

Omegaverse Genetics - One Theory

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Omegaverse Genetics - One Theory

by [Diana Williams \(dkwilliams\)](#)

Summary

A pseudo-scientific look at the genetic possibilities for the Omegaverse.

Notes

After reading Azriona's post on [Omegaverse Genetics](#), and the comments others made, I was fascinated with the possibilities. Coincidentally, my daughter was studying genetics in Biology, so after she refreshed my memory on the concept, I sat down and worked out a couple of scenarios (genetically speaking) that might explain some of the more common population structures I've seen in Omegaverse stories. (This may have something to do with an Omegaverse story I'm plotting for writing in the distant future.)

Thanks to Azriona and everyone who commented on her post for kick-starting my brain on this. Some studies have shown that obsessing over Punnett squares can cause loss of hair and/or sanity. Your mileage may vary. Comments/suggestions are welcome.

EDIT: Added more variants, chapters, and notes

See the end of the work for [more notes](#)

Science

Chapter Notes

See the end of the chapter for [notes](#)

They Blinded Me With Science!

Or what happens when you combine tutoring your daughter in Biology with reading too much Fanfiction...

Basic Premise

That presentation (fertility) in the Omegaverse is determined by a gene or a cluster of linked genes on a pair of chromosomes. This gene has three versions, or alleles: A, B, and O. The genes are not sex-linked. Each person has a pair of genes, one inherited from each parent, and the combination determines their genotype for presentation. There are six possible genotypes: AA, AO, AB or BA, BB, OB, and OO. Depending on the Variation (see below), one or more of these alleles can be dominant or recessive.

Allele Inheritance

Each parent has two possible alleles of the presentation gene to pass on, as well as two sex-determining chromosomes. For example, Alpha males can pass on A and o presentation genes, and X and Y sex chromosomes. Since the presentation gene is not sex-linked, there are four combinations possible. Assuming that the Alpha male is of the Ao genotype, he can pass on A + X, A + Y, o + X, and o + Y.

Below is a Punnett square for a AA male and an oo female, as a simple example:

Alpha Male w/ omega Female (AA/oo)												
	Ax	Ay	Ax	Ay		oo Males	0	0%		Alphas	16	100%
ox	Aoxx	Aoxy	Aoxx	Aoxy		oo Females	0	0%		Betas	0	0%
ox	Aoxx	Aoxy	Aoxx	Aoxy		Ao Males	8	50%		omegas	0	0%
ox	Aoxx	Aoxy	Aoxx	Aoxy		Ao Females	8	50%		Males	8	50%
ox	Aoxx	Aoxy	Aoxx	Aoxy						Females	8	50%

As you can see, there are four possible combinations from each parent, with 16 possible combinations for offspring. Since the A allele is Dominant, it will be expressed (2 “o” alleles required for a child to be an Omega). So here, all children will be Alphas, and they have a 50/50 possibility of being male or female.

Looking at a more complicated pairing, for example an Ao male with an oo Male, you get the following:

Alpha Male w/ omega Male (Ao/oo)												
	Ax	Ay	ox	oy		oo Males	4	25%		Alphas	8	50%
ox	A o xx	A o xy	ooxx	ooxy		oo Females	2	13%		Betas	0	0%
oy	Aoxy	Aoyy	ooxy	ooyy		Ao Males	4	25%		omegas	8	50%
ox	A o xx	A o xy	ooxx	ooxy		Ao Females	2	13%		Males	8	50%
oy	Aoxy	Aoyy	ooxy	ooyy		Ao Unsexed	2	13%		Females	4	25%
						oo Unsexed	2	13%		Unsexed	4	25%

Because the A allele is dominant, the Ao parent is still an Alpha; because the o allele is recessive, the other parent has to be of the oo genotype. Their children will have a 50/50 probability of being Alpha or Omega. However, because both parents are male, you have the possibility of offspring with YY sex chromosomes. The probability of a child being male/female/unsexed(YY) is then 50/25/25.

Omegaverse tropes

There are probably as many different variations on the Omegaverse structure as there are writers crafting stories for it. Some of them can/are combined, but some are conflicting and require different genetic explanations. I have attempted to cover all the options I have seen in this list (if you know of more, let me know and I will add them).

