

Tumours in the donor: what is the risk?

Pr Olivier Detry

Dpt of Abdominal Surgery & Transplantation
CHU Liège, University of Liege, Belgium

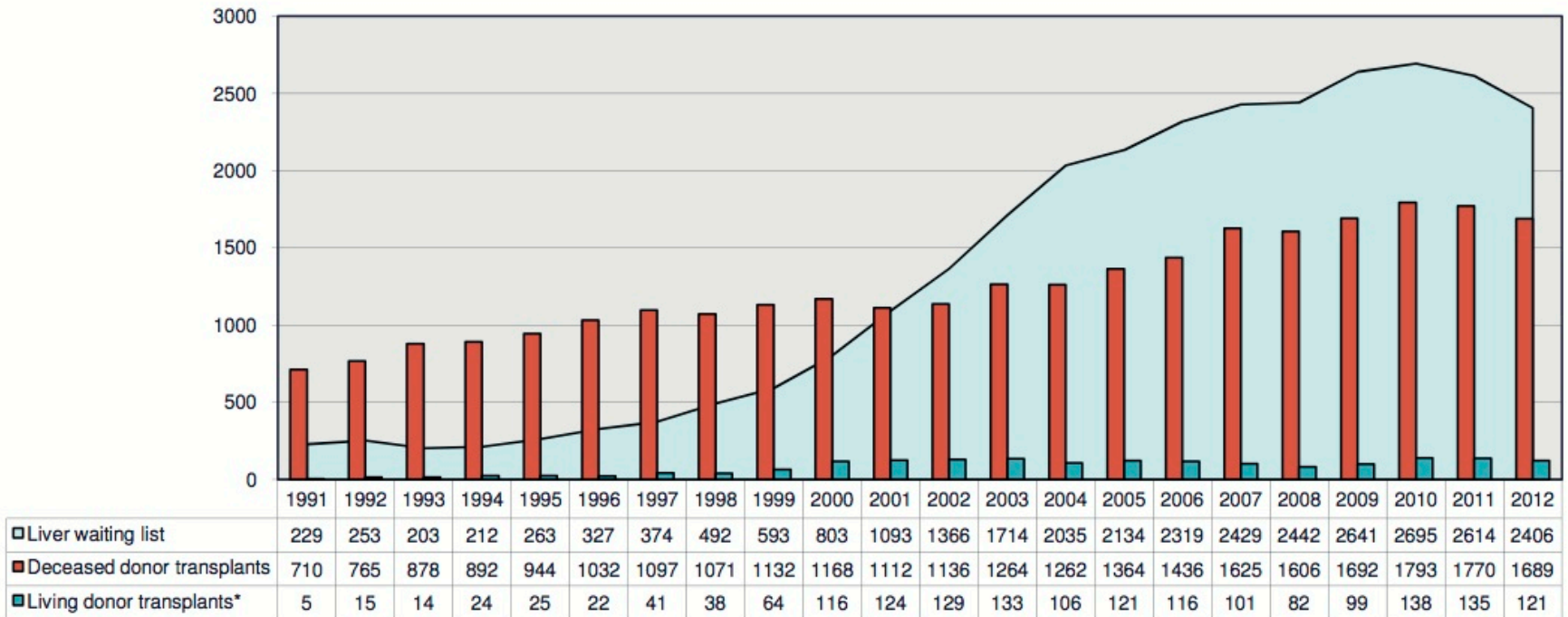
olivier.detry@transplantation.be

Financial Disclosure

- Research & Travel grants from Astellas, Novartis, Roche, Sandoz

Conflicts of Interest

Conflicts of Interest



Tumours in the donor: what is the risk?

- Cancer can be transmitted by organ transplantation

Tumours in the donor: what is the risk?

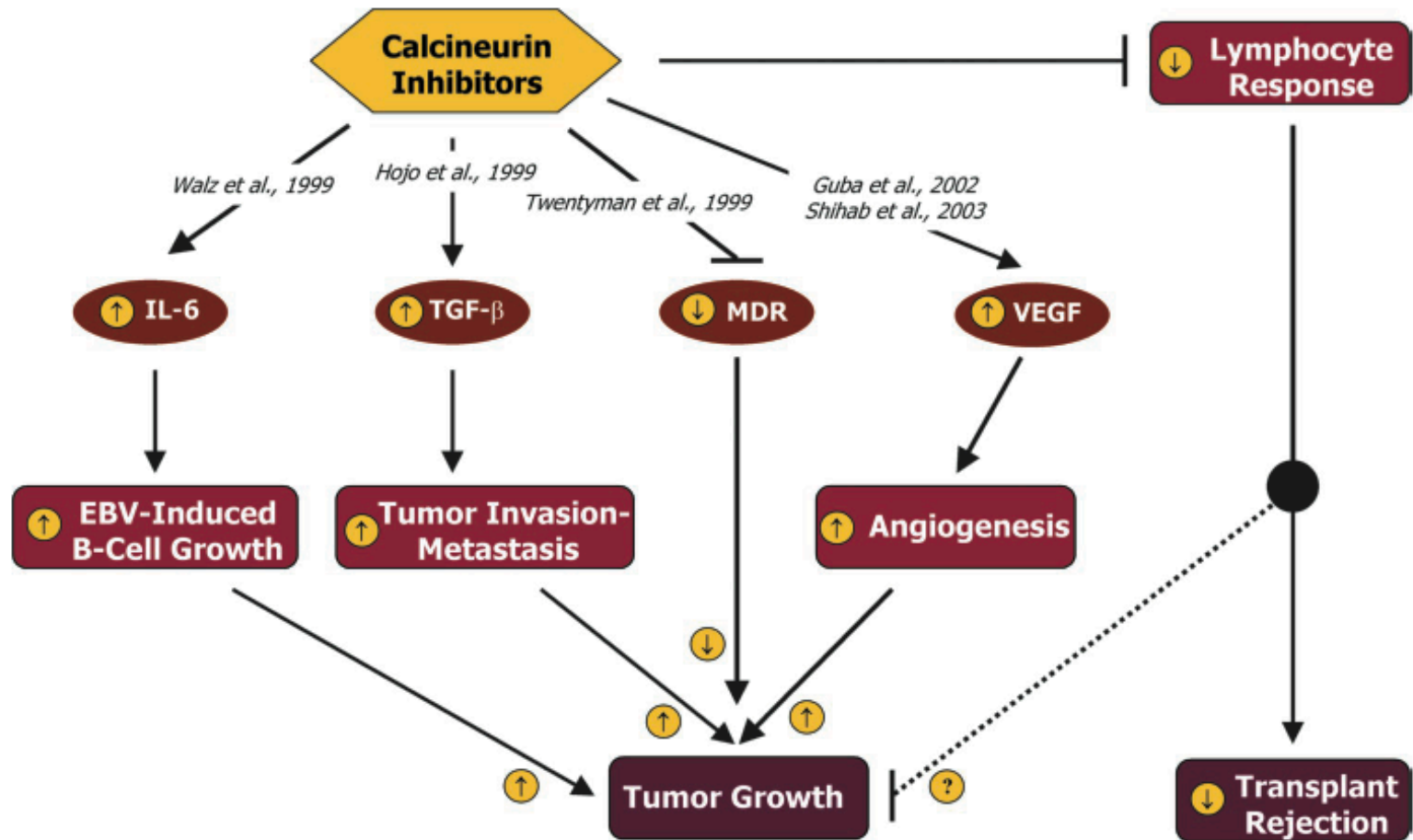
- Cancer can be transmitted by organ transplantation

- Cancer can be transmitted otherwise
 - mother-to-fetus
 - fetus to fetus (twins)
 - daughter to mother
 - patient to surgeon

