Risque viral et procréation

Comment diminuer le risque de transmission pour les couples séro-différents (VIH et/ou VHC)?

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Evidence for HIV-1 in semen

- Epidemiological evidence
  - Sexual transmission
  - Transmission using donor semen

    (MMWR 1990)

- Virological evidence : HIV can be detected in semen by
  - Culture
  - P24 antigen detection
  - RNA and DNA detection

HIV risk and natural procreation

- Risk of transmission during a single sexual intercourse is low
- Estimated at 0.05 to 0.15 % per act

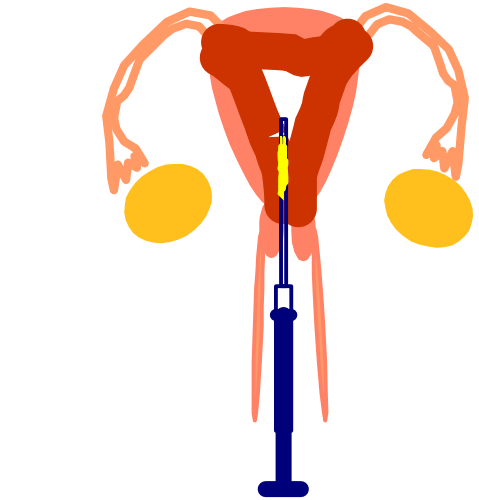
- This risk is not acceptable and unprotected intercourse must not be recommended
- The systematic condom use induced an Artificial sterility

Procreation without HIV risk
(HIV infected man)

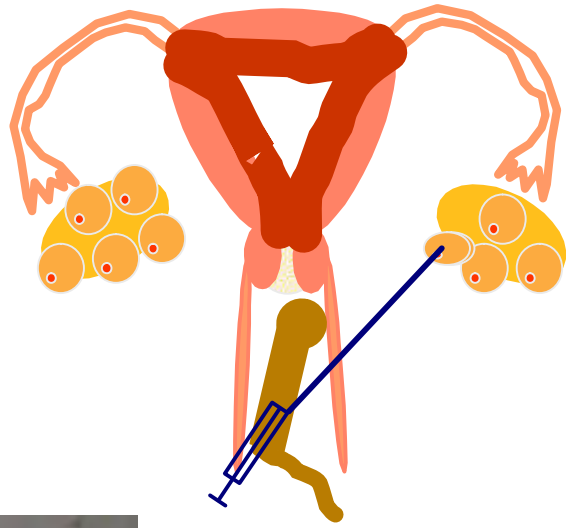
- **No risk**
  - Child adoption
  - Insemination with donor sperm
- **Decreased risk**
  - Unprotected intercourse on the day of ovulation *(Mandelbrot et al, Lancet 1997)*
  - Medically assisted procreation

MAP technologies

- **Inséminations intra-utérines**
  - Dysovulation
  - Glaire cervicale anormale
  - Anomalies modérées du sperme

