

Dana Zzyym and Intersex

by

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Part I – The Sex Spectrum

Dana Zzyym (they/them, pronounced “Zimm”) is a Navy veteran and intersex activist who realized after many years that they should be classified as intersex, rather than the endosex male or female (Figure 1). When it came time for Dana to apply for a new passport in 2014, their application was rejected because the passport office would not let them classify as intersex, saying that they had to choose either male or female. This case study will share with you their journey of determining they were intersex and what Dana went through to discover their identity.

Endosex refers to the people that have innate sex characteristics that fall within the typical male or female sex binary, as this is what we see most commonly across individuals. Due to biological variability, individuals do not always fall within what is considered “typical.” Intersex refers to those individuals whose biological sex characteristics do not fall within the endosex duality. Intersex can manifest in a variety of ways, in the same way that sex can be defined by multiple parts of the body. Chromosomes, internal gonads, hormone production, and genitalia are some of the various biological characteristics that can determine one’s sex. Typically, sex is assigned at birth based on genitalia shape, so intersex may be overlooked if it does not manifest in the external norm.

As a child, Dana had trouble fitting in with other boys. They were assigned male at birth, but they felt like they never fit in. When it was time to shower after gym class, the other boys would make fun of their genitalia and say it was too small. Even their older brothers would play sports with them to try and help them fit in, since they would not throw or kick the ball as far as the other boys. There was also pain that was present while urinating that progressed as they got older. These questions about who they were followed Dana throughout their life, during their Navy career and throughout college. When they started exploring their true identity, they revisited the intense pain and slightly ambiguous genitalia, as well as returned to the vague childhood memories of being in the hospital for multiple surgeries.

Use the information in Table 1 to answer Questions 1–7 (see next page).



Figure 1. Dana Zzyym speaks at a Columbia Law School panel on intersex issues. Credit: Randolfe Wicker, CC BY 3.0.

Table 1. Comparison of sexes across various characteristics.

Sex	Sex Chromosomes and SRY Gene	# of Chromosomes on Karyotype	Internal Ducts that Develop	Gonads	Genitalia
Normative or typical male	XY SRY present on Y	46	Wolffian	Testes	Penis/Scrotum
Normative or typical female	XX SRY absent, no Y	46	Mullerian	Ovaries	Clitoris/Labia
Intersex spectrum	XXY, X0, XY*, XX*, XXX, XYY *SRY could be absent in XY, SRY could be present in XX	45–47	Various Both present, or either one or the other.	Various A combination of both.	Various Masculinized clitoris and labia, or feminized penis and scrotum.

Questions

- Using the table, define intersex. Include four biological features in your definition.
- How many total chromosomes are possible in a karyotype of an intersex individual?
- How many sex chromosomes are possible in a karyotype of an intersex individual?
- How many total chromosomes would you expect in a karyotype of an individual that lacked sex chromosomes?
- Is it possible for a zygote (a fertilized egg) to be viable (survive) with a single X as the only sex chromosome? What is the karyotype? Explain your reasoning. (*Hint*: see MedlinePlus at <https://medlineplus.gov/genetics/chromosome/x>.)
- Is it possible for a zygote to be viable with a single Y as the only sex chromosome? What is the karyotype? Explain your reasoning. (*Hint*: see MedlinePlus at <https://medlineplus.gov/genetics/chromosome/x>.)
- Is it possible for a zygote to be viable with no sex chromosomes? What is the karyotype? Explain your reasoning. (*Hint*: see MedlinePlus at <https://medlineplus.gov/genetics/chromosome/x>.)

Part II – Making Gametes

Questions

8. Fill in the following schematic by filling in the blanks and drawing the X and Y chromosomes to review the replication process and help you answer the additional questions below.

