EADGENE
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Comparison of bovine and human O26 EHEC strains by the Whole Genome PCR Scanning (WGPS)

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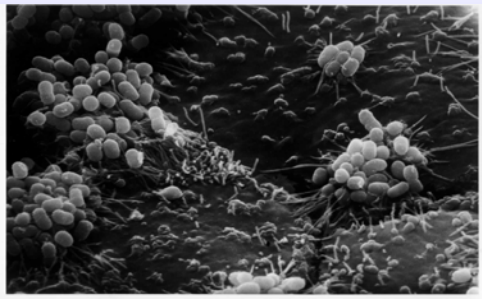
Introduction



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Enterohemorragic *E.coli*

In humans

Infected by plant and animal foods soiled by feces from cattle/sheep

In 90% → Hemorrhagic colitis

Important problem in public health in developped countries

Hemolytic Uremic Syndrome

Particularly in children and elderly → Renal sequelae, Death

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Enterohemorragic *E.coli*

In cattle

Several serogroups directly associated with diarrhea in calves

(2 weeks - 2 months)

Consequence: **Economic losses**

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Enterohemorragic *E.coli*

In cattle/sheep

Healthy carrier

Consequence: **Public health hazard**

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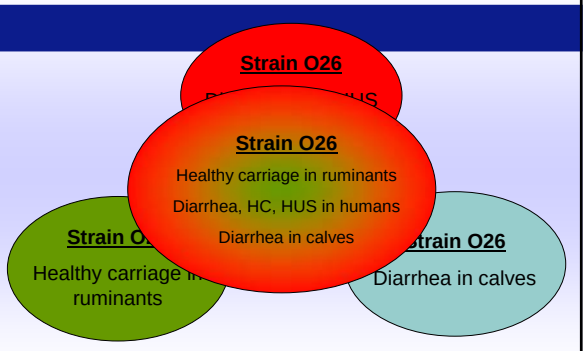
Host specificity



Aim

Identification of factors involved in host specificity (man or cattle) of EHEC O26 strains

Aim

Comparison of 12 bovine and human O26 strain genomes

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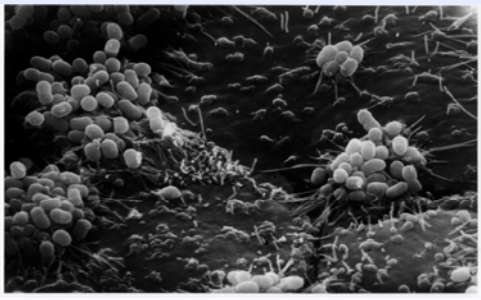
Whole Genome PCR Scanning

Material and methods



Whole Genome PCR Scanning (WGPS)

Amplification by PCR of the whole genomes with 579 pairs of primers based on a human O26 EHEC strain genome sequence

Comparison of the amplicon (10 000 bp) profiles

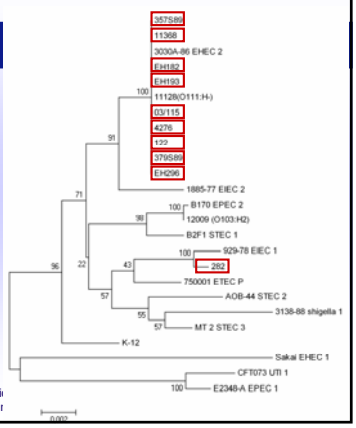
Strains O26

	Serogroup	Origin	Disease	Country	Shigatoxin	Intimin
EH193	O26:H11	Human	Diarrhea	Belgium	2	beta
EH182	O26:H11	Human	Diarrhea	Belgium	1	beta
EH296	O26:H11	Human	HUS	Belgium	2	beta
03/151	O26:H11	Human	?	France	1	beta
122	O26:H11	Bovine	?	Ireland	1	beta
379S89	O26:H11	Bovine	Diarrhea	Belgium	1	beta
357S89	O26:H11	Bovine	Diarrhea	Belgium	1	beta
4276	O26:H11	Bovine	Diarrhea	Ireland	1	beta
282	O26	Bovine	non pathogenic	USA	-	-
11368	O26:H11	Human	Diarrhea	Japan	1	beta
13247	O26:H11	Human	Diarrhea	Japan	1	beta
ED80	O26:H11	Bovine	-	Italy	1 and 2	beta

MLST

MLST on 7 housekeeping genes (*aspC, clpX, icdA, fadD, lysP, uidA, mdh*)

EcMLST (http://www.shigatox.net/stec/mlst-new/index.html)