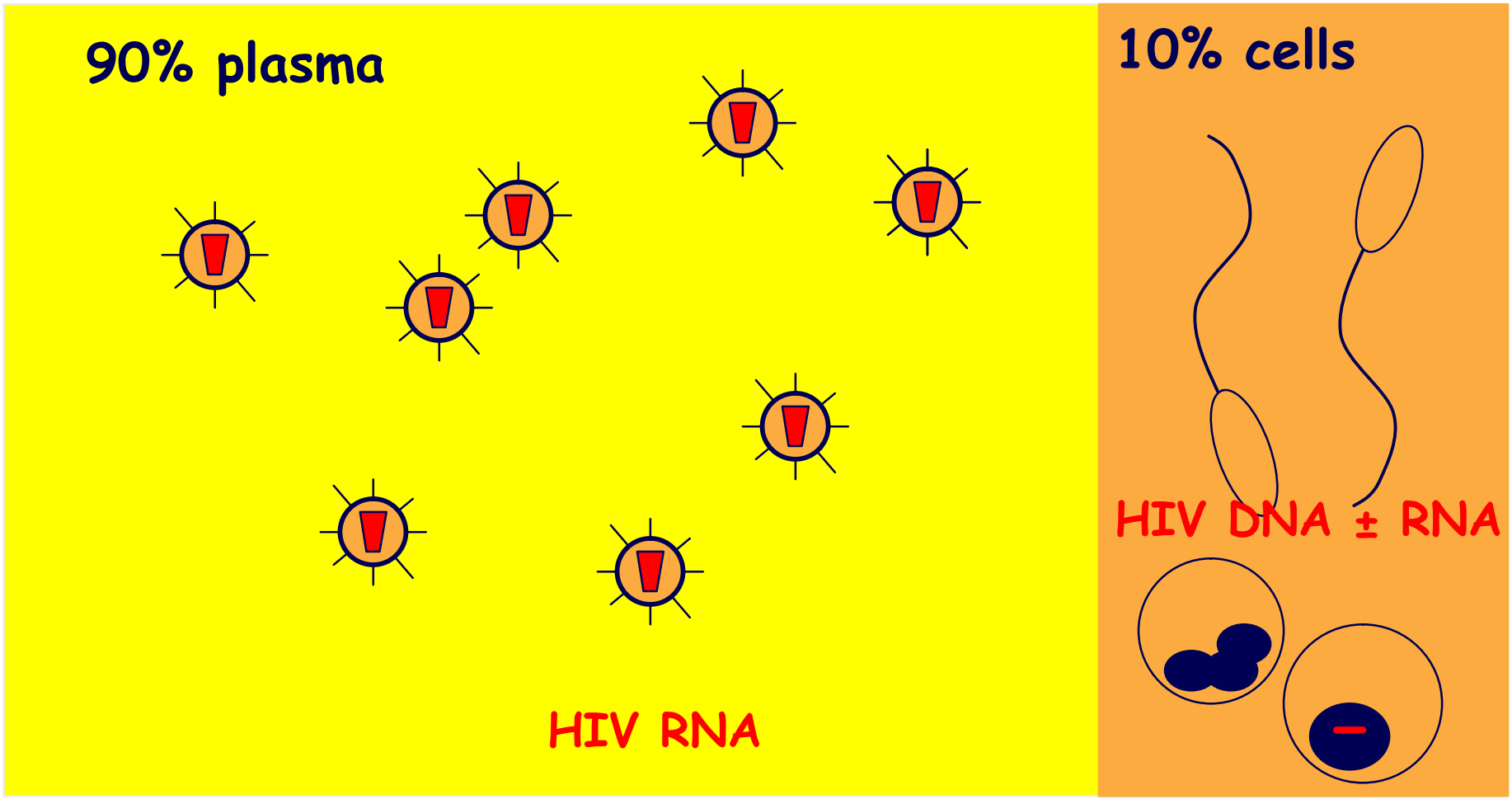


- **Fécondation In Vitro – ICSI**
  - Pathologie tubaire
  - Anomalies sévères du sperme
  - Echec des inséminations



