

Pregnancy



WHAT IS NORMAL,
WHAT CAN GO WRONG, AND HOW
CAN WE ASSIST INFERTILE
COUPLES?

PART 1



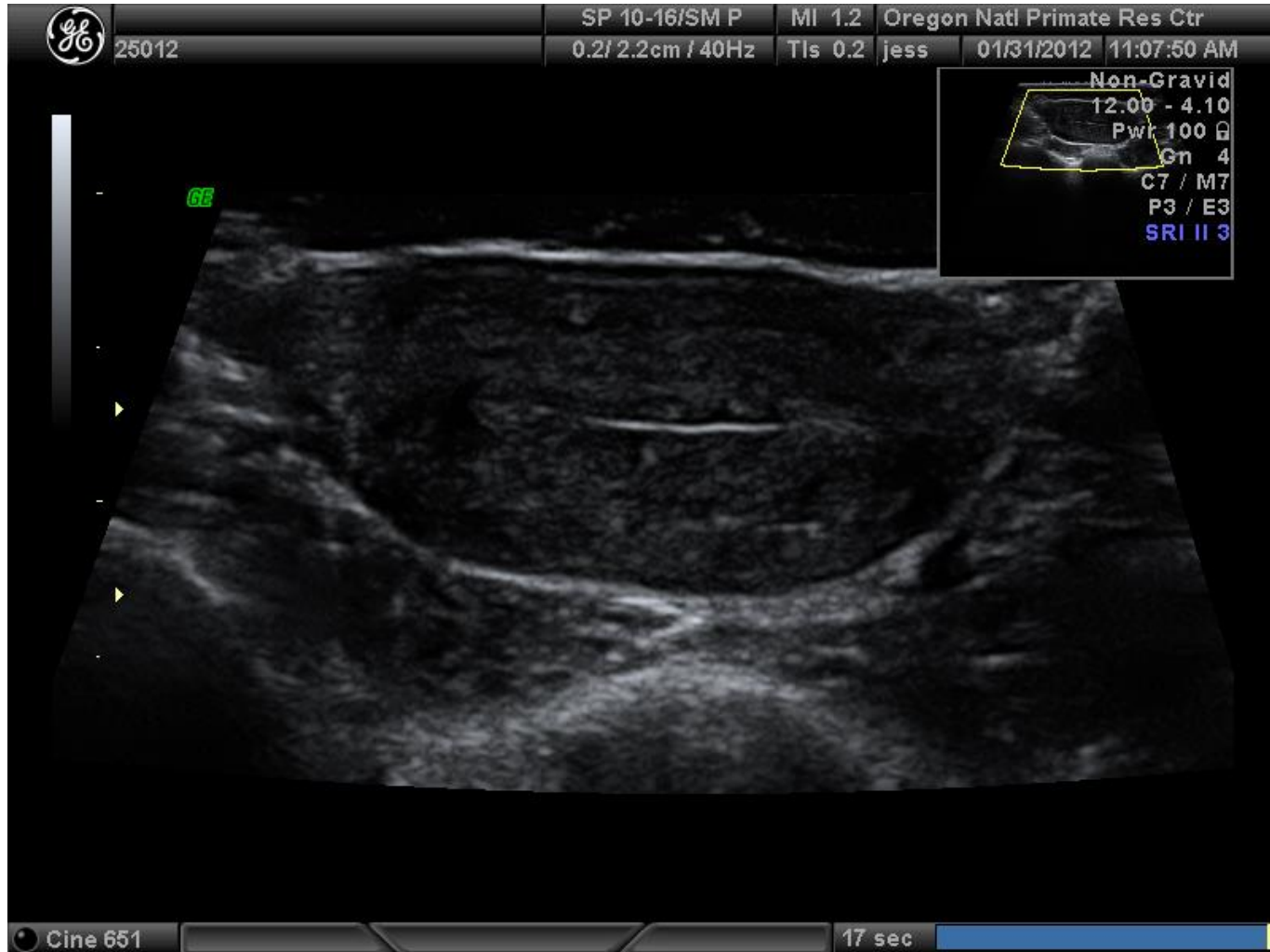
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When Does Pregnancy Occur?



