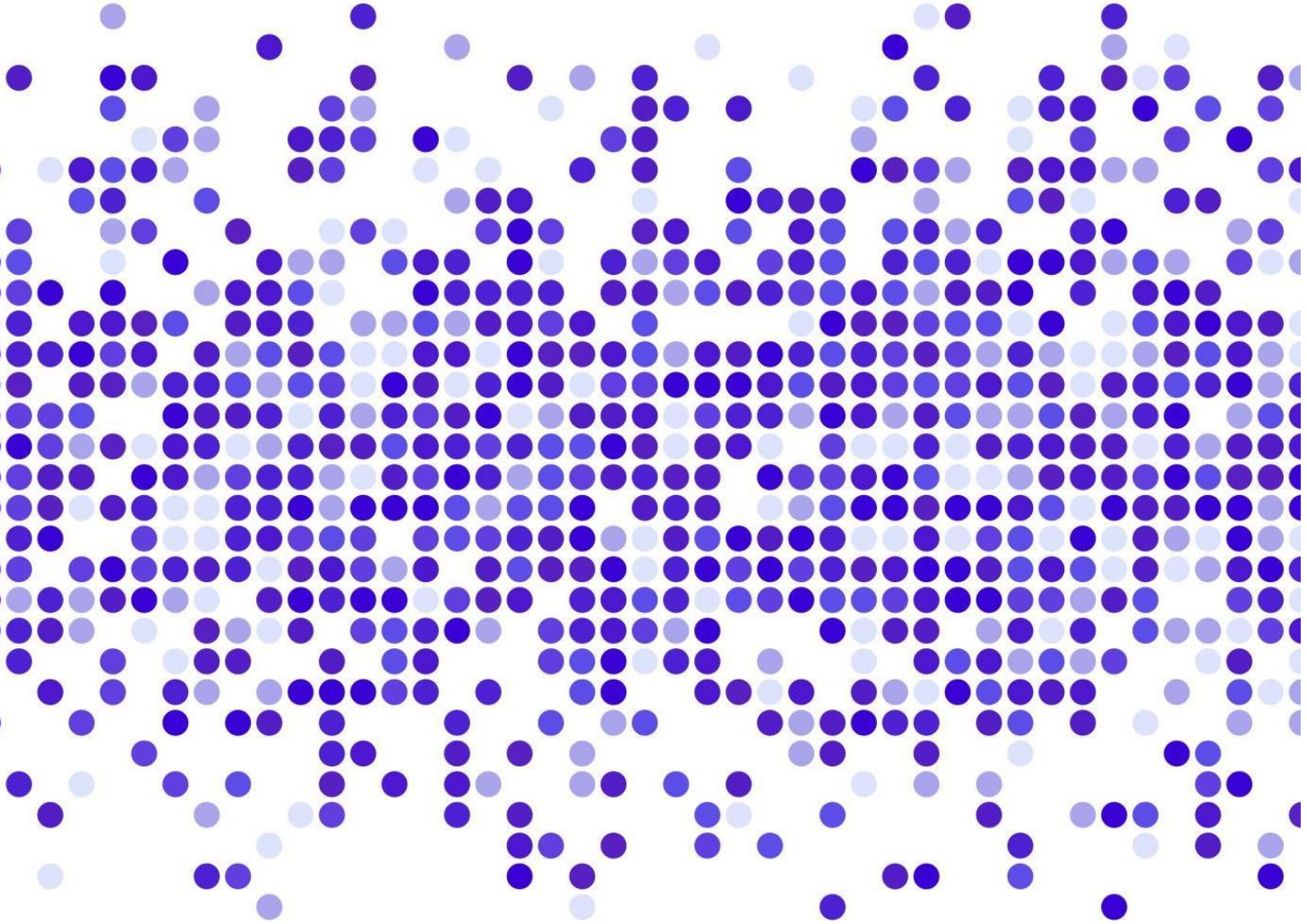


Sexual Reproductive Technologies

Artificial Insemination

- A 200-year-old technology. This is where sperm cells are collected from a male and injected into a female for fertilization.
- It is mainly used to breed farm animals or help couples when a person has a mutation that renders them infertile.
- The sperm can come from the partner or a donor.