Couples hypofertiles

Location of HIV in semen



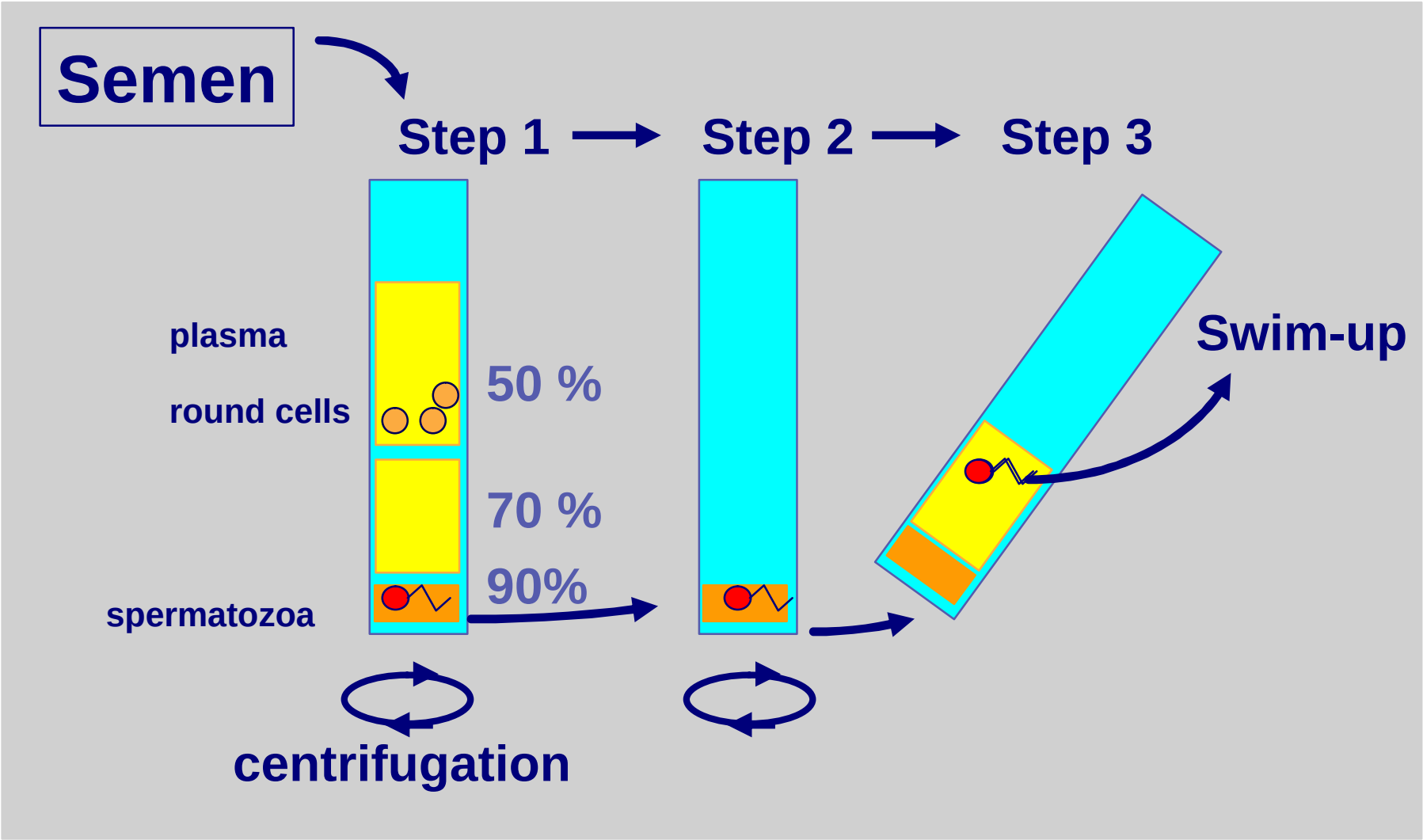
No evidence in favour of HIV infection of spermatozoa

Risk reduction using MAP

- Use of sperm processing (sperm-wash)
  - Discard seminal plasma
  - Discard round cells (lymphocytes,…)
  - Isolation of motile spermatozoa
- Use of MAP
  - Reduce the number of potential exposition to HIV by monitoring, ovulation induction, …
  - Choice of MAP technique ($2x10^6$ or less spermatozoa)

Spermatozoa Processing

Density gradient + swim-up



Detection of HIV genome

HIV genome in semen	**171/832**	**21%**
HIV RNA in seminal plasma	**114/832**	**14%**
HIV DNA in semen cells	**45/793**	**6%**
HIV RNA in semen cells	**66/764**	**9%**
HIV genome after preparation	**0/804**	**0%**

Pasquier, AIDS 2000, Bujan AIDS 2004

Detection of HCV genome in semen fractions

HCV genome in semen	**45/389**	**12%**
HCV RNA in seminal plasma	**45/389**	**12%**
HCV RNA in semen cells	**0/134**	**0%**
HCV genome after preparation	**0/115**	**0%**

