

# Generalities

# ANIMALS

# HUMANS

**Scrapie  
(sheep/goats)**

**Creutzfeldt-  
Jakob disease**

**TME  
(mink)**

**Sporadic**

**Familial**

**CWD  
(deer/elk)**

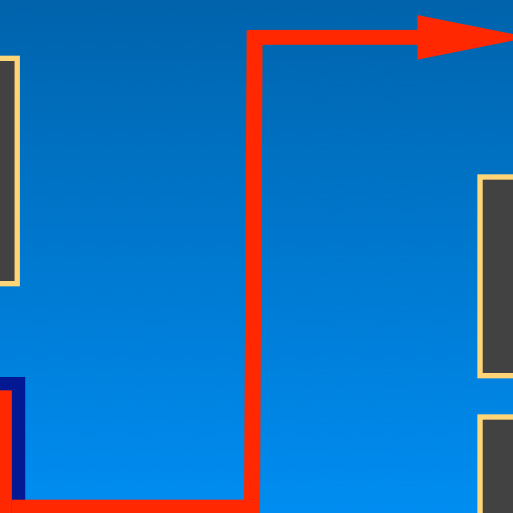
**Iatrogenic**

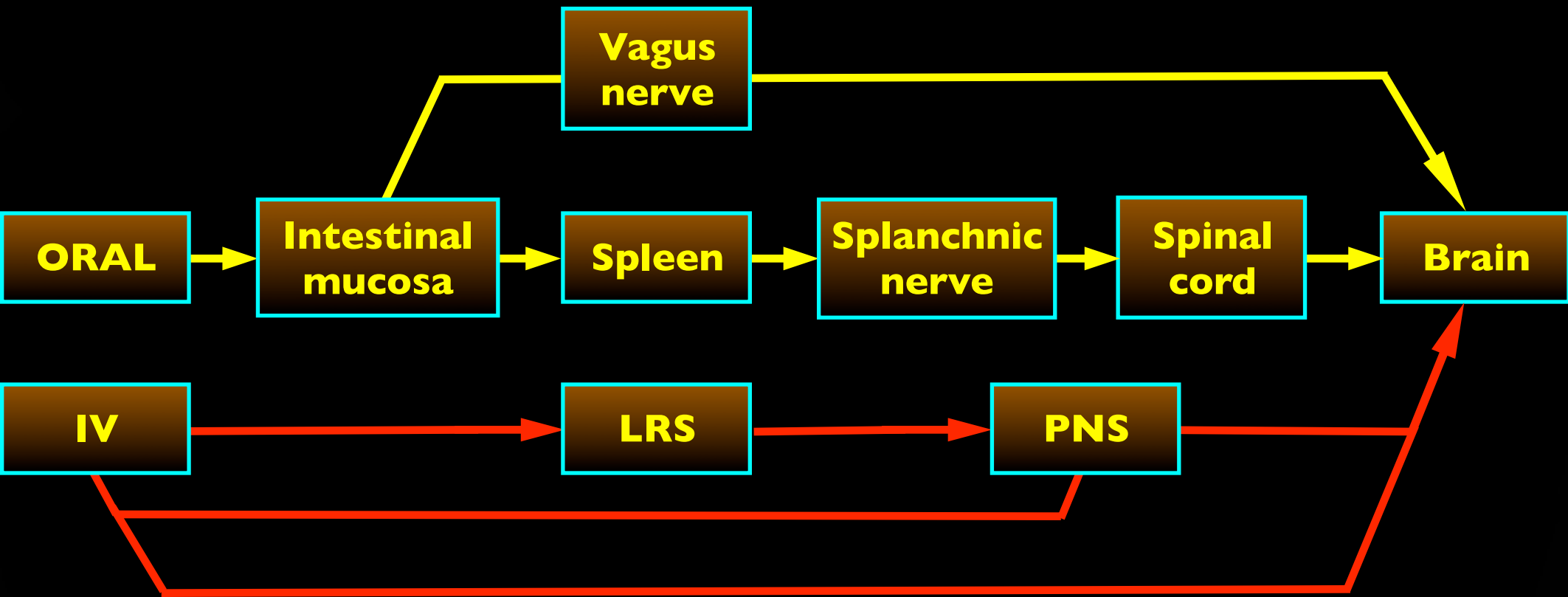
**Variant**

**BSE  
(cattle)**

**GSS**

**FFI**

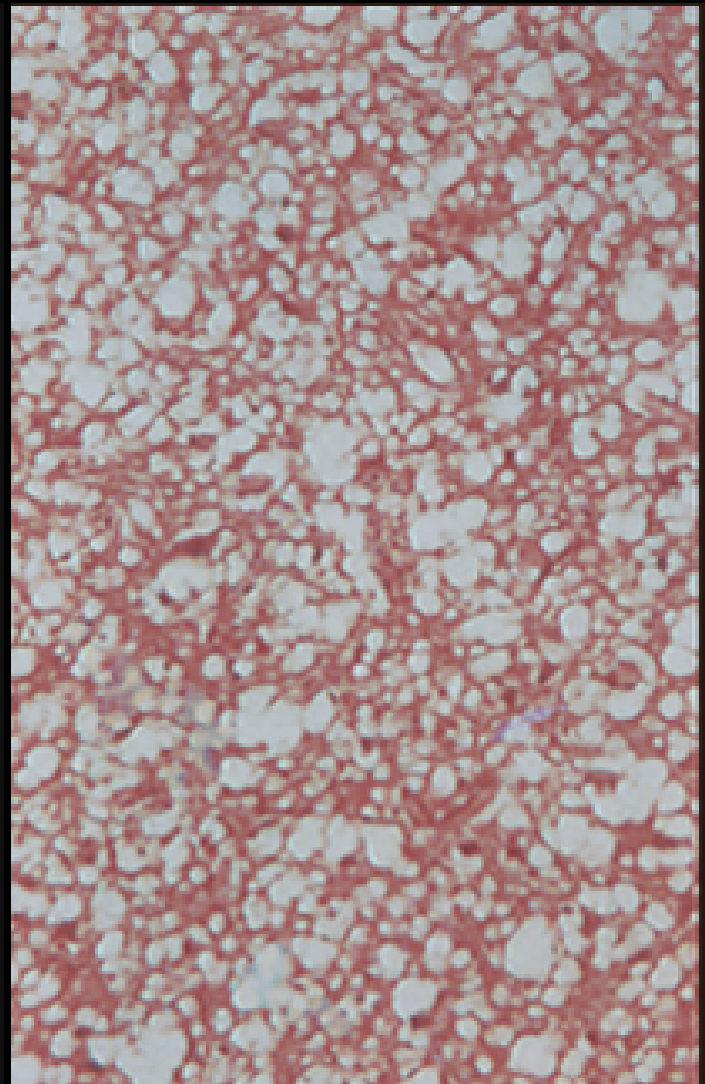
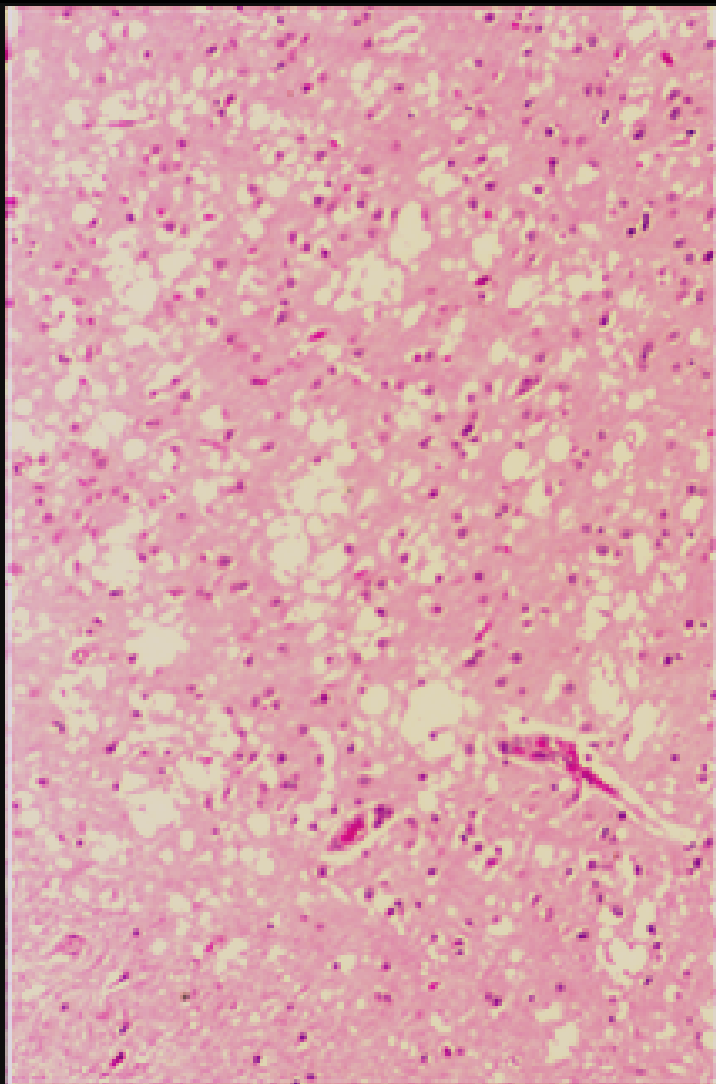
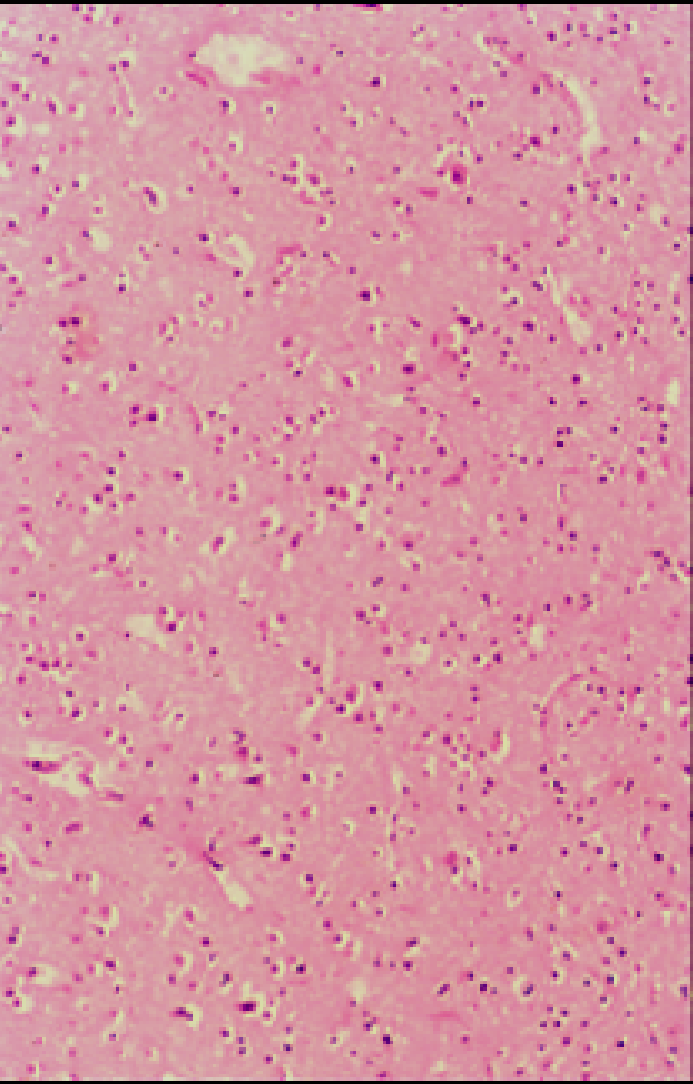