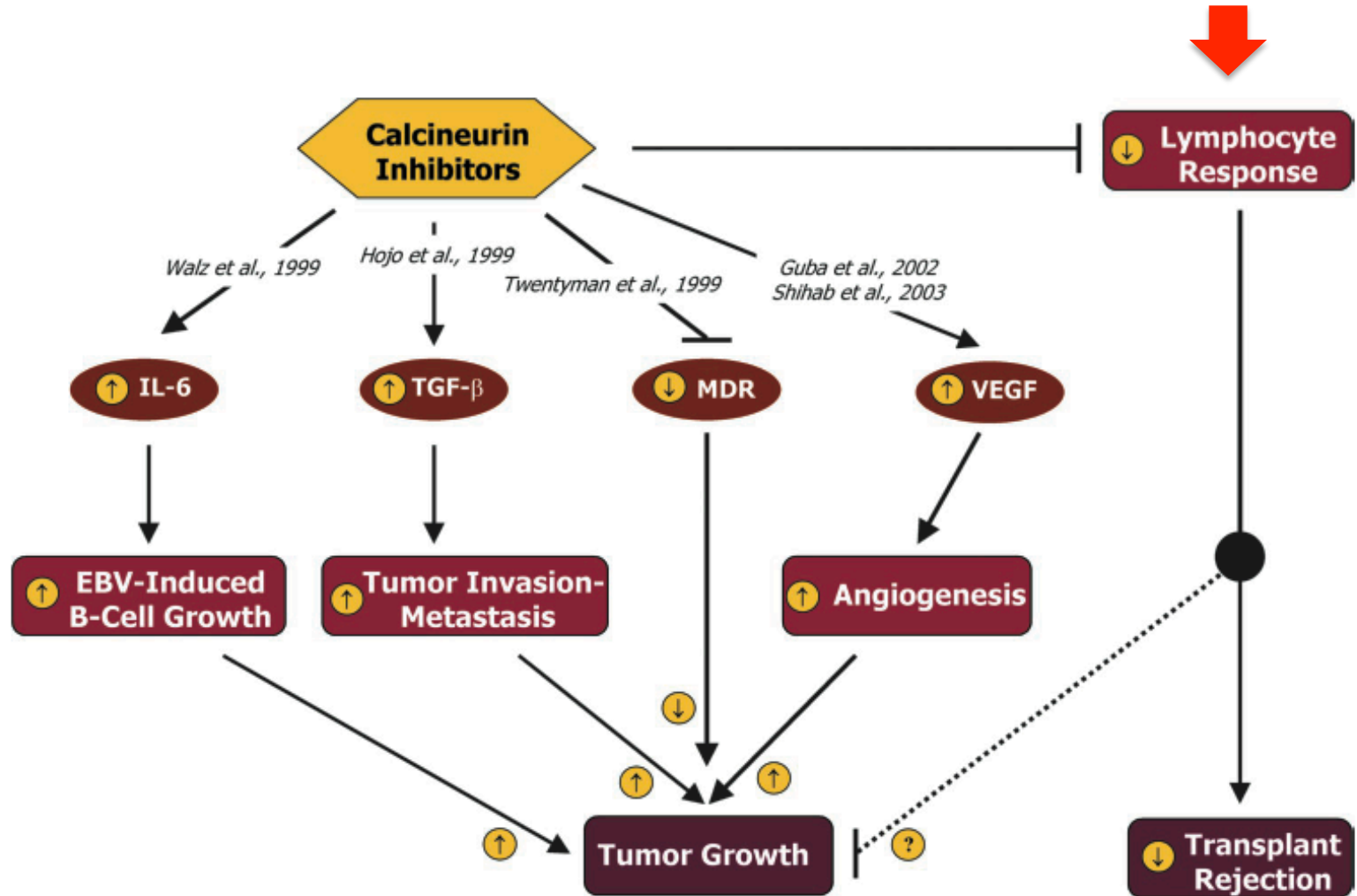
Tumours in the donor: what is the risk?

- Cancer can be transmitted by organ transplantation
- Cancer can be transmitted otherwise
 - mother-to-fetus
 - fetus to fetus (twins)
 - daughter to mother
 - patient to surgeon