- Betas are the majority population
- Betas are the minority population
- Alphas are the dominant population
- Omegas are the second most numerous population (after Alphas)
- Omegas are rare
- Omega males are very rare (smallest part of the population)
- Betas are sterile
- Alpha females can sire children
- Alpha females can bear children
- Alphas and Omegas do not mate within their own presentation
- Alpha females can mate with any other gender/presentation as they both sire & bear children
- Alpha females are as rare as Omega males

Exploration of the Variations

Originally, I thought I'd have to come up with a dozen variations to cover all of the tropes in some way, but these ~~three~~ five worked very well. I have included the overall statistics for each but if you are interested in seeing the detailed Punnett squares as well as the statistics for individual Sire groups (Alpha males, Alpha females, Beta males), a link is provided to the

PDF version of the tables. Additional tinkering can be done if you want to a certain result – email me and I will be glad to either send you the spreadsheets for tinkering or make whatever manipulation you want and email you the results.

The main differences in the variations are 1) whether or not Alpha females can bear children as well as sire them (i.e., do they have a working uterus as well as a penis), and 2) whether or not Betas (all or part of the population) are sterile. Because this part focuses on the science side of the question, cultural opinions aren't factored in - for example, Alpha males and females may be capable of mating but there might be cultural taboos that make it unlikely that they do. In that case, you would probably have to use the Variation Two for most of your population except for that area where Alpha matings are common.

The Total Progeny number is for statistical purposes and refers to the total number of unique combinations x the total possible offspring variations. In other words, on an isolated island where there is exactly one of each possible type of pairing, and each pairing has exactly 1 child from each possible gene pairing (or 16 children), this number equals the statistical offspring and their gender+presentation. So, for example, in Variation 3 where all Betas are sterile, the combinations for Alpha men and women are AAxOO, AAxOB, AOxOO, AOxOB times 2 bearing genders (i.e, AAmalexOOfemale, AAmalexOOmale, etc) times possible offspring (16) = 4 x 2 x 16 per Alpha gender = 128 children each for Alpha male or Alpha female combinations or 256 unique combinations. Betas are slightly different as only the males are able to sire offspring, but they can almost always mate with Beta females unlike Alpha males who only in one variation mate with Alpha females.

Variation One

[Link to full document](#)

All genders/presentations are fertile and capable of either siring or bearing children. Alpha females are capable of BOTH siring and bearing children, allowing them progeny with all other presentations/genders. This variation allows for mating among same presentations except for Omegas (both genders of Omegas can only bear children). This variation is geared to make Betas the majority and Omegas the minority, with Alphas somewhere in between. So the B allele is dominant and O is recessive, thus any genotype with a "B" allele will result in a Beta, while it takes two "O" alleles for an Omega.

Alpha genotypes: AA, Ao

Beta genotypes: BB, BA, Bo

Omega genotypes: oo

Sires	Progeny		NUMBER	PERCENT
44 Unique	704	Alphas	308	43.8
		Betas	324	46
		Omegas	78	11.1
		A-Female	184	26.1
		O-Male	28	4
		O-Female	48	6.8
		Double-Y	24	3.4

Omegaverses where this would work:

Betas the largest part of the population (46% of progeny)

Alphas are a large part of the population (44%)

Omegas are rare (11%)

Omega men are very rare (4%)

Alpha women are uncommon (26%)

Alpha women can both bear and sire children

Omegaverses where this would not work:

Betas are sterile

Alphas don't pair with each other

Alpha women are as rare as Omega men

Variation Two

[Link to full document](#)

In this variation, all genders are fertile but Alpha women can only sire children, not bear them. Thus Betas are the only ones who can successfully mate within their presentation and Omegas are the only ones who can mate with either gender (Alpha males or females, Beta males). As with variation One, B is dominant and O is recessive.

