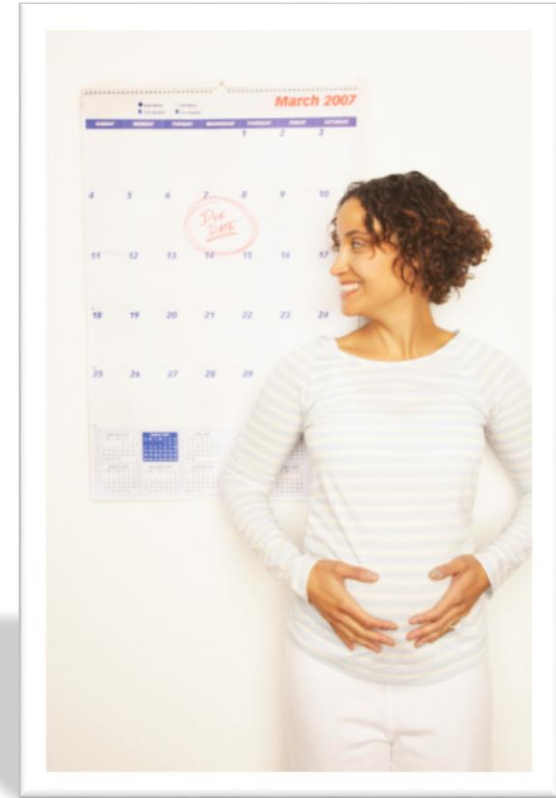


Making Sense of HIV and Pregnancy

3-day prenatal course

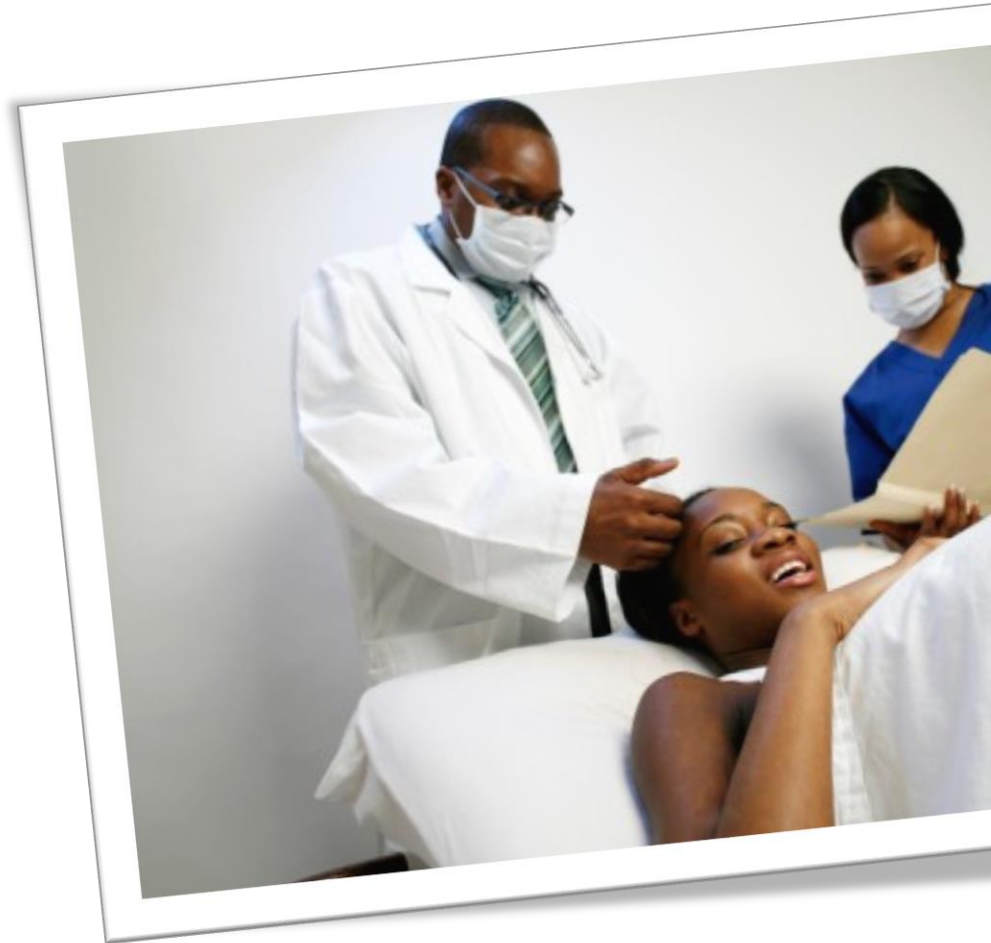
Making Sense of HIV and Pregnancy: Introduction to Day 1

- HIV 101
- Perinatal Transmission
- 1st Trimester (0-13 weeks)
- 2nd Trimester (13-26 weeks)
- 3rd Trimester (26-40 weeks)



Making Sense of HIV and Pregnancy: Introduction to Day 2

- Labor
- Vaginal Delivery
- Cesarean Section
- After the delivery for mom and baby
- Contraception options
- STIs



Making Sense of HIV and Pregnancy: Introduction to Day 3

- Nutrition
- Post-partum depression
- Newborn care
- Administering AZT to your baby - demo



Prenatal Screening: First Trimester Tests

- Pap Smear
- STI testing & HIV testing
- Hepatitis B
- Complete blood count
- Blood type and RH factor



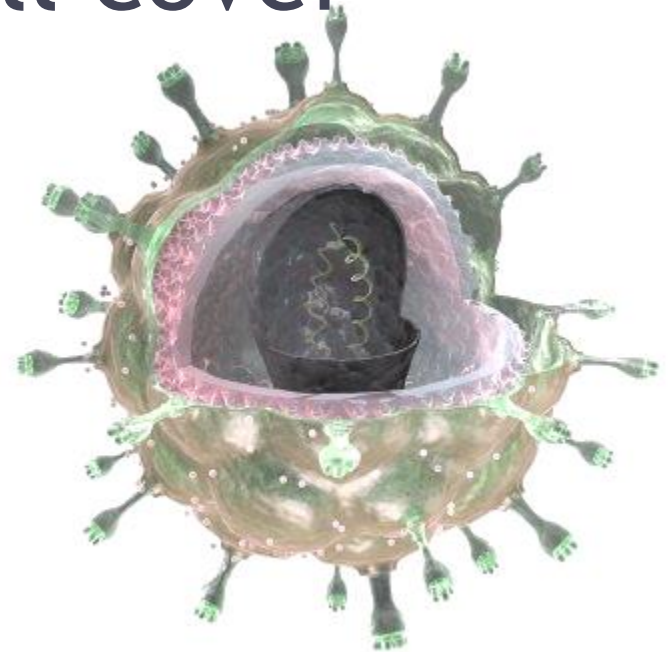
Prenatal Screening:

First Trimester Tests

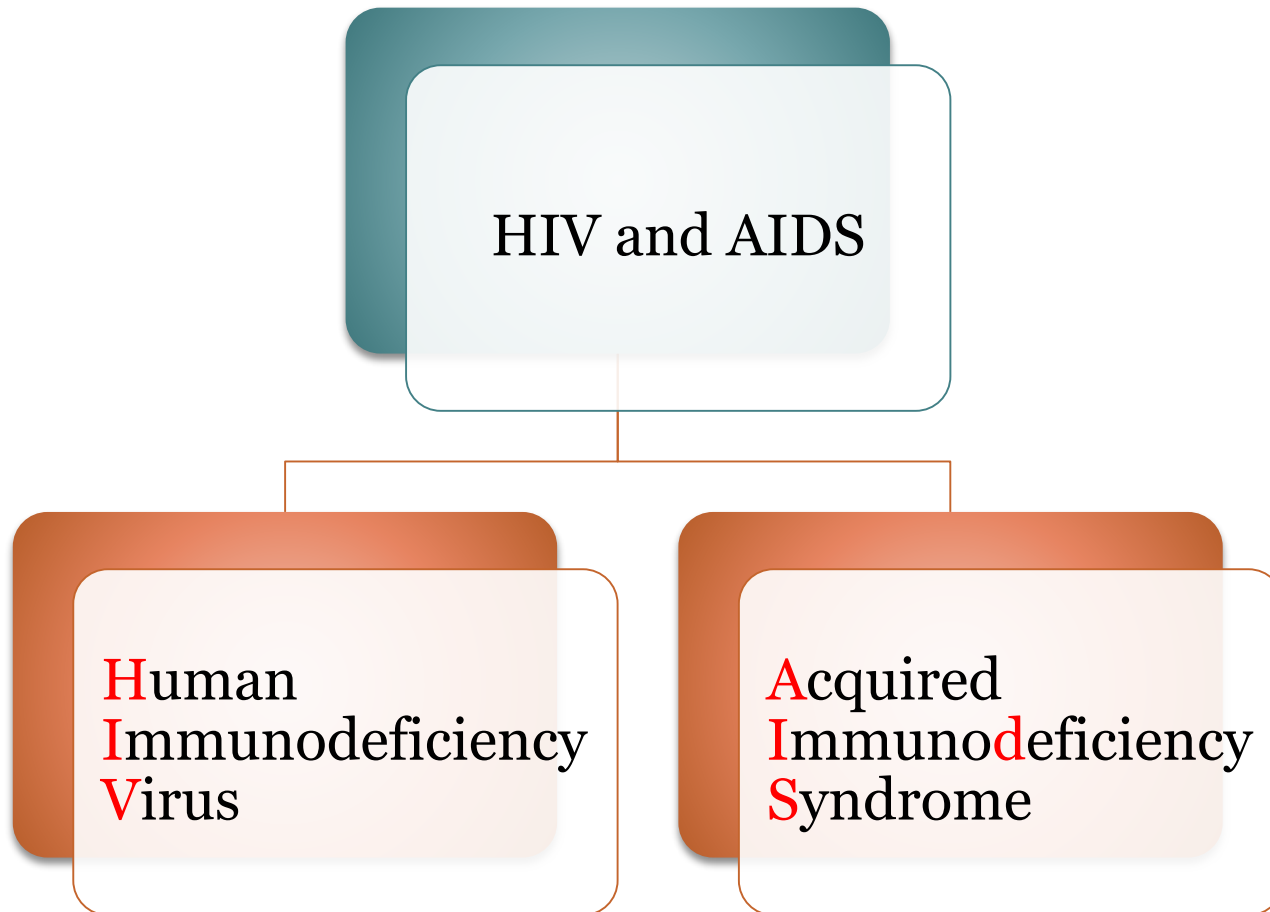
Test	Frequency
Urine Test	Every Visit
Blood Pressure Test	Every Visit
Weight	Every Visit
Fetal Heart Tones	12 weeks
Prenatal Genetic Screen	16-18 weeks
Ultrasound	18 weeks
Fundal Height	22 weeks
Glucola Test	24-28 weeks
Non-Stress Test / Bio physical profile	3 rd Trimester

HIV 101 - What we will cover

- What is HIV?
- How is HIV transmitted?
- What cells does it infect?
- How does HIV cause illness?
- How is it treated?



HIV and AIDS



How is it transmitted?