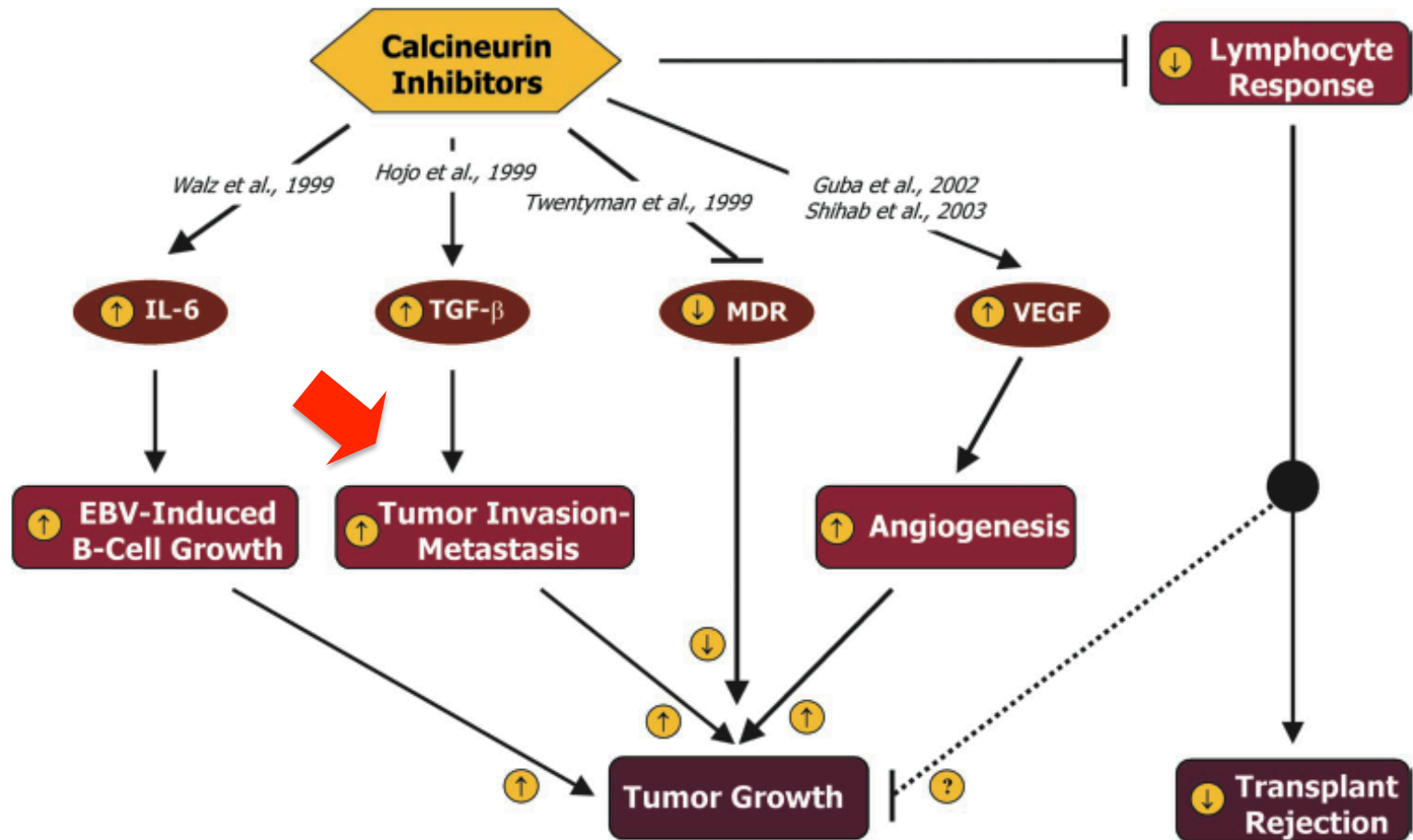
Calcineurin inhibitors



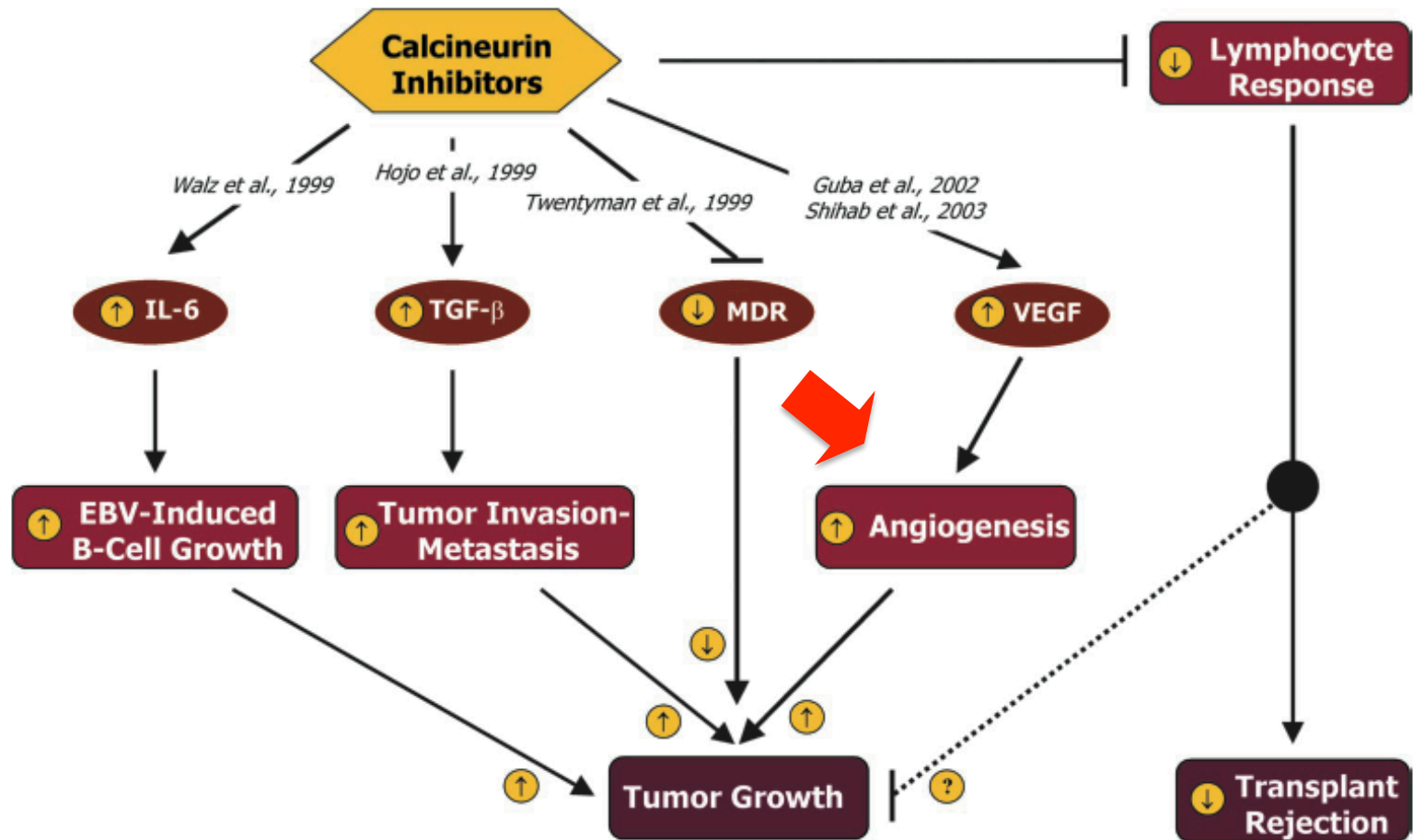
Calcineurin inhibitors



Calcineurin inhibitors



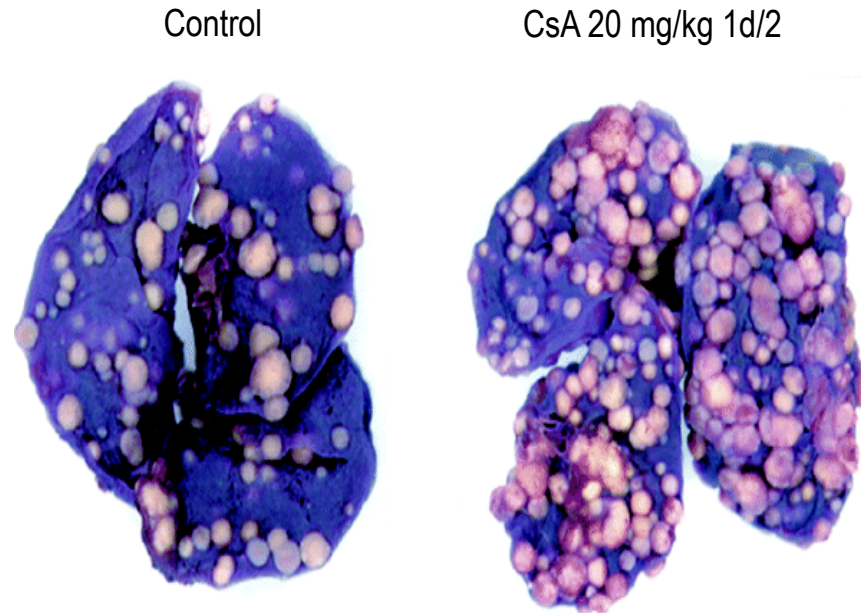
Calcineurin inhibitors



Cyclosporine induces cancer progression by a cell-autonomous mechanism

Hojo M, *Nature*, 1999,397, 530.

NUDE MICE,
IV injection of tumoral cells
Sacrifice D19-23

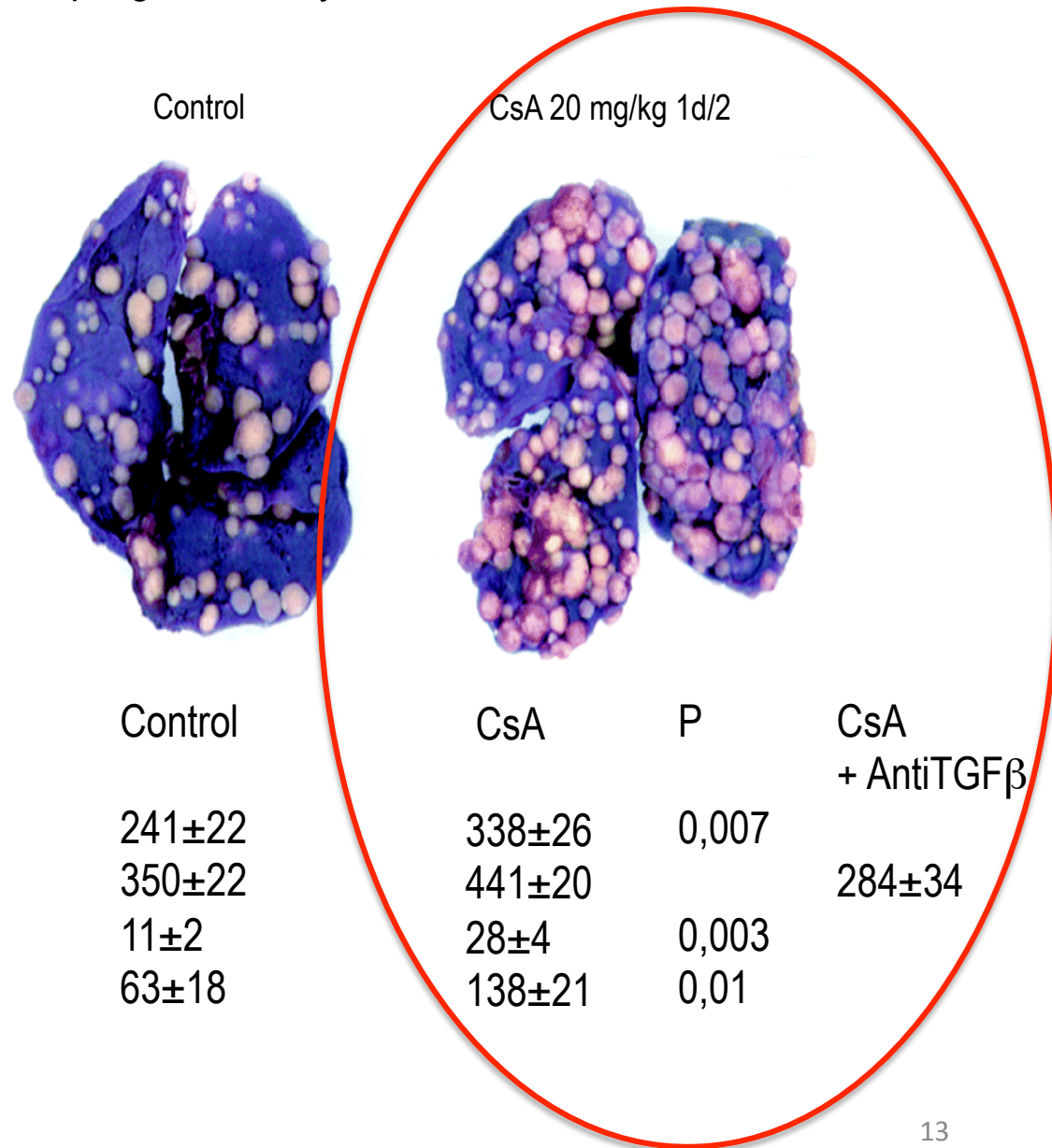


| | Control | CsA | P | CsA + AntiTGFβ |
|-------------------------------|---------|--------|-------|-------------------|
| Kidney adenocarcinoma (Renca) | 241±22 | 338±26 | 0,007 | |
| | 350±22 | 441±20 | | 284±34 |
| Pulmonary carcinoma (LLC) | 11±2 | 28±4 | 0,003 | |
| Bladder carcinoma(T24) | 63±18 | 138±21 | 0,01 | |

Cyclosporine induces cancer progression by a cell-autonomous mechanism

Hojo M, *Nature*, 1999,397, 530.

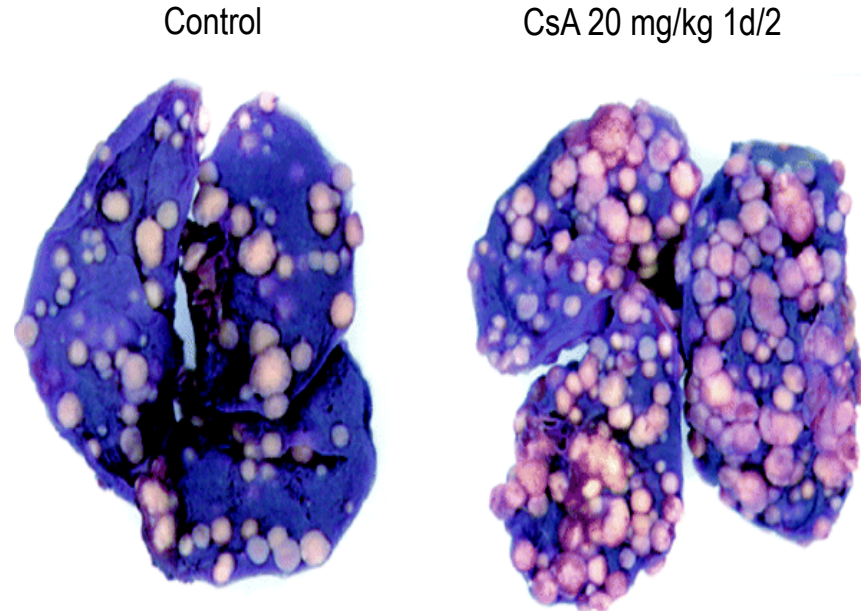
NUDE MICE,
IV injection of tumoral cells
Sacrifice D19-23