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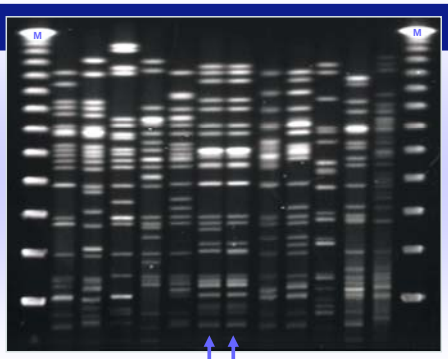
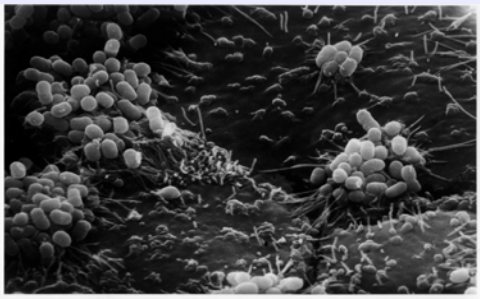
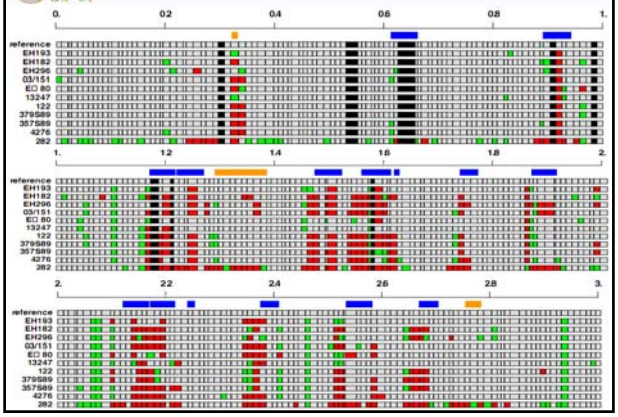
Pulse Field Gel Electrophoresis (PFGE)



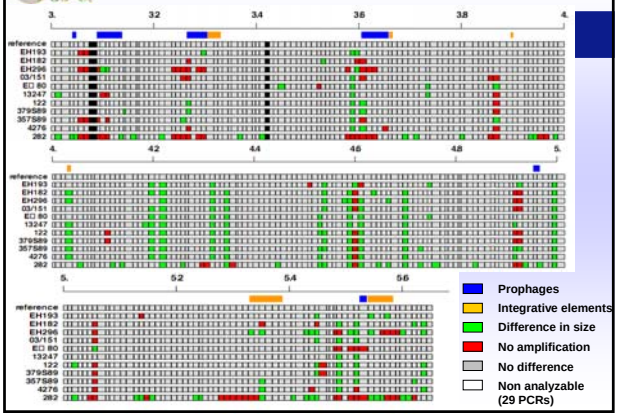
Results



WGPS



WGPS



O26 strain structural diversity: total of 550 PCRs

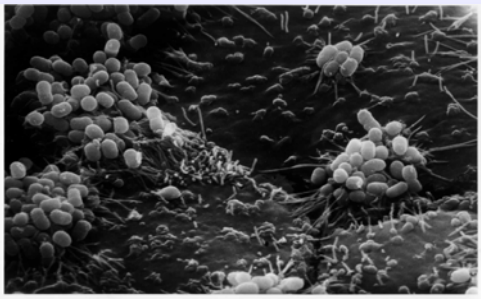
	EH182	EH193	EH296	03/115	122	4276	357S89	379S89	282	ED80	13267
Amplicons identical in size	**90%**	**83%**	**79%**	**85%**	**84%**	**84%**	**84%**	**85%**	**56%**	**88%**	**89%**
	497	458	432	468	462	462	460	468	306	486	492
Amplicons different	**10%**	**17%**	**21%**	**15%**	**16%**	**16%**	**16%**	**15%**	**44%**	**12%**	**11%**
	53	92	118	82	88	88	90	82	244	64	58
Amplicons different in size	**5%**	**6%**	**9%**	**6%**	**7%**	**7%**	**7%**	**6%**	**18%**	**7%**	**7%**
	29	35	49	31	41	39	39	35	98	39	41
Amplicons not amplified	**4%**	**10%**	**13%**	**9%**	**9%**	**9%**	**9%**	**9%**	**27%**	**5%**	**3%**
	24	57	69	51	47	49	51	47	146	25	17

Comparison between bovine and human strains

14 regions seem to be different between bovine and human strains

Mostly in prophage and integrative element regions

Conclusion and perspective



Conclusion and perspective

O26 strains structural diversity

- Average of 15% of diversity
- Mostly in prophage and integrative element regions
- Study in details
- Need for more PCR

Conclusion and perspective

Comparison between bovine and human strains

- 14 « interesting » regions
- Study in details (genes)
- Need for more PCR
- Sequencing

Conclusion and perspective

Comparison between pathogenic and non pathogenic strains

- Non pathogenic O26 *E.coli* well characterized
- A tool for further study

Aknowledgments

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and his team

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