# Infectivity distribution in human CJD (primate bioassays)

TEST	INFECTIVITY <sup>1</sup>	TISSUE	INFECTIVITY <sup>1</sup>
Brain	+++	Heart muscle	0
Eye	+++	Skeletal muscle	0
Dura mater	++	Adipose tissue	(0)
Pituitary gland	++	Testis	(0)
Spinal cord	++	Prostate	(0)
CSF	++		
Lung	+	Tears	0
Liver	+	Nasal mucous	0
Kidney	+	Saliva	0
Spleen	+	Sputum	0
Lymph nodes	+	Urine	0
Blood	+ (?)	Feces	0

<sup>1</sup> Presence of infectivity: +++ usual, ++ frequent, + irregular, 0, absent.  
Parentheses indicate very few tested specimens



**iatrogenic CJD**

## Surgical procedures

## Hormone therapy

Dura mater  
graftsSurgical  
instrumentsEEG  
needlesCorneal  
transplantsGrowth  
hormoneGonado-  
tropin

Argentina

1

Australia

5

1

4

Austria

1

Brazil

1

Canada

4

Croatia

1

France

9

2

100

Germany

4

Holland

2

1

Ireland

1

Italy

4

Japan

113

1

N. Zealand

2

5

Qatar

1

Spain

9

Switzerland

1

2

Thailand

1

U.K.

7

3

46

U.S.