Cyclosporine induces cancer progression by a cell-autonomous mechanism

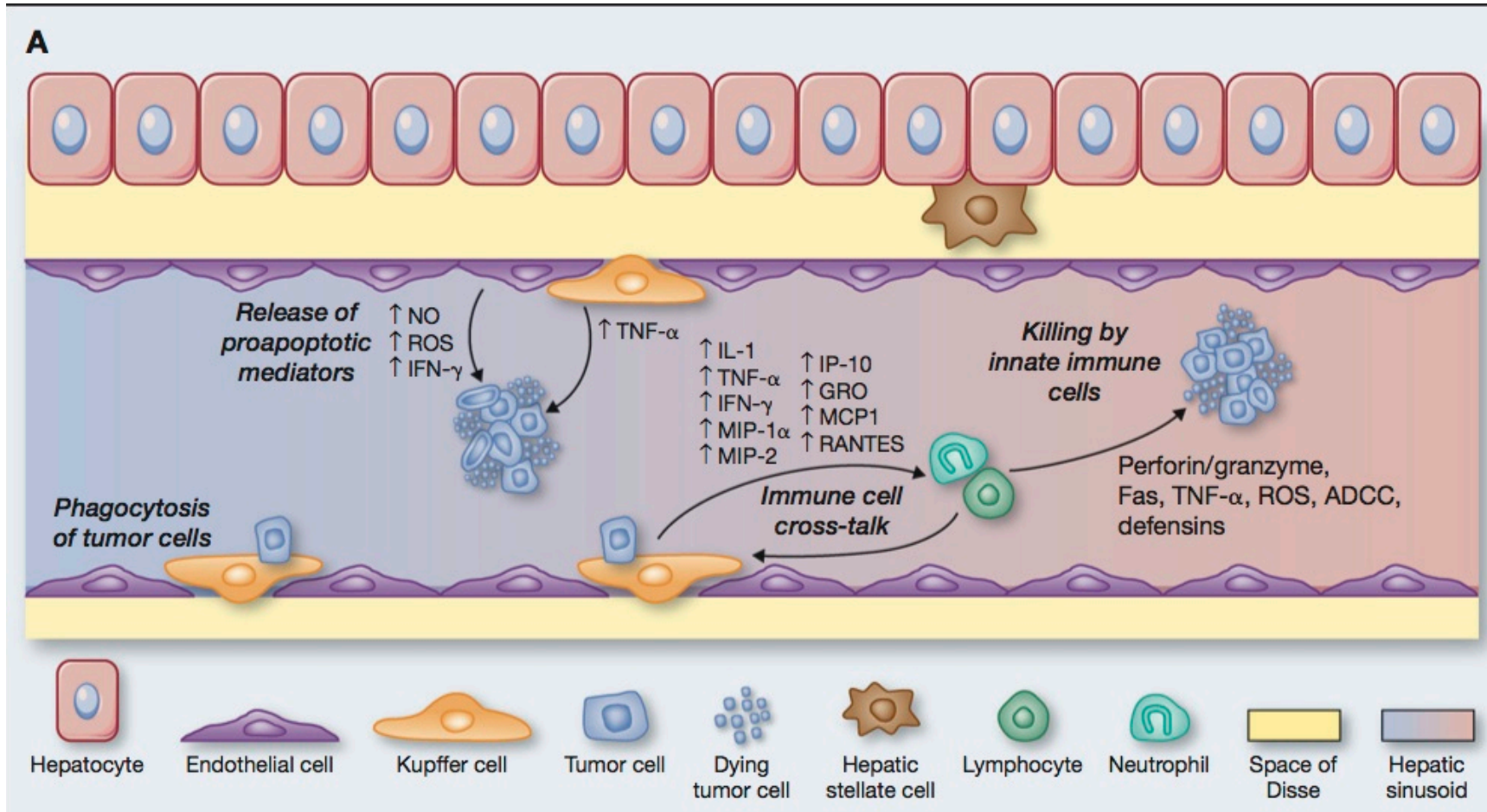
Hojo M, *Nature*, 1999,397, 530.

NUDE MICE,
IV injection of tumoral cells
Sacrifice D19-23

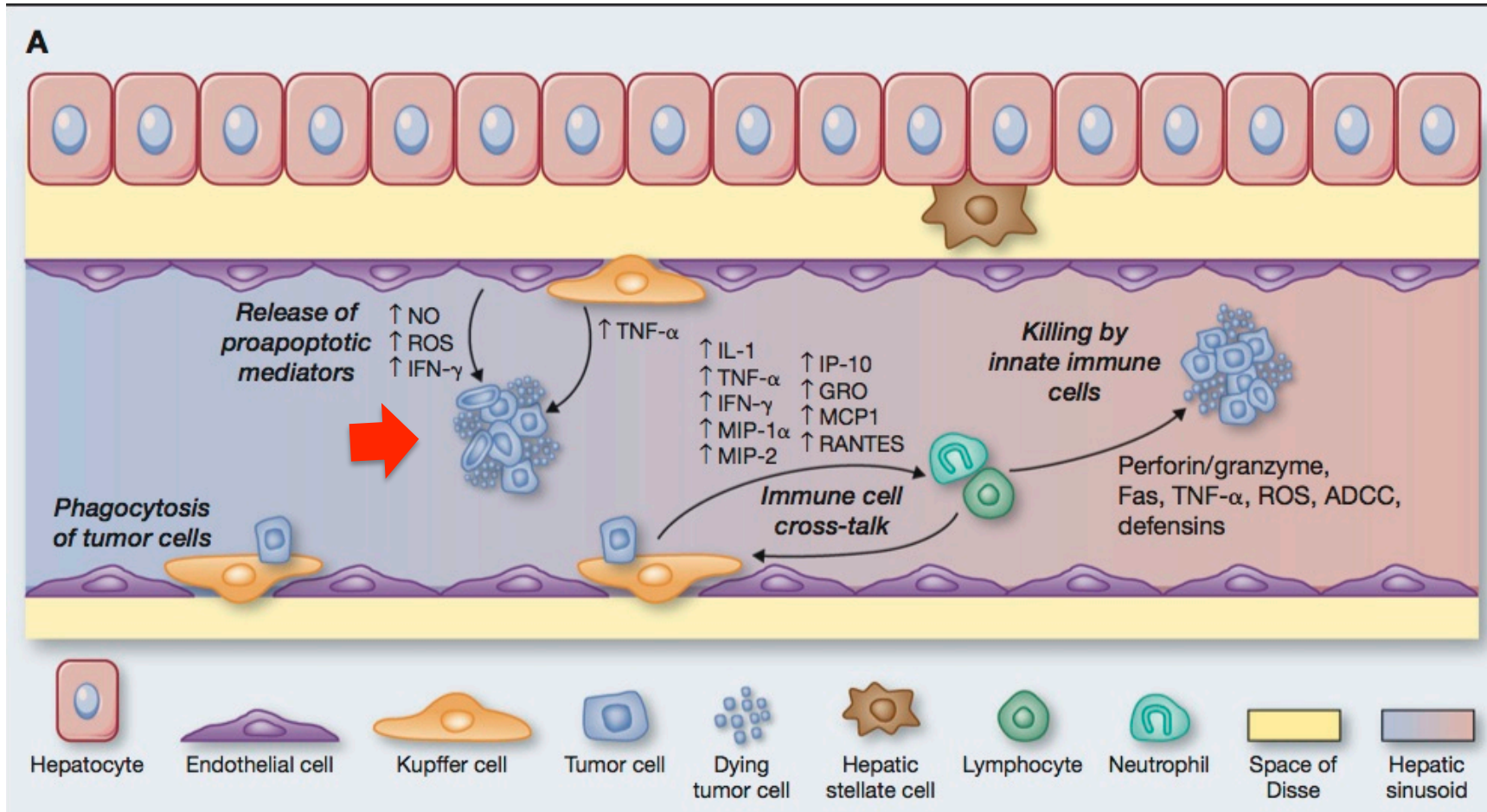


| | Control | CsA | P | CsA + AntiTGFβ |
|-------------------------------|---------|--------|-------|-------------------|
| Kidney adenocarcinoma (Renca) | 241±22 | 338±26 | 0,007 | |
| | 350±22 | 441±20 | | 284±34 |
| Pulmonary carcinoma (LLC) | 11±2 | 28±4 | 0,003 | |
| Bladder carcinoma(T24) | 63±18 | 138±21 | 0,01 | |

