

Guy Meets Girl¹

Jacques-Pierre-Francois LaSpermier grew up in a “guys only” world in the region of G’nad, province of Scrotum, in the teeming twin cities of Testes. He waited there along with the rest of the guy-population (of which there were to be millions upon millions), more of a work in progress really, while his host, Reggie, developed from ‘boy’ to ‘man’. Reggie spent a number of years professing to hate members of the opposite sex. But then something changed. Although he still claimed to his mother that he hated girls, he busied himself in the mirror conducting a daily inventory of his armpit hairs—which for the longest time seemed to number only three or four. Then one day he discovered a very similar hair, dark and curly, *elsewhere*. His voice began to squeak and crack. He wanted only to eat and sleep and to flex his muscles in the mirror, and his mother swore that if she stood quietly next to him she could actually *hear him growing*. Things changed for Reggie—and as his body changed, well...his mind did, too. Suddenly, he wanted to be clean and neat in his appearance. His father asked, “Are you *swimming* in that stuff?” remarking on the smell of aftershave, which for all intents and purposes was truly before shave, since the hairs of Reggie’s chinny-chin-chin did not yet match the thickness and coarseness of the other hairs he had found on his body.

Things went along developing over time until Reggie had revised all of the little-boy beliefs and convictions he had held since age three. He would *not* wait until he was 40 to have sex. He would *not* marry his mom when he grew up. And most importantly, he did *not* hate girls. In fact, he rather liked them a lot. In fact, there was one girl in particular that he really, really rather *loved* a lot: dear Phoebe. And this was a very necessary development for Jacques-Pierre-Francois LaSpermier. Now quite mature himself (well, sort of), he anxiously awaits the opportunity to leave G’nad and Testes far behind him to fulfill his divine purpose.

Act I, Sperm Creation and Delivery²

It seems only right to start at the beginning (and in the grand scheme of things, *THE beginning* is pretty difficult to find, so we’ll start at Jacques-Pierre-Francois’s beginning), in the seminiferous tubules of the testicles. It is here, in a convoluted, dense mass, that we can find the beginning of sperm development. Meiosis, discussed in more detail in assignment one of this unit, is the process by which sperm cells are ultimately created. Figures 1 and 2 illustrate the development of sperm from spermatagonia (literally “sperm egg”, also known as the “primordial germinal cell”) to full-fledged spermatozoa. The process is supported by Sertoli cells, or “nurse cells”, whose functions include assisting in germ cell migration, cleanup of cellular debris, provision of nutrients along the way, and protecting the germ cells from the body’s immune system (these developing cells carry antigens on their surface that are not recognized, so they would otherwise be subject to attack. Having only 23 chromosomes and a very special purpose, they are quite unlike any other body cells).

¹ Starring: Jacques-Pierre-Francois LaSpermier; co-starring millions of “other guys.” Also starring Madame Ovary (Mistress of the Female Realm) and daughter Ova Ovary (Grand Damme of YinWorld).

² On quite a different timeline, Madame Ovary releases daughter Ova (she releases about a daughter a month, on average). Ova begins her journey after bidding fond farewell to her mother and her home, where she has resided for all the pre-child-bearing years of her host, Phoebe. Ova is only minutes into the fallopian tube as we begin the discussion of sperm development in Act I. Jacques-Pierre-Francois is really all ready to meet her, but we have some more background to cover in his case. In Act II, we will see them come together.

[See Figure 1: Spermatogenesis](#)

[See Figure 2: Sperm Anatomy](#)

Figure 3 illustrates the anatomy of the male reproductive system and figure 4 summarizes the basic stages of sperm development and delivery. Beginning around the age of puberty, sperm (capable of fertilization and that awaits delivery) develop in about two months, with another two weeks to mature within the epididymis. The final stage of maturation (capacitation) takes place in the female's body, as this is where the sperm's "cap" or acrosome is prepared by removal of the glycoprotein covering, enabling it to release enzymes once in contact with the ovum.