- Through sharing of body fluids that contain HIV
 - Blood
 - Genital secretions
 - Breast milk
 - Pre-chewing
- Getting stuck by or sharing a needle when using drugs
- During pregnancy or childbirth

Risk of HIV Transmission

- *Risk of transmission through heterosexual sex*

1 in 1000

- **Risk of transmission from untreated HIV during pregnancy**

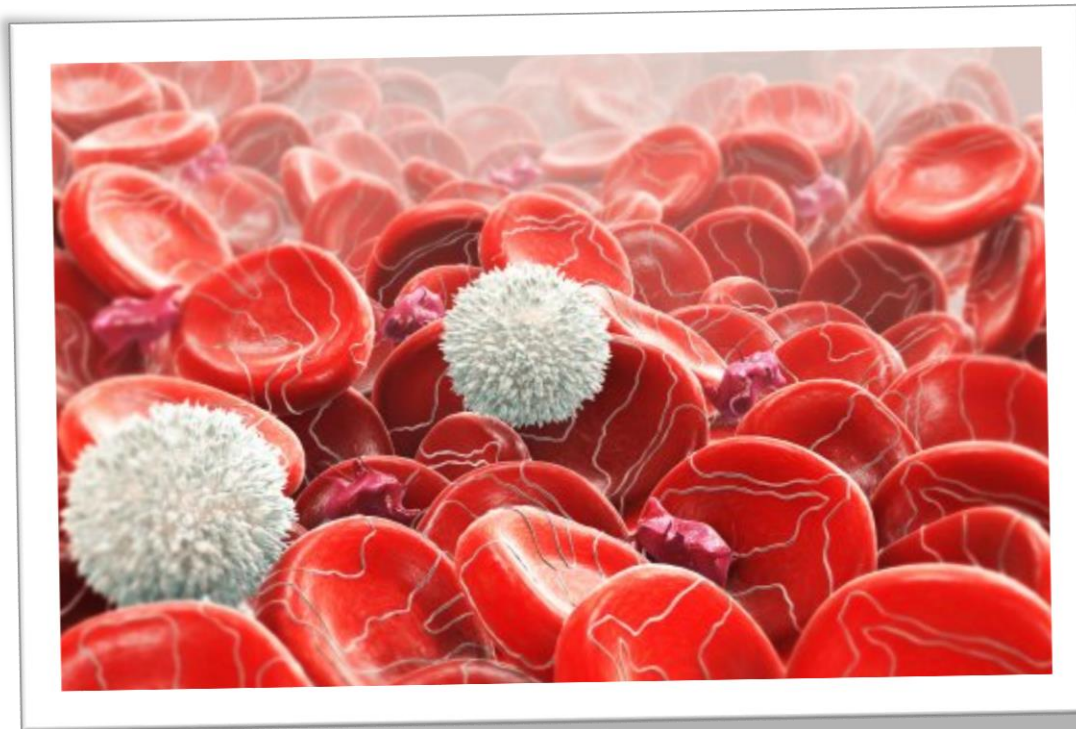
1 in 4

Decreasing Transmission: Pre-Chewing

- When the mother chews food and passes it on to baby
- This is dangerous because it can pass on organisms, including HIV
- Mom could have bleeding gums, small cuts from brushing teeth, or sharp food
- Child may be teething or have an infection in their mouth
- Same reasons why it isn't recommend to share toothbrushes

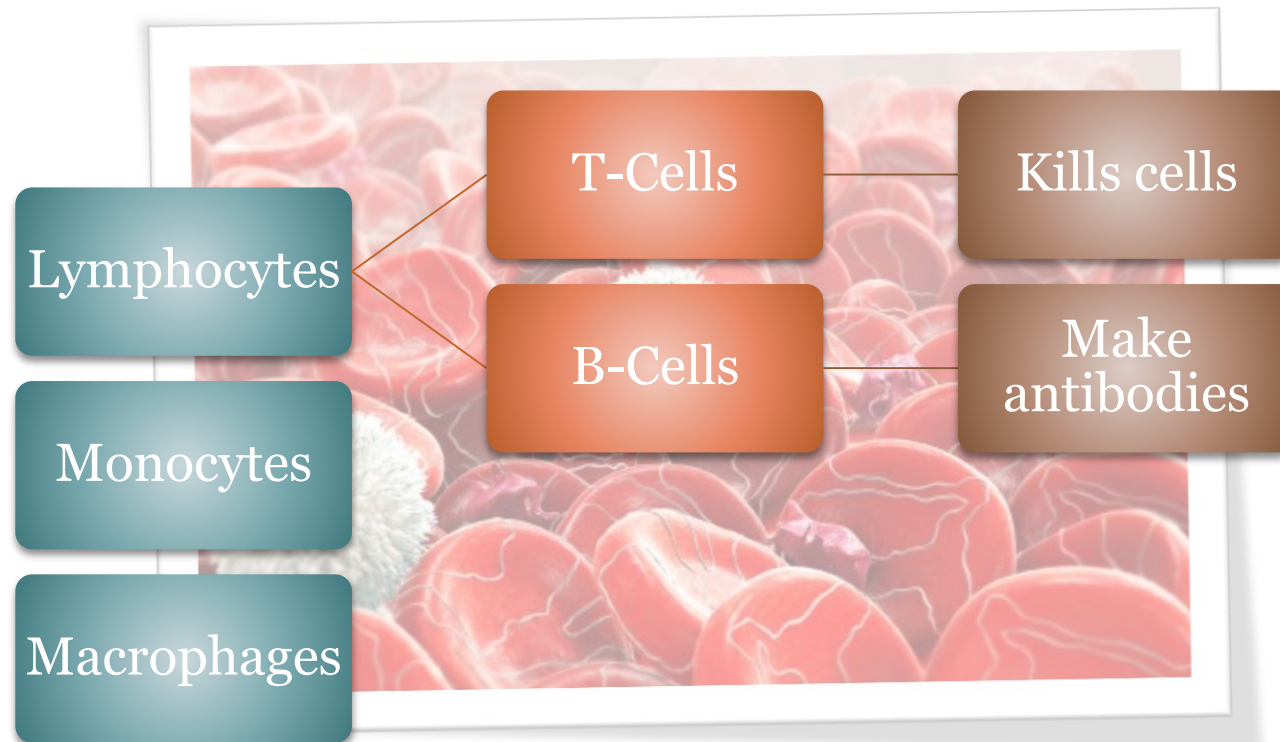


What cells does it infect?



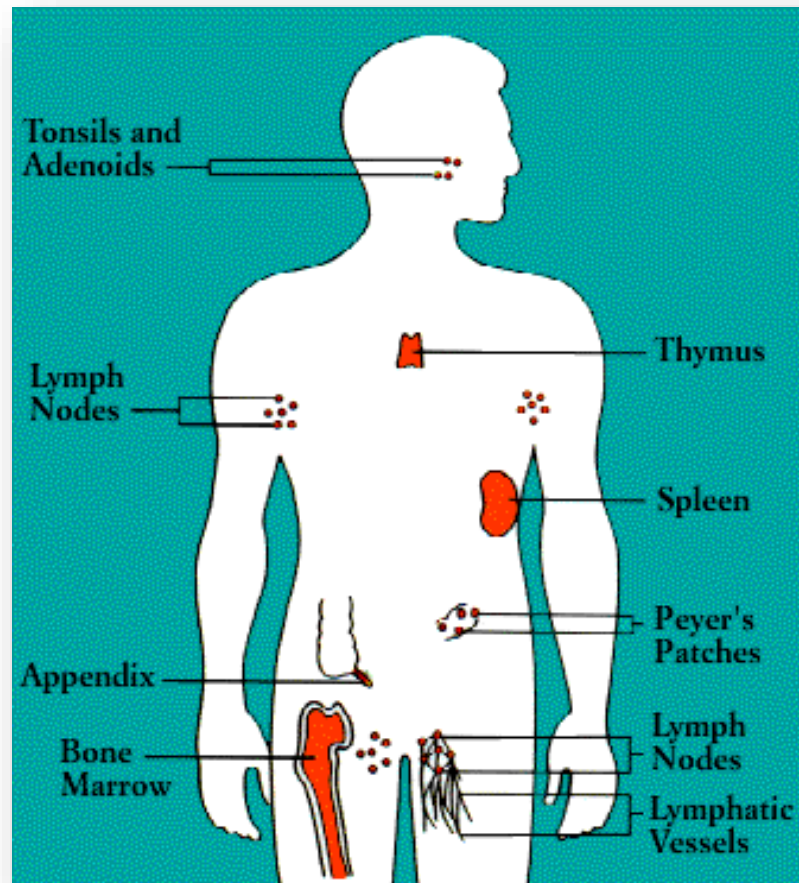
White Blood Cells

What cells does it infect?

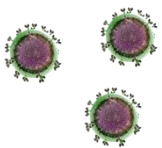
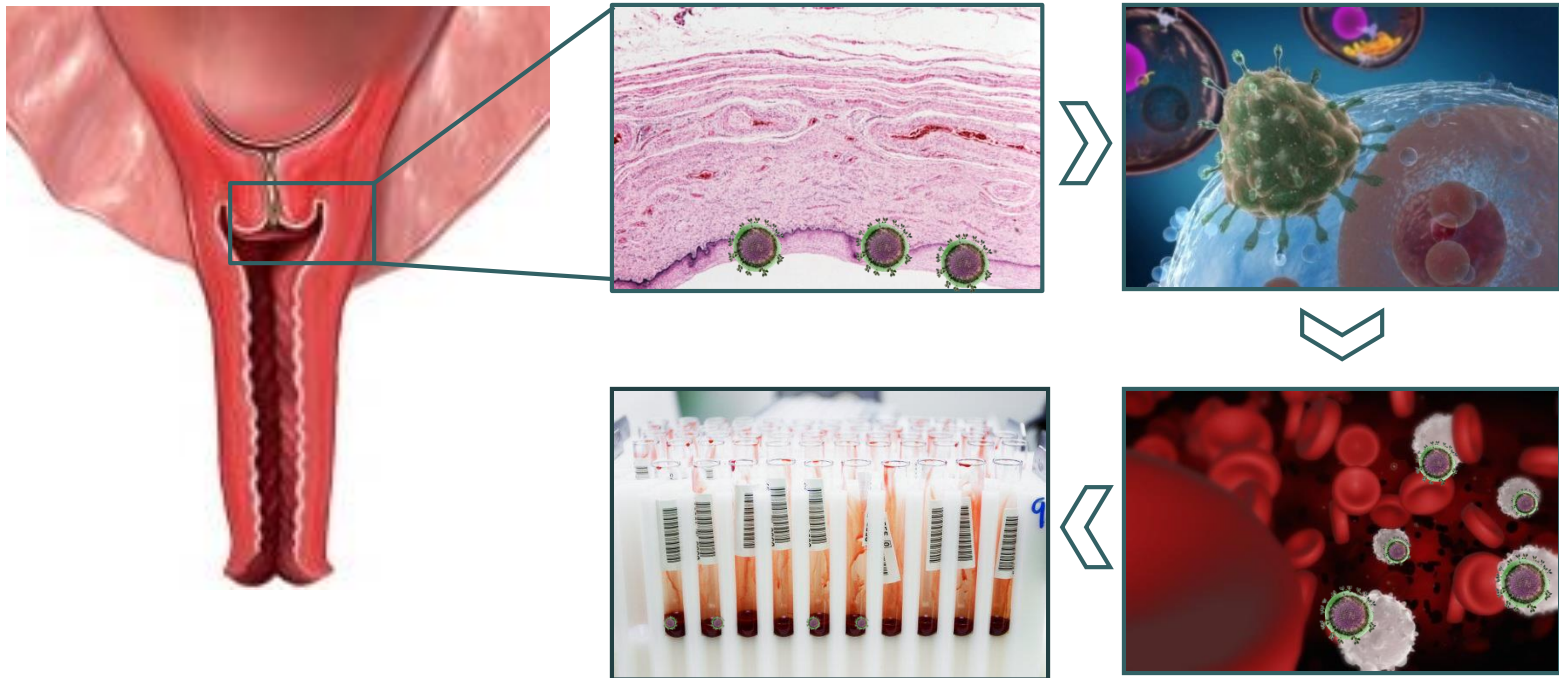