3

1

26

Totals

168

5

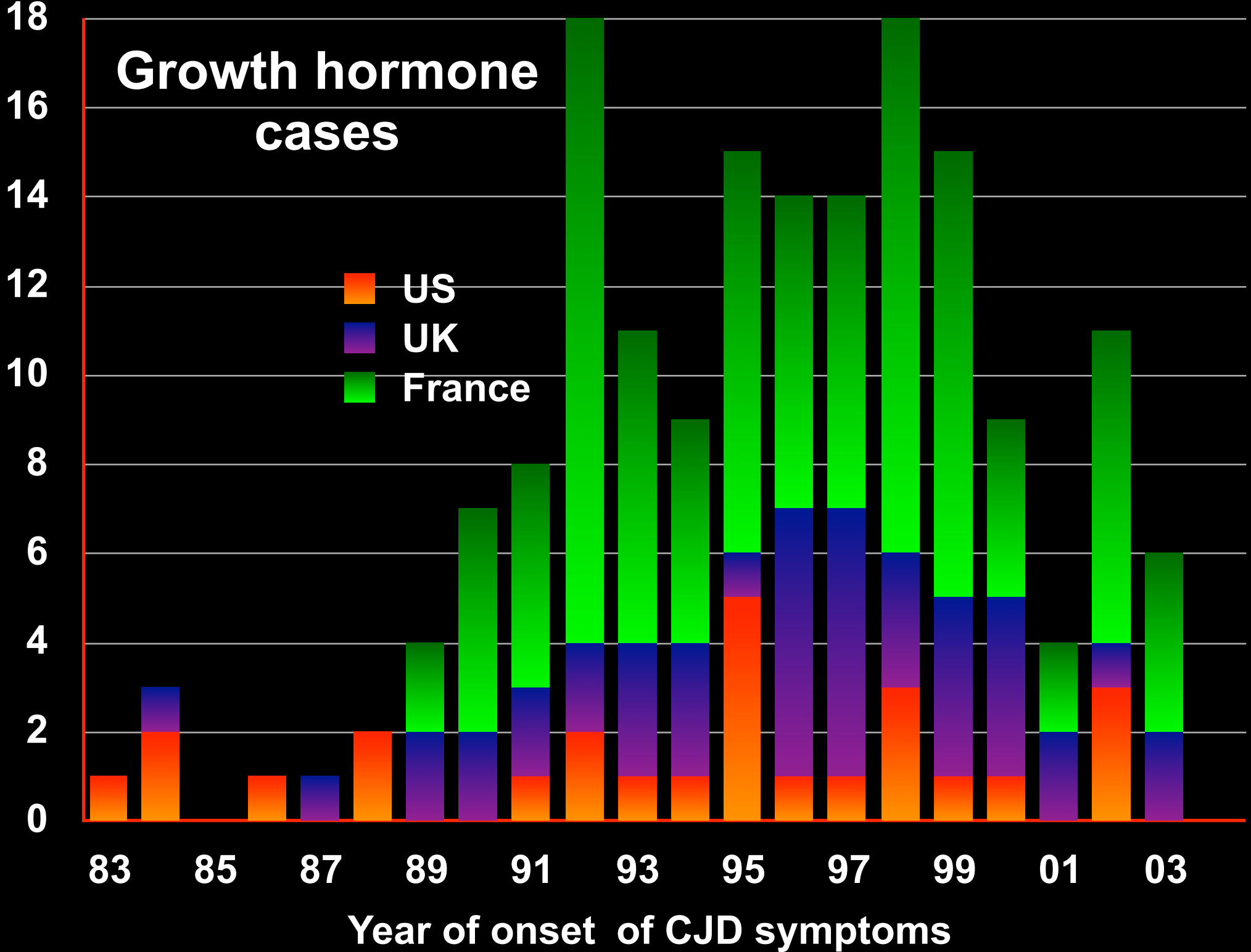
2

3

180

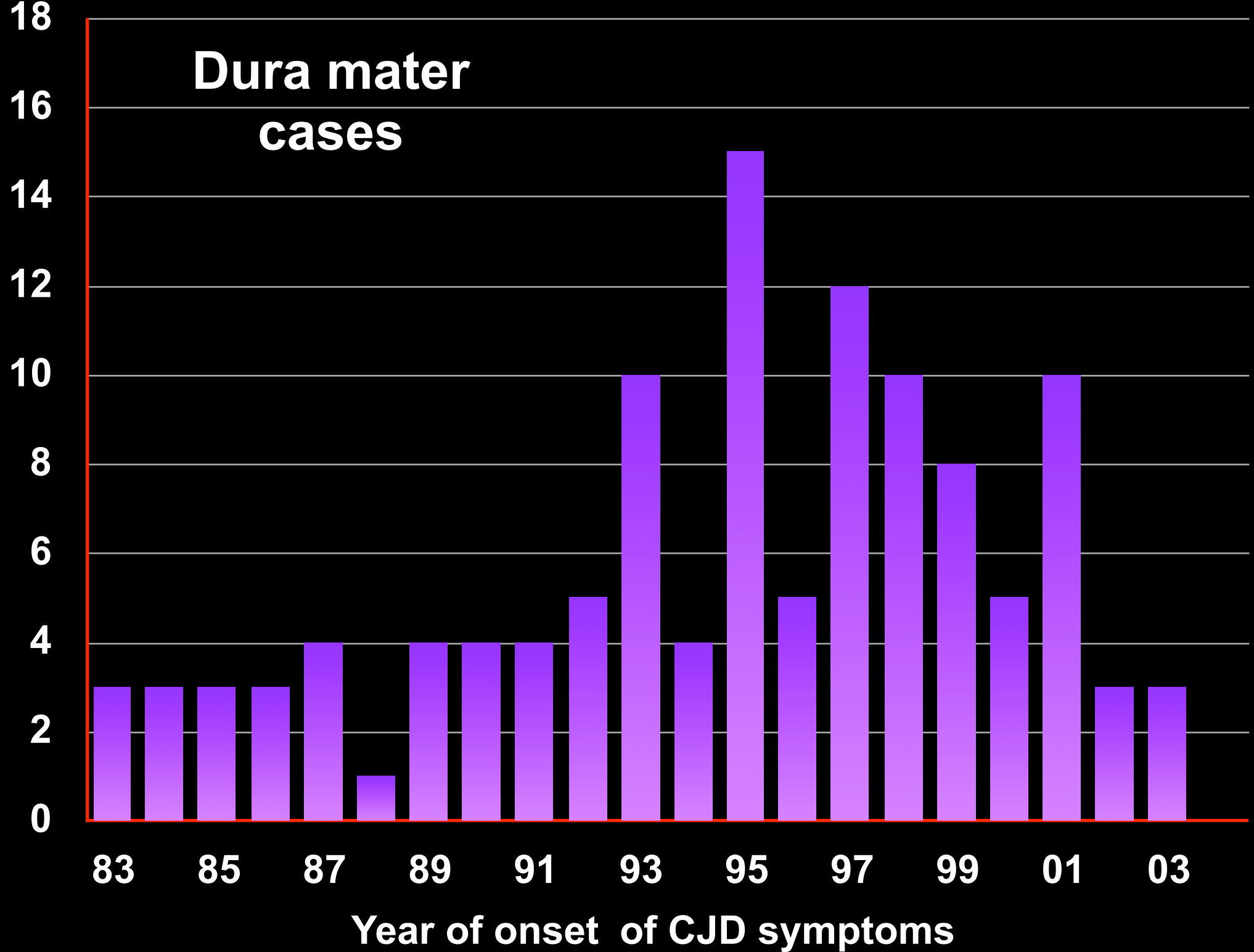
4

# Growth hormone cases





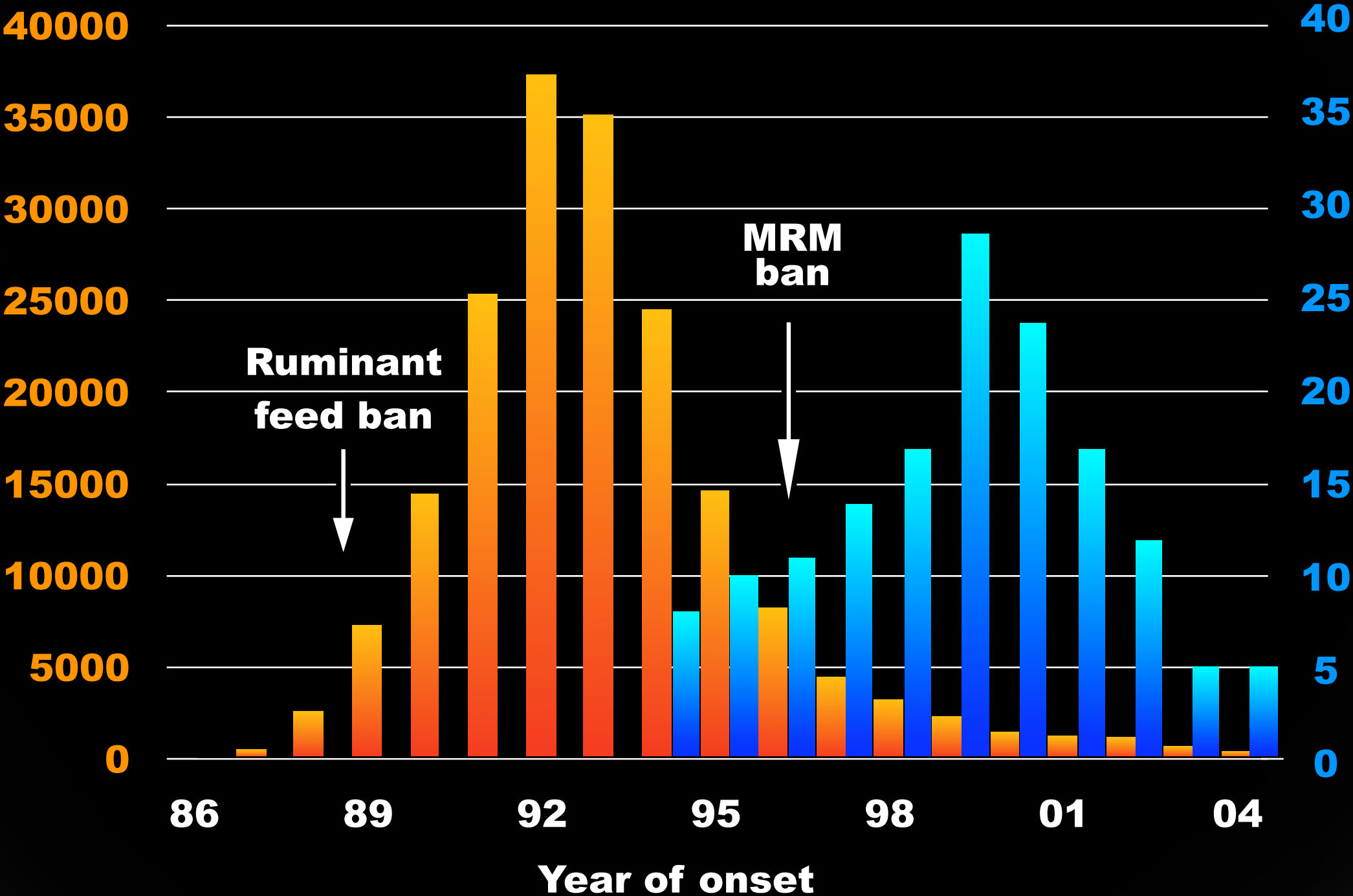
# Dura mater cases

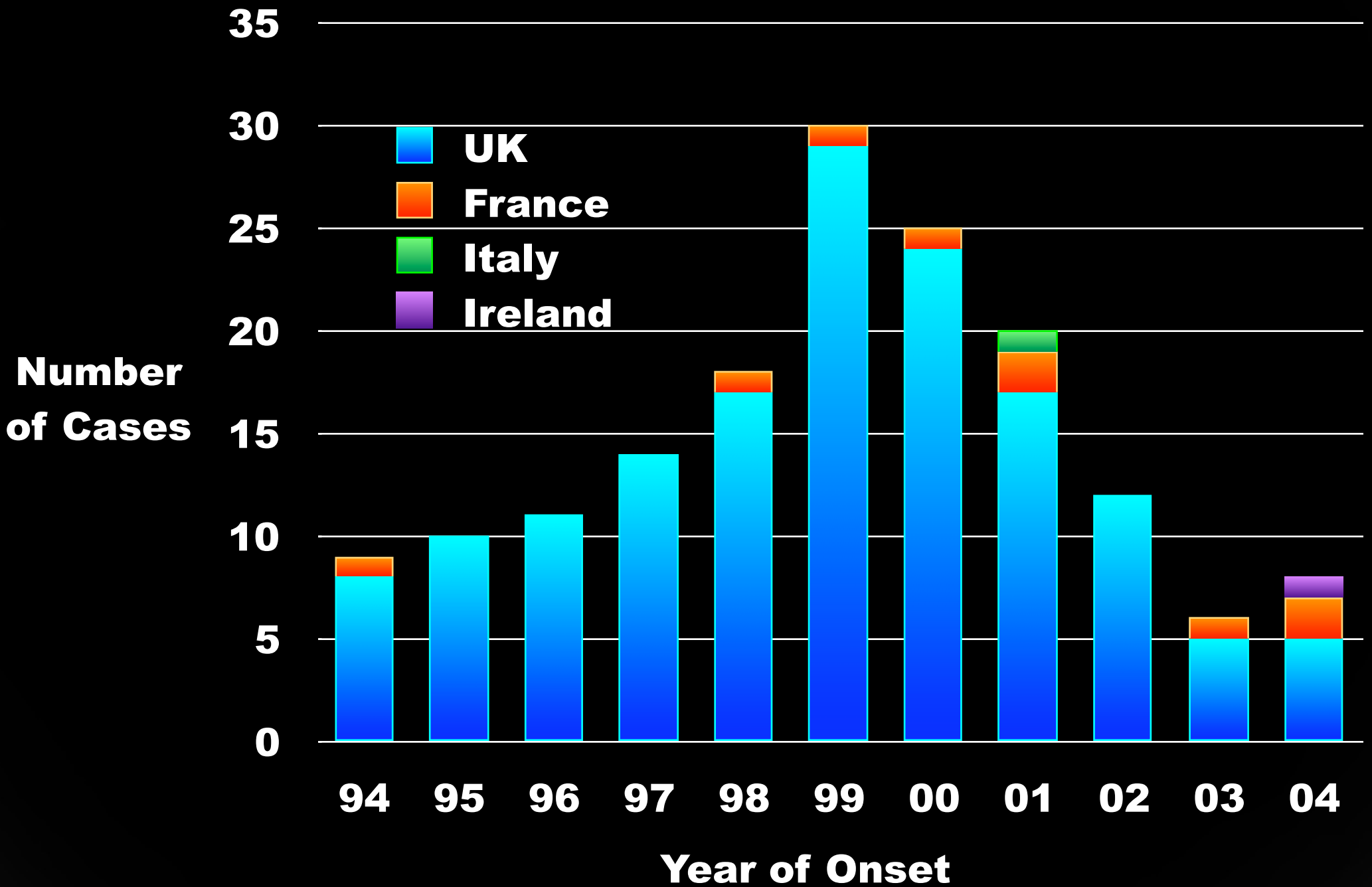


# BSE & vCJD

**BSE**

**vCJD**





24 year-old donor



3 yrs later (1999): vCJD

Packed RBCs (1996)



62 year-old recipient



7 yrs later (2003): vCJD

27 year-old donor

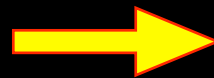


18 mos later (2001): vCJD

Packed RBCs (1999)



77 year-old recipient



5 yrs later (2004): vCJD

# Current concerns

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- **Appearance of atypical BSE strains**
- **Possibility of spontaneous occurrence of BSE**
- **Back-crossing of BSE to sheep (goat already +)**
- **Possibility of 'second wave' of orally-acquired vCJD in heterozygous codon 129 humans**
- **Possibility of large number of human 'carriers' who could transmit secondary infections via blood, tissue graft, or surgical contaminations**