In the absence of ejaculation, sperm eventually breakdown and die, and their remains are reabsorbed. Obviously, with millions and millions of these guys required for a single moment if there is any hope for fertilization in the female (40 to 100 million sperm per ml, with around 2 to 5 mls of semen produced), this is a pretty active and on-going process, gradually declining over the lifespan of the male.

[See Figure 3: Male Reproductive Organs](#)

In the case of Jacques-Pierre-Francois LaSpermier, we need not be concerned with the absence of ejaculation, nor his eventual breakdown. Recall that Reggie knows Phoebe is the girl for him. His pulse quickens and his heart pounds whenever he sees her. He cannot concentrate for thinking of her. His palms get sweaty, and, well, frankly, when he thinks of her an awfully lot, he experiences an erection (and it's a good thing, because this physiological response to his emotions is a requirement for Jacques to get where he wants to go, if he wants to go naturally!). Clinically, this is known as the excitement phase of the human sexual response. As fortune would have it, Phoebe is equally smitten with Reggie (having an excitement phase of her own!), and the couple wants to have a child together. These two fellows, Reggie and Jacques-Pierre-Francois, are about to get very lucky.

[See Figure 4: Development and Delivery](#)

[See Figure 5: Mature Sperm In Epididymis](#)

Act II, The Moment Arrives

Once things heat up, it doesn't take long for Jacques and his millions of traveling companions to be on their way. Excitement phase, plateau phase, orgasmic phase—and all in a mad rush (emission and ejaculation), the race is on.

[Figure 6: The Race Is On!](#)

This is when the real challenge begins. Getting out of Reggie is pretty easy to do, but getting to the final destination, fertilization of the ovum (remember her?), involves quite a process of travel that can literally take an hour or more. Sperm travel at a rate of about one to three millimeters per minute, which roughly equates to only about 8 inches an hour. And they aren't going anywhere at all if the female isn't ready for them—the window of opportunity in which the cervical canal can be bridged is only about two days a month. Fortunately, today is one of those days. As Reggie climaxes and ejaculation is completed, semen entering Phoebe's vagina thickens, making it easier for some of the sperm to stay in place long enough to slip through her cervical canal and into her uterus. Those remaining in the vagina will die, and those entering the canal will find the swimming gets a little easier as the fluids become more viscous. Fortunately, they also pack along mitochondria to provide them with the necessary energy for the journey. Only about 0.1 percent of the sperm actually make it to the uterine tube³, and these may be assisted by uterine contractions. Literally swimming against the current, eventually making their way through the uterus, into the correct fallopian tube, out to the distant end at the oviduct, about one hundred sperm arrive, and *there she is*.

[See Figure 7: Boy Meets Girl](#)

She does not make it easy for them. Seeming to play as 'hard to get' as a human female might play, the egg is protected by a transparent membrane (zone pellucida) and the follicular cells (corona radiata) she brought with her from the ovary. Since she has to wait a while for the guys to arrive, she needs the nutrients. They literally have to 'break through' in order to fertilize her, and one of them (in this case, Jacques) will literally lose his head for her (not unlike Reggie appears to have done for Phoebe).

³ It is a wonder women ever get pregnant, considering there is a window of just a couple days, 300,000,000 of these guys start out on the journey, none of them ask for directions, only about 100 of them actually make it to the egg – and at least ONE of those has to be mature enough to fertilize her!

The final stage of maturation (capacitation) takes place at this moment, enabling the release of acrosomal enzymes that will ultimately break down just enough of the ovum's membrane and follicle cells for Jacques (the lucky guy) to fuse with the egg. In fact, attempts by other sperm to do the same thing may actually have facilitated his ability to do the deed. All in a moment, he fuses with her, binding to a sperm receptor, and she engulfs him—head, body, and tail—and at the same moment her membrane undergoes immediate chemical and electrical changes, preventing the entry of any other sperm (figures 7 and 8). They will hang around still, outside, no doubt cursing their competitor, Jacques, but they will perish within a couple of days—having made the journey only to be refused entry. She becomes an activated egg, finalizing her maturation by a final meiotic division and expulsion of the last polar body (figure 9).

