5. Sex Differentiation, not Sex Determination

The steps required to build a sexual body capable of making gametes, and reproducing in nature are extraordinarily complex, and can be examined at multiple levels: Genes, Chromosomes, Gonads, Ducts, Hormones, Genitals, and other phenotypic features that are only secondarily associated with reproduction (what we call the secondary sexual traits). As we will see, sex is not determined, for example there is nothing intrinsic about having a Y chromosome in a mammal that will result in that individual always becoming a male, but rather individuals differentiate into a sexual phenotype following a cascade of events that result from the conversation between genes, the internal environment (the organism itself), and the external environment. None of these steps are deterministic in any meaningful way since different types of chromosomes, gonads, hormones, genitals and other sexual features do not necessarily all converge on any individual sexual phenotype. For an excellent in-depth discussion of such processes I recommend the book “Performance all the way down” by Richard Prum.

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