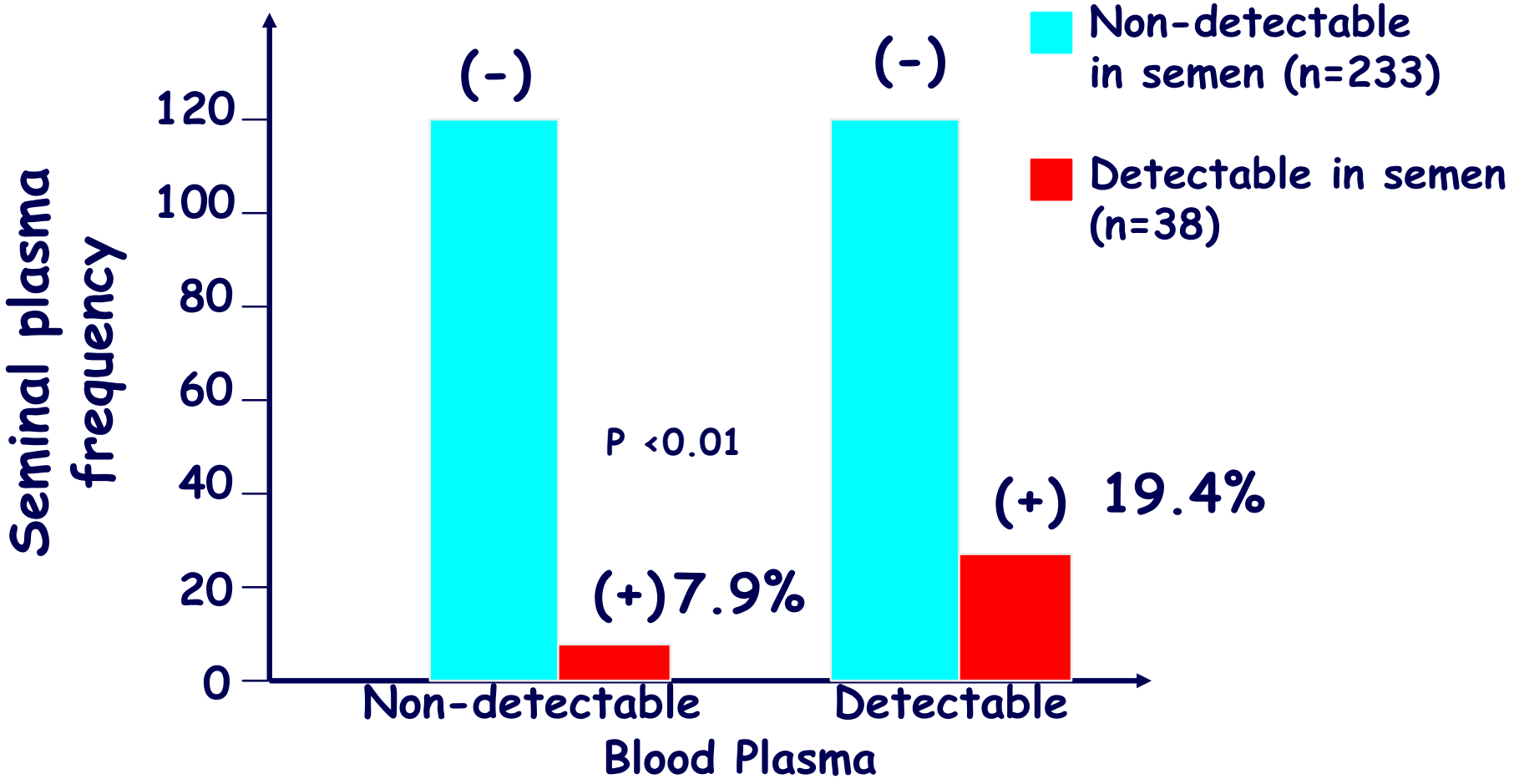
Pasquier J Med Virol 2004

Can we predict
HIV shedding in semen ?

or

Is HIV detection in semen
systematically needed?