Alpha genotypes: AA, Ao

Beta genotypes: BB, BA, Bo

Omega genotypes: oo

Sires	Progeny		NUMBER	PERCENT
32 Unique	512	Alphas	176	34.4
		Betas	276	53.9
		Omegas	60	11.7
		A-Female	90	17.6
		O-Male	24	4.7
		O-Female	28	5.5
		Double-Y	14	2.7

Omegaverses where this would work:

Betas are the largest part of the population (54% of progeny)

Omegas are rare (12%)

Omega men are very rare (5%)

Alpha women are rare (18%)

Alpha women can sire children but not bear them

Alphas don't pair with each other

Alpha women are as rare as Omega men

Omegaverses where this would not work:

Betas are sterile

Alphas are the largest part of the population (34%)

Variation Three

[Link to full document](#)

In this variation, Betas are sterile. None of the alleles are dominant.

Alpha genotypes are: AA, AO

Beta genotypes are: BB, BA

Omega genotypes are: OO, Ob

Sires	Progeny		NUMBER	PERCENT
16 Unique	256	Alphas	144	56.3
		Betas	48	18.8
		Omegas	64	25
		A-Female	86	33.6
		O-Male	28	10.9
		O-Female	36	14.1
		Double-Y	16	6.3

Omegaverses where this would work:

Alphas are the largest part of the population (56%)

Betas are sterile

There are more Omeas than Betas (25%)

Omega men are rarer than women (11% to 14%)

Alpha women can sire children but not bear them

Alphas don't pair with each other

Omegaverses where this would not work:

Omeas are rare (25%)

Beta the largest part of the population (19%)
Alpha women are rare (34%)

Variation Four

[Link to full document](#)

In this variation, only BB Betas are sterile (BA and BO combinations can have children, either easily or with hormone therapy), and none of the alleles are dominant.

Alpha genotypes are: AA, AO

Non-sterile Beta genotypes are: BA, BO

Sterile Beta genotypes are: BB

Omega genotypes are: OO

Sires	Progeny		NUMBER	PERCENT
23Unique	368	Alphas	176	47.8
		Betas-NS	120	32.6
		Betas-Sterile	12	3.3
		Omegas	60	16.3
		A-Female	90	24.5
		O-Male	24	6.5
		O-Female	28	7.6
		Double-Y	16	4.3

Omegaverses where this would work:

Alphas are the largest part of the population (48%)

Omegas are rare (16%)

Alpha women can sire children but not bear them

Alphas don't pair with each other

Omegaverses where this would not work:

Beta the largest part of the population (36%)

There are more Omegas than Betas (16%)

Omegaverses where this would sort of work

Betas are sterile (3% of them) (a low percent are sterile - but also Beta sires are reduced by 25% from Variant 2)

Alpha women are rare (24%) (they aren't huge but a quarter of births)

Omega men are rarer than women (6.5% to 7.6%) (they are almost even but slightly less men)

Variation Five

[Link to full document](#)

In this variation, only BBs are considered Betas and they are completely sterile, so that ABs are now Alphas and OBs are Omegas. This makes Betas a small percent of the population and could possibly make them extinct as a genotype.

Alpha genotypes are: AA, AO, AB

Sterile Beta genotypes are: BB

Omega genotypes are: OO, OB

Sires	Progeny		NUMBER	PERCENT
24 Unique	384	Alphas	256	66.7
		Betas	16	4.2
		Omegas	112	29.2
		A-Female	148	38.5
		O-Male	42	10.9
		O-Female	63	16.4
		Double-Y	24	6.3

Omegaverses where this would work:

Alphas are the largest part of the population (67%)

Omegas are fairly rare (30%)

Omega men are rarer than women (11% to 16%) There are more Omegas than Betas Alpha women can sire children but not bear them

Alphas don't pair with each other

Omegaverses where this would not work:

Beta the largest part of the population (4%)

Betas are sterile

Alpha women are rare (38%)

Conclusion of the Science Presentation

Remarkably enough, there is a possible scientific explanation for most of the tropes seen in the Omegaverse. The next section speculates on what effect the B allele might have, depending on the variation we are looking at.

If you don't want to go to all the trouble of putting together a Punnett Square and figuring out the probabilities, [this site](#) has a customizable square for you to enter your traits and any other options (like dominance) and produces results with colors and percents.

Speculations

Chapter Summary

Moving away from the scientific side of things to speculate on the "whys" and "hows".

Consider the Lowly Beta

Betas don't get much respect in the Omegaverse world. Either they are sterile or they have low reproduction rates, and they rarely get to have Heat related fun. So let's consider the biology behind that (yeah, I know how to take the joy out of things).