[Figure 8: Mission Accomplished](#)

Jacques actually loses his tail, not his head⁴ (his head, in fact, enlarges a bit—big surprise, he just beat out 300,000,000 other guys to claim the girl), and the two nuclei with their respective sets of 23 chromosomes unite in a remarkable transformation, pairing together as the zygotic beginning of a brand new human being.

[See Figure 9: Becoming One](#)

⁴ He loses just about everything but his nucleus packed with 23 chromosomes.

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Entertaining Paper on the Speed of a Sperm Cell can be found at:

<http://hypertextbook.com/facts/2000/EugeneKogan.shtml>

Figure 1: Spermatogenesis

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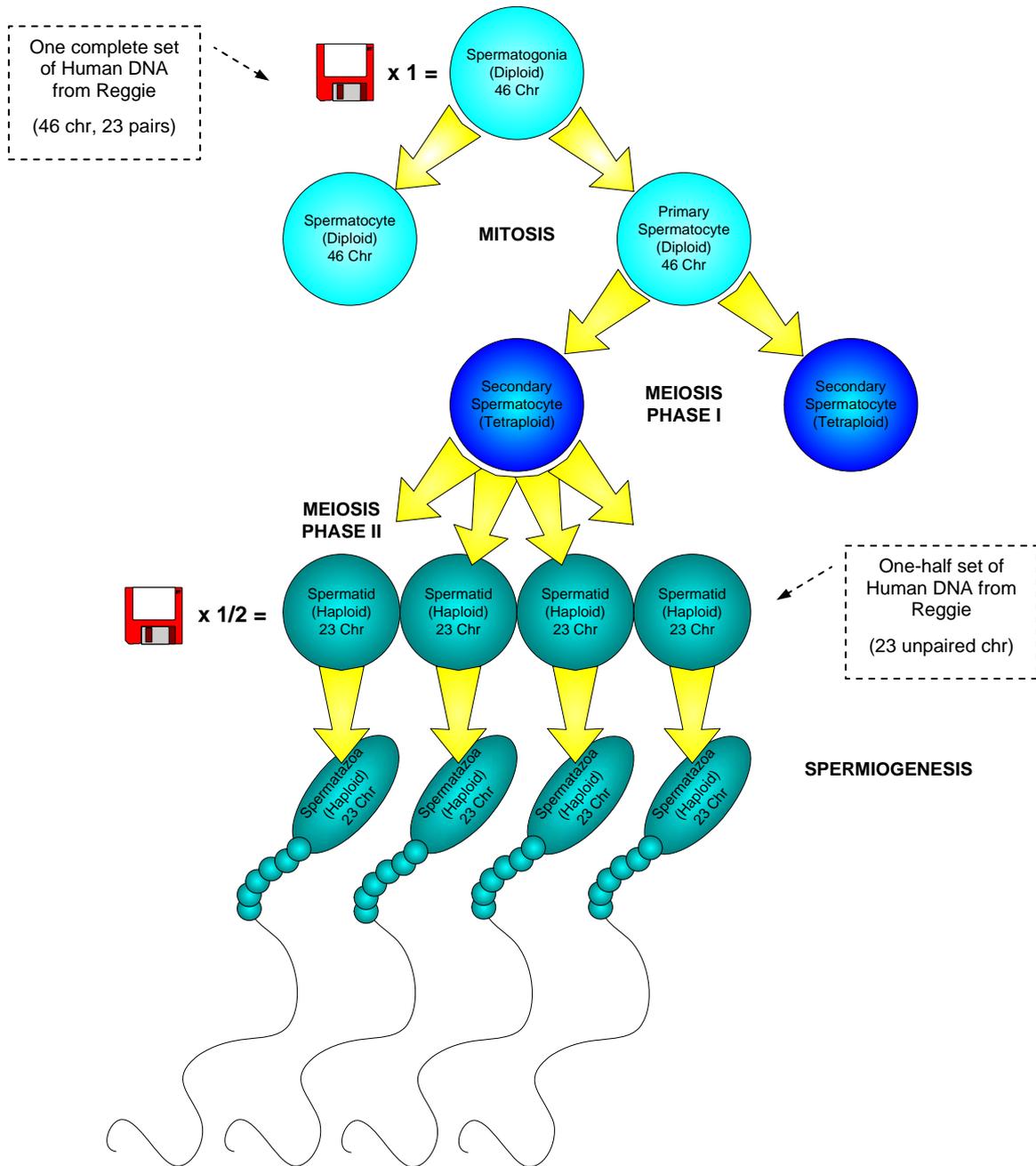