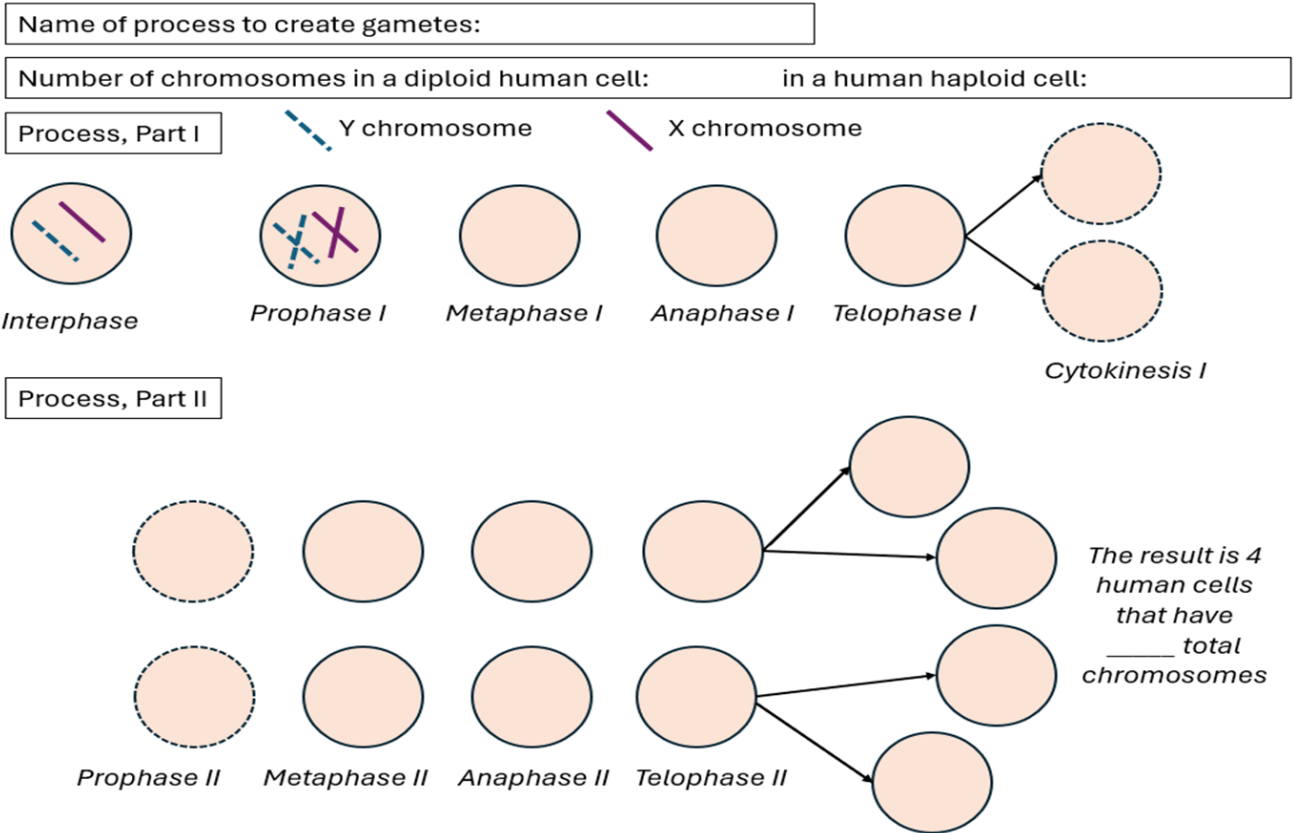


Figure 2. Replication process.

9. Describe what happens in Metaphase I. How many chromosomes are present in each cell?
10. Describe what happens in Telophase II. How many chromosomes are present in the cell (before cytokinesis)?
11. Typically, oocytes have _____ sex chromosome(s) of the _____ type. Whereas typically sperm have _____ sex chromosome(s) of the _____ type.
12. Using what you learned in Part I and in the questions above, how could intersex genotypes come about at the chromosomal level? Describe two different ways.

Part III – Hermaphroditism

In relation to intersex, hermaphroditism is only a subset of the intersex spectrum. Hermaphroditism was formerly the term used to describe intersex in humans, but in present time the definition has become more specific. True hermaphroditism is a condition in which a person has ovary and testis tissues that are functional. These tissues can either exist at the same time or develop at different times in an organism's life span. Sequential hermaphroditism occurs when one gonadal tissue type develops during one stage, and the other gonadal tissue type develops during another life stage. Simultaneous hermaphroditism occurs when an organism has both types of gonadal tissue functioning at the same time. Due to the biological variability of hermaphroditism, this term is used to describe the biological sexes of multiple different organisms.

Many plants can successfully breed with themselves because they have working female and male reproductive structures, making them simultaneous hermaphrodites. Flowering plants, such as roses, lilies, and daffodils, do not have to rely on pollinators for fertilization since they have both male and female organs. However, pollinators still play a vital role in spreading gametes across individual flowering plants. A large variety of fish species develop gonads and gametes of the opposite sex to fill a biological role, making these species sequential hermaphrodites. For example, blue-headed wrasses form harems of multiple females and one male around one patch of a coral reef. When the one male is eaten, the largest female of the group begins to change their behavior, interacting more with females and developing behaviorally male traits. On the inside, the reproductive system of that female regresses and starts to redevelop with male organs that produce sperm. This transition allows for the harem to continue existing, since a female has transitioned to male and fills that biological role. Organisms have evolved various characteristics to ensure that their genes will be passed onto the next generation, increasing their biological fitness.