# Decontamination



# Materials

# Methods

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**Disposables**

**Incineration, burial**

**Re-usables**

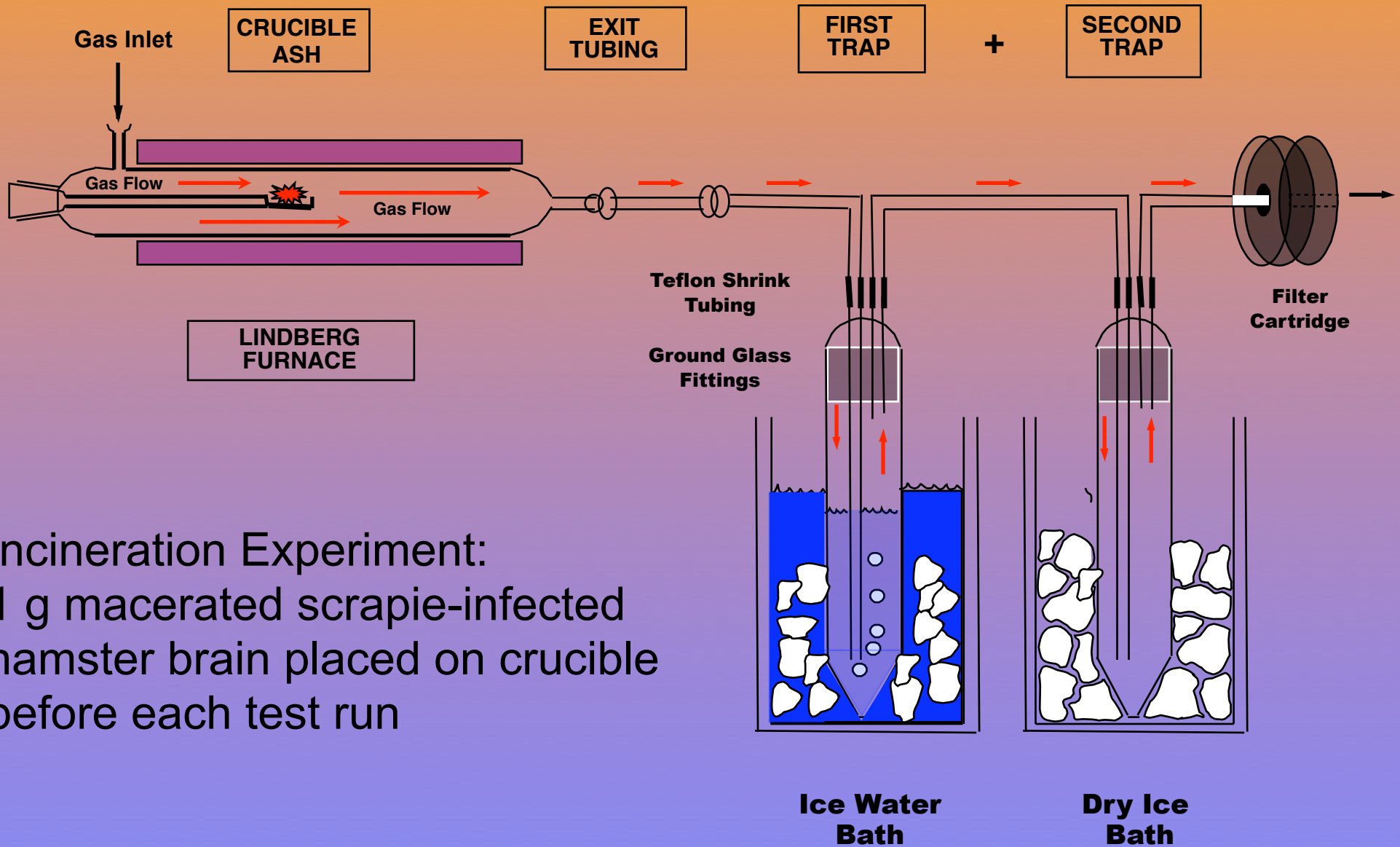
**Autoclave, chemicals**

**Biologicals**

**Chemicals (rare),  
removal methods**

**Consumables**

**Ultra-high pressure**



Incineration Experiment:  
 1 g macerated scrapie-infected  
 hamster brain placed on crucible  
 before each test run

Test Conditions			Bioassay Results		
Tissue	°C	Gas	Crucible	Exit tube	Traps
Infected	600	Air	<b>2/21</b>	0/22	0/24
		N <sub>2</sub>	0/20	0/19	0/26
	1000	Air	0/15	0/26	0/23
		N <sub>2</sub>	0/23	0/18	0/23
Normal	600	Air	0/20	nt	nt
		N <sub>2</sub>	0/21	0/18	
	1000	Air	0/23	nt	nt
		N <sub>2</sub>	0/20	0/18	

# Physical & chemical Choices

## Ineffective

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Physical

Boiling

Irradiation

Chemical

Acids

Iodine

Alcohols

Permanganate

Detergents

Peroxide

Ethylene oxide

Phenolics

Formaldehyde

$\beta$ -propiolactone

Gluteraldehyde

Organic solvents

## Partially effective

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### Physical

Steam heat at 121°C (autoclave)

Dry heat at 300°C (oven)

Pressure (100,000 psi) at 121°C

### Chemical

Alkali, 0.1 N (pH 12)

Hypochlorite, 0.5-2.5%

Guanidinium thiocyanate

Keratinase

Urea, 6 M

## Effective

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### Physical

Steam heat at 134°C (autoclave)

Dry heat > 600°C (oven)

Pressure ( $\geq$  150,000 psi) at 134°C

### Chemical

Alkali,  $\geq$  1 N (pH  $\geq$  13)

Hypochlorite,  $\geq$  2.5%

Saturated phenol

Formic acid (>90%)

## New Methods for delicate Instruments

Chemical treatment	Time and temperature	Log reduction
Peracetic acid (0.25%)	12 min/55°C	3.5
Alkaline cleaner (1.6 %)	15 min/43°C	> 5.6
Phenolic disinfectant (5%)	30 min/20°C	> 5.6
Enzymatic cleaner (0.8%)	5 min/43°C	3.5
Hydrogen Peroxide vapor	3 hr/25°C	4.5
Enz cleaner + HP vapor	Sequence	> 5.6