- Pregnancy can occur when the oocyte (egg) is released during ovulation and sperm is present.
- Ideally, the sperm fertilizes the oocyte in the fallopian tubes so the developing embryo has time to mature before reaching the uterus for implantation.
- Fertilization can occur ectopically (in the abdomen) and also in the uterus but these do not usually result in successful pregnancies.

Ultrasound of a Non-Pregnant Uterus in Rhesus Macaque



Spermatogenesis in Males



Spermatogonium-
Stem cell which
may mitotically
divide to form more
spermatogonia.



Primary
Spermatocyte

Meiosis I

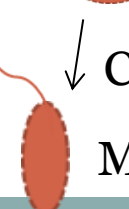
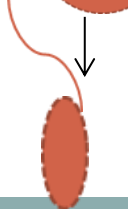
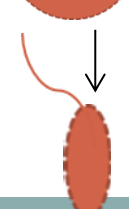
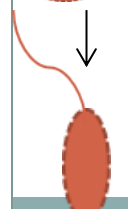


Secondary
Spermatocytes

Meiosis II



Spermatids



Cell Differentiation

Mature Sperm Cells

Each sperm=23 chromosomes

Oogenesis in Females

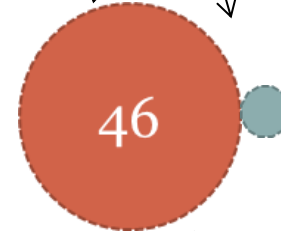


Oogonium



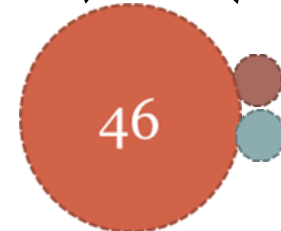
Primary
Oocyte

Meiosis I



Secondary
Oocyte & Polar
Body-Released
at ovulation

**Meiosis II-
Triggered by
Sperm Entry**



Zygote-46
Chromosomes,
23 Each From
Oocyte & Sperm



Drawing: Lynda Jones, MS, ONPRC

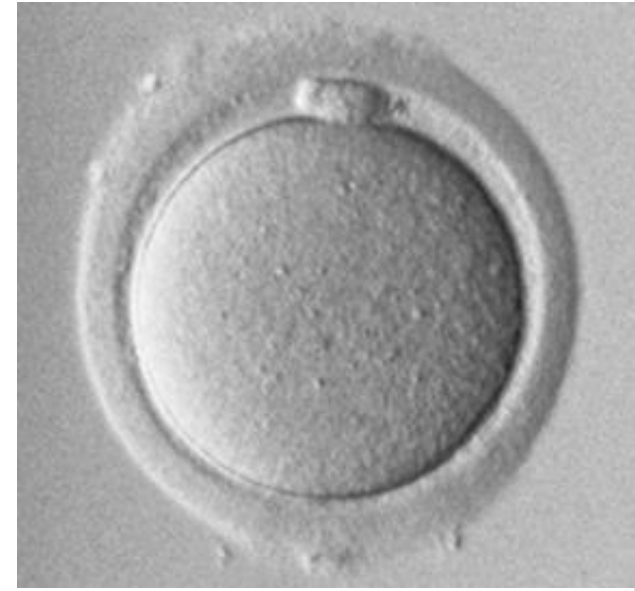
How do Oocytes Develop?



Primary oocyte with its nucleus arrested at prophase I of meiosis I. Clinically called **Germinal Vesicle (GV)**.