White Blood Cells

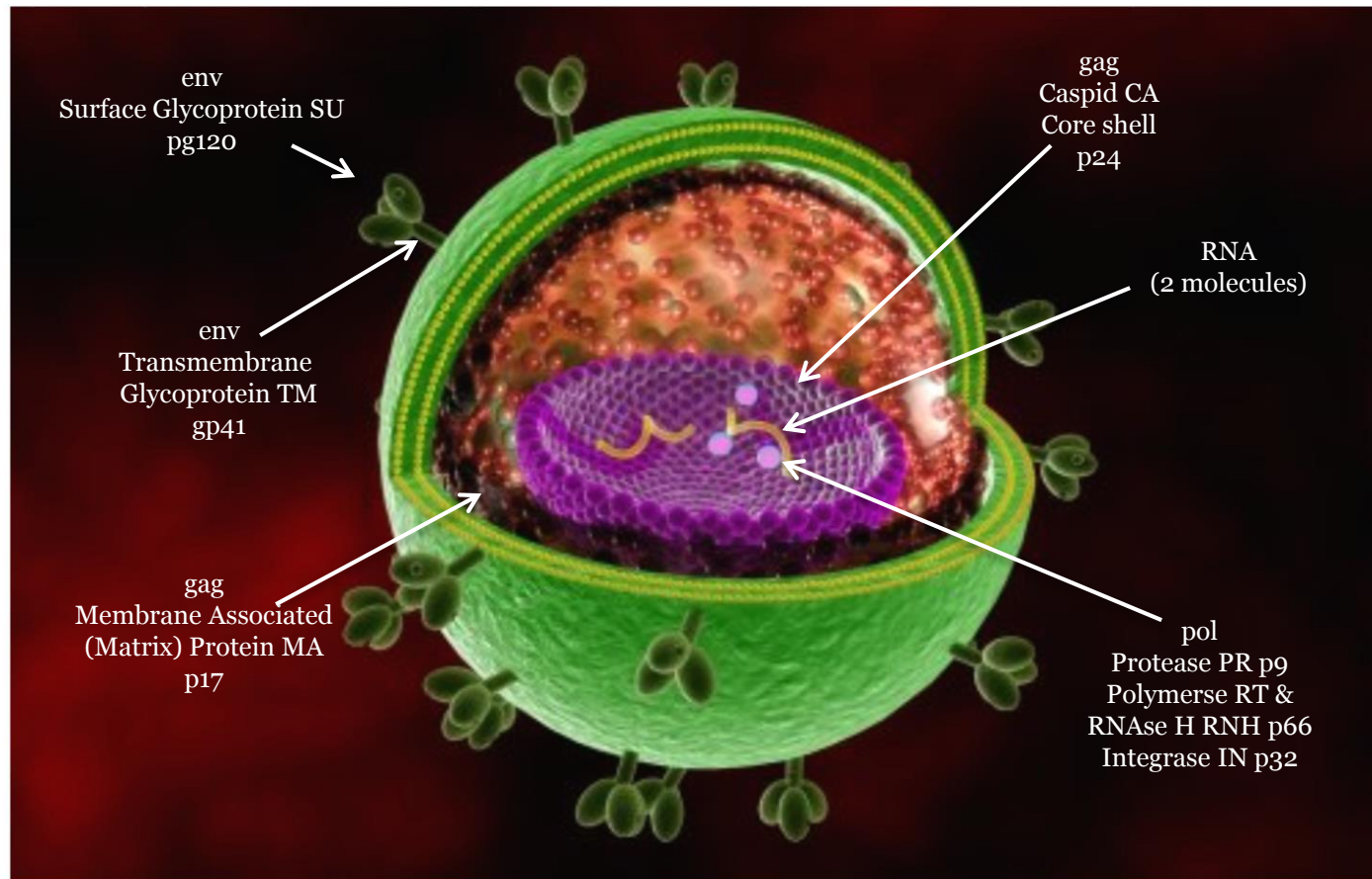
Immune System

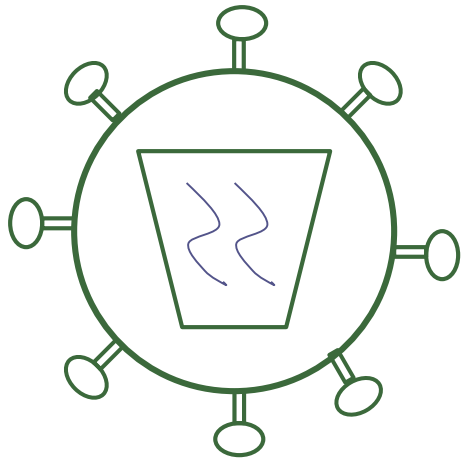


Sexual Transmission of HIV-1

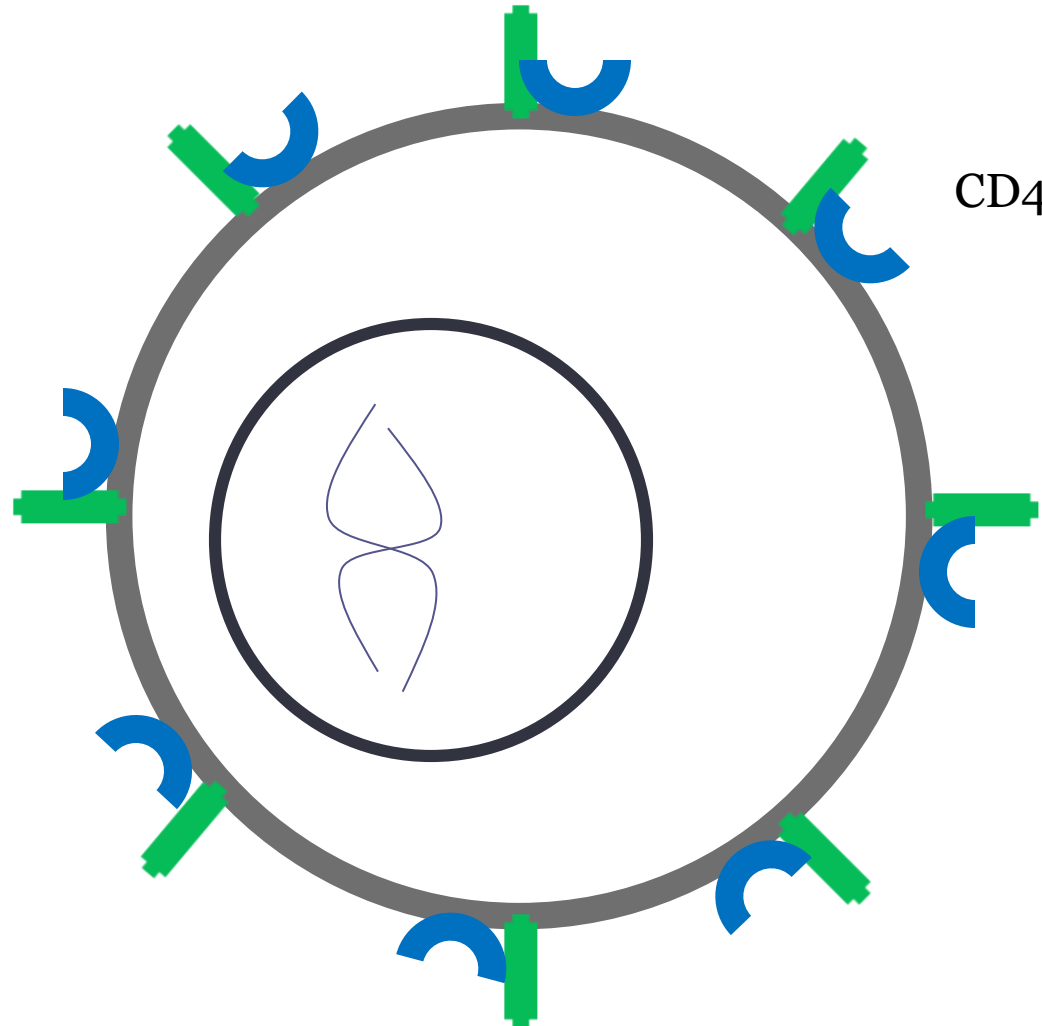


HIV Virus





HIV virus



CD4 cell

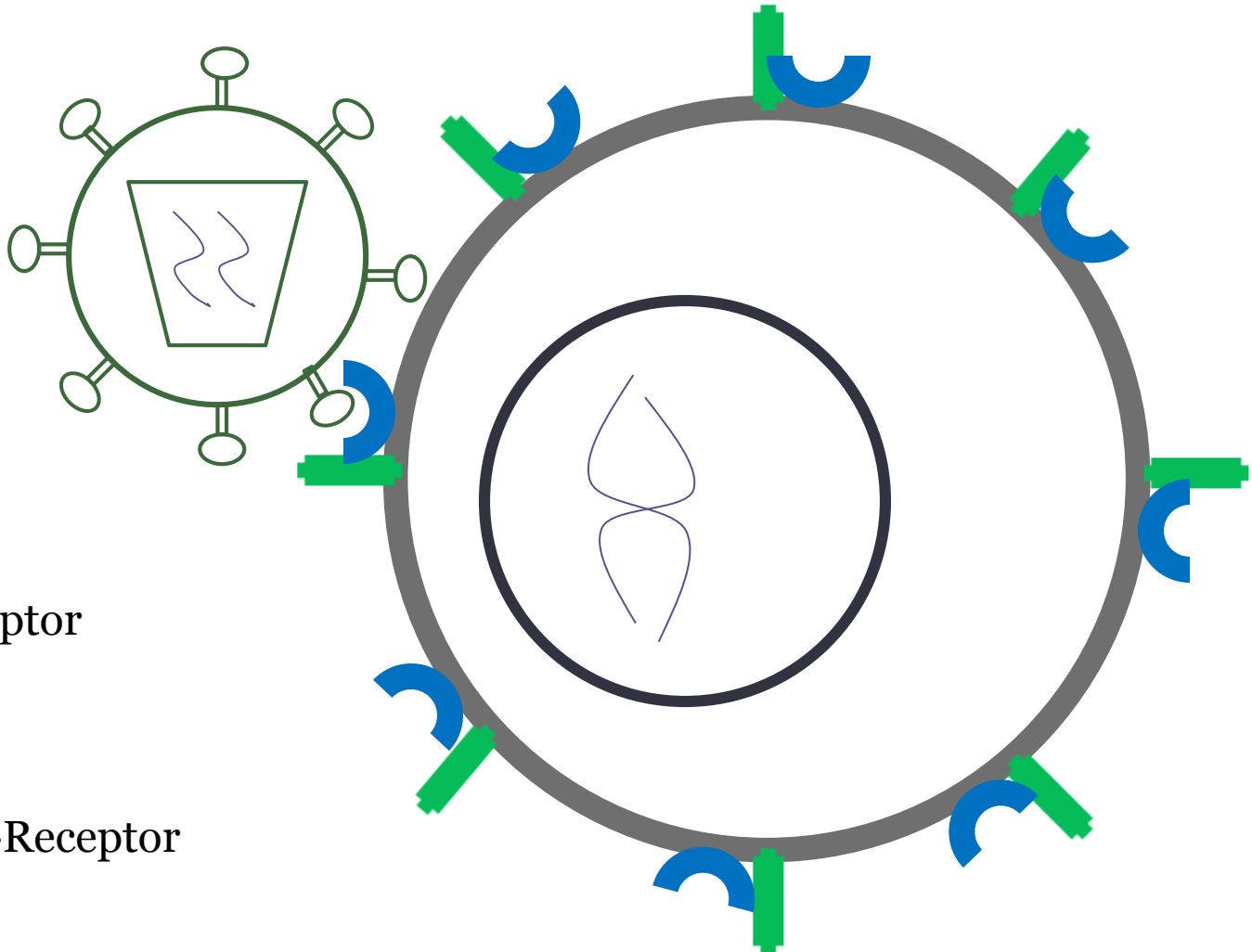


CD4 receptor



CCR5
(HIV Co-Receptor)

