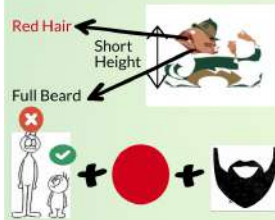




# COULD WE EVOLVE INTO LEPRECHAUNS?

Cailey Brogan and Will Connolly

What makes a Leprechaun a Leprechaun?



- Recipe for a leprechaun:**
- MC1R mutation red hair
  - Bolivian descent or just short!
  - Not married and no kids
  - Not sexually active

Red hair comes from a mutation in the MC1R gene. The MC1R gene is found on chromosome 16

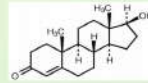
16



Hundreds of genes determine our height. The shortest people live in Bolivia.

Average height in Bolivia is... **4' 11"**

Testosterone triggers beard growth. Higher testosterone is linked with people who do not have kids, are not married, and are not sexually active.



A 2014 study found these socio-demographic effects on testosterone levels

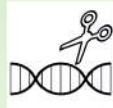
## EVOLUTIONARY FORCES



**Natural Selection** - This force allows for the genotypes of fit individuals to be passed down. Natural selection can occur through directional selection, stabilizing selection, or disruptive selection.

**Mutation** - Mutations are changes to DNA that are passed down to the next generation. This is the only evolutionary force that brings about new alleles.

**Genetic Drift** - This force occurs as a result of a random change that alters allele frequencies; Bottleneck effect and Founder effect are two common types of genetic drift.



### Possibility 1

**Red Hair:** Natural Selection (Selection on phenotype)

- Everyone moves north to avoid global warming; red hair becomes advantageous (for warmth; absorbing sunlight). Following Mendelian inheritance patterns, the frequency of red heads slowly increases.

**Short Height:** Natural Selection (Selection on Complex Trait - Disruptive Selection)

- Drones become more and more prevalent, taller people are being hit in the head and killed by low-flying drones. Average height shifts to a lower height.

**Raised Testosterone:** Genetic Drift (Bottleneck)

- A natural disaster wipes out the majority of the earth's land population, leaving hundreds of single's cruises designed specifically for abstinent singles.

### Possibility 2

**Raised Testosterone:** Mutation

- Humans develop a mutation that causes males to die after reproduction.\*\*

**Red Hair:** Genetic Drift (Bottleneck)

- Almost all human life is destroyed by a fast-acting virus. The virus does not hit the town of Crosshaven in County Cork, Ireland. Here, Ireland's Annual RedHead Convention is being held, and thousands of red heads survive leading to a massive increase in the frequency of red hair

**Short Height:** Genetic Drift (Bottleneck)

- In the same town, the Bolivian national soccer team (and all of their fans) are practicing for an upcoming game against Ireland. They are all spared from the virus, and the average height of humans immediately drops several inches (if not a foot)

\*\* Kaluta (a marsupial in Australia), males mate as many times in one day and then die. "During these brief, frenzied breeding seasons, male kalutas mate with several females — for up to 14 hours at a time — until they succumb to exhaustion and die." In humans, this new mutation causes similar behavior.



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