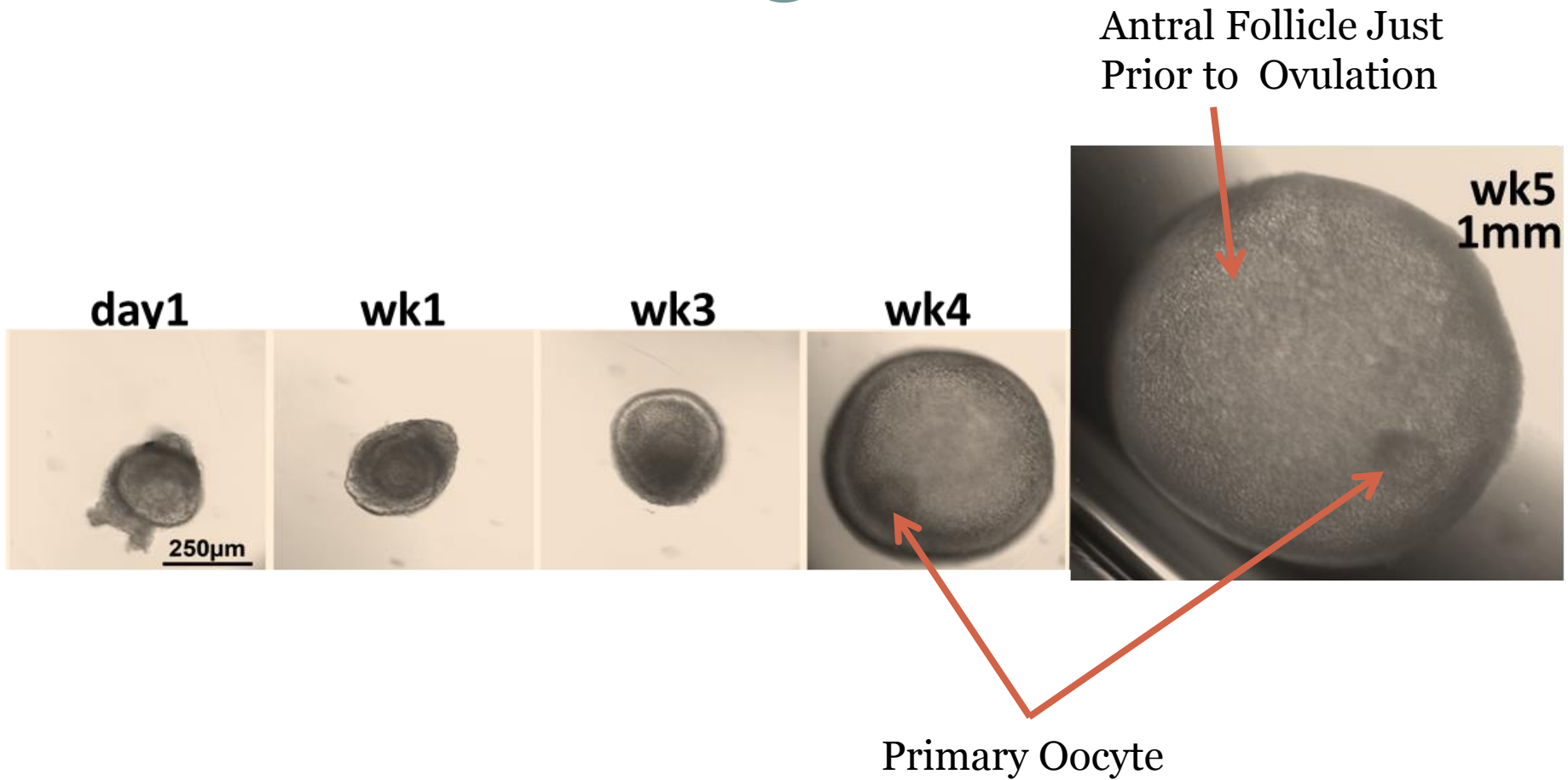


Primary oocyte undergoing meiosis I – nucleus and nucleolus have disappeared. Clinically called **Metaphase I (M1)**.