Viron Binding

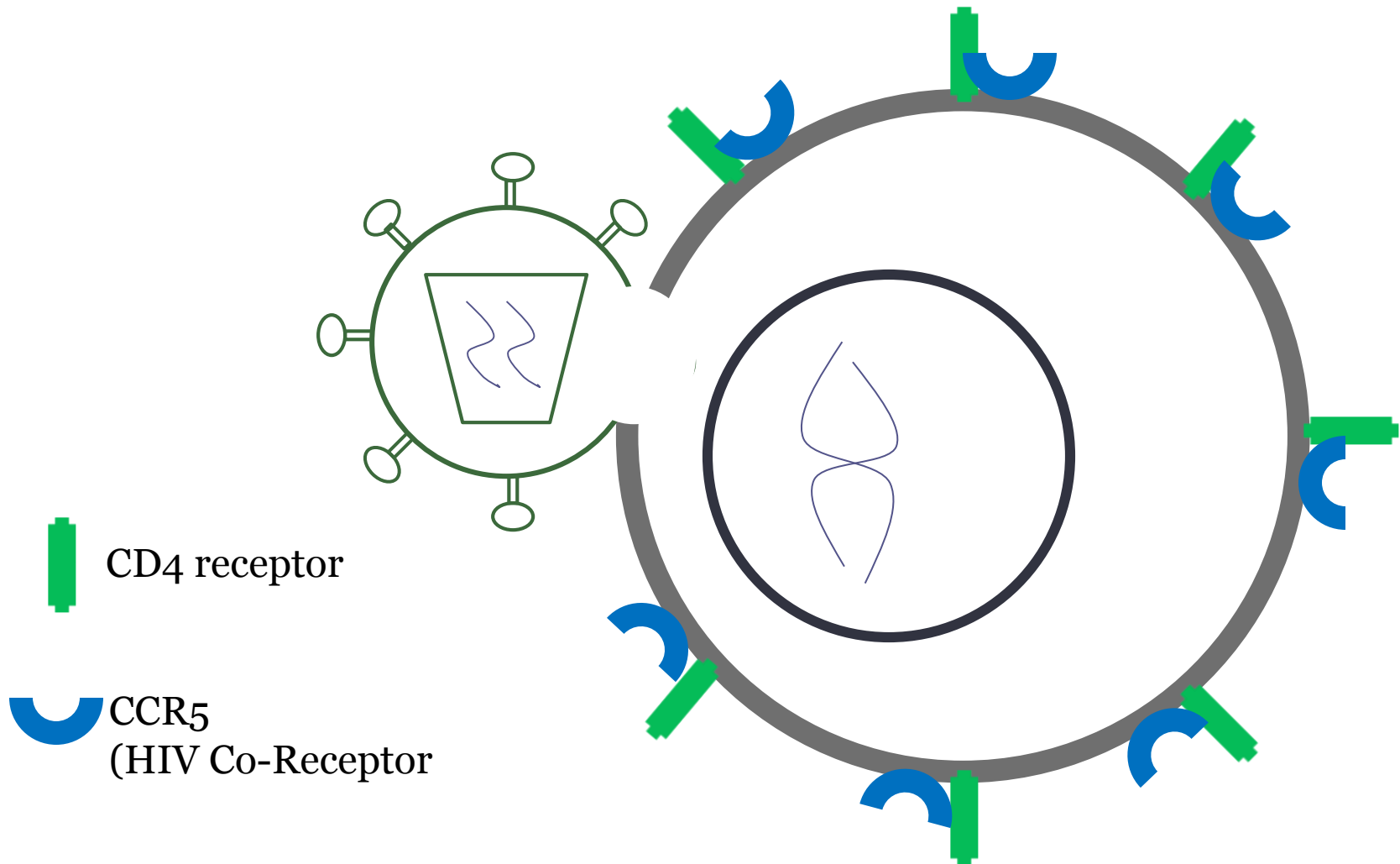


CD4 receptor

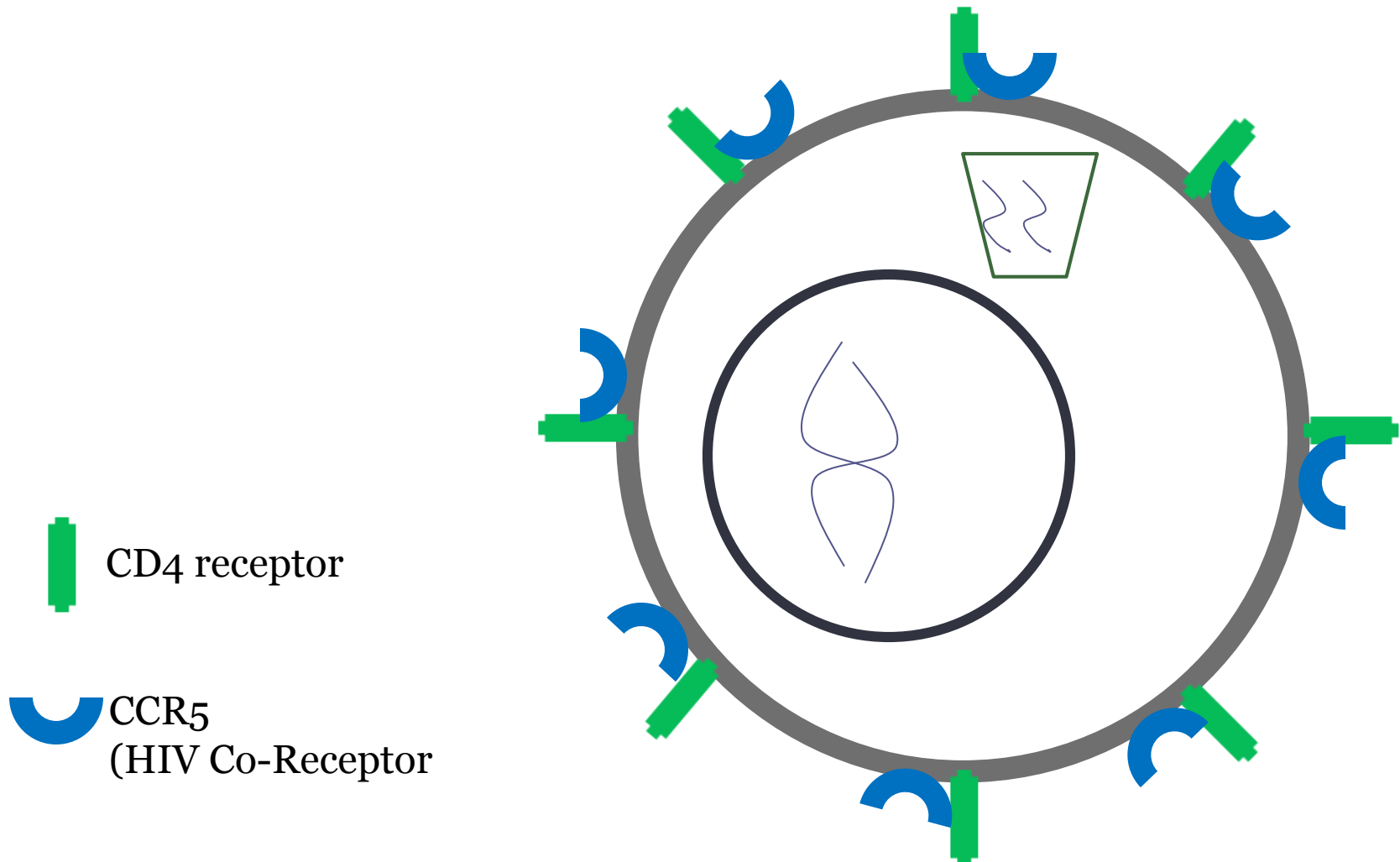


CCR5
(HIV Co-Receptor)

