

"Genotyping of *Chlamydia trachomatis* strains in a clinical lab"

IS IT USEFUL?

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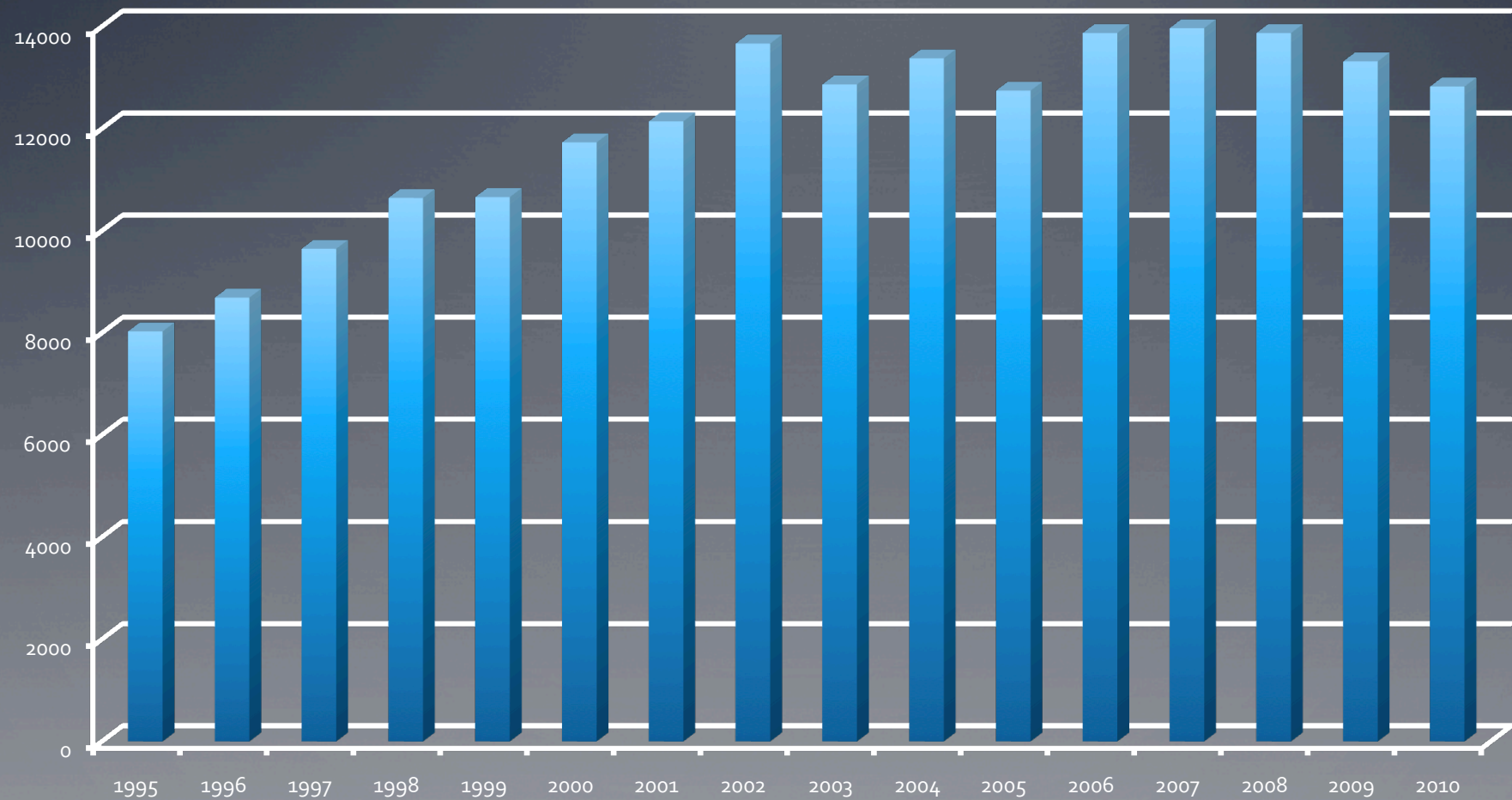
# *C. trachomatis* diagnosis in our lab