Figure 2: Sperm Anatomy

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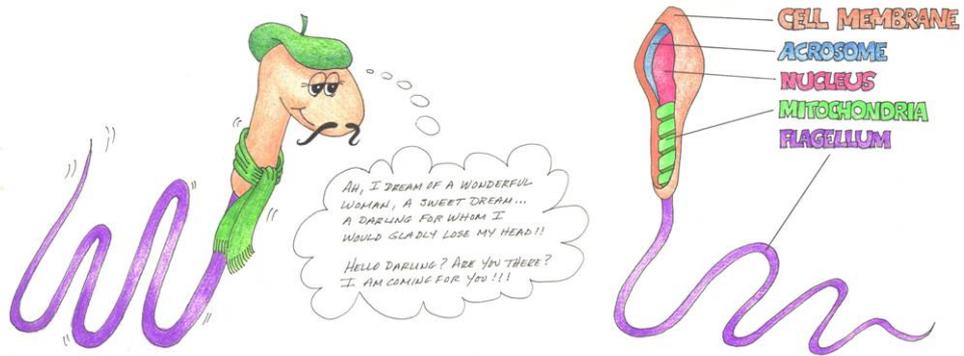


Figure 3: Male Reproductive Organs

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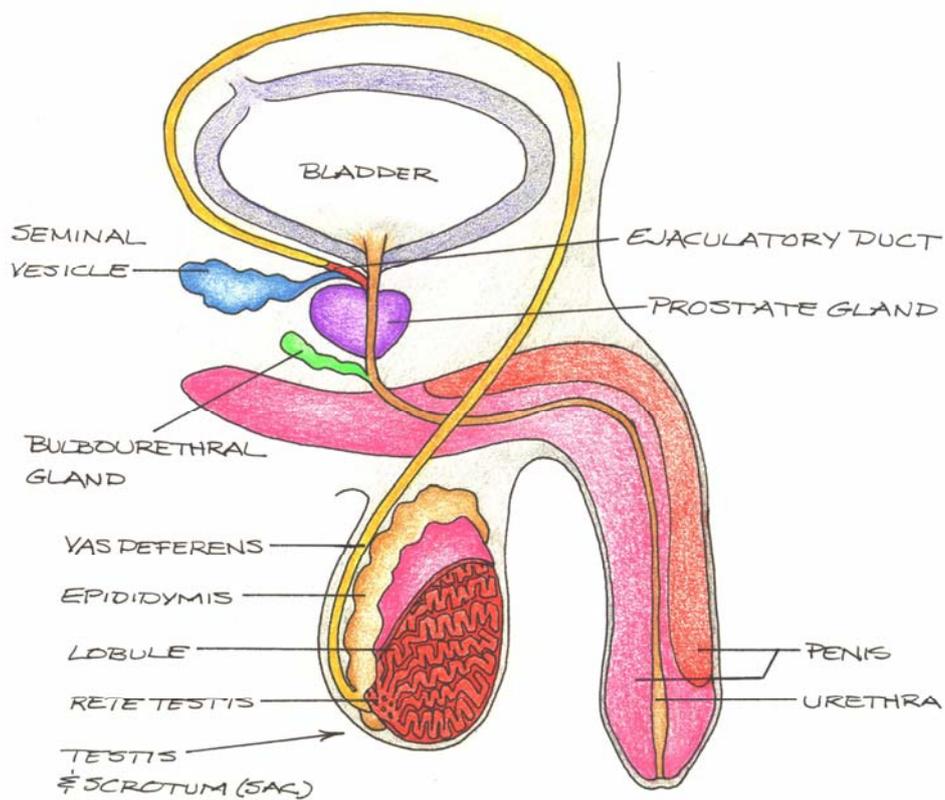