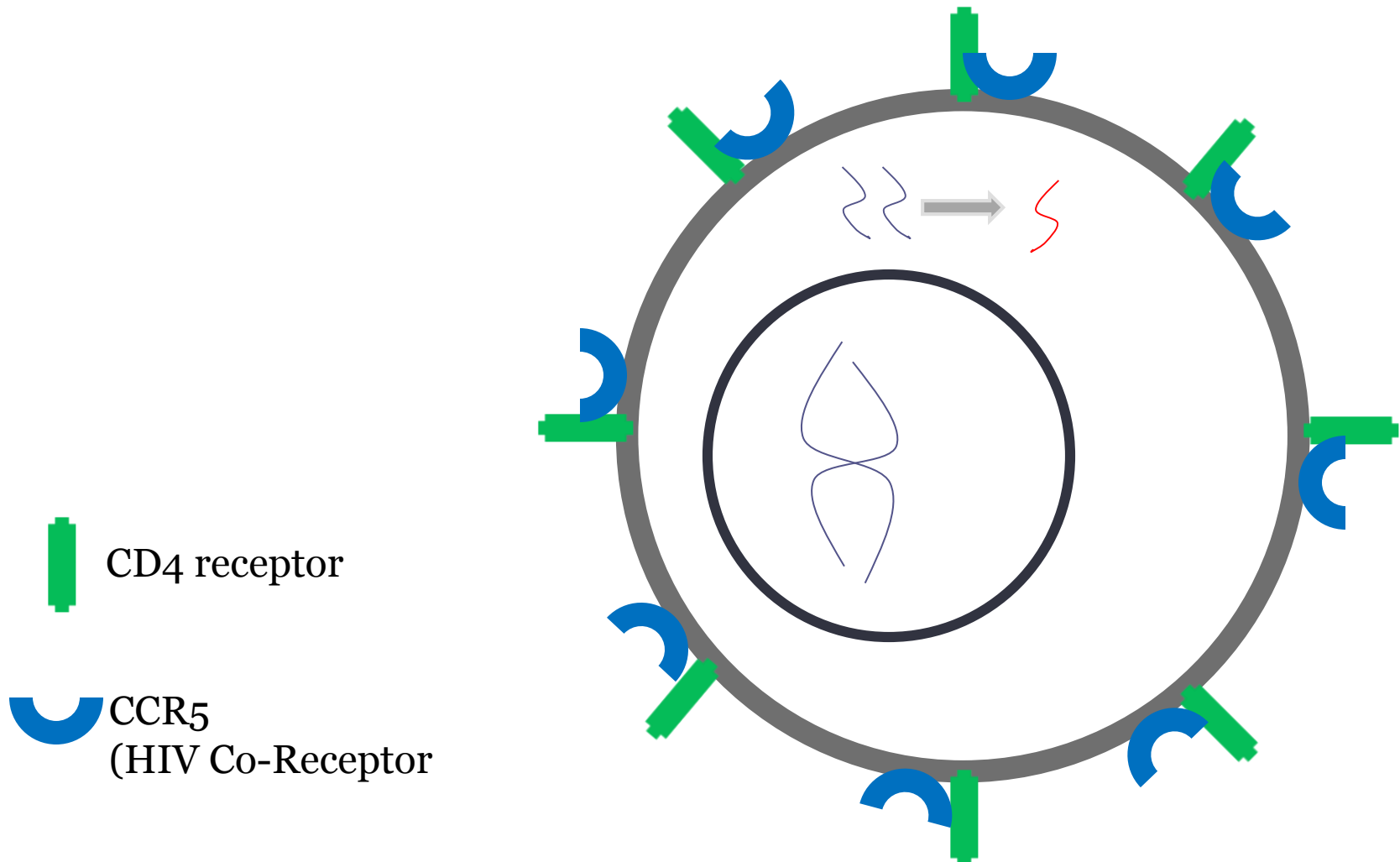
Fusion and Entry



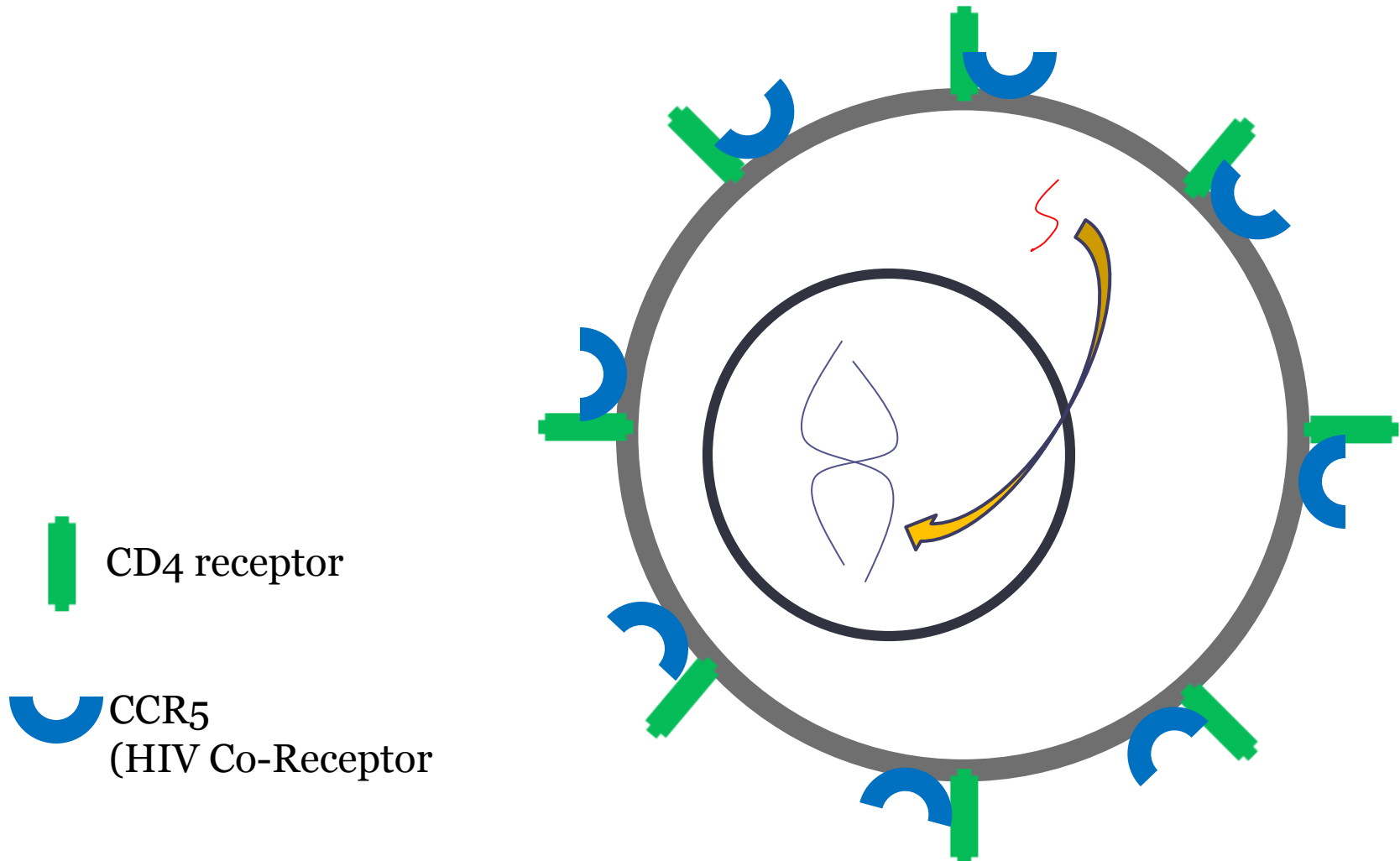
Fusion and Entry



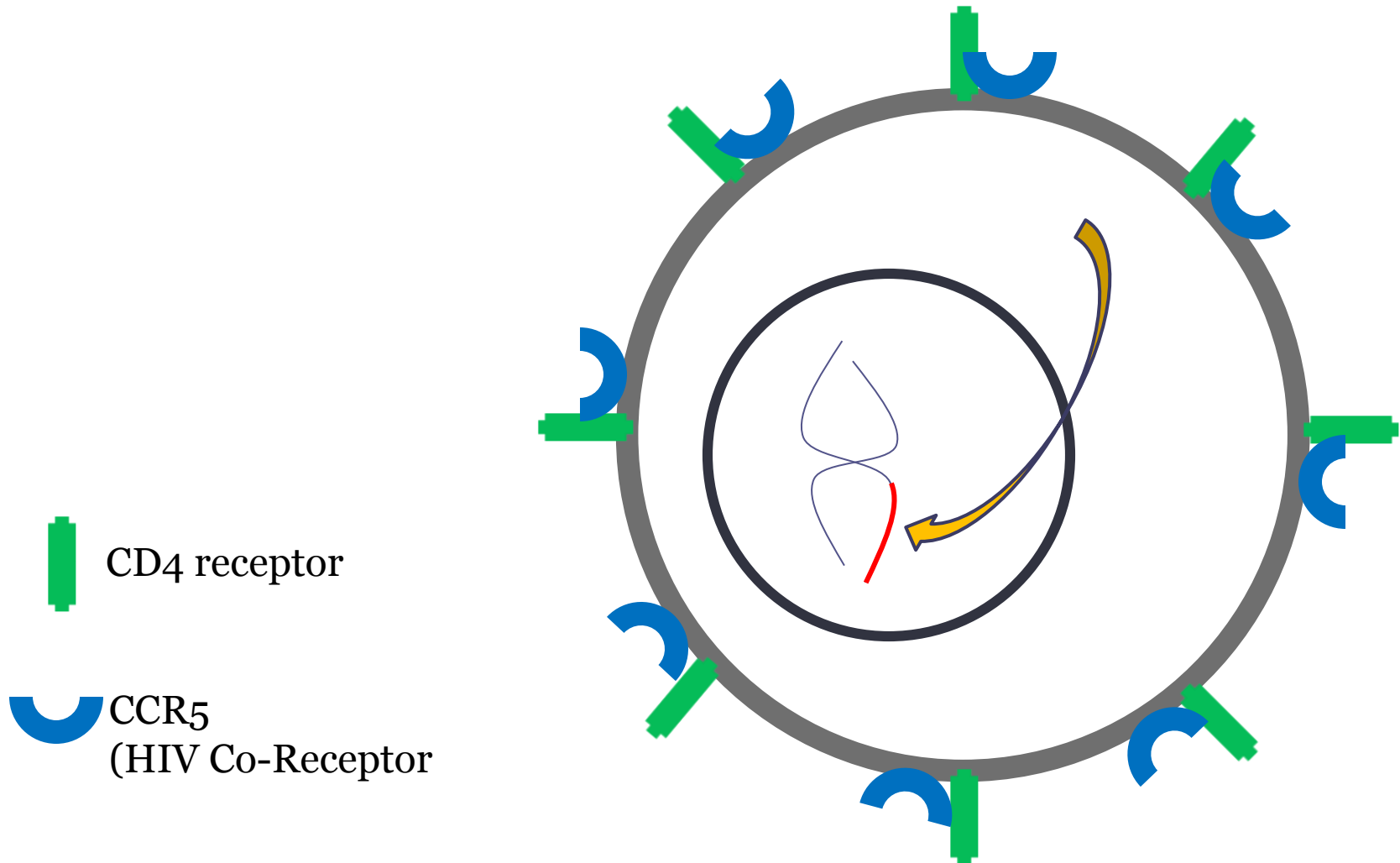
Reverse Transcription



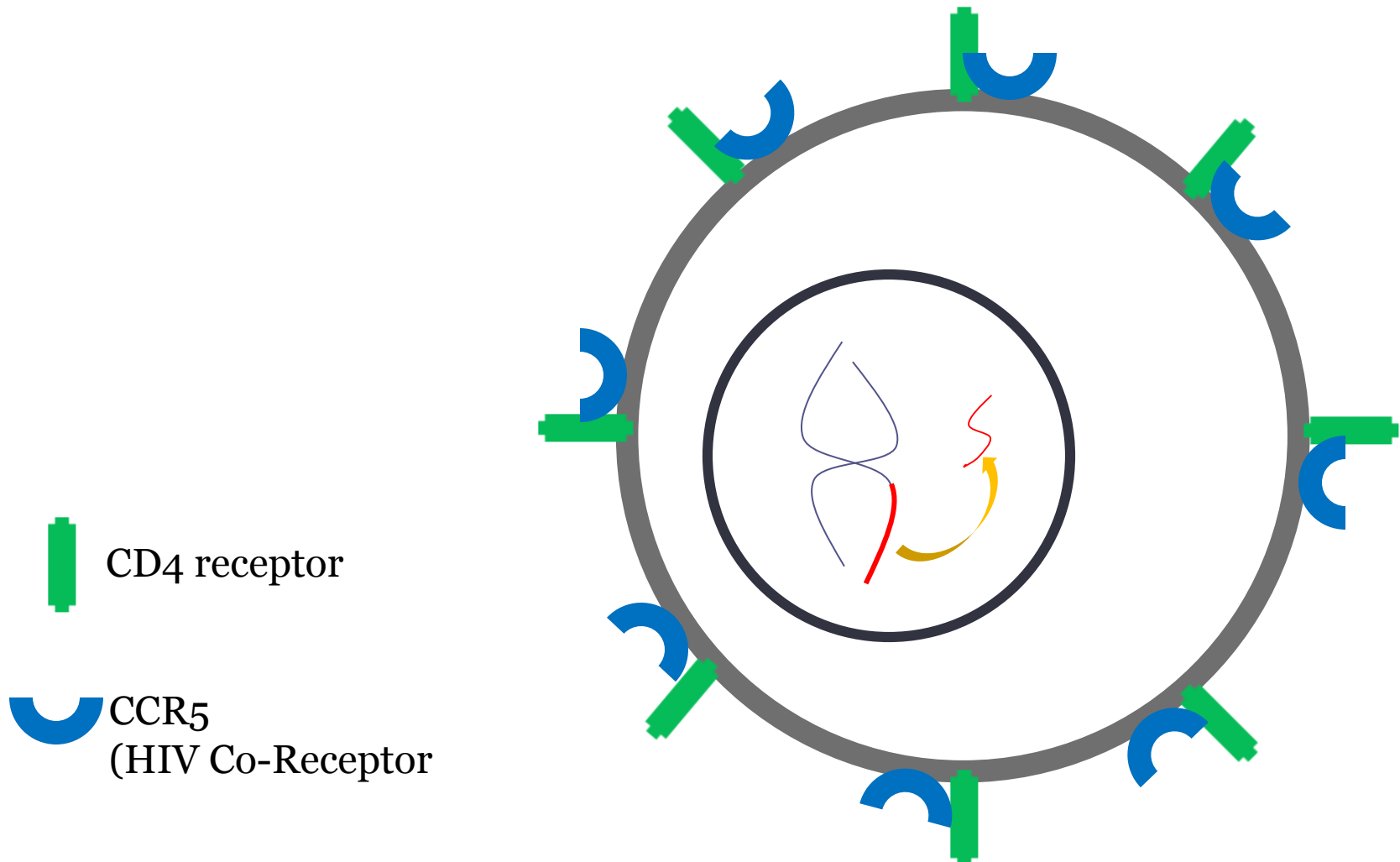
Integration



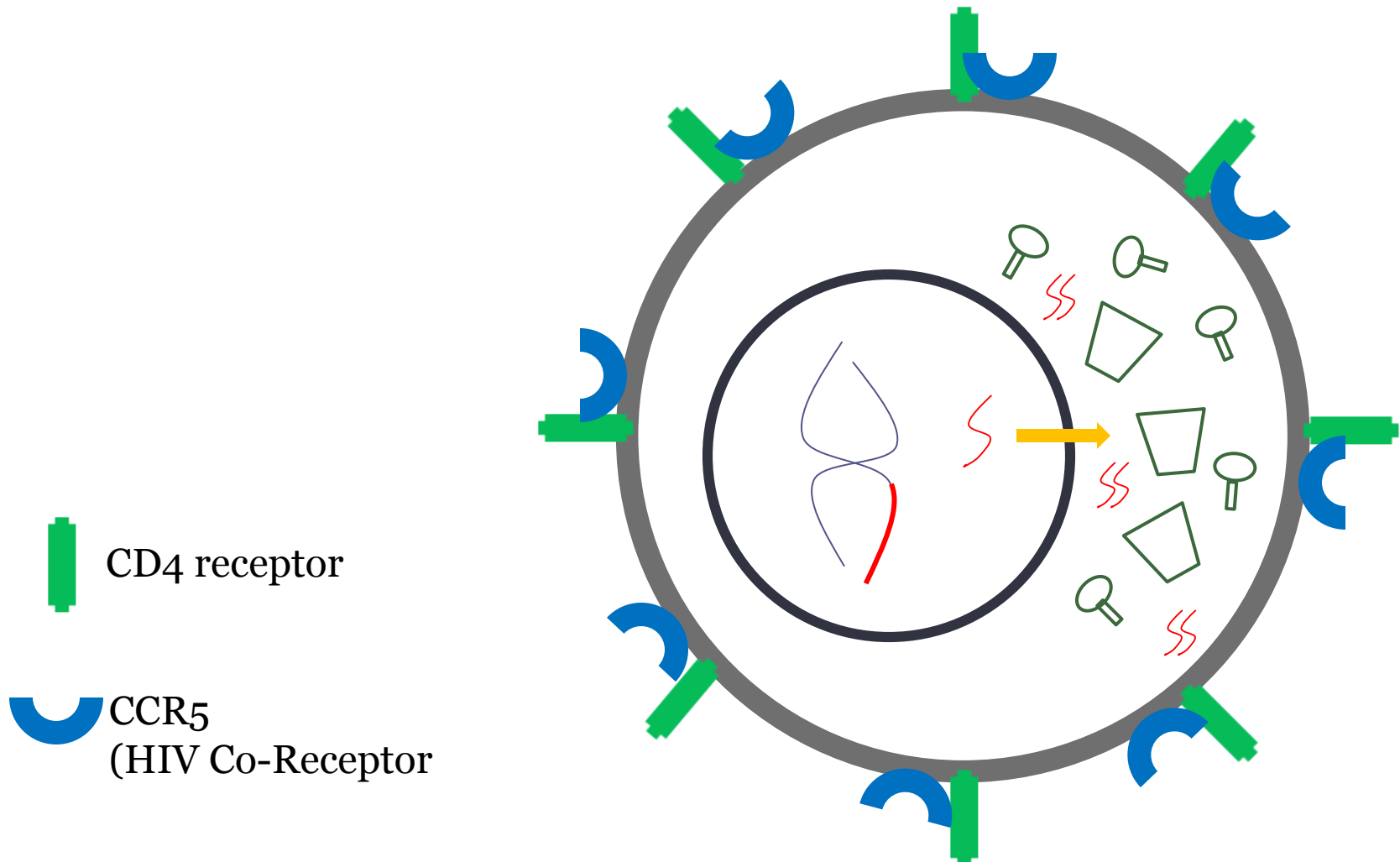
Integration



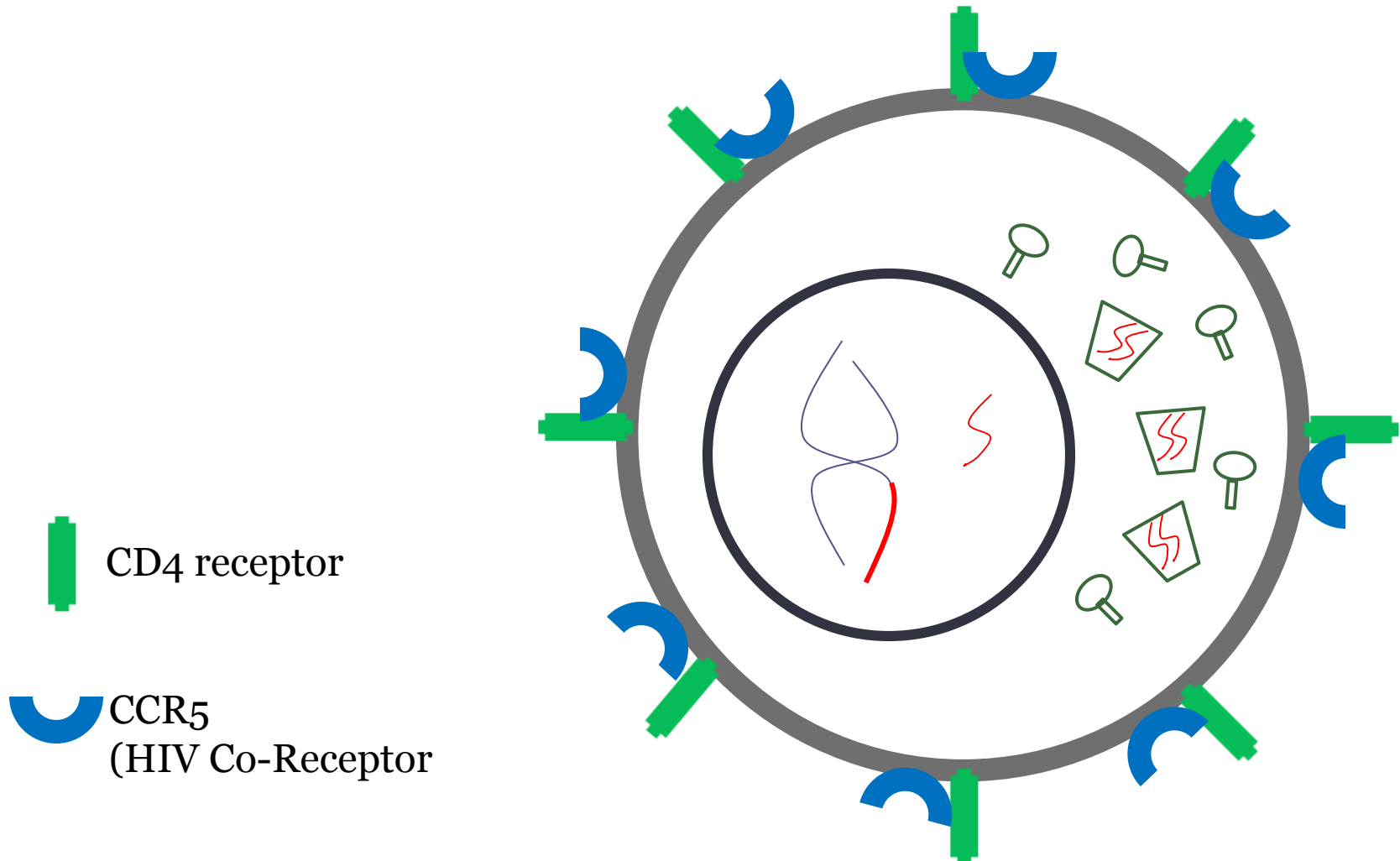
Proviral Transcription



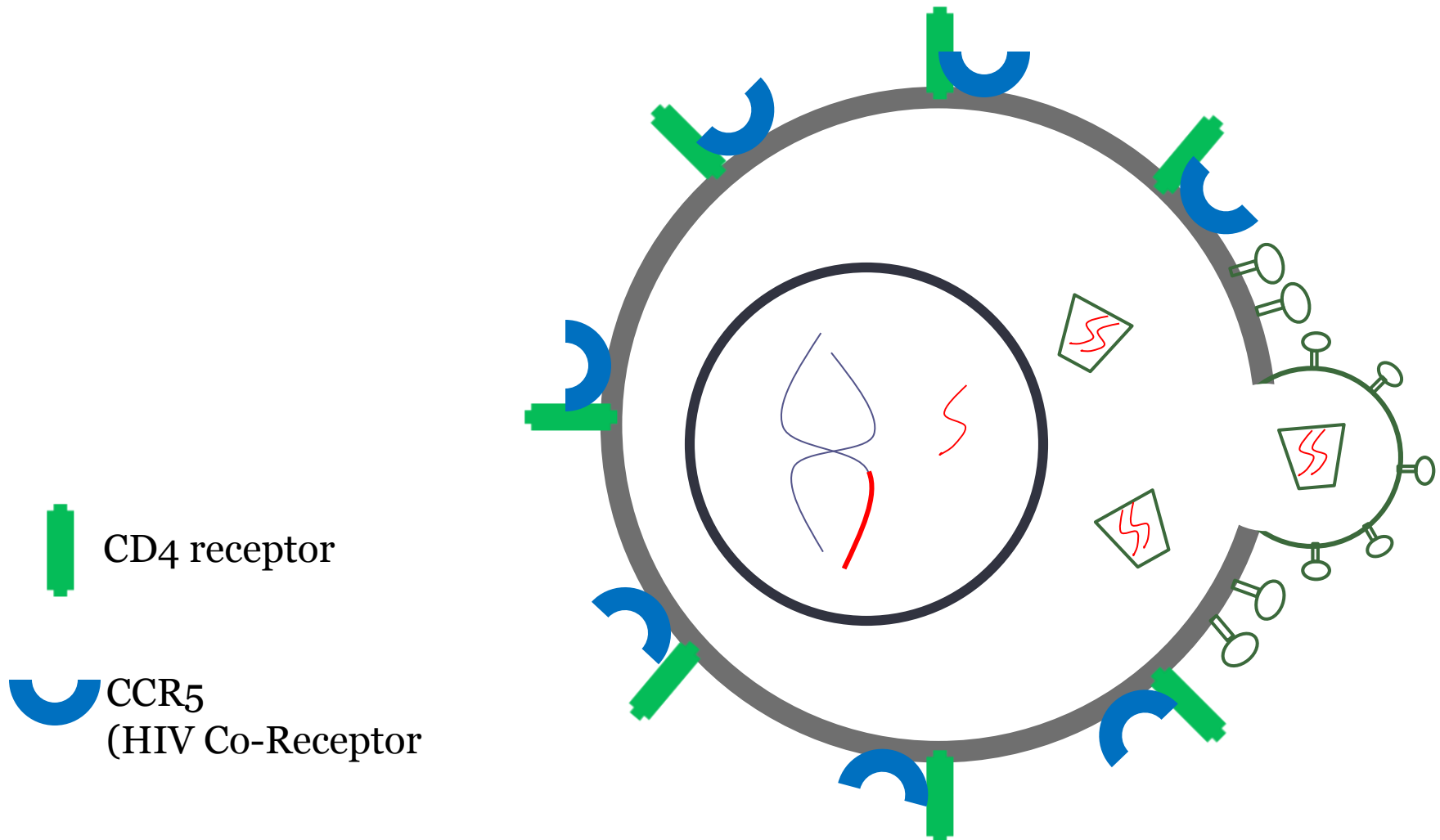
Translation



Viron Assembly



Viron Maturation and Budding



Antiretroviral Drugs

* = Once Daily

Red = Combination Drugs

Nucleoside reverse transcriptase inhibitor

- ZDV, AZT, zidovudine, Retrovir
- ddI, didanosine, Videx
- 3TC, lamivudine, Epivir *
- d4T, stavudine, Zerit *
- ddC, zalcitabine, Hivid
- ABC, abacavir, Ziagen
- FTC, emtricitabine, Emtriva

Integrase Inhibitors

- MK0518, Raltegravir,
- GS9137, Elvitegravir

Nucleotide RTI

- viread, Tenofovir*

Non-nucleoside reverse transcriptase inhibitors

- NVP, nevirapine, Viramune
- DLV, delavirdine, Rescriptor
- TMC-278, Rilpivirine
- ~~•EFV, efavirenz, Sustiva *~~
- TMC 125, Etravirine,

Combination Drugs

- Combivir = ZDV + 3TC
- Trizivir = ABC + 3TC + ZDV
- Truvada = Tenofovir + FTC *
- Epzicom = ABC + 3TC *
- Atripla = Tenofovir + FTC + EFV *
- Complerea
- Stribild

Fusion / Entry Inhibitors

- T-20, Enfuvirtide
- Maraviroc
- Vicriviroc
- TNX-355

Protease inhibitors

- IDV, indinavir, Crixivan
- NFV, nelfinavir, Viracept
- RTV, ritonavir, Norvir
- Lopinavir + ritonavir, Kaletra
- Tipranavir, Aptivus
- Fosamprenavir, Lexiva *
- Atazanavir, Reyataz*
- Darunavir, Prezista

HIV Terminology

- Viral Load
 - Amount of virus circulating in peripheral blood