- Gen-Probe Aptima Combo 2 Assay
- Detects ribosomal RNA
- Excellent performance
- Positive vs. negative
- Tigris and Panther



*C. trachomatis* infections in Finland 1995-2010  
(data from National Infectious Disease Registry)



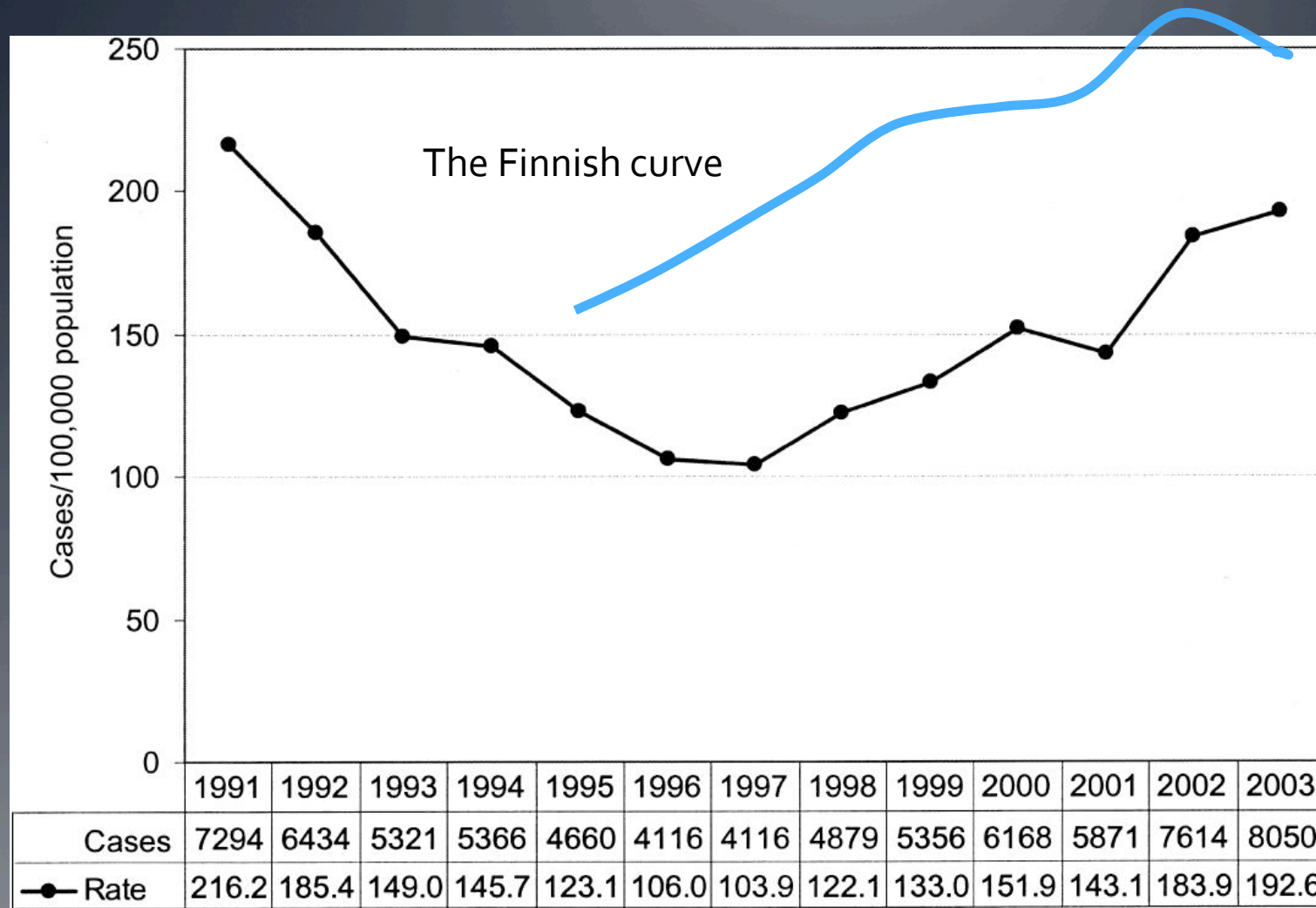
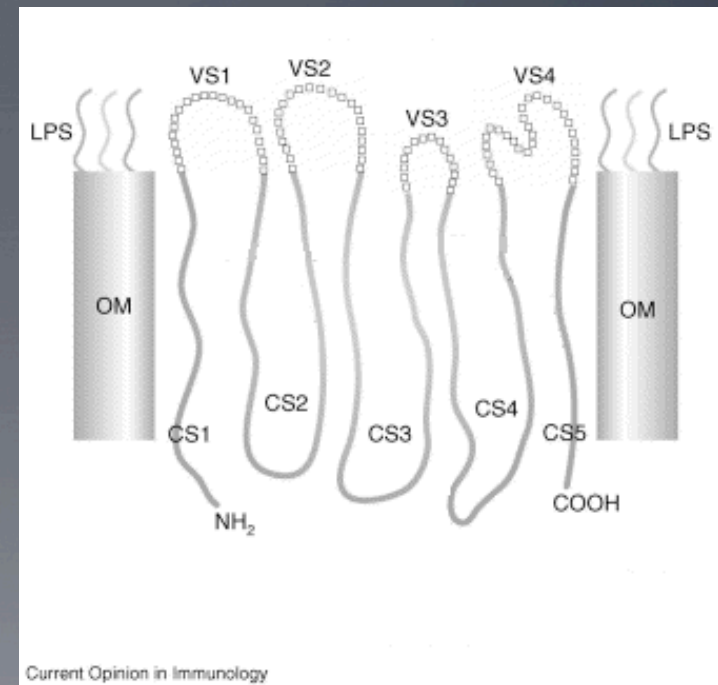