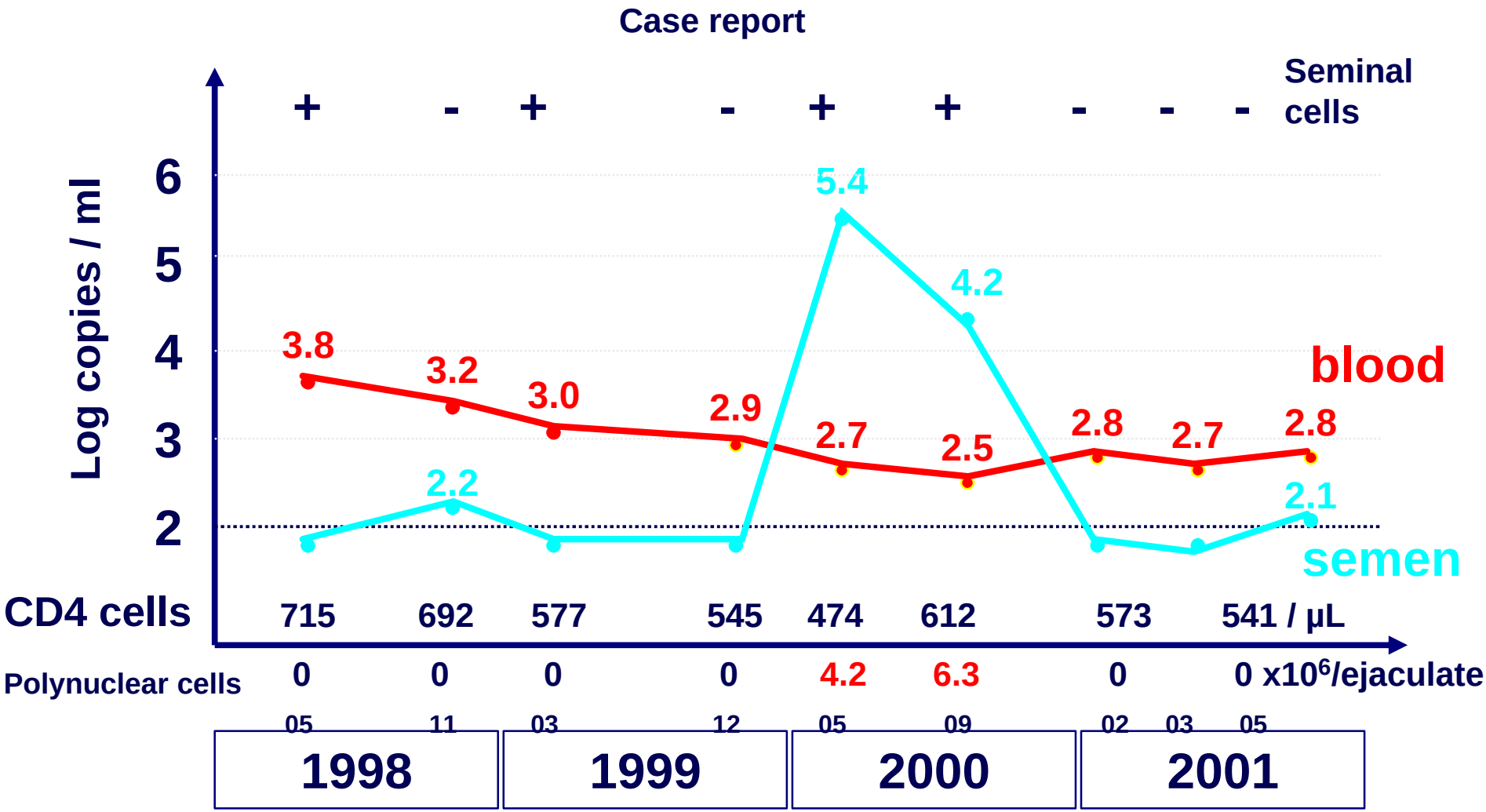
HIV-1 viral load seminal plasma vs blood



Detection with non-detectable blood viral load occurred in 7.9%

Bujan et al, AIDS 2004

Intermitent HIV-1 shedding



Bujan et al, Fertil Steril 2002

HIV shedding in semen

- Associated with :
  - Low CD4 Cells count
  - AIDS clinical stage
  - No HIV treatment or non-optimal treatment
  - Leucocytes in semen

- There is no predictive marker valid for HIV shedding in one individual man

Other HIV risk in AMP

- Risk of nosocomial infections not directly linked to MAP techniques
- Risk of unprotected sexual intercourse

Toulouse
PMA results of IUI program

	Update 2005
84 couples, 298 IUI cycles	**159 couples** **402 cycles**
56 pregnancies : 18.8% /cycle	**76 pregnancies**
44 deliveries, 52 children **9 miscarriages : 16.07% /pregnancy** **3 ongoing pregnancies**	**64 children**