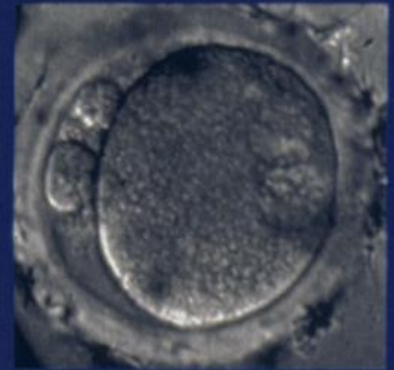
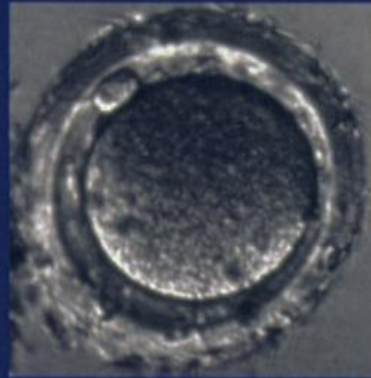
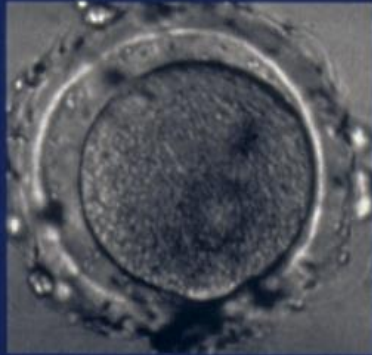
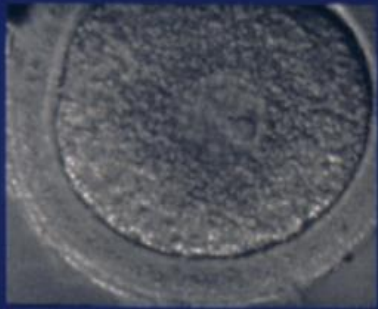


Secondary oocyte with first polar body resulting from meiosis I. Clinically called **Metaphase II (M2)**.

In Vitro Primary Oocyte Growth in Its Follicle



Oocyte Maturation & Fertilization

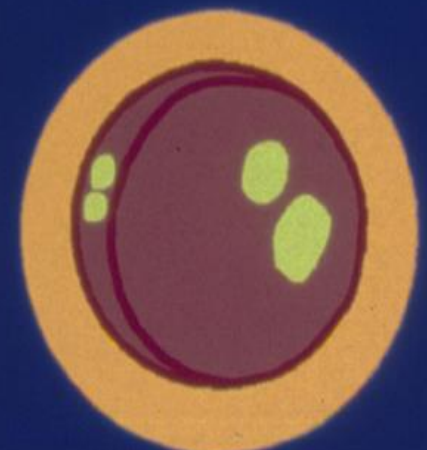
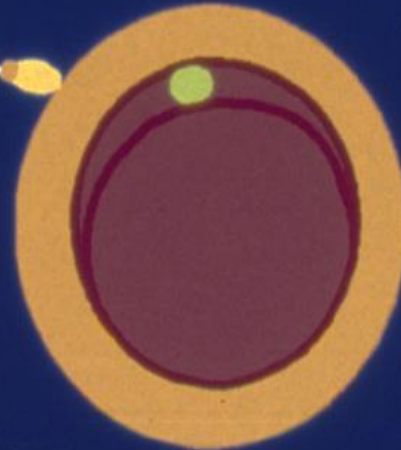
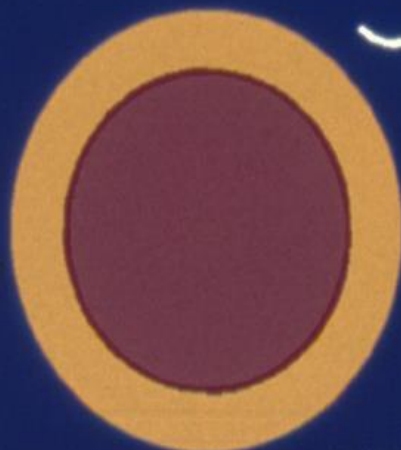
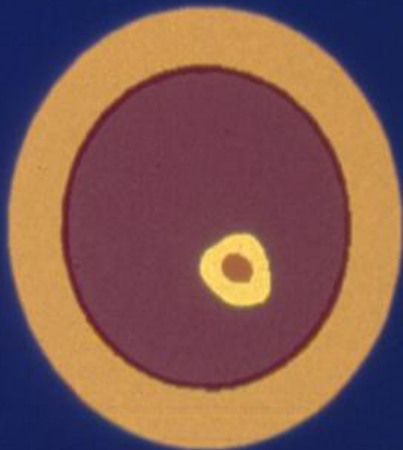