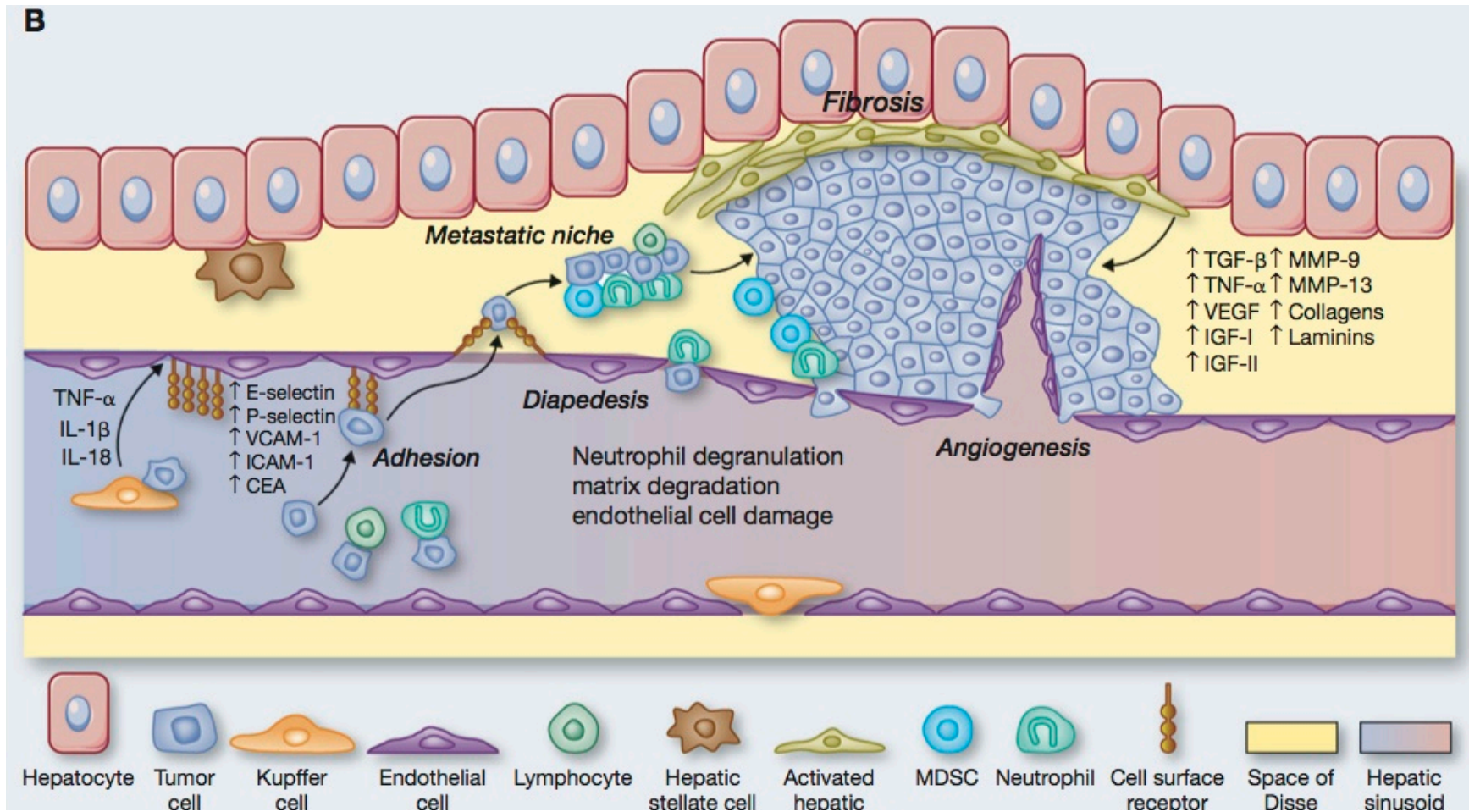
Liver and metastases



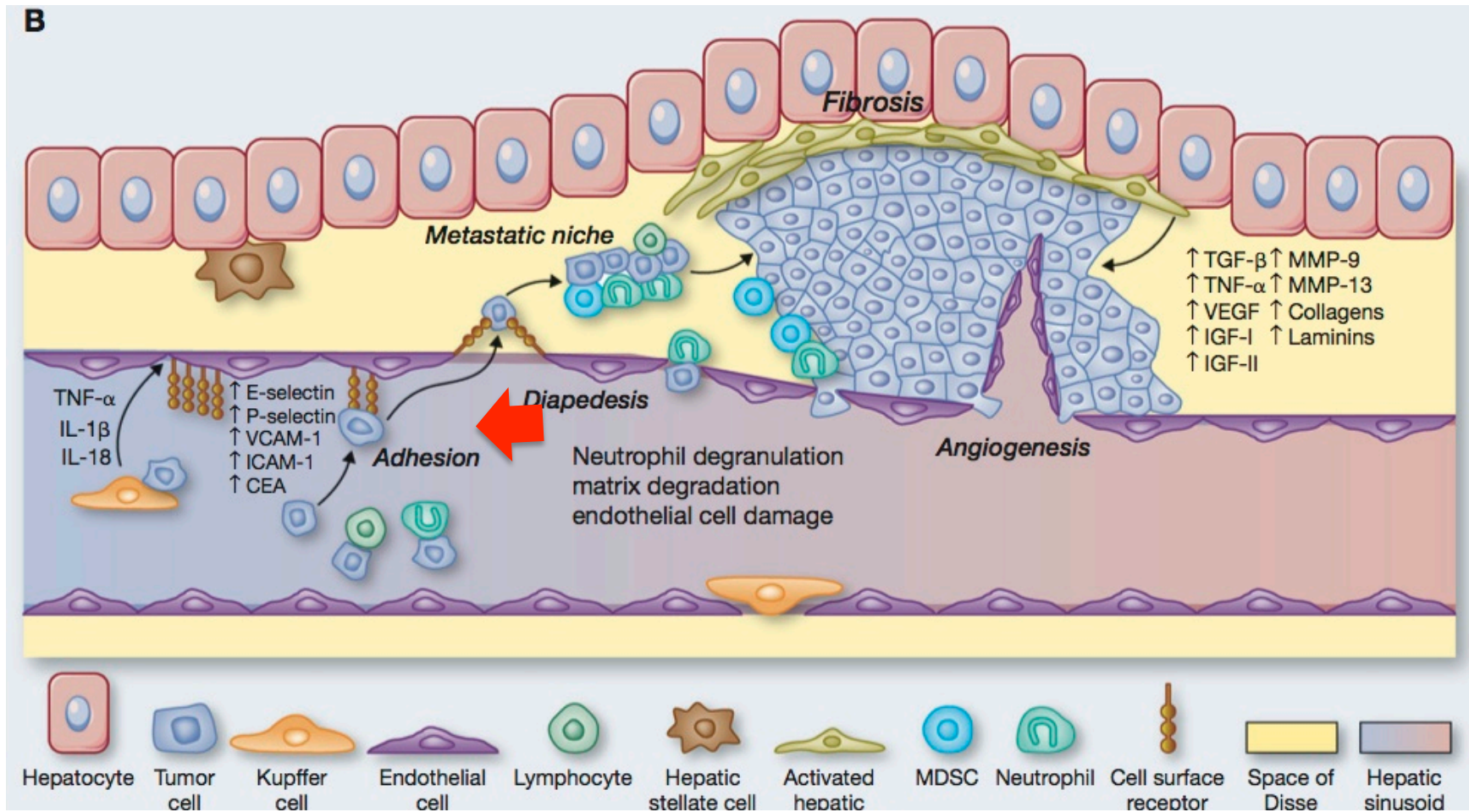
Liver and metastases



Liver and metastases



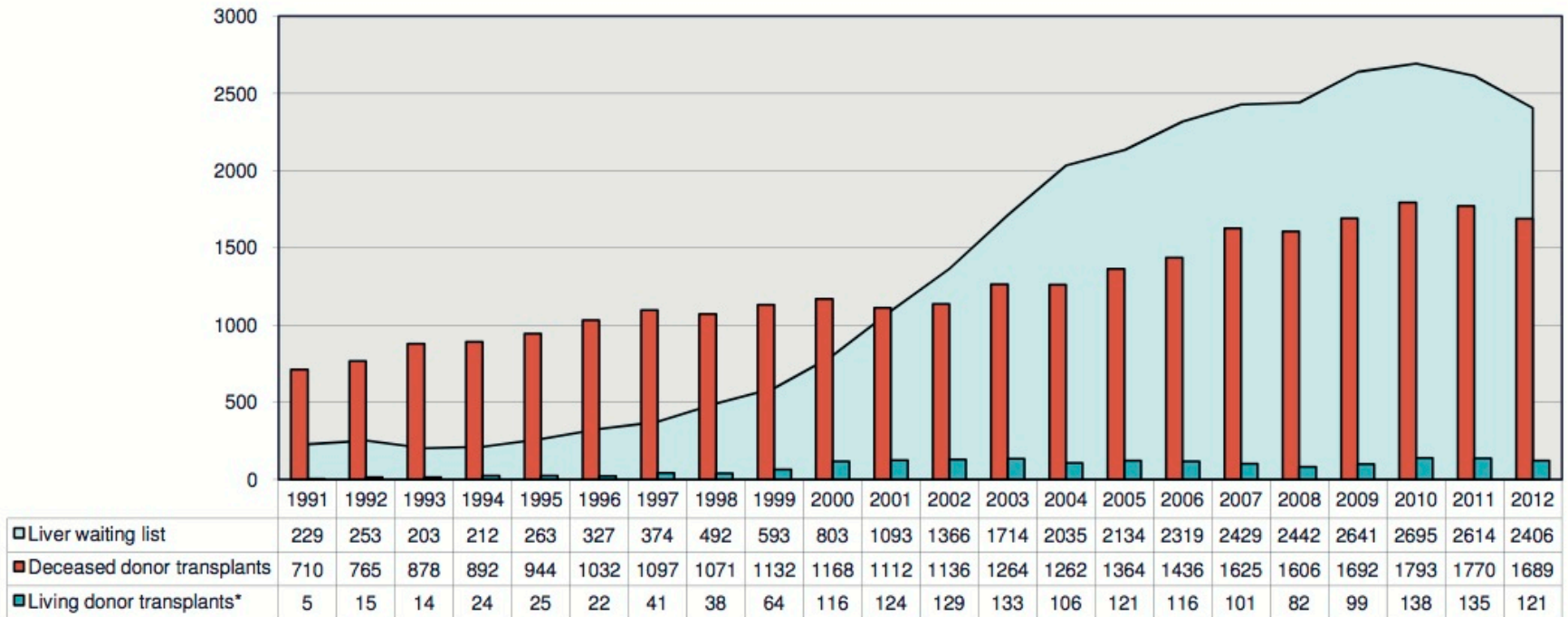
Liver and metastases



Organ donation & donor cancer

- Patients diagnosed with neoplasia should not be considered for organ donation, except:
 - low grade skin tumours
 - in situ carcinoma of the uterine cervix
 - primary CNS tumours (except high grade)
 - low-malignancy grade kidney tumours