Figure 1. Chlamydia trachomatis infection incidence rates in British Columbia from 1991 to 2003. Rates initially declined between 1991 and 1997 and have increased since then. The no. of cases in 2003 (8050) exceeds that in 1991 (7294).

## *C. trachomatis* outer membrane protein A OmpA

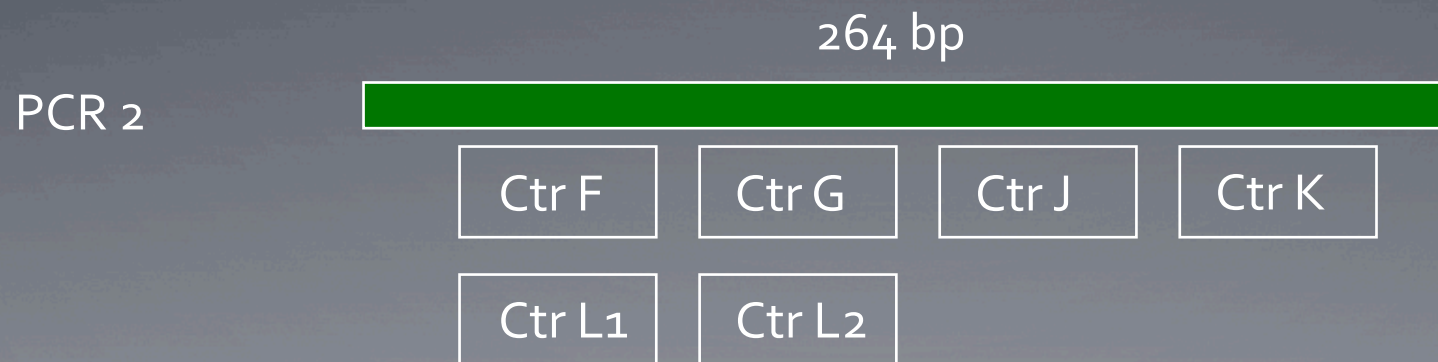
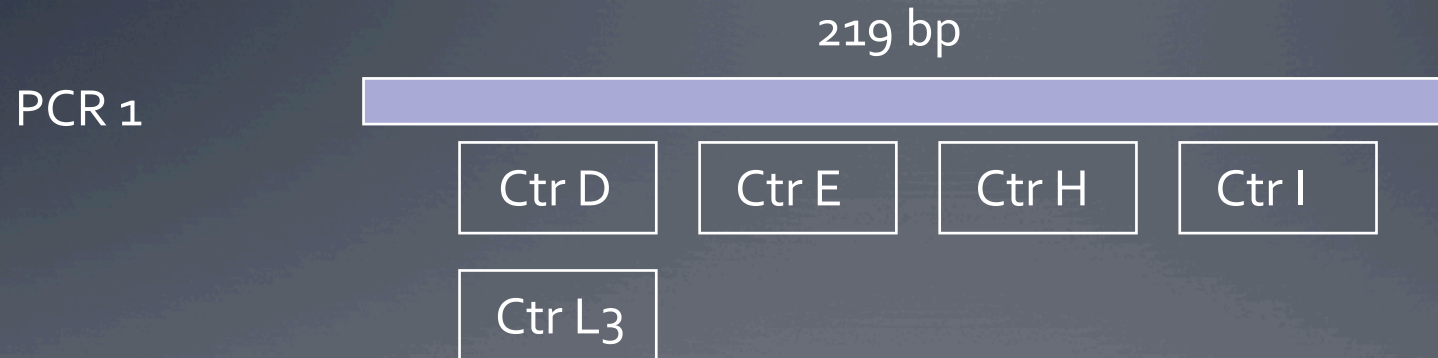
- major outer membrane protein (60%)
- Disulfide bridges
- Porin
- Typing
  - VS<sub>2</sub> (monoclonal ab)
  - the gene coding for VS<sub>2</sub> (PCR, sequencing)



