

Comparison of bovine and human O26 EHEC strains by the Whole Genome PCR Scanning (WGPS)
 Marjorie Bardiau(1)*, Yoshitoshi Ogura (2), Tetsuya Hayashi (2), Jacques Mainil(1)
 1University of Liège, Belgium, 2 University of Miyazaki, Japan

EADGENE European Animal Disease Genomics Network of Excellence for Animal Health and Food Safety

Animal Disease Genomics: Opportunities and Applications
 10th - 11th June 2008, Edinburgh, UK

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Marjorie Bardiau^{1*}, Yoshitoshi Ogura², Tetsuya Hayashi², Jacques Mainil¹

¹Laboratory of Bacteriology, Department of Infectious Diseases, Faculty of Veterinary Medicine, University of Liège, B-4000 Liège, Belgium
²Division of Biomedical Science, Frontier Science Research Center, University of Miyazaki, 5200 Kihara, Miyazaki, Miyazaki, Japan.
 *mbardiau@ulg.ac.be

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Introduction

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EADGENE **Enterohemorrhagic E.coli**

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

In 90% Hemorrhagic colitis

Important problem in Hemolytic uremic syndrome developed countries

Particularly in children and elderly

Renal sequelae Death

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EADGENE **Enterohemorrhagic E.coli**

In cattle Several serogroups directly associated with diarrhea in calves (2 weeks - 2 months)

Consequence: **Economic losses**

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EADGENE **Enterohemorrhagic E.coli**

In cattle/sheep Healthy carrier

Consequence: **Public health hazard**

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EADGENE **Host specificity**

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EADGENE **Aim**

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

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EADGENE **Aim**

Comparison of 12 bovine and human O26 strain genomes

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Whole Genome PCR Scanning

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EADGENE **Material and methods**



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EADGENE **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

O26 genome

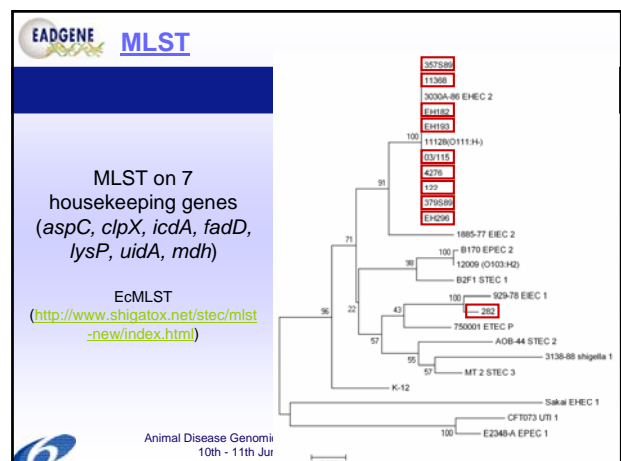
Comparison of the amplicon (10 000 bp) profiles