 - **GOAL** → **undetectable < 50 copies/ml**
 - Check very trimester AND after initiation or change of meds

Public Health Service Task Force
**Recommendations for Use of Antiretroviral
Drugs in Pregnant HIV-Infected Women for
Maternal Health and
Interventions to Reduce Perinatal HIV
Transmission in the United States**

July 8, 2008

Revisions to the November, 2, 2007
Public Health Service Task Force
Recommendations for Use of Antiretroviral
Drugs in Pregnant HIV-1-Infected Women
for Maternal Health and Interventions to
Reduce Perinatal HIV-1-Transmission
in the United States have been made by the
Perinatal HIV Guidelines Working Group

It is emphasized that concepts relevant to HIV management evolve rapidly. The Task Force has a mechanism to update recommendations on a regular basis, and the most recent information is available on the **AIDSinfo** Web site (<http://AIDSinfo.nih.gov>).

What the US Public Health Service says about Antiretroviral Drugs in Pregnant HIV-Infected Women

“Although considerations related to pregnancy may factor into decisions as to timing and choice of therapy, **pregnancy per se is not an adequate reason to defer standard therapy...** Standard antiretroviral therapy should be discussed with and offered to HIV-1 infected pregnant women. Additionally, to prevent perinatal transmission, ZDV prophylaxis should be incorporated into whatever antiretroviral regimen is offered...”

Antiretroviral Pregnancy Registry:

Updated July 31, 2013

1st Trimester Exposures, Any ARV

- 201 defects/6,926 births
- 2.9 defects for every 100 live births
- 2.3-3.3% chance for defects