Figure 4: Development and Delivery

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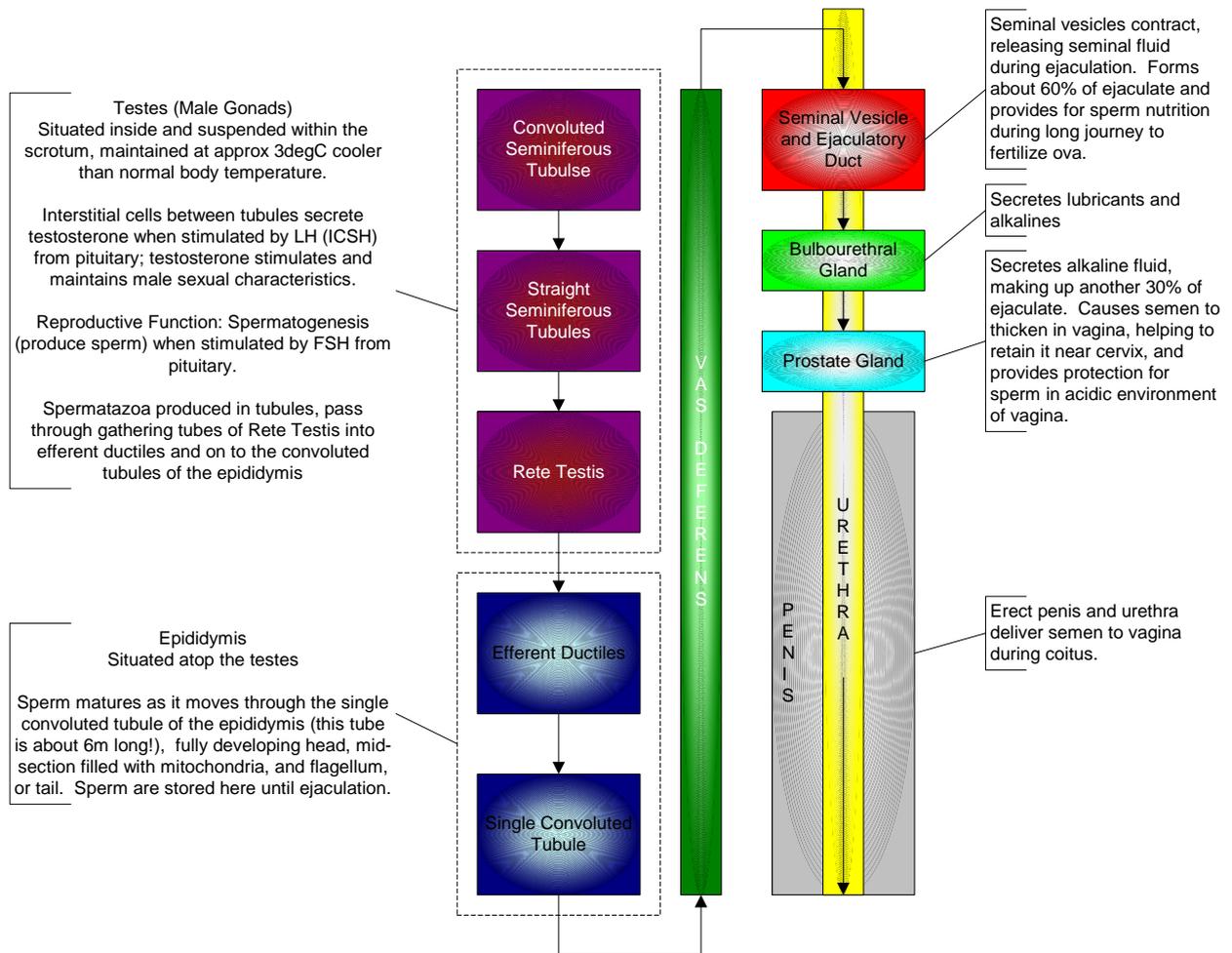