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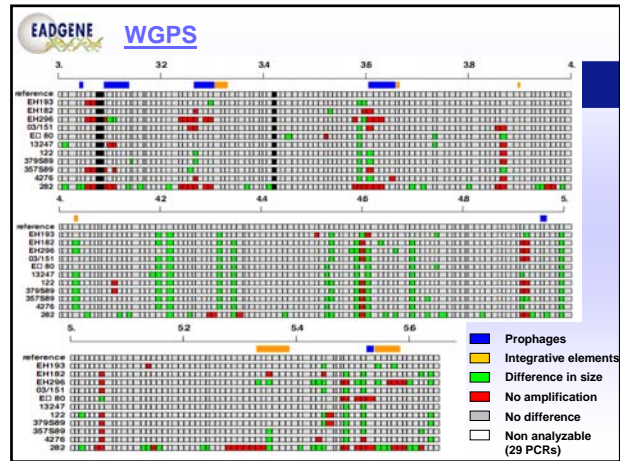
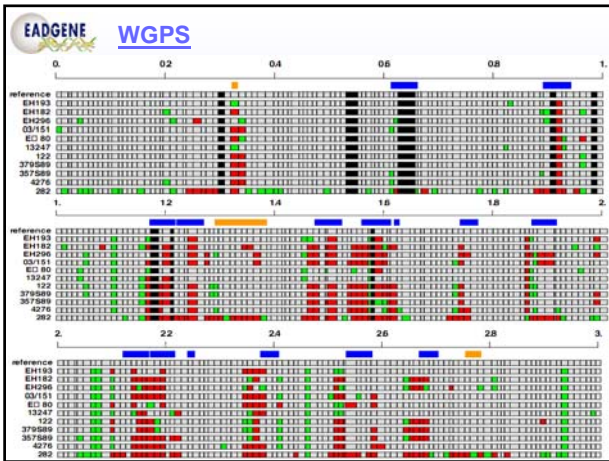
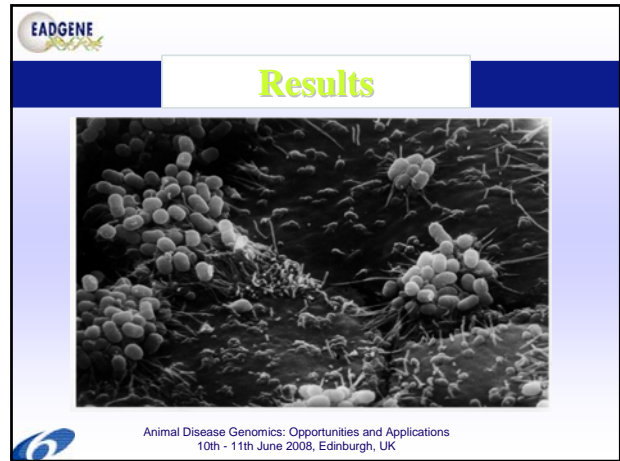
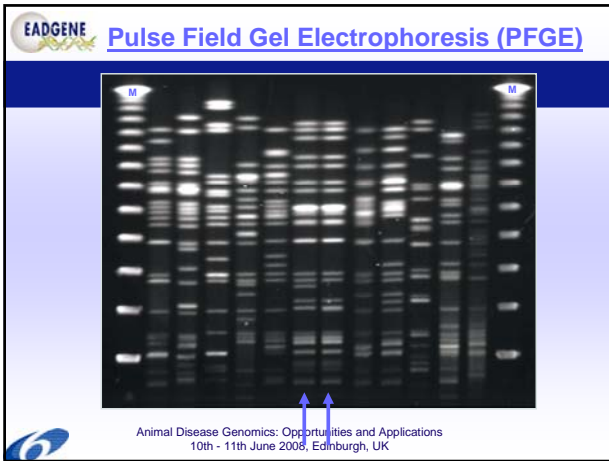
EADGENE **Strains O26**

	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

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EADGENE O26 strain structural diversity: total of 550 PCRs

	EH182	EH193	EH296	O3/115	122	4276	379589	379589	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

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EADGENE Comparison between bovine and human strains

14 regions seem to be different between bovine and human strains

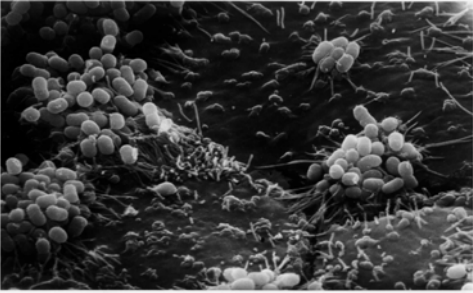
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Mostly in prophage and integrative element regions

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Conclusion and perspective



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EADGENE 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

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EADGENE Conclusion and perspective

Comparison between bovine and human strains

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

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EADGENE Conclusion and perspective


Comparison between pathogenic and non pathogenic strains

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

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EADGENE Acknowledgments

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Division of Bioenvironmental Science, Frontier Science
Research Center, University of Miyazaki, 5200 Kihara,
Kiyotake, Miyazaki, Japan.

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