GV

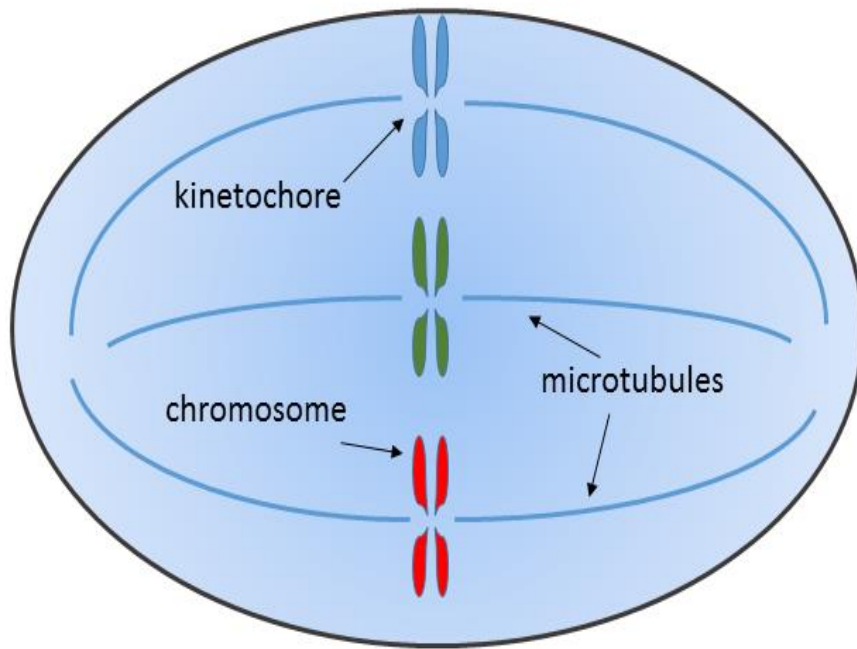
M1

M2

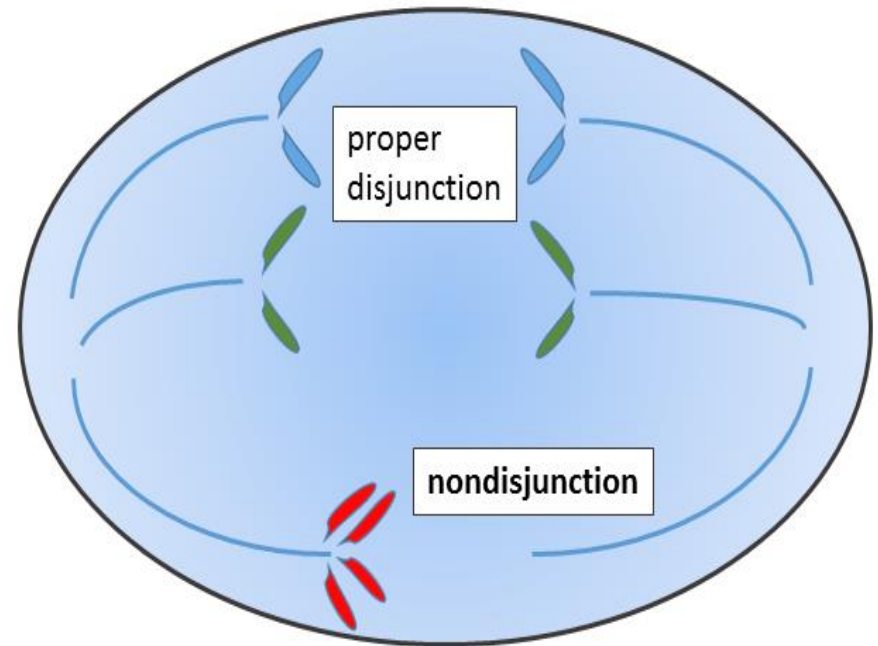
2PN



What Types of Genetic Errors Can Occur As Oocytes and Sperm Develop?