Questions

13. What are some advantages and disadvantages to being a self-breeding, hermaphroditic organism?

14. Define true hermaphroditism in humans. How is this similar and different to other hermaphroditic organisms?

Part IV – Biological Variety of Intersex

There are all kinds of ways intersex can biologically exist. Fill out Table 2 below regarding the various differences.

Table 2. Comparison of types of intersex.

<i>Intersex Type</i>	<i>Karyotype (Number & Config)</i>	<i>Gonads</i>	<i>Genitalia & Secondary Sex Characteristics</i>	<i>Sex Hormones Produced</i>	<i>Sex Typically Assigned at Birth</i>
Klinefelter syndrome					
Turner syndrome					
Congenital adrenal hyperplasia (CAH)					
Complete androgen insensitivity syndrome (AIS)					
Swyer syndrome					
True hermaphroditism					

Questions

- Go back to Dana’s story above and list what we know regarding their intersex characteristics.
- Highlight or circle the characteristics within the table that fit into Dana’s story. Which conditions follow most closely to what Dana may experience?
- The information in Dana’s story is vague and incomplete. If you were a medical professional trying to understand Dana’s condition, what additional information would be useful to narrow down a diagnosis? Why?

Part V – Intersex Within Society

In 2009, a visit to the urologist confirmed to Dana that they were born without a clear physiological sex. They were in fact born with ambiguous genitalia. For cases like this, parents are given the choice as to which sex their child will conform to. In Dana's case, their parents chose for them to be male. Those hazy memories of surgeries in hospitals as a young child were genital reconstruction surgeries to make Dana look more conventionally male. Considering the consistent ambiguity of their genitals and chronic pain throughout their life, the surgeries failed. There is no other public information on Dana's genetics.

After their discovery, Dana fully embraced their intersex identity and went to work on spreading awareness of intersex and its role in society. In 2012, they were able to erase their male gender from their birth certificate. As associate director of the Intersex Campaign for Equality, they were invited to a talk in Mexico, for which they needed an updated passport. As we know, this application was rejected since Dana would not "conform to the binary." Instead of conforming, Dana filed a lawsuit against Colorado's state department stating that "Many people are able to get their passports with their biological sex, and I should be allowed to do the same thing." The defense argued that adding a third option could lead to more security risks when issuing driver's licenses and passports.

After six years of appealing their case, going through multiple federal courts and two different presidential administrations, Dana finally got their wish. As of late 2021, Dana is the first person in the United States to have a passport that has "X" labeled as their sex, a milestone for intersex individuals throughout the country. About 1.7% of the world population identifies as intersex, which equates to over 130 million individuals. Dana has done incredible work to make these intersex individuals visible in society and strives to do more.

Questions

19. Name three states that allow "X" to be on a driver's license.

20. Name three states that do not allow for amending designations on official documents.



On January 20, 2025, President Donald Trump signed an executive order stating that only two sexes would be recognized on legal documentation and that intersex individuals like Dana cannot use "X" to identify their sex on passports, birth certificates, and other identifying documentation. Individuals however are still permitted to use "X" on a driver's license, as those are dependent on state legislation.

Part VI – Sex, Gender, and Societal Conformity

Question

21. What is the difference between sex and gender? Use intersex in your explanation.



Many intersex individuals undergo either sex reassignment surgery or other gender affirming care as their way of seeking comfort in their identity. Sex reassignment surgery is a type of gender affirming care where someone alters their physical sexual characteristics to align with their gender identity. Gender affirming care is a broader term that describes any kind of treatment that aligns the individual with their gender identity. This can include hormone therapy, surgery, or any change that affirms their identity.

Watch the following trailer for a documentary on intersex policy in Texas:

- Focus Features. (2023). “Every Body: Official Trailer.” [Video]. Running time: 2:36 min. YouTube. <<https://youtu.be/SoNvk5N-MKo>>

Questions

22. What could be some pros and cons of juvenile sex reassignment surgery (when born with ambiguous genitalia)?

23. Should intersex surgery be practiced on young children? Why or why not? Base your arguments on the following articles:

- Creighton, S. (2001). Surgery for intersex. *Journal of the Royal Society of Medicine* 94(5): 218–20. <<https://doi.org/10.1177/014107680109400505>>
- Behrens, K. (2020). A principled ethical approach to intersex paediatric surgeries. *BMC Medical Ethics* 21, 108. <<https://doi.org/10.1186/s12910-020-00550-x>>