Waiting lists



Tumours in the donor:
what is the risk with LTx?



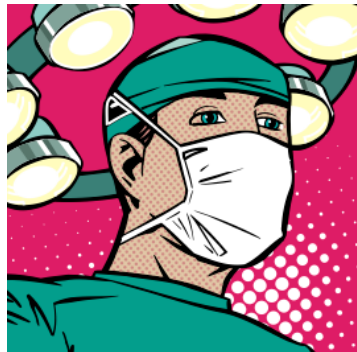
Liver Transplantation & Cancer Transmission

- Case reports



Liver Transplantation & Cancer Transmission

- Case reports
- Registries
 - Prospective: UNOS, UK, Australia, Italy, Spain
 - Voluntary: IPPTR



4 clinical scenarios

- Cadaveric donor with past history of non CNS cancer
- Cadaveric donor with past history of CNS cancer
- Cadaveric donor diagnosed with cancer shortly after liver transplantation
- Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation

4 clinical scenarios

- Cadaveric donor with past history of non CNS cancer
- Cadaveric donor with past history of CNS cancer
- Cadaveric donor diagnosed with cancer shortly after liver transplantation
- Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation

Cadaveric donor with past history of non CNS cancer

- According to several published guidelines & Council of Europe: no organ donation

Cadaveric donor with past history of non CNS cancer

- According to several published guidelines & Council of Europe: no organ donation
- In all reported cases of non-CNS cancer transmission with organ transplantation in these last 20 years, none were known before donation !

UNOS 1994-1996

- 14,705 deceased donors
- 257 deceased donors with history of cancer
650 organs (178 livers)
- Mean follow-up: 45 months

UNOS 1994-1996

TABLE 1. Organs from donors with cancer history

| Site | Total | Kidney | Liver | Heart |
|------------------------|------------|------------|------------|-----------|
| Skin | 207 | 128 | 63 | 16 |
| Brain | 188 | 105 | 48 | 35 |
| Genitourinary | 154 | 96 | 42 | 16 |
| <i>Breast</i> | 38 | 26 | 9 | 3 |
| <i>Thyroid</i> | 11 | 7 | 3 | 1 |
| <i>Lymphoma</i> | 9 | 6 | 2 | 1 |
| <i>Throat / tongue</i> | 8 | 4 | 3 | 1 |
| <i>Ovarian</i> | 5 | 4 | 1 | |
| <i>Melanoma</i> | 4 | 2 | 2 | |
| <i>Iris melanoma</i> | 3 | 2 | 1 | |
| <i>Prostate</i> | 3 | 2 | 1 | |
| <i>Testicular</i> | 2 | 2 | | |
| <i>Lung</i> | 2 | 2 | | |
| <i>Larynx</i> | 2 | 2 | | |
| <i>Colorectal</i> | 1 | | 1 | |
| Unknown | 13 | 9 | 2 | 2 |
| Total | 650 | 397 | 178 | 75 |

Italicized sites = histologically defined malignancies.

UNOS 1994-1996



TABLE 1. Organs from donors with cancer history

| Site | Total | Kidney | Liver | Heart |
|------------------------|-------|--------|-------|-------|
| Skin | 207 | 128 | 63 | 16 |
| Brain | 188 | 105 | 48 | 35 |
| Genitourinary | 154 | 96 | 42 | 16 |
| <i>Breast</i> | 38 | 26 | 9 | 3 |
| <i>Thyroid</i> | 11 | 7 | 3 | 1 |
| <i>Lymphoma</i> | 9 | 6 | 2 | 1 |
| <i>Throat / tongue</i> | 8 | 4 | 3 | 1 |
| <i>Ovarian</i> | 5 | 4 | 1 | |
| <i>Melanoma</i> | 4 | 2 | 2 | |
| <i>Iris melanoma</i> | 3 | 2 | 1 | |
| <i>Prostate</i> | 3 | 2 | 1 | |
| <i>Testicular</i> | 2 | 2 | | |
| <i>Lung</i> | 2 | 2 | | |
| <i>Larynx</i> | 2 | 2 | | |
| <i>Colorectal</i> | 1 | | 1 | |
| Unknown | 13 | 9 | 2 | 2 |
| Total | 650 | 397 | 178 | 75 |

Italicized sites = histologically defined malignancies.

UNOS 1994-1996



TABLE 1. Organs from donors with cancer history

| Site | Total | Kidney | Liver | Heart |
|------------------------|-------|--------|-------|-------|
| Skin | 207 | 128 | 63 | 16 |
| Brain | 188 | 105 | 48 | 35 |
| Genitourinary | 154 | 96 | 42 | 16 |
| <i>Breast</i> | 38 | 26 | 9 | 3 |
| <i>Thyroid</i> | 11 | 7 | 3 | 1 |
| <i>Lymphoma</i> | 9 | 6 | 2 | 1 |
| <i>Throat / tongue</i> | 8 | 4 | 3 | 1 |
| <i>Ovarian</i> | 5 | 4 | 1 | |
| <i>Melanoma</i> | 4 | 2 | 2 | |
| <i>Iris melanoma</i> | 3 | 2 | 1 | |
| <i>Prostate</i> | 3 | 2 | 1 | |
| <i>Testicular</i> | 2 | 2 | | |
| <i>Lung</i> | 2 | 2 | | |
| <i>Larynx</i> | 2 | 2 | | |
| <i>Colorectal</i> | 1 | | 1 | |
| Unknown | 13 | 9 | 2 | 2 |
| Total | 650 | 397 | 178 | 75 |

Italicized sites = histologically defined malignancies.

UNOS 1994-1996

TABLE 1. Organs from donors with cancer history

| Site | Total | Kidney | Liver | Heart |
|------------------------|-------|--------|-------|-------|
| Skin | 207 | 128 | 63 | 16 |
| Brain | 188 | 105 | 48 | 35 |
| Genitourinary | 154 | 96 | 42 | 16 |
| <i>Breast</i> | 38 | 26 | 9 | 3 |
| <i>Thyroid</i> | 11 | 7 | 3 | 1 |
| <i>Lymphoma</i> | 9 | 6 | 2 | 1 |
| <i>Throat / tongue</i> | 8 | 4 | 3 | 1 |
| <i>Ovarian</i> | 5 | 4 | 1 | |
| <i>Melanoma</i> | 4 | 2 | 2 | |
| <i>Iris melanoma</i> | 3 | 2 | 1 | |
| <i>Prostate</i> | 3 | 2 | 1 | |
| <i>Testicular</i> | 2 | 2 | | |
| <i>Lung</i> | 2 | 2 | | |
| <i>Larynx</i> | 2 | 2 | | |
| <i>Colorectal</i> | 1 | | 1 | |
| Unknown | 13 | 9 | 2 | 2 |
| Total | 650 | 397 | 178 | 75 |

Italicized sites = histologically defined malignancies.

No transmission of cancer in the recipients !