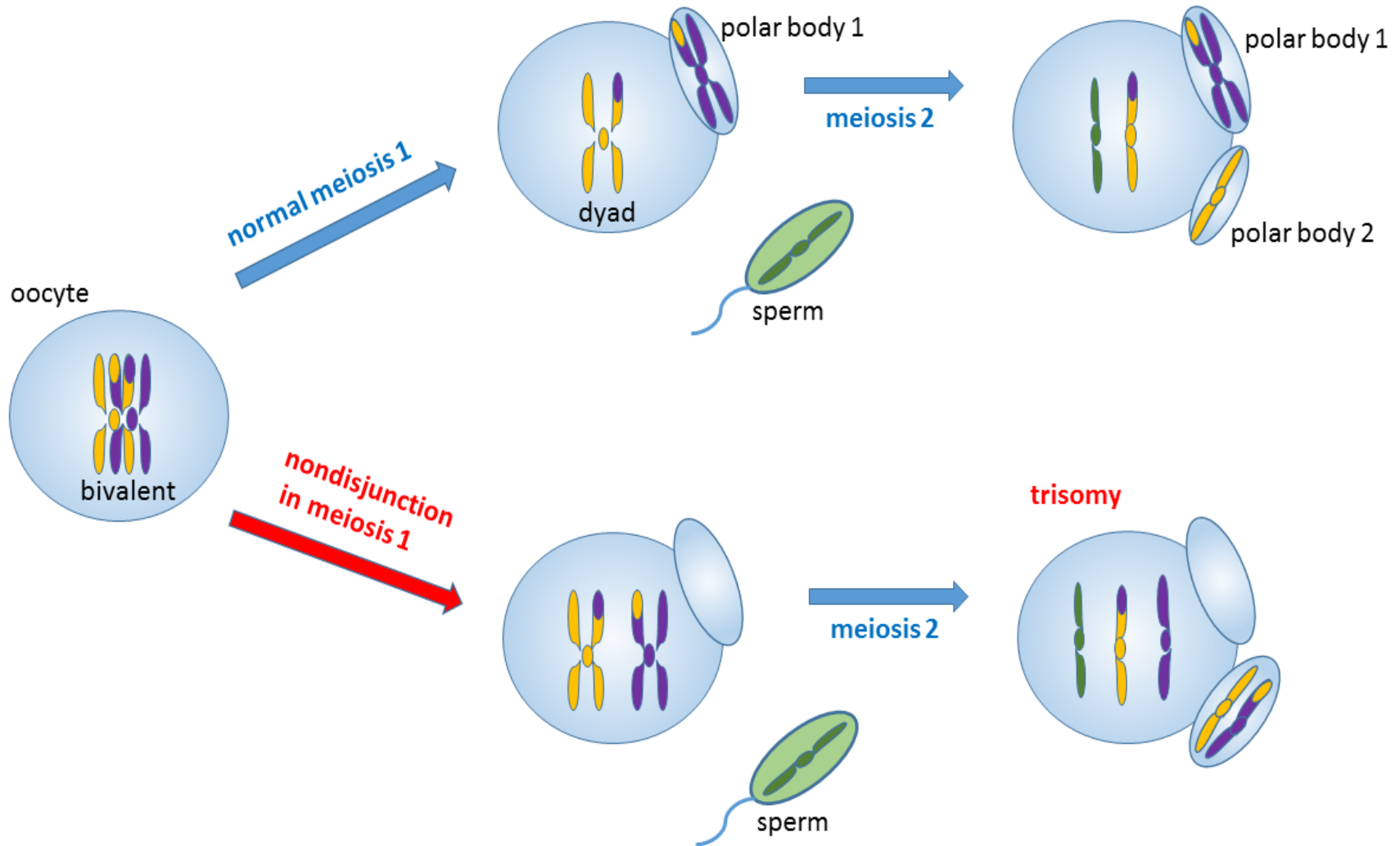


metaphase

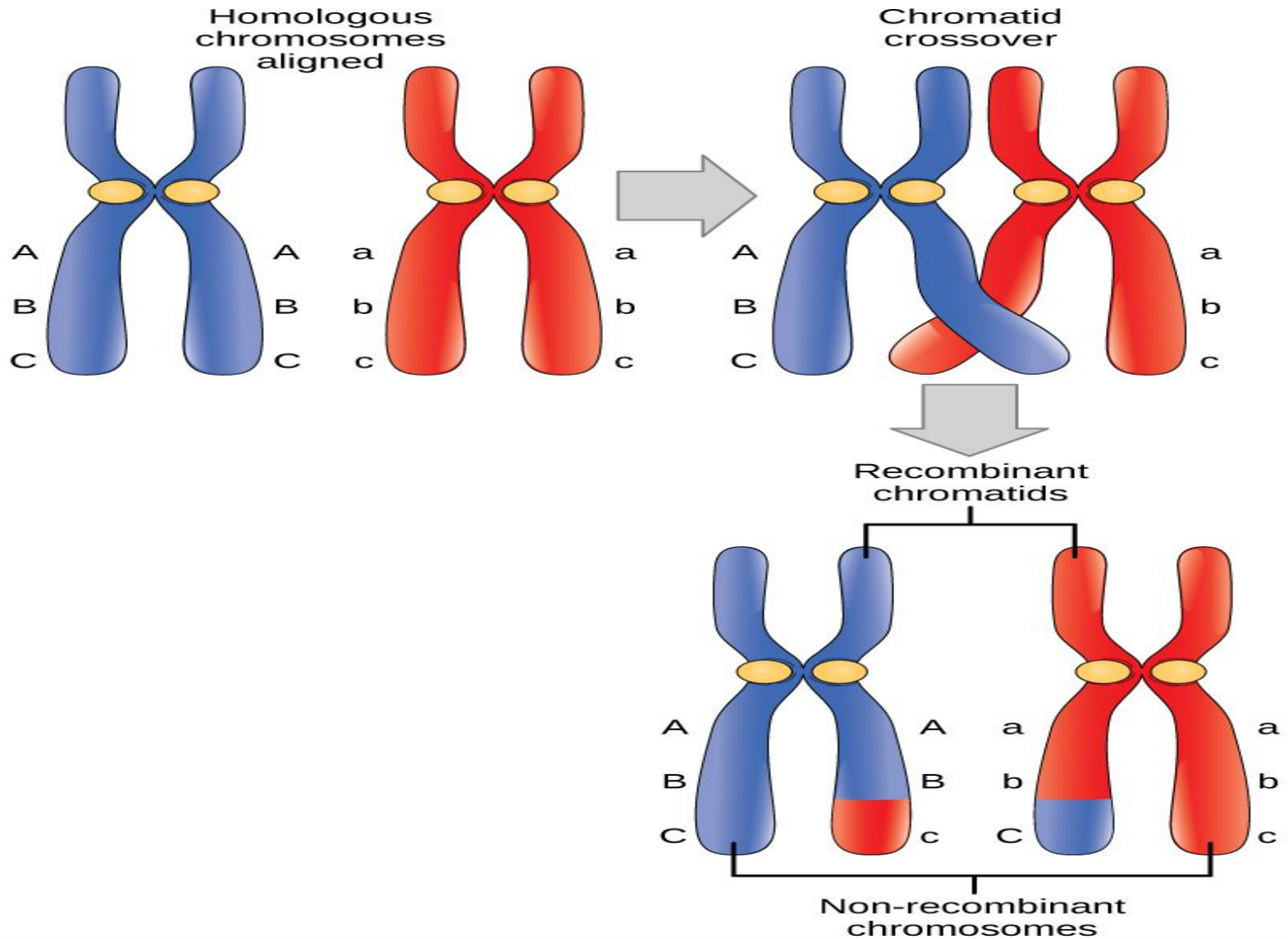


anaphase

The Origin of Aneuploidy Gametes by Nondisjunction at the First or Second Meiotic Division



Crossing Over in Meiosis I



Translocation Between Chromosomes 9 and 22



A metaphase cell positive for the BCR/ABL translocation (shown as green and red fused together) using FISH.