couples with pregnancy : 57 %

take home baby rate : 52.4%

NO HIV contamination of women

Bujan, Fertil Steril 2004

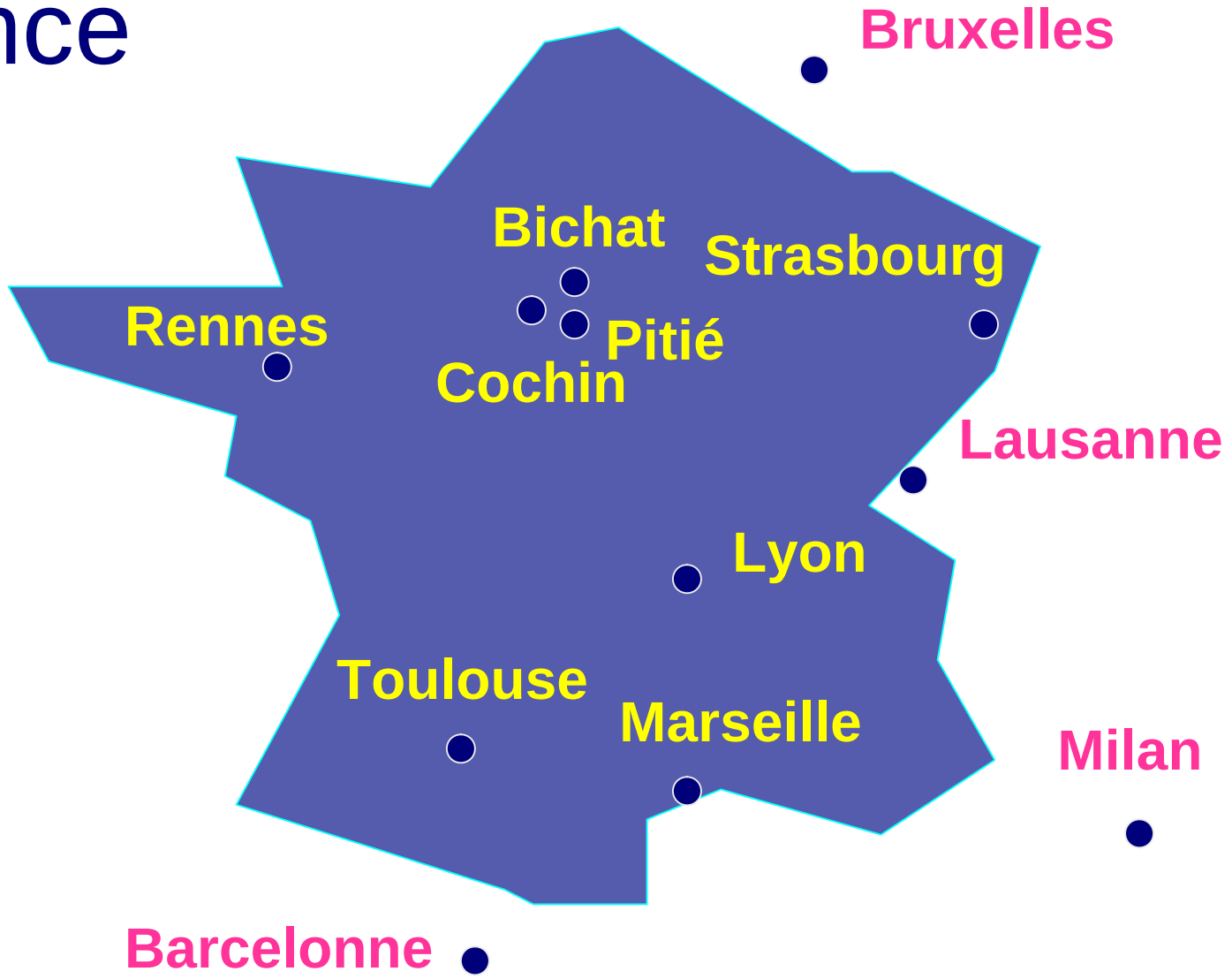
Conclusion (1)

- Sperm processing techniques are effective to obtain spermatozoa without HIV detection
- Semen must be systematically tested for HIV because of
  - Unpredictable intermittent shedding
  - Risk of processing errors
- Development of quality control should help to find optimal algorithm for HIV risk reduction
  - Results of the first QC are under analysis

Conclusion (2)

- **In France legal limits apply to MAP (decree - Arrêté du 10 mai 2001)**
  - CD4 cells counts > 200 µL, stable for 4 months
  - HIV-1 Viral load in blood stable for 4 months
  - Viral load in seminal plasma is required to choose MAP technique
    - < 1,000 c/mL — all MAP techniques
    - 1,000 to 10,000 c/mL — ICSI or IVF only
    - > 10,000 c/mL — no MAP possible
  - Final sperm fraction is systematically tested for HIV
  - Couple evaluation by a multidisciplinary team

AMP à risque viral HIV en France



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