In a universe where Alphas and Omegas reside, they have obviously evolved as superior breeding organisms. After all, as Darwin said, it's all about the survival and **reproduction** of the species. It doesn't matter if you are the fastest or smartest if you don't pass those genes into the gene pool. So Alphas and Omegas have evolved through natural selection to be superior reproductive partners, but have not completely replaced Betas. (Hell, you need someone around to do the laundry and stock the fridges for the sex-crazed breeders, not to mention keeping the Government/Universe rolling along.)

So, taking the distribution charts from Part 1, we can focus a little more on those with B alleles and see what makes them less desirable, even in worlds where the B is the dominant allele. Or, more precisely, speculate on what the combinations of alleles might do.

It is highly likely that the A and O alleles have evolved to ensure success in either siring or conceiving young. As it is unlikely that such a complicated biological process would depend on just one gene, there are probably other genes linked to these specific alleles that, for example, allow those with A alleles to generate more sperm, or to develop larger frames (to better protect their pregnant mate), or even to better generate pheromones to attract potential partners. Conversely, those with O alleles would develop the biological support structure to better conceive and carry young, such as a smaller frame (to better conserve energy taken in as food), more eggs, a milk delivery system, and so on. Combining like alleles makes the person have more of that characteristic, while combining different alleles modifies the characteristics, for better or worse. For example, looking at each combination you might get something like this (depending on the world building)

AA- Alpha with a larger, bulkier frame, more aggression, better breeder; in worlds where Omegas are more intelligent, the AA male is more brute than brain.

AO - Alpha with a more slender or shorter frame, less aggressive, possibly a better leader than an AA, or more intelligent, to offset lower ability to sire

AB - In worlds where the B allele is not dominant and the AB combination results in an Alpha instead of a BA Beta, an AB Alpha might be more average in build and aggression. The presence of the B allele could either severely impact their ability to sire children, or could be negated by the A allele, but one would expect that they would have average reproductive abilities. So an Omega paired with an AB Alpha who fails to conceive might want to point the finger at their partner.

OO - Omega with smaller (in general) size or frame, less assertive, more nurturing.

OB - In worlds where the B allele is not dominant and the OB combination results in an Omega instead of a BO Beta, an OB Omega might be larger than the typical Omega, more average in build and slightly more aggressive. The presence of the B allele could either severely impact their ability to conceive and/or carry children to term, or it might not have any affect at all. In worlds where Omegas don't get pregnant at the first sign of Heat (and where Betas are not dominant), having the B allele could be one reason.

BA - Betas with a medium build and/or frame, possibly more dominant than an AO male but less than an AA, however without the dominant posturing. Possibly the kind of person you'd want running the Government or covering your six in a firefight, as they are less likely to run off to Breed an Omega. Male BAs in worlds where Betas are not sterile would be more likely to sire offspring. However, a female BA in the same world might be less likely to conceive or to carry children to term.

BO - Betas with a smaller build, closer to an Omega but without the heat. Possibly the kind of person you'd want teaching your children, or running your churches or hospitals. In universes where Omegas are smarter, a BO Beta would be a valuable assistant as they could organize your life without having to take personal time off for Heat. A BO female would be more likely to conceive offspring, although a BO male might be less likely to sire young.

BB - Double betas might be very average, either the drones of the universe or the general Everyman who goes about their jobs without fantasizing about Heats. They could either be truly sterile (new BBs coming from offspring on ABs and/or OBs), or they could be extremely average in reproductive ability. This could allow worlds where some Betas are sterile but Omegas don't have to be constantly pregnant to make up the deficit. (See Variant 4 in Part 1)

Conclusion

Using a combination of the Punnett Squares on the previous page, and a little creative interpretation, you can work out a scientific explanation for whatever kinds of genetic situations you want to inflict upon your characters. Of course, it isn't necessary to sweat over charts and probabilities before writing a story, but if you want to do a little world-building to explain whatever unique spin you want to place on your Omegaverse story, it can certainly be fun to play with!

Speculation Continued

History Repeating Itself

An interesting exercise when world-building is to take historical (or fictional) characters and see where they would fit within your framework. You can do this to help predict the behavior of your characters, or just for fun. Here are a few of my thoughts so far.