ATS 2013 Abstract #D1711

UNOS 1987-2009

204,946 organ transplantations

1,360 donors with history of cancer

- 899 living donors

- 561 deceased donors (55% CNS)

No increased risk of cancer in the recipients

2 cases of transmitted cancer from living donation KTx (myeloma & melanoma)

ATS 2013 Abstract#350

- NHS 1990-2008

17,639 organ donors

202 donors with history of cancer

High risk cancers in 61 donors (133 recipients)

breast:10, melanoma: 3, lymphoma: 5;
colon: 3; ovary: 2; sarcoma: 4; CNS: 34

ATS 2013 Abstract#350

- NHS 1990-2008

17,639 organ donors

202 donors with history of cancer

High risk cancers in 61 donors (133 recipients)

breast:10, melanoma: 3, lymphoma: 5;
colon: 3; ovary: 2; sarcoma: 4; CNS: 34

No transmission of cancer to the recipients

ATS 2013 Abstract #C1250

U Essen 2002-2012

47 LTx from donor with history of cancer

- genito-urinary carcinoma: 19
- CNS: 14
- breast: 5
- skin, thyroid, lung: 2
- leukemia, larynx, liver: 1

No transmission of cancer by LTx

4 clinical scenarios

- Cadaveric donor with past history of non CNS cancer
- Cadaveric donor with past history of CNS cancer
- Cadaveric donor diagnosed with cancer shortly after liver transplantation
- Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation

Cadaveric donor with past history of CNS cancer

- According to several published guidelines & Council of Europe:
 - low grade tumour: OK for donation
 - high grade tumour: no donation
- Higher risk if surgery, radiotherapy, VP shunt

UNOS 1992-1999

- 42,340 deceased donors
- 397 deceased donors with history of CNS cancer
- 1,220 organs (293 livers)
- Mean follow-up: 36 months

UNOS 1992-1999

- 42,340 deceased donors
- 397 deceased donors with history of CNS cancer
- 1,220 organs (293 livers)
- Mean follow-up: 36 months

No transmission of cancer in the recipients !

UNOS 1992-1999

- 42,340 deceased donors
- 397 deceased donors with history of CNS cancer – only 19 with High grade Tumours
- 56 organs (15 livers)
- Mean follow-up: 36 months

Other series

- Australia & NZ:
 - 46 donors, 28 High grade, 153 organs, 27 livers
- Czech Republic:
 - 41 donors, 91 recipients
- UK:
 - 177 donors, 495 organs, 72 livers

No transmission of cancer in the recipients !

4 clinical scenarios

- Cadaveric donor with past history of non CNS cancer
- Cadaveric donor with past history of CNS cancer
- Cadaveric donor diagnosed with cancer shortly after liver transplantation
- Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation

Cadaveric donor diagnosed with cancer shortly after LT

- Wait & See ?
- Urgent retransplantation ?

4 clinical scenarios

- Cadaveric donor with past history of non CNS cancer
- Cadaveric donor with past history of CNS cancer
- Cadaveric donor diagnosed with cancer shortly after liver transplantation
- Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation

Cadaveric recipient diagnosed with a cancer from donor origin months after LT

- Is there something to do?
- Reduction/interruption of immunosuppression
- Modification of IS from calcineurin inhibitors to mTOR inhibitors
- Appropriate therapy: surgery, chemotherapy
- Retransplantation (urgent or delayed)

Tumours in the donor: what is the risk?

Pr Olivier Detry

Dpt of Abdominal Surgery & Transplantation
CHU Liège, University of Liege, Belgium

What is the risk?

- Unknown
- Overestimated by publications of case reports
- Donors with active non-CNS cancer: no
- Donors with active CNS cancer: yes
- Donors with past cancer?
 - interval, tumor aggressiveness
 - lymphoma, melanoma: no
- Donors with no history of cancer ???

ATS 2013 Abstract#D1708

- NHS 2001-2010

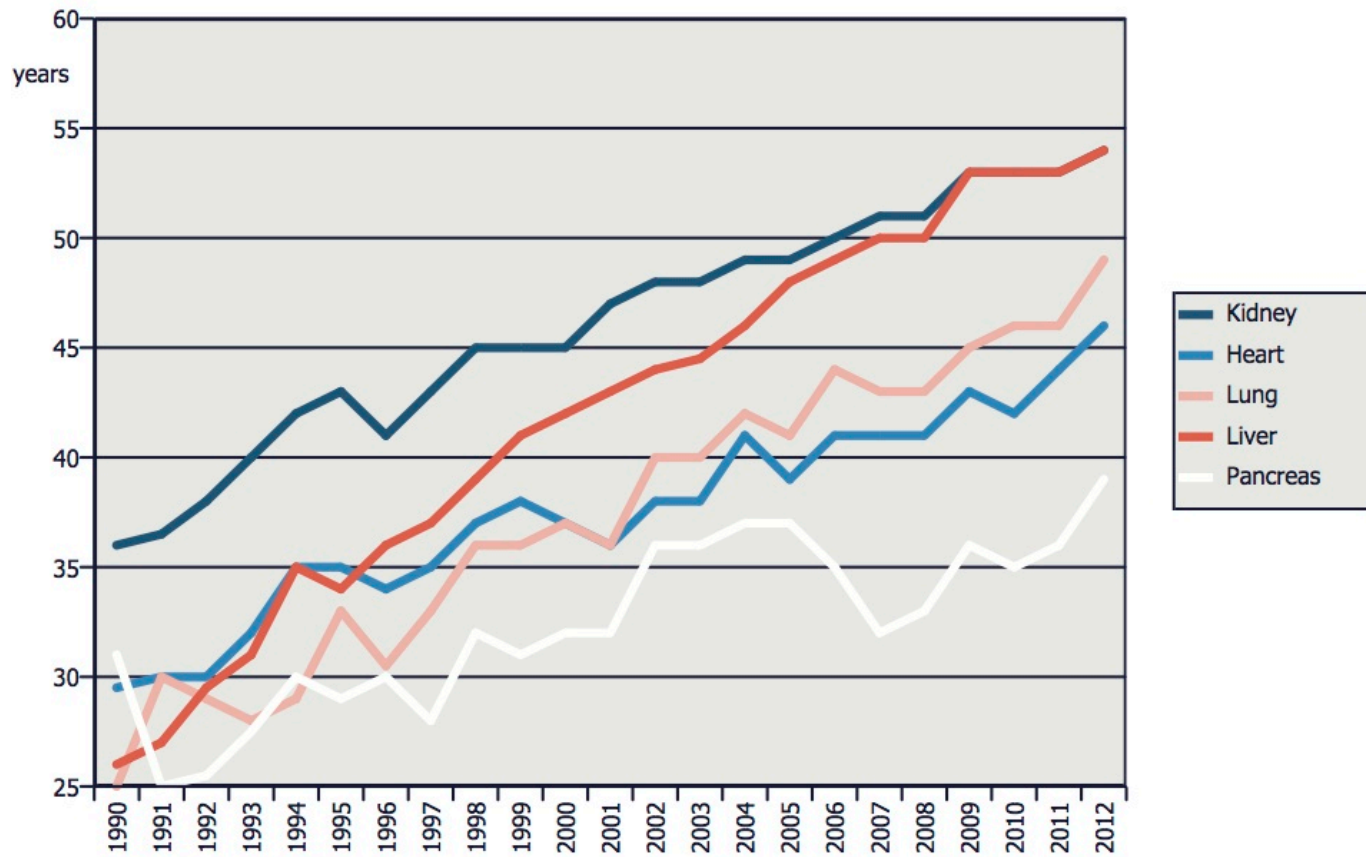
30,765 organ transplants from 14,986 donors

15 donor-transmitted cancer

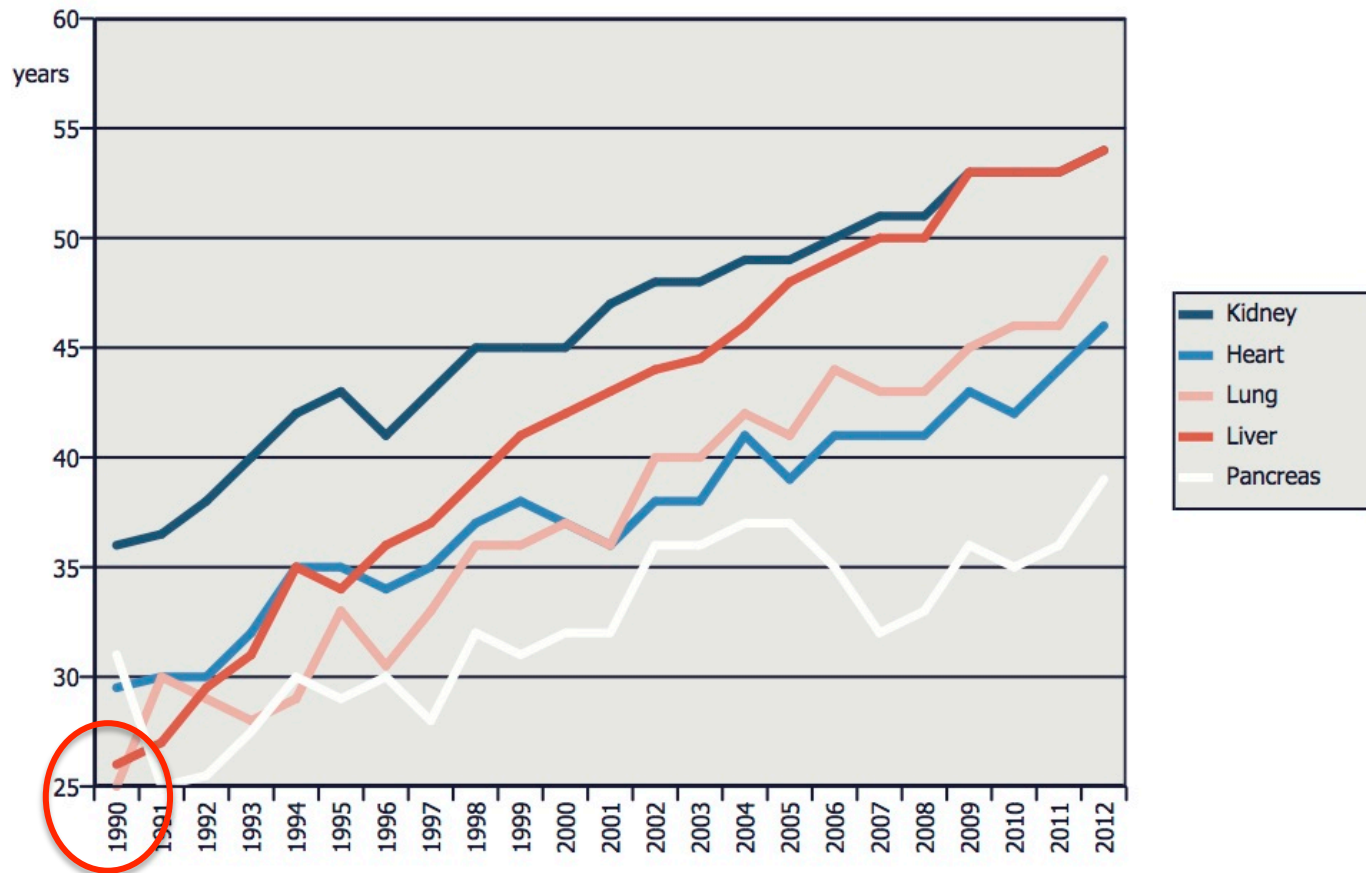
6 renal K, 5 lungs, 2 lymphoma, 1 NET, 1 colon

