner's Syndrome
  - Partly or completely missing the second X chromosome
  - Display as female
  - Short, webbed neck, infertile, broad chest
  - Can suffer from heart disease, thyroid disorders, and others
  - Most have normal intelligence
  - Cannot be determined when it will happen
  - Can have a normal lifespan depending on heart issues

Sex Linked Traits

- Some traits are controlled by genes on the X chromosome
- Because males only have ONE X chromosome – these traits effect them more than women
  - Women can hide the recessive with the other X – men can't
- Example: Red-green color blindness
  - Recessive X linked trait
  - About 8% of males in the US have this type

Sex Linked Traits



- Look at the picture to the left – what number do you see?
- A person with RG color blindness will see not see the 8
- To determine color blindness – a Punnett square can be used

Sex Linked Traits

B = normal

b = red green color blind

	X_B	Y
X_B	X_BX_B	X_BY
X_b	X_BX_b	X_bY

How many females? Males? Normal? Color blind?