Henry II and Eleanore of Aquitaine - A classic example of two Alpha AAs paired together: plenty of fireworks of both the good and bad kind, with both wanting to rule the roost

Petrucchio and Kate from Taming of the Shrew - Another Alpha pairing, trying to sort out who's the boss. However, I think it likely that they are AA and AO respectively, which allows for some wiggle room

Richard III and the Two Princes - First of all, in worlds where presentation is determined by genes instead of by environmental triggers (i.e., the Phrygian Skies series), it is a common trope that you don't know for sure what presentation will be until puberty although there might be some indications and in modern times a test can be done. Some things are obvious: a girl baby with a penis is obviously an Alpha, without she is either a Beta or Omega. Boys with a smaller penis might be Omegas, or the BO combination. So, in a world with Alphageniture (i.e., Alphas inherit), having underage heirs to the throne can be tricky. But let's say there were indications that the younger boy was Omega but that the Woodevilles swore that Edward was an Alpha. The boys go into the Tower to prepare for Edward's coronation - and 12-year-old Edward Presents as an Omega. Richard III was an Alpha, quite obvious since he was a brilliant soldier, so he is declared king and the two princes barred from the succession. When Henry VII takes the throne, he suppresses the information so as to discredit Richard. (Can you tell that I'm a Ricardian?)

Henry VIII, his wives, and his children - in Omegaverse, Henry not only needs a son as his heir, he needs an Alpha son. By his first wife, he has an Omega daughter, which is great for dynastic marriages, but not for succession. His illegitimate offspring are either girls or Omega boys, and in most cases die young or are stillborn (now believed caused by him being Kell positive). In the end, and after several wives (Omega Catherine of Aragon, Alpha Anne Boleyn, Beta Jane Seymore, Beta Anne of Cleves, Omega Catherine Howard, and Beta Katherine Parr), Henry ends up with an unrepresented-yet son (Edward), an Omega daughter (Mary) and an Alpha daughter (Elizabeth). So the Succession was drawn up with possibly-Alpha-Edward first, followed by his half-siblings in birth order, thus making way for non-Alphas to inherit the throne.

Elizabeth I, the Virgin Queen - Supposing a world where Alpha females can bear children, there could also be two variations: Ao Alphas who can easily bear children, and AA Alphas who can only conceive with difficulty and have a greater risk of dying in childbirth. Although they wouldn't have the technology to determine alleles at this time, Elizabeth has

reason to suspect that she falls into the latter category (quite rightly, I believe). Thus her reluctance to marry and give birth, not to mention the Alpha need to be top-dog in the relationship. Her only other option is an Omega spouse, and not Beta Robert Dudley as Betas were still discriminated against among the peerage. (This could be either because 1) all Betas are sterile or 2) only BB Betas are sterile but until modern times it is only known that Betas sometimes produce sterile off-spring.)

Mary, Queen of Scots - an Omega, which certainly explains all the Alpha males flocking around her. Her abduction by Lord Bothwell was obviously Heat-related, resulting in the twins she later miscarried.

Queen Victoria - an Omega, who benefitted from the Act of Settlement of 1701. Albert was an Ao Alpha, which resulted in quite a number of Omega offspring, which is why Victoria was known as "the grandmother of Europe". She also proved that Omegas are just as capable of leadership as Alphas, an important step for Omega-rights.

Act of Settlement of 1701 - determined that the succession to the British throne to 1) exclude Catholics or anyone married to a Catholic, 2) inheritance went first to Alpha males, then Alpha females, then any Omega son or daughter in order of birth. The eligible descendants of deceased elder siblings take precedence over living younger siblings, which is why Victoria inherited the British throne instead of Ernest Augustus. (He inherited the Hanoverian throne because they only allowed inheritance to Alpha males). Recent changes to the Succession have determined that inheritance goes to the first-born regardless of presentation, so it would be possible for a Beta to sit on the throne, unless that universe has only sterile Betas, in which case they are still out of luck. Note that this Settlement only applies to the British throne; other countries and non-royal peerages may have completely different rules for succession, including or excluding Omegas and Betas.