None of the donors were known to have cancer

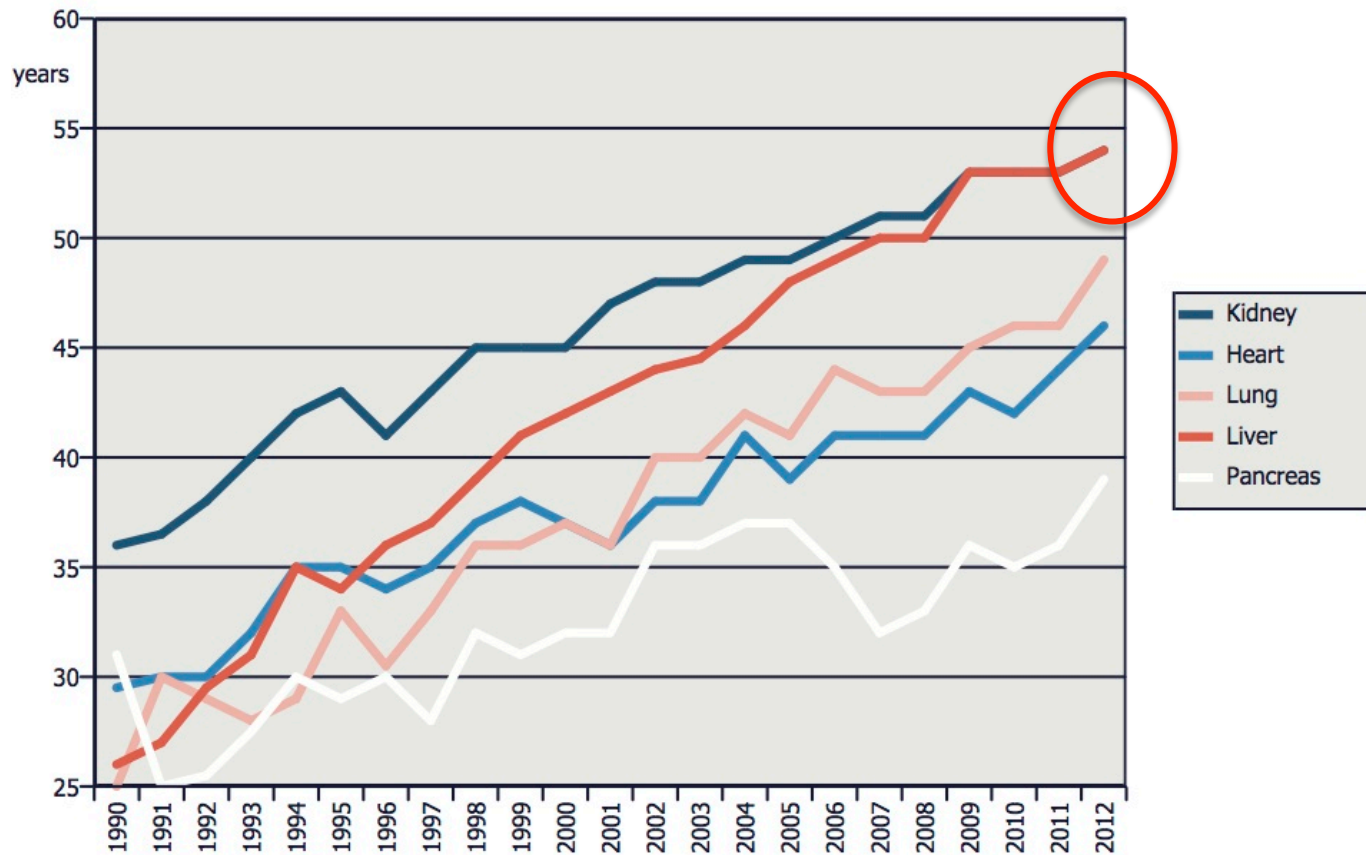
Donor age



Donor age



Donor age





Société
canadienne
du cancer
Canadian
Cancer
Society



Agence de la santé
publique du Canada

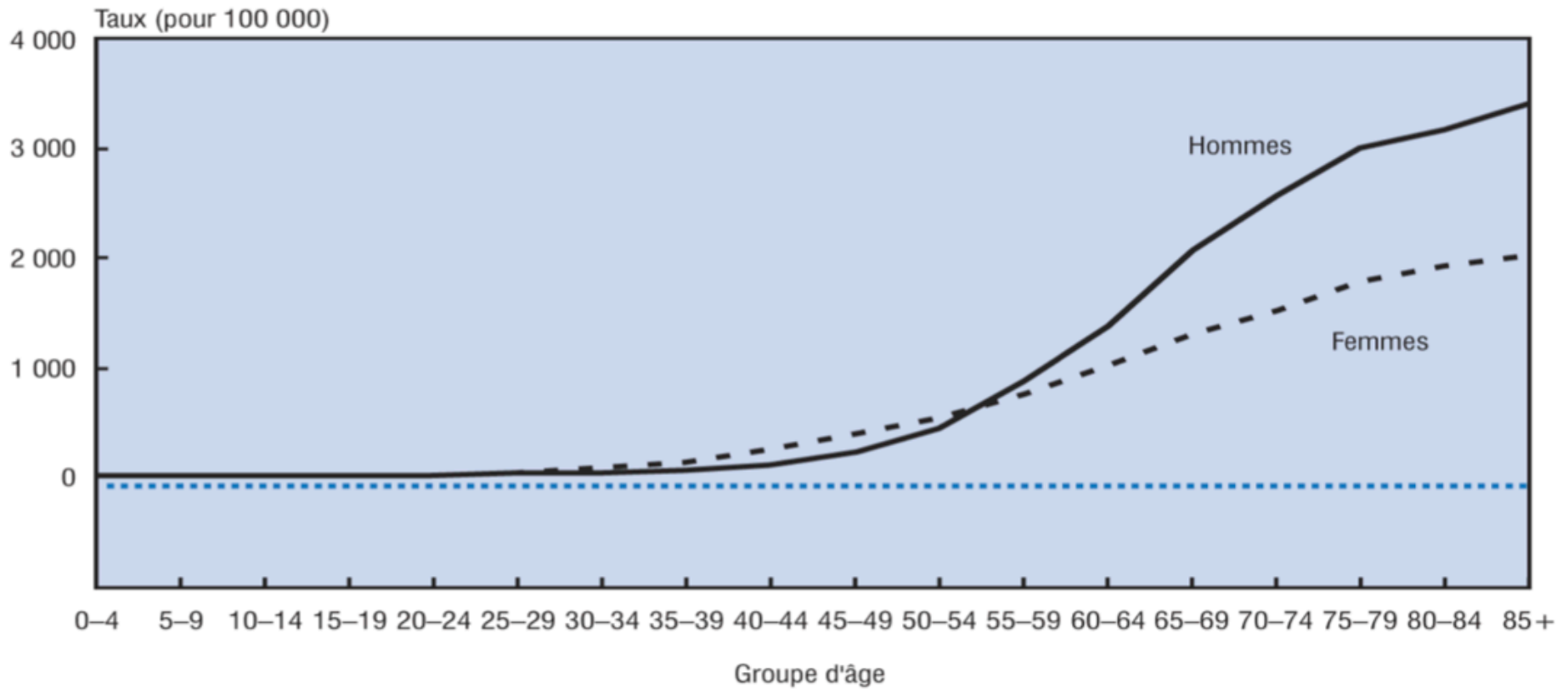
Public Health
Agency of Canada



Statistique
Canada

Statistics
Canada

Incidence



Litterature

- Breast cancer:
 - no reported case of transmission with liver transplantation!
- Prostate cancer
 - no reported case of transmission with liver transplantation!

Thank you !