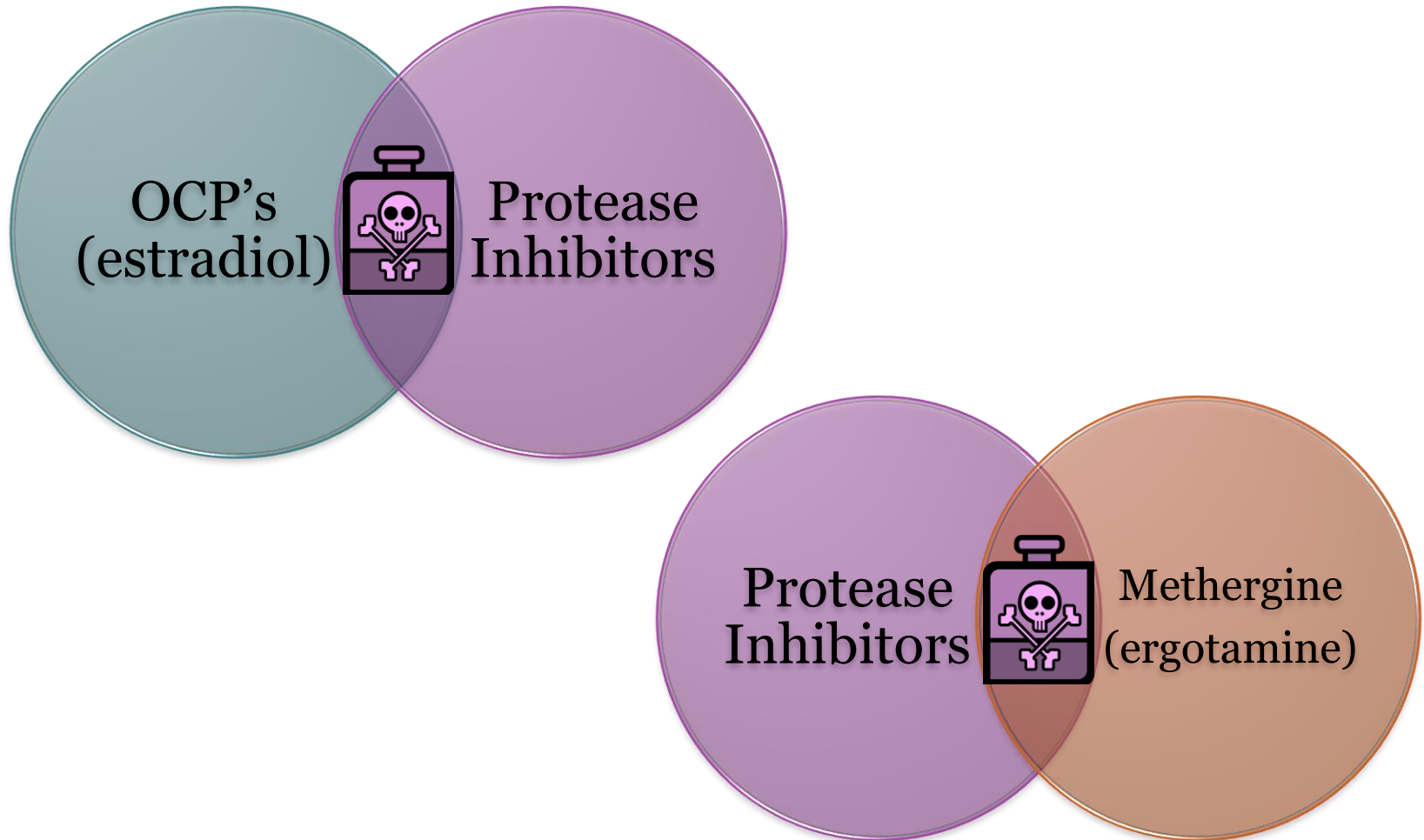
Any Pregnancy Exposures, Any ARV

- 445 defects/15,451 births
- 2.9 defects for every 100 live births
- 2.6-3.1% chance for defects

CDC population birth defects surveillance program

- **2.72 defects for every 100 live births**
- **2.1-2.23% chance for defects**

Antiretroviral Drug Interactions



HIV Terminology

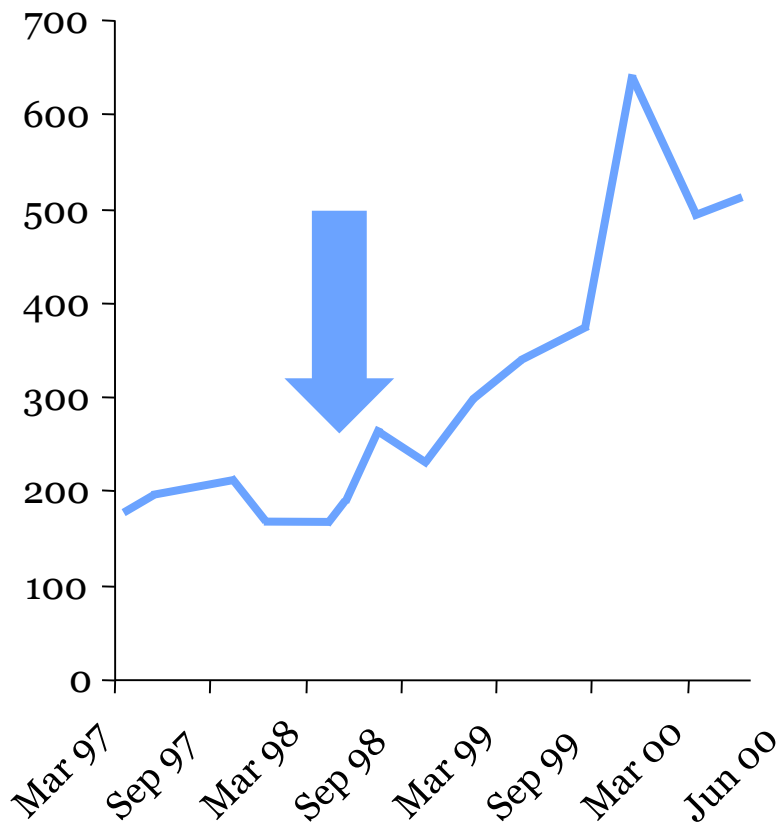
- Resistance Testing
 - Genotyping & Phenotyping
 - Measures drug resistance to each antiretroviral medications
 - Indications
 - Virologic failure
 - Suboptimal viral suppression after initiation of ART
 - Acute HIV infection

What does a genotype look like?

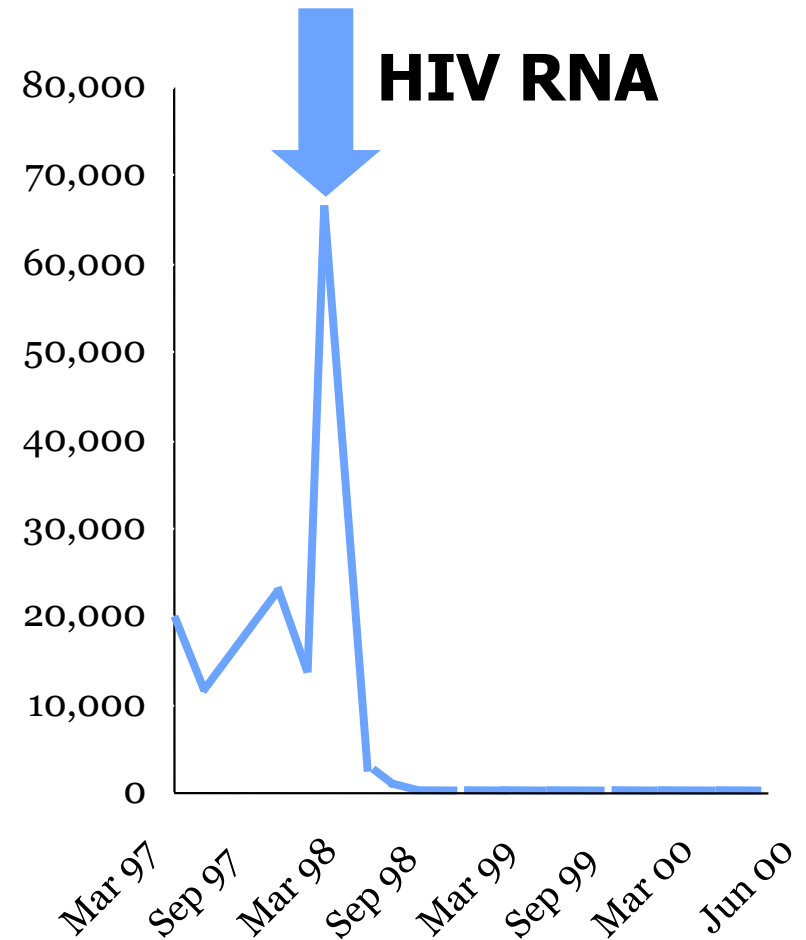
7480 · HIV-1 GenotypR™ PLUS			
Generic Name	Trade Name	Interpretation	Mutations Detected
Nucleoside RT Inhibitors			
AZT Zidovudine	Retrovir®	Sensitive	None
3TC Lamivudine	EpiVir®	Resistant	[M184V]
ddI Didanosine	Videx®	Low resistance	M184V
ddC Zalcitabine	Hivid®	Resistant	[M184V]
d4T Stavudine	Zerit®	Sensitive	None
Abacavir	Ziagen®	Sensitive	None
Abacavir+AZT+3TC	Trizivir®	Sensitive	None
Tenofovir	Viread™	Sensitive	None
AZT+3TC	Combivir®	Low resistance	M184V
Non-nucleoside RT Inhibitors			
Nevirapine	Viramune®	Resistant	[V108V/I] [K103N]
Delavirdine	Rescriptor®	Resistant	[K103N] V108V/I
Efavirenz	Sustiva®	Resistant	[K103N] V108V/I
Protease Inhibitors			
Indinavir	Crixivan®	Low resistance	L90L/M
Ritonavir	Norvir®	Low resistance	L90L/M
Saquinavir	Fortovase®	Resistant	[L90L/M]
Nelfinavir	Viracept®	Resistant	[L90L/M] V77I
Lopinavir+Ritonavir	Kaletra™	Sensitive	None
Amprenavir	Agenerase®	Sensitive	None
Other Mutations Detected: L63P			
All HIV GenotypR™ results must be interpreted in the context of both clinical and laboratory findings. Interpretation algorithm can be accessed at www.SpecialtyLabs.com or by calling Client Services at 800-421-4449. Resistant = One or more primary mutations shown in bold Low resistance = One or more secondary mutations with no primary Sensitive = No primary or secondary mutations detected This test or one or more of its components was developed and its performance characteristics determined by Specialty Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA) as qualified to perform high complexity clinical laboratory testing. <i>Albert Rabinovitch, MD, PhD</i> Albert Rabinovitch, MD, PhD Chief Medical Officer			

NFV + EFV + Combivir: March 1998 - June 2000

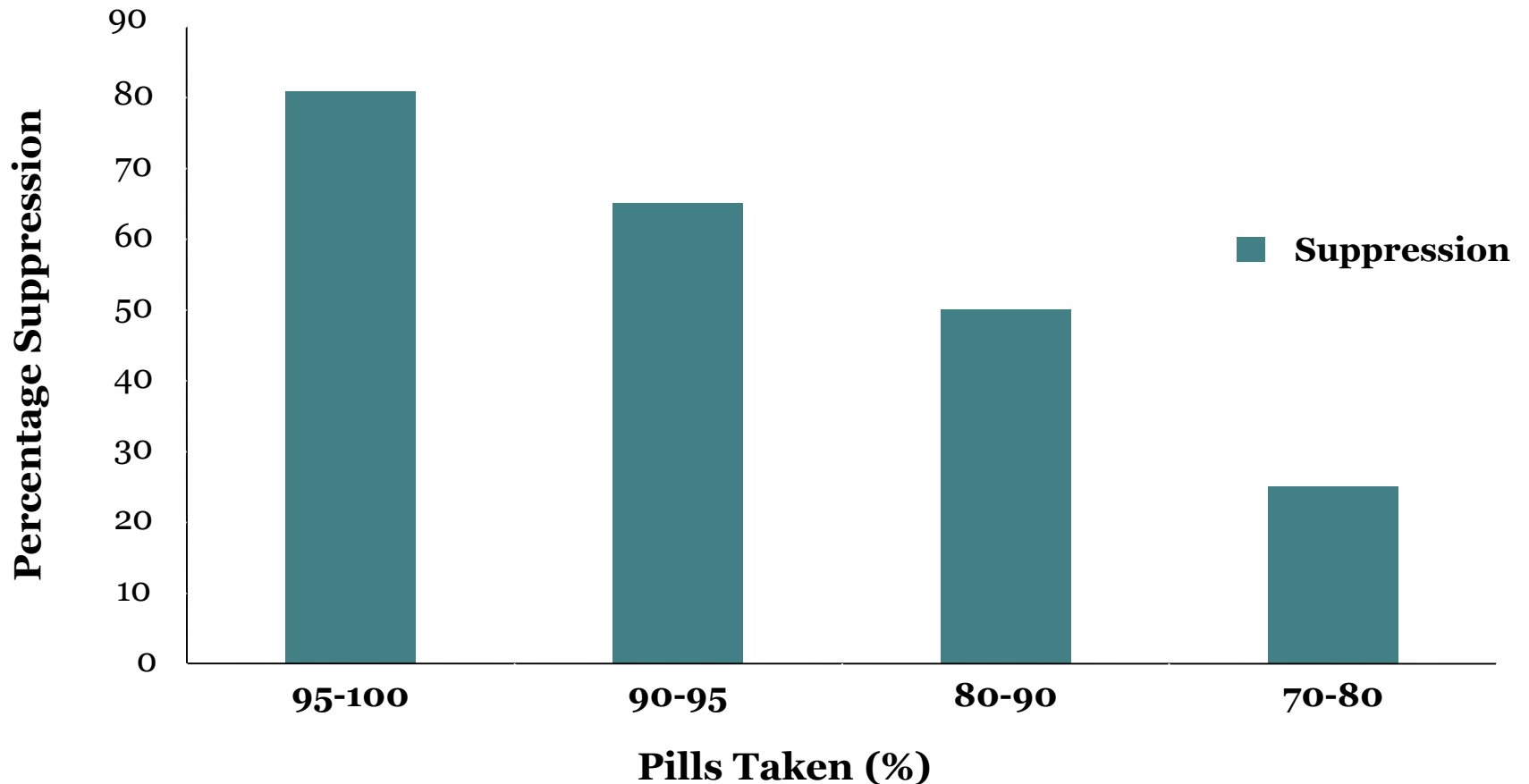
CD4



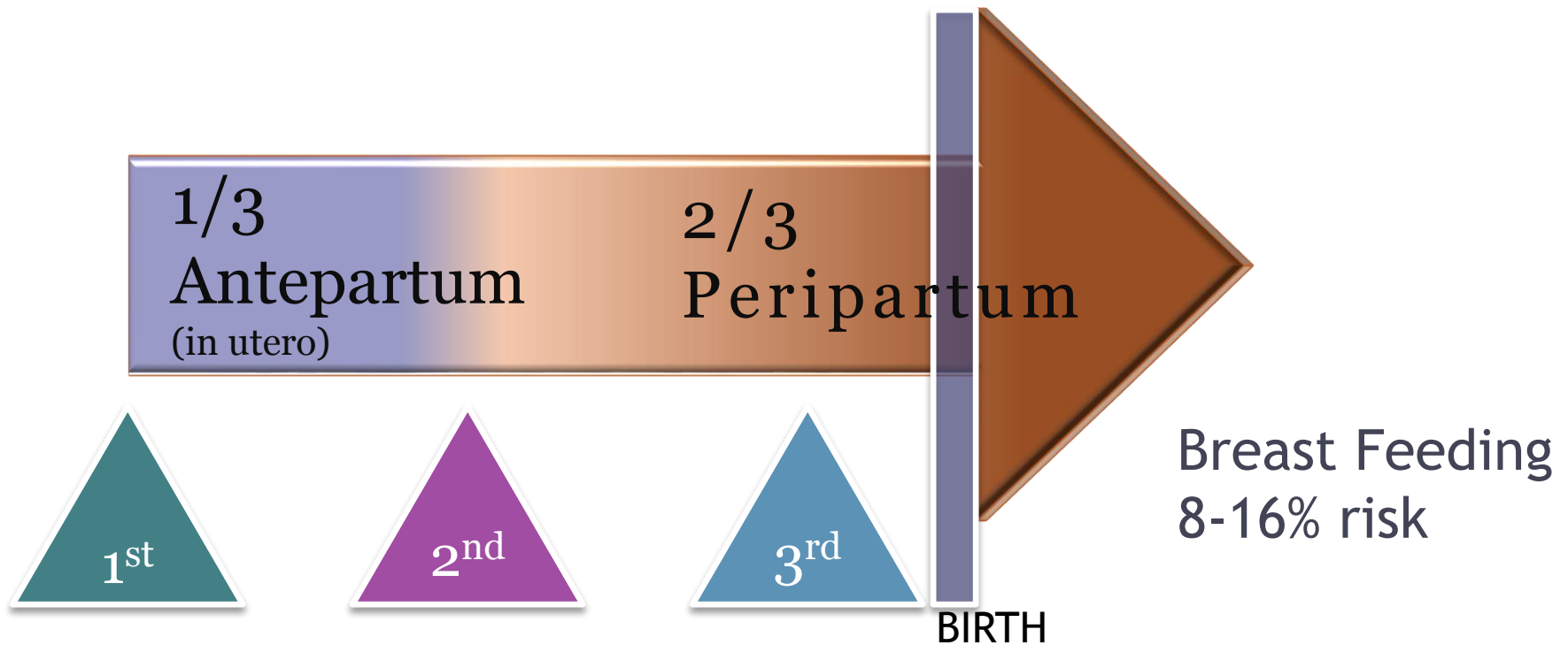
HIV RNA



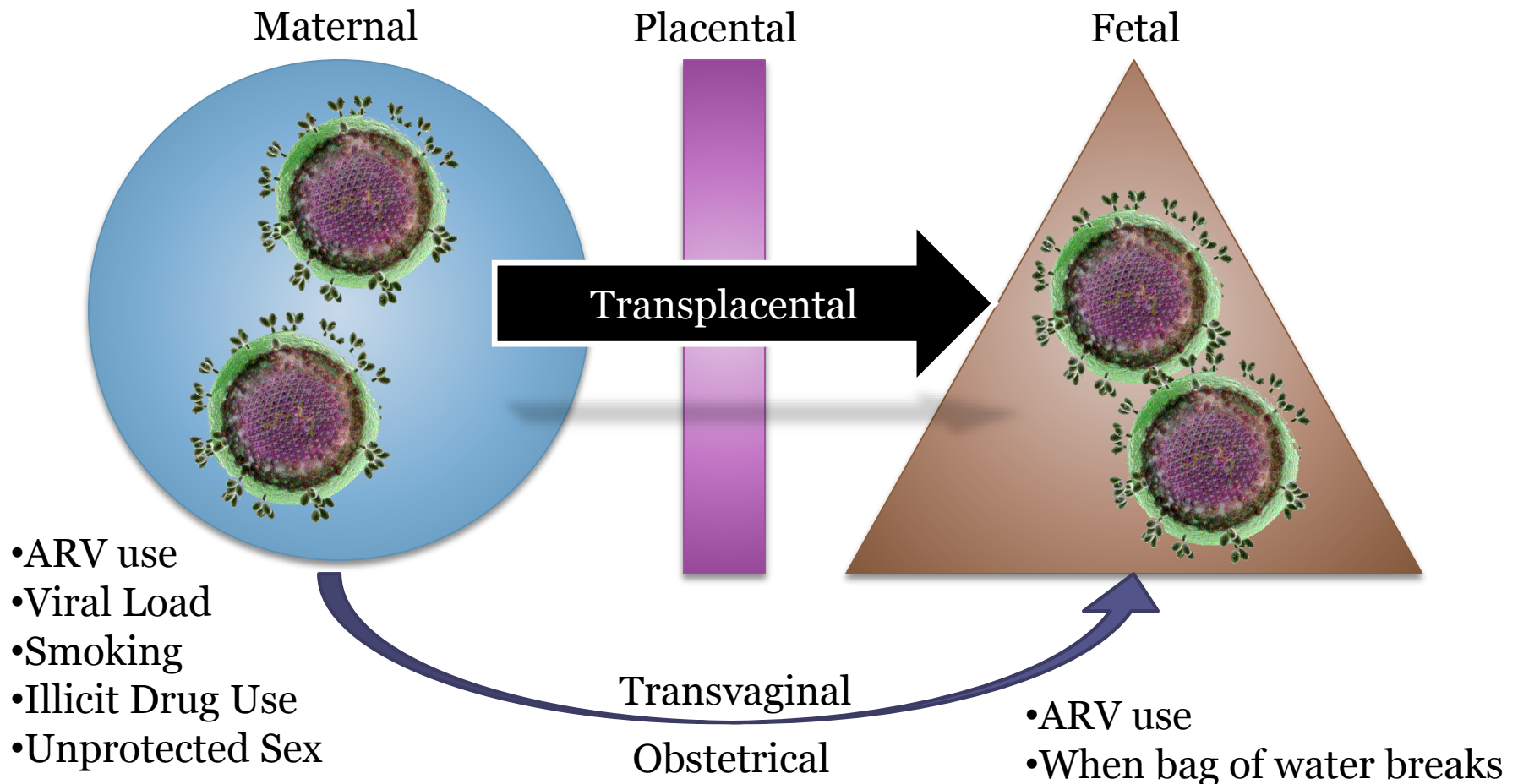
Adherence Predicts Outcome



Timing of Transmission



Perinatal Transmission of HIV



Strategies to Interrupt Perinatal Transmission

- Antiretroviral therapy (AZT, NVP)
- Cesarean Delivery
- Bottle feeding
- Pre-chewing

R. Nduati Abstract S13, 7th Retrovirus Conf, 2/00

Nairobi Breast Feeding Study

425 HIV infected women randomized

212 Breast Fed

213 Formula Fed

61 (36.6%) infected infants 31 (20.5%)

excess breast feeding risk : 16.2% (1.5, 25.9)

Mode of Delivery: Cesarean Section

- Fetal Benefit
 - Most beneficial for women **NOT** taking ARV therapy and those with a viral load **higher than 1000**
 - For women with a viral load **lower than 1000** offers no prevention benefit
 - Women should be explained the benefits and risks of all modes of delivery and the choice is ultimately up to the woman

Decreasing Transmission:

Less than 2% transmission rate

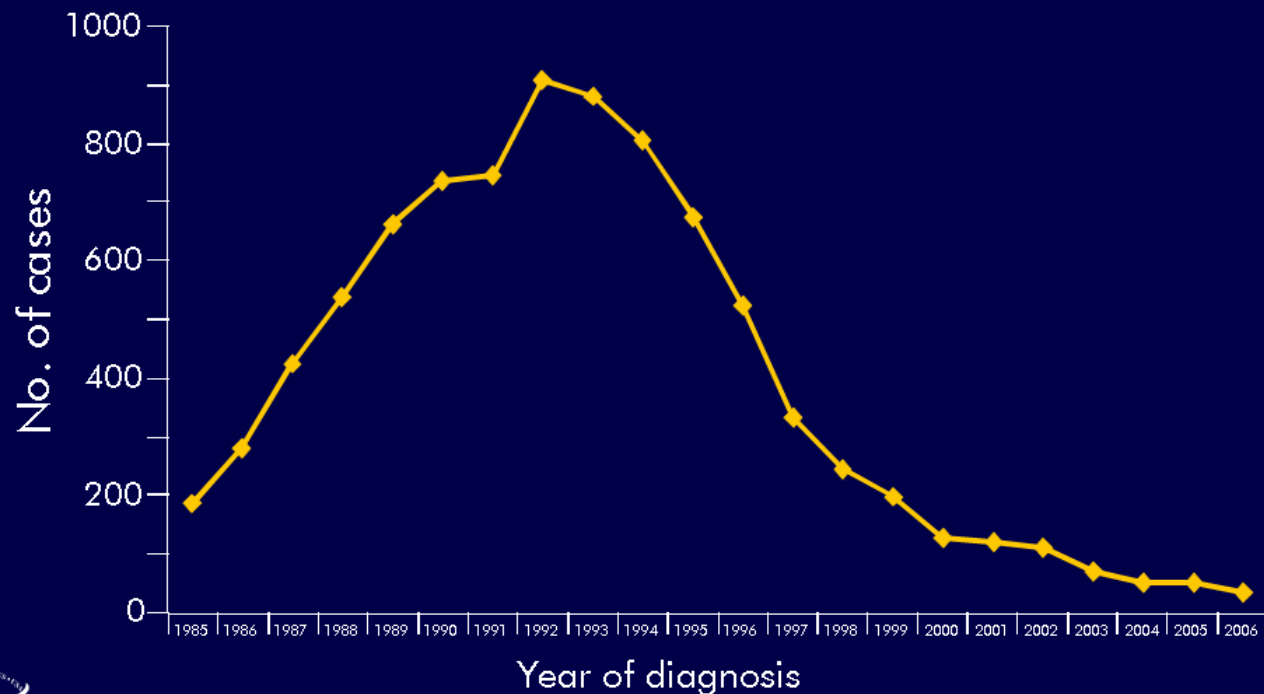
- Start AZT and two other antiviral medications as soon as possible (14-34 weeks)
- Viral load < 50 count
- IV AZT load given to mother during labor, until baby's cord is clamped
- Oral AZT to baby as soon as possible after delivery and every 12 hours as prescribed
- No breastfeeding

Perinatal HIV Transmission rates

Study	#	Rate
Scott(85/87)	20	50-65%
Italian Cohort (89)	486	33%
ECS (1992)		14%
WITS	>1000	20.5%
PACTG 076 Placebo	209	22.6%
PACTG 076 ZDV Group	210	7.6%
ACTG 185 (1997)	1035	4.8%
North Carolina + ZDV	409	3%
North Carolina – ZDV (Ficus, 1996)		17%
New York + ZDV	939	6%
New York – ZDV (Wade, 1996)		27%
Florida + ZDV	145	3%
Florida – ZDV (Delke, 1999)		25%
PACTG 316	1500	1.5%

HIV Transmission Graph

Estimated Number of Perinatally Acquired AIDS Cases, by Year of Diagnosis, 1985–2006—United States and Dependent Areas



Note. Data have been adjusted for reporting delays and cases without risk factor information were proportionally redistributed.



Legal Disclosure of HIV Results

- Doctor to Partner
- Doctor to Spouse
- Doctor to father of the baby