Oscar Wilde - an Omega. The scandal wasn't that his lovers were male, but that they were also Omega males. Same presentation pairings were illegal until recently, except for Beta male/Beta female, and are still discriminated against in some places. (Another exception is Alpha male/Alpha female pairings in Universes where Alpha females can bear children.)

Captain Jack Harkness - Omnisexual hero of television spin-off, Torchwood, Harkness is famous (or infamous) for not having qualms about gender or presentation. An Alpha-male himself, he has hooked up with Alphas, Omega, Betas, males, females, Unpresented, and Unsexed, as well as aliens with no idea of their gender/presentation.

The Doctor - debate has ranged over the Presentation of the Doctor, which appears to change upon regeneration. For example, Nine was an Alpha as was his Companion, Rose. Ten was a Beta, which explains his conflicted emotional relationship with Rose; surprisingly, his human-clone Presented as Omega, which allowed for a happy-ending with Rose. Martha was a Beta and pined over her obvious-match Beta-Ten, Donna an Alpha (which explains her insisting they were NOT together). Amy was an Alpha and Rory a Beta, proof that Betas make excellent Roman Centurions as well as other types of soldiers. Eleven was Unpresented for the longest time, until he fell for Alpha River and Presented as an Omega.

Conclusion - For Now

Well, obviously I've been thinking about this much more than is good for any human being.... I would be interested in reading your comments in regard to my thoughts, or any speculations you might have about other characters/people.

A Three Gender World

Chapter Summary

An alternate idea with Presentation determined by a sex-linked gene

Travelling along a completely different train of thought, the following came up during a discussion about the possibility of omegaverse being linked to gender, specifically the X & Y genes.

In this universe, there are three separate genders - XX (Beta/female), XY (Alpha), and YY (Omegas). Alphas are always males, Betas are always females, and Omegas are hermaphrodites with both male and female sexual characteristics, and they could be either male or female in appearance, depending on your world-building. Offspring would come out as follows:

Alpha and Beta - results are 50% Alpha and 50% Beta:

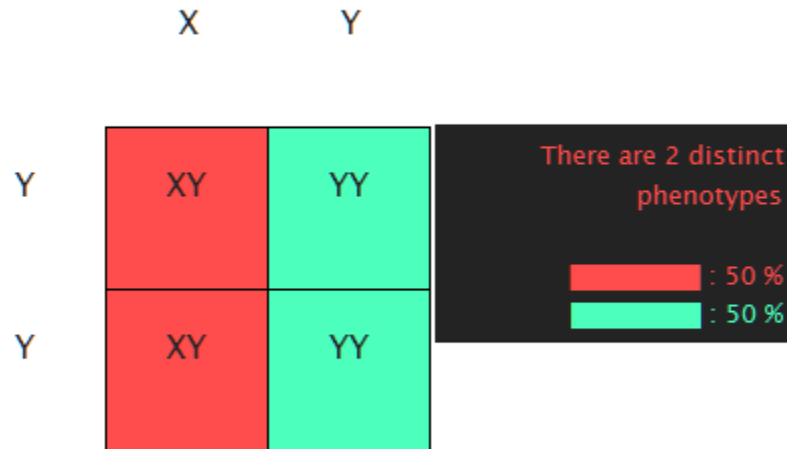
Cross:

XY × XX

	X	Y	
X	XX	YX	There are 2 distinct phenotypes : 50 % : 50 %
X	XX	YX	

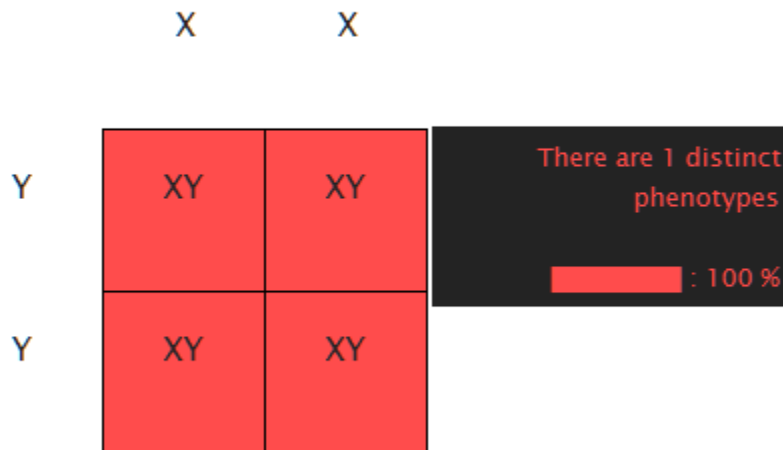
Alpha and Omega - Results are 50% Alpha and 50% Omega:

Cross:
 $XY \times YY$



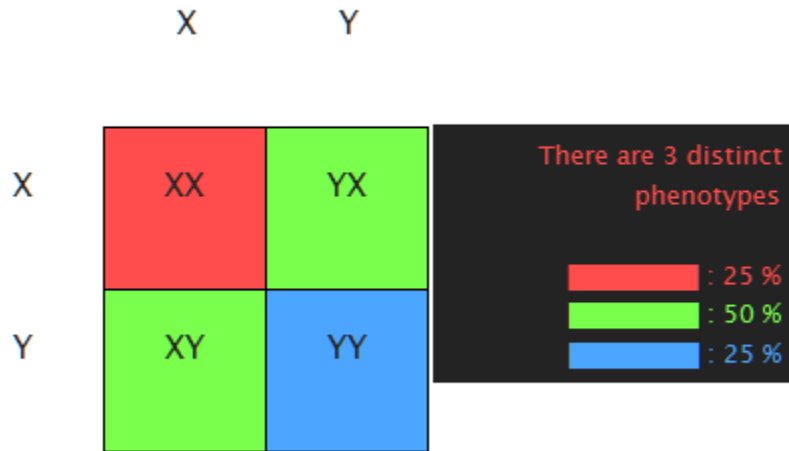
Beta and Omega - Results are 100% Alpha:

Cross:
 $XX \times YY$



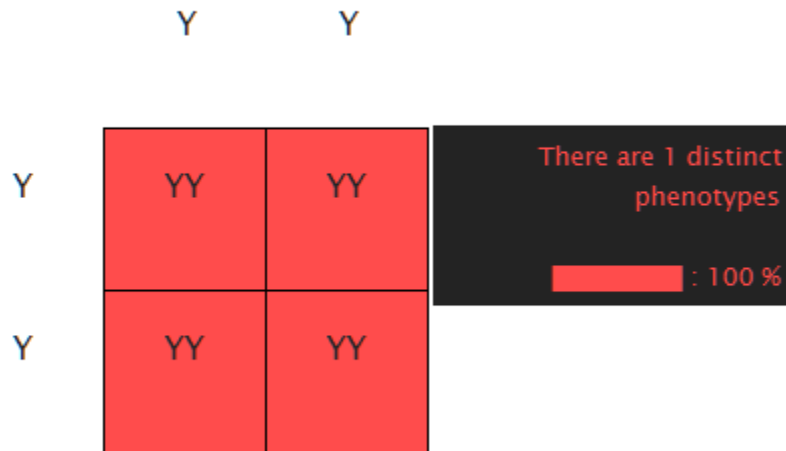
Alpha and Alpha - Results are interesting - 25% either Beta or Omega, and 50% Alpha. However, it would be difficult for two males to have kids with no female contributor.

Cross:
 $XY \times XY$



Two Betas, of course, would only produce Beta children although it would take some artificial meddling for two women to have a baby with no male contributor. Two Omegas would also just produce Omega children, but as they have both male and female gender characteristics, it would be possible for them to have children with no intervention:

Cross:
 $YY \times YY$



An interesting idea, one that is less complicated than the non-sex-linked gene option. It could be fun to play with an Omegaverse built along these lines.

End Notes

If you would like your own copy of the charts, right click on the links and save. Or click here for the [Full Charts for all Variants](#)

Email me if you want a copy of the Excel spreadsheets to play with.

Everyone reading Omegaverse stories should check out [Alphas, Betas, Omegas: A Primer by norabombay](#). Not only is it informative, but it is funny as hell.

Also, you should check out [Omegaverse Genetics by azriona](#) - the meta that inspired my meta. She goes into more detail on the genetics of transmission of traits from parent to child, and has a fascinating theory using two alleles instead of three.

Works inspired by this one

[Restricted Work] by Anonymous

Please [drop by the Archive and comment](#) to let the creator know if you enjoyed their work!