Figure 5: Mature Sperm in Epididymis

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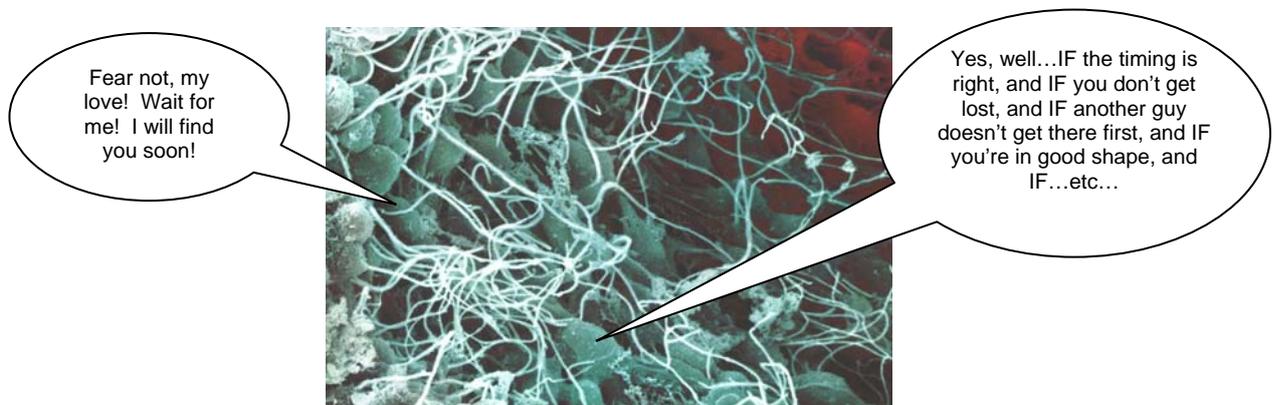


Figure 6: The Race Is On!