In Vitro Fertilization – Petri Dish Babies

- A technology used to treat specific infertility problems.
  - **Sperm and egg cells are collected from the couple and combined in a petri dish.**
  - **The embryos are implanted in the uterus to begin development.**
- The process has been used to allow many couples to have families, but the success rate is low (and gets lower with age) and the hormone given to the female has unpleasant side effects (nausea, headache…).

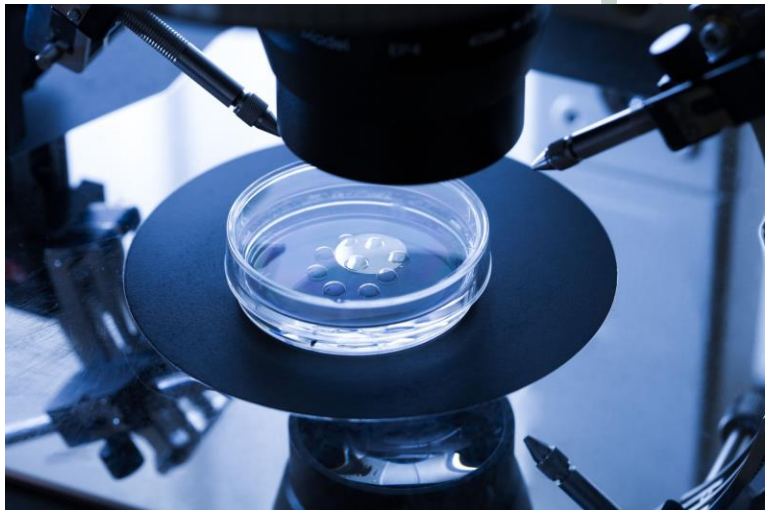


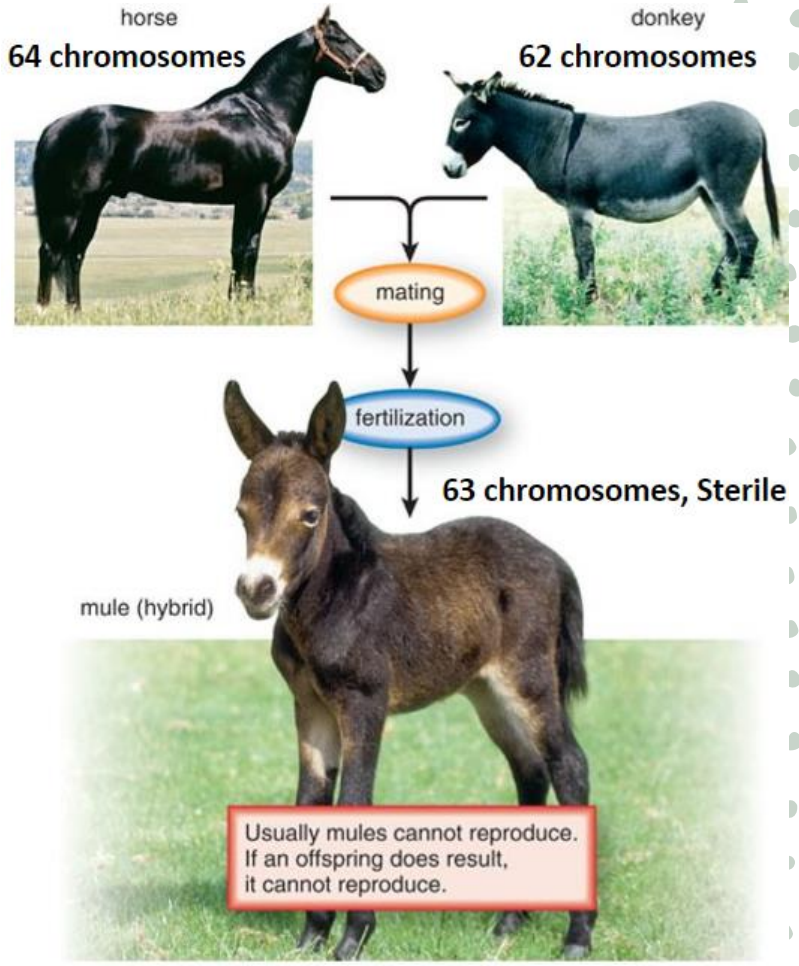
Figure 6.42 Robbie Reid and his mother

Other Technologies

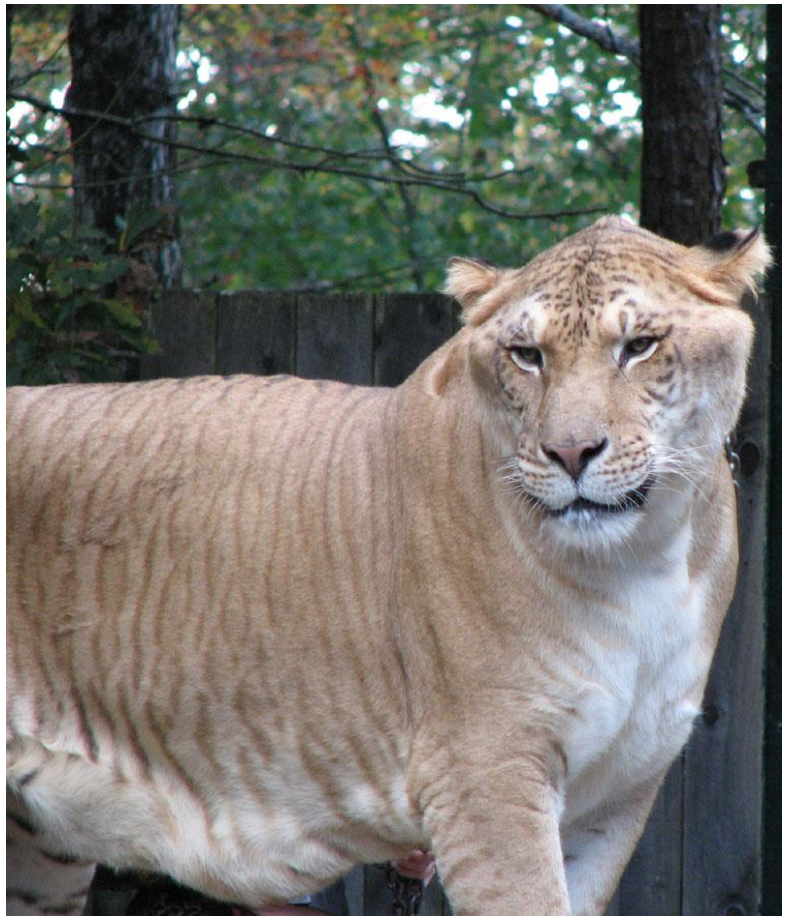
- Gamete IntraFallopian Transfer (GIFT)
  - Summary: Takes eggs cells from female, mixes them with sperm cells, and places the fertilized egg back into the same women, bypassing the reason they cannot create an embryo
- Intracytoplasmic Sperm Injection (ICSI)
  - Summary: Uses technology to artificially perform fertilization when the sperm cell cannot fertilize an egg cell. The resulting zygote is place in the female. This is usually 25% successful.

Hybrid Species

- Very similar species of animals can utilize sexual reproduction to create hybrid offspring with characteristics from both parental species.
- The result is usually very unpredictable, and the hybrid species may be **infertile/ sterile**, which means **it cannot make gametes** and therefore offspring.
- A Horse (64 chromosomes) can mate with a Donkey (61 Chromosomes) to produce a Mule (63 chromosomes). However, because the chromosomes do not match well and the horse gave the mule an extra, lone chromosome, meiosis cannot be performed correctly. This means that the mule is sterile.
- Humans have bred mules and other hybrid species as they can have useful applications



Hybrid Species



Liger

Groller Bear

Beefalo

Ethical Concerns

- Low success rate for some of the technologies
- High rate of birth defects
- Often times more embryos are created than needed
  - Additional embryos can be frozen alive for later use. Many times, the extra embryos are used in stem cell research.
  - What should be done with the spares?
- Should people know if they were created by artificial technology? How would this information affect them?
- If a surrogate mother or donor parent is used, who is the biological parent, and who is the child's guardian?