Modified from Baehr et al. PNAS 1988  
and Kim & deMars 2001

# Genotyping PCR (*ompA*)

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## *C. trachomatis* genotypes in urogenital samples

161 positive specimens:

89 % could be genotyped

**E was the most frequent genotype**

**Do we have the Swedish variant of Ctr?**

No L<sub>1</sub>-L<sub>3</sub> types detected!

**Do the L types occur in Finland?**

Genotype	Number	(%)
E	57	40
F	41	28
G	20	14
D	11	8
K	7	5
H	5	3
J	2	1
I	0	0
D-F	1	1
total.	144	100

# PCR to detect the Swedish variant of Ctr

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variant (deletion  
in the plasmid)

98 bp PCR product, fluorescence



normal plasmid

475 bp PCR product, no fluorescence

Catsburg ym. 2007

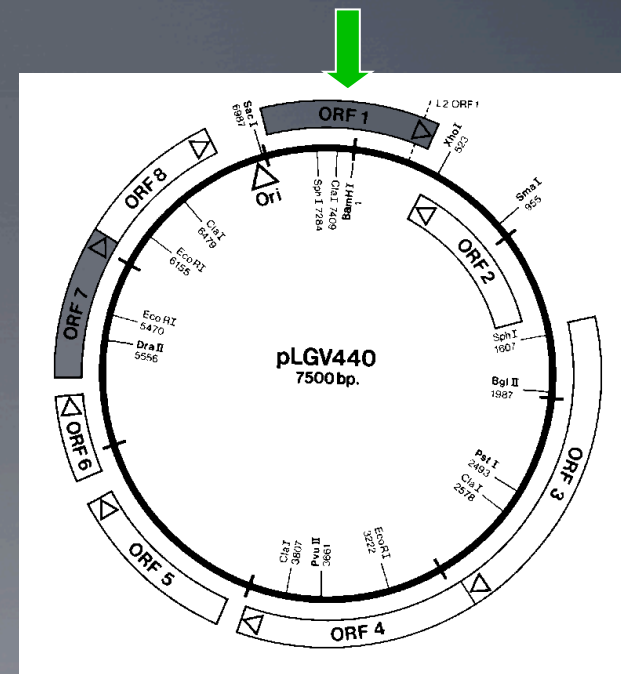
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# Search for the variant *Ctr*

495 samples were studied  
2 contained *Ctr* with the  
variant plasmid (0.4%)