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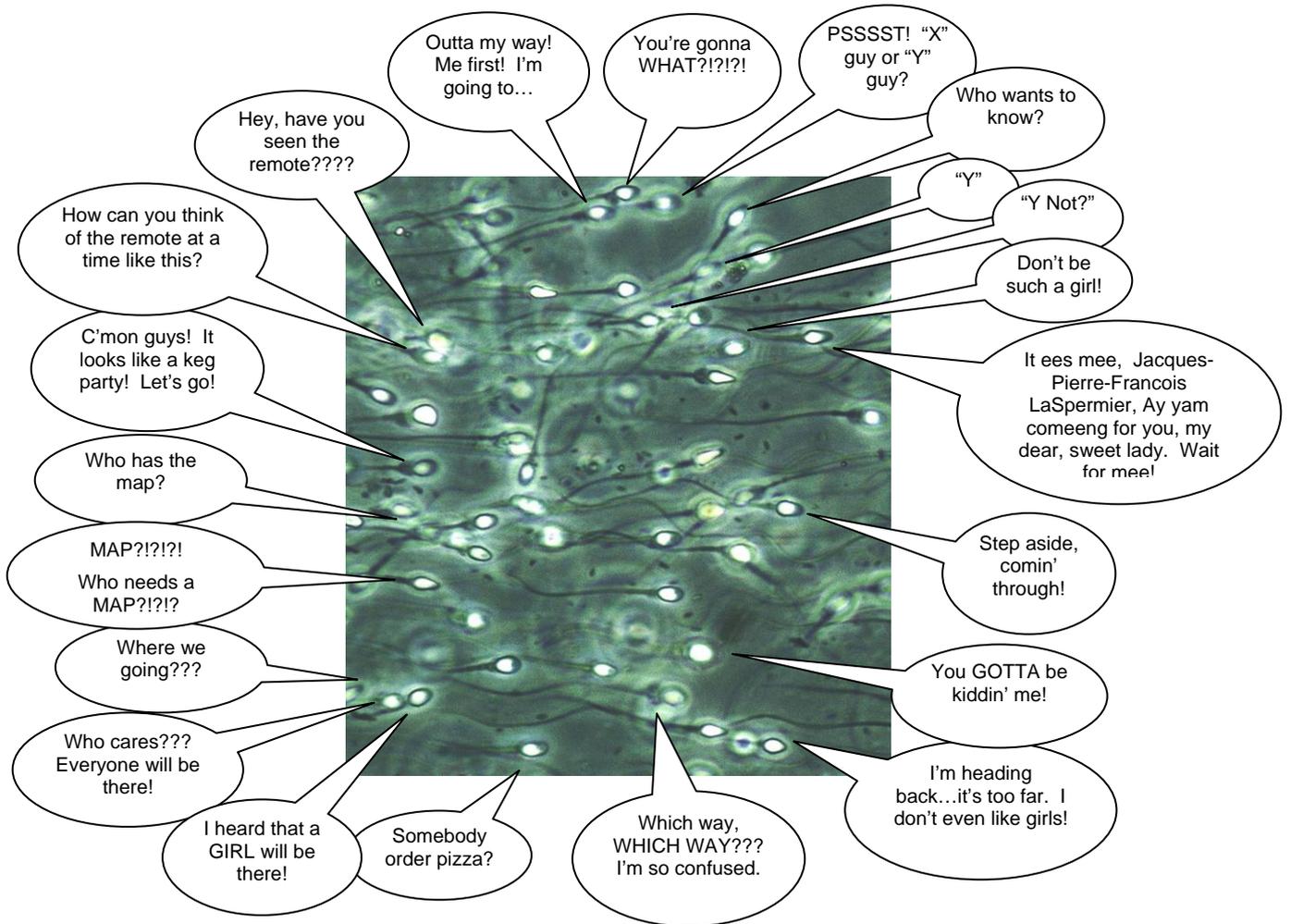


Figure 7: Boy Meets Girl

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Figure 8: Mission Accomplished

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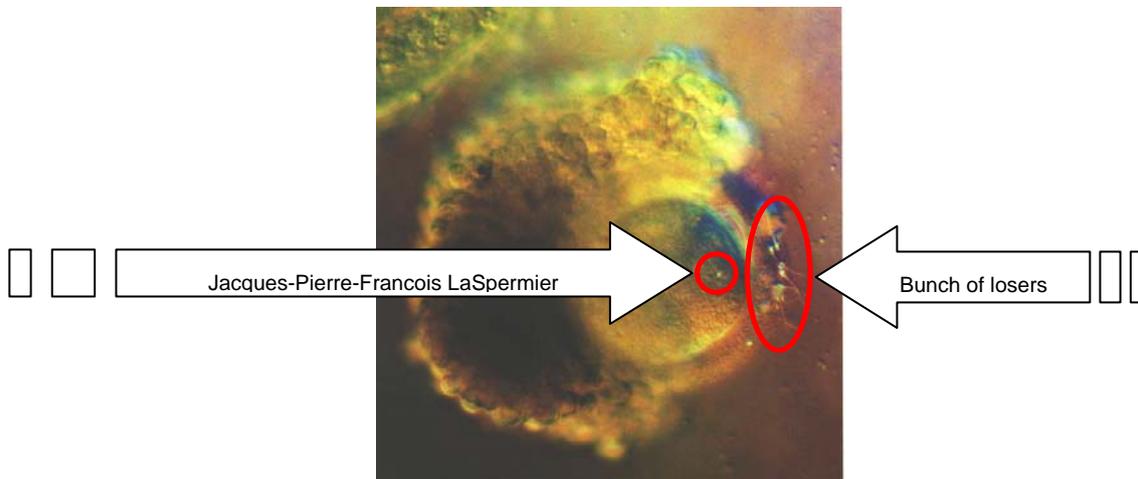


Figure 9: Becoming One

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