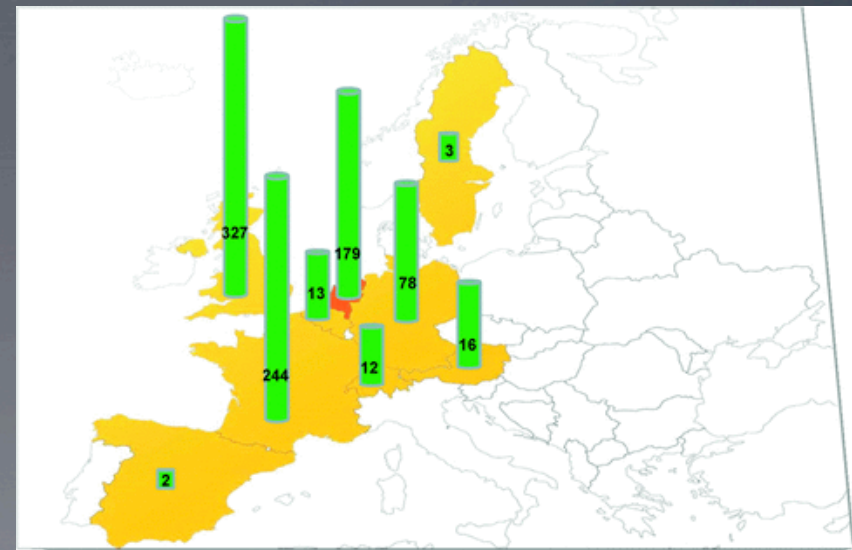
Genotype E

Sequencing



# Lymphogranuloma venereum (LGV)

- Endemic in Africa, India, Southeast Asia and South America
- In Finland: 1930's 100-200/year; nowadays rare
- 2003 on: Outbreaks among MSM



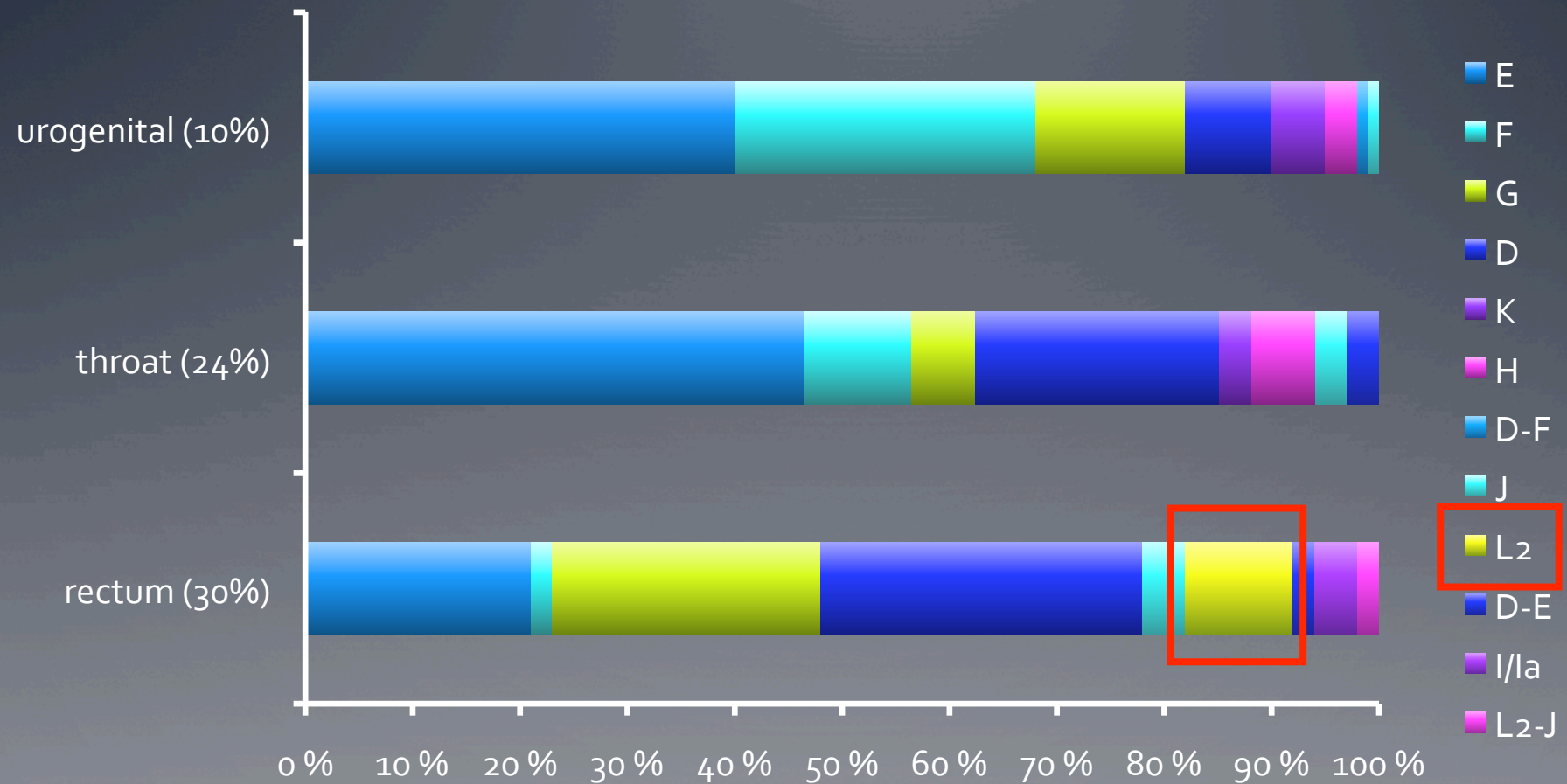
Stary & Stary 2008

# Genotyping PCR (*pmpH*): LGV vs. non-LGV

- Probes for LGV and non-LGV (Chen et al. 2008)
- A deletion of 36 bp in the *pmpH* of LGV strains

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CtrlA AACTCCGCCTGCTCTAGATCCATCCCCTACCGCTTCAAGCTCTTCATCTCCCACAGTCAGTGAT
CtrlB AACTCCGCCTGCTCCAGATCCATCCCCTACCGCTTCAAGCTCTTCATCTCCCACAGTCAGTGAT
CtrlBa AACTCCGCCTGCTCCAGATCCATCCCCTACCGCTTCAAGCTCTTCATCTCCCACAGTCAGTGAT
CtrlC AACTCCGCCTGCTCCAGATCCATCCCCTACCGCTTCAAGCTCTTCATCTCCCACAGTCAGTGAT
CtrlD AACTCCTCCAGCACCAGCACCAGCTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlE AACTCCTCCAGCACCAGCACCAGCTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlF AACTCCTCCAGCACCAGCACCAGCTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlG AACTCCTCCAGCACCA-----GTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlH AACTCCTCCAGCACCA-----GTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlI AACTCCTCCAGCACCA-----GTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlJ AACTCCTCCAGCACCAGCACCAGCTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlK AACTCCTCCAGCACCAGCACCAGCTCCTGCTGCTTCAAGCTCTTTATCTCCAACAGTTAGTGAT
CtrlL1 AACTCCGCCTGC-----TCCAACAGTTAGTGAT
CtrlL2 AACTCCGCCTGC-----TCCAACAGTTAGTGAT
CtrlL3 AACTCCGCCTGC-----TCCAACAGTTAGTGAT
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# Genotyping: Urogenital, rectal and throat swabs



# LGV

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- Subtypes L2a and L2b
  - MSM outbreaks: L2b
  - Sequencing( *ompA*)
    - 4 x **L2b** (more or less asymptomatic proctitis)
    - 1 x **L2** (lymphadenopathy)
  - All HIV-positive, MSM, some also had syphilis and/or GC
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# Conclusions

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- Samples sent for NAAT contain enough DNA for genotyping of *C. trachomatis*
    - Urogenital (90%)
    - Rectal (70%)
    - Throat (76%)
  - The Swedish variant *C. trachomatis* was rare in Finland
  - Infections due to L genotypes do occur
    - In rectal swabs only
      - Mild proctitis (L2b)
      - Lymphadenopathy (L2)
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## Is it useful in a clinical lab?

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- Epidemiologic surveillance
    - At times?
  - When LGV is suspected
    - Rectal swab (NAAT, culture)
    - Bubo pus aspirate (NAAT, culture)
    - Serology (even the CF test will be positive)
  - When rectal specimens are NAAT positive
    - Management
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# Thanks to

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- Haartman Instituutti: **SUVI NIEMI**, Eveliina Markkula, Anu Haveri, Jaakko Hulkkonen and